A STUDY TO EXAMINE THE EFFECTIVENESS OF THE BoTT APPROACH FOR WATER SCHEMES TO RURAL AREAS

by

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Submitted in part fulfillment of the requirements for the degree of Magister Technologiae : Engineering: Civil in the Department of Civil Engineering and Survey in the Faculty of Engineering at M.L. Sultan Technikon

Supervisor	:	**Dr. D Allopi**
Co-Supervisor	:	**Mr C.P. Brand**
Date Submitted	:	**25 June 2002**

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ANNEXURE E1

DECLARATION BY THE CANDIDATE IN RESPECT OF THE CONTENTS OF THE DISSERTATION/THESIS

The Administration Officer
School of Postgraduate Studies
ML SULTAN TECHNIKON

Dear Sir/Madam

I, Vasanthie Munnery

Reg. No.: 5512

Hereby declare that the thesis entitled

A study to examine the effectiveness of the BoTT approach for water supply to rural areas.

Submitted for a Masters Degree in Technology :Civil Engineering in the Department of Civil Engineering and Survey, Faculty of Engineering is the result of my own investigation and research and that it has not been submitted in part or in full for any other degree or to any other Tertiary Institution.

Signature of Student

25 June 2002
Date

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ANNEXURE E2

PREFACE

The work described in this dissertation/thesis was carried out by the author in the Department of Civil Engineering & Survey, Faculty of Engineering, ML Sultan Technikon, from August 1999 to December 2001 under the supervision of

Dr D. Allopi

These studies represent original work by the author and have not been submitted in any form to another Tertiary Institution. Where use is made of the work of others, it has been duly acknowledged in the text.

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ANNEXURE D

SUPERVISOR'S PERMISSION FOR SUBMISSION OF DISSERTATION / THESIS

STUDENT SURNAME:	Munnery	INITIALS:	V

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A study to examine the effectiveness of the BoTT approach for water supply to rural areas.

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ANNEXURE D

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ANNEXURE F

REPORT OF THE EXAMINATION PANEL FOR A DISSERTATION/THESIS

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Title of Dissertation/Thesis:

A study to examine the effectiveness of the BoTT approach for water supply to rural areas.

Examiners :

External Examiner 1 : Dr.Joslin.....

External Examiner 2 : Professor Utting.....

The reports of the examiners were considered. The recommendation of the examination panel is (all examiners reports to be attached to this report)

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Signature of Chairperson Date

Examination Panel:		**SIGNATURE**
Dean/Chairperson	:	.....
Head of Department	:	.....
Director: Research or his representative	:	.....

Two Technikon staff with appropriate qualifications, preferably from the faculty:

.....

Faculty EXCO Recommendation

.....

.....

_____ _____

Dean's Signature Date

ABSTRACT

The new South African Government that came into power in 1994 faced a daunting task of undoing the political injustices of the past. The government immediately introduced a Reconstruction and Development Programme (RDP) to address these injustices.

The emphasis of RDP was on creating job opportunities through labour-based construction. At that time in South Africa, between 12 and 21 million people in the rural, previously disadvantaged communities were without adequate water and basic sanitation. It would take the government between 20 and 30 years to bring these services to all South Africans by conventional means.

The government, through the Department of Water Affairs and Forestry (DWAF), recognized the need for clean, safe water and healthy sanitation for all the people of South Africa. The traditional methods of construction however, were considered to be "too slow". The Department of Water Affairs and Forestry (DWAF) subsequently came up with a new, imaginative way to "fast track" the process of delivering water and sanitation to more communities. This new concept was called BoTT, which stands for Build, Operate, Train, Transfer.

The thesis compared the two methods of delivery i.e. the traditional method with the BoTT approach to see which was effective. The water sector of both approaches was analysed.

The BoTT approach was found to be more effective in meeting the RDP principles. However, the system was indicated to be most suitable for localised projects.

The conventional Civil Engineering method was found to be most affective in large schemes and less costly because the tender process had the benefit of competition between the tenderers. However, skilled labour was imported resulting in little local training. The conventional method did not provide Operation and Maintenance service after delivery.

The recommendations of this thesis are:

- that the BoTT approach be confined to concentrated, regionalised areas and
- that the water supply be provided to individual households in order to be self-sustainable through higher water sales.
- A sustainability study must be undertaken prior to the initiation of any scheme to assess the ability of the District Municipality and the community to operate and maintain the scheme.

The clear message to be drawn from the comparison of the BoTT and Non-BoTT approaches to water supply was that BoTT schemes have a place in the engineering sector. It will be incumbered upon the responsible Water Authority to carry out a sustainability study as to which method is most appropriate for a specific project or group of projects.

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ABBREVIATIONS

ADU	Automatic Dispensing Unit
AMSL	Assumed Mean Sea Level
BoTT	Build, Operate, Train and Transfer
BP	Business Plan
CWSS	Community Water Supply Schemes
DM	District Municipality
DWAF	Department of Water Affairs and Forestry
EIA	Environmental Impact Assessment
ER	Employer's Representative (BoTT)
IA	Implementing Agent
ISD	Institutional and Social Development
LA	Local Authority
NEF	National Economic Forum
NPWP	National Public Works Programme
O&M	Operation and Maintenance
PDI	Previously Disadvantaged Individual
PDC	Previously Disadvantaged Company
PIA	Provincial Implementing Agent (BoTT)
PSC	Project Steering Committee
RC	Regional Council (KwaZulu Natal)
RDP	Reconstruction and Development Programme
SAFCEC	South African Federation of Civil Engineering Contractors
SMMSE	Small Micro and Medium Sized Enterprise
TMC	Town Management Committee
WC	Water Committee
WSA	Water Services Authority
WSI	Water Services Institution
WSP	Water Services Provider
WCA	Workman's Compensation Act
UIF	Unemployment Insurance Fund

DEFINITIONS

ADUs	Automatic Dispensing Units Both the Shemula and Nqutu CWSS have pre-paid ADUs as a means of dispensing water. The Shemula CWSS has the Bambimanzi ADUs, while the Nqutu CWSS utilizes the AquaNova ADUs. Tokens, which are purchased from water vendors, are used to activate the ADUs.
Support	Once construction of a BoTT project is complete, the Operation and Maintenance component of AquAmanzi supports the project. AquAmanzi monitors, evaluates and where necessary, provide ongoing training to the WSP/WSA.
Mentoring	On completion of the Operations and Maintenance Support Period, the project will move into an optional five-year mentorship period. The mentorship phase requires a reduced support level by the PIA, in the form of regular monitoring, evaluation and report back.
Sustainability	The ability of a project to be self-supporting ie a cost recovery system has to be in place.

CHAPTER 1: INTRODUCTION

The industrial revolution heralded a new era. The invention of machinery was seen to be not only a sign of progress but also as an improvement in productivity.

In South Africa the "apartheid" era controlled the balance between the application of machinery and labour based construction. Government policies encouraged the purchase of capital equipment whilst at the same time discouraged the migration of labour to urban areas. The introduction of the minimum wage legislation led to a further decline of the labour force whilst at the same time machinery enjoyed favourable fiscal treatment. The downturn of the economy of the country in the late 1980s also led to a decline in labour employed in construction. This in turn led to high unemployment.

The high level of unemployment, resulting in a backlog of basic infrastructures as well as the shortage of capacity to build and maintain infrastructure in the rural disadvantaged communities in the 1990s, led the National Economic Forum (NEF) to carry out a pre-investment study for the National Public Works Programme (NPWP).

The cabinet of the Government of National Unity approved the report of the pre–investment study (NEF, 1994) and used this as a basis for its NPWP, which was an important part of the Reconstruction and Development Programme (RDP), in an attempt to repair the injustices of the past. The RDP programme was set up by the government in 1994 to "fast track" the backlog of infrastructure to previously disadvantaged communities.

The basic principles to a NPWP adopted by the NEF study (NEF, 1994) were:

- The systematic re-orientation of the public sector approaches to infrastructure provision to ensure a substantial increase in job creation, skills development and capacity building.
- A fund that would support communities undertaking their own public works.

The NEF had many focus groups, however only the technical aspects relevant to this research topic are dealt with. One of the focus areas of the NPWP was the concentration on labour intensive construction methods where possible and feasible.

The Department of Water Affairs and Forestry (DWAF) recognized the need for the provision of clean, safe water and healthy sanitation to mainly rural communities through the Government RDP programme. The Department also saw a great potential using labour intensive methods to construct water supply and sanitation schemes in rural areas but also realised that owing to the high material costs, the costs of labour would also be high.

At the time, between 12 and 21 million people in the rural previously disadvantaged communities were without adequate water and basic sanitation and the estimation was that it would take the government between 20 and 30 years to bring these services to all South Africans (DWAF, 1997a).

The BoTT scheme was therefore introduced as a way of fast-tracking delivery in order to meet the needs of the people. The Thesis will examine the effectiveness of the water supply to rural schemes by establishing whether the expectations of the communities were met .

1.1 BASIC PRINCIPLES OF LABOUR INTENSIVE CONSTRUCTION

Labour intensive construction refers to the construction process that utilises as much labour as possible without lowering standards or quality. Construction techniques should result in good quality, cost effective and lasting infrastructure while also providing effective training and capacity building. The employment of labour could be made directly by government departments, small local contractors under a main contractor or under a project management team. Labour based construction should utilise a combination of machine/labour in order to obtain a good quality, cost effective project within its time constraints(Philips *et al* 1995).

1.1.1 Appropriate Materials and Design for Labour Intensive Construction

Design should be appropriate for labour intensive construction. The implementation of machinery based design methods on labour intensive design projects could be very expensive. The appropriate standards for labour intensive construction methods must therefore be applied. Labour intensive construction should be an important part of NPWP at the design stage (NEF, 1994).

1.1.2 Development of Improved Labour Intensive Construction Techniques

Labour intensive construction must be developed using modern engineering, project management and human resource techniques in order to improve the productivity and cost effectiveness of labour intensive techniques (World Bank 1986). The improvement of productivity must be achieved by the use of incentive systems of payment and the training of supervisory as well as managerial personnel.

1.1.3 Pilot Projects

Pilot projects should be run on a small scale so that methods may be developed and teething problems solved.

1.1.4 Tendering and Contract Administration

Tendering and contract administration should be adjusted to allow for labour intensive construction. However, the contract document must be compiled in such a way that contractors are not given an allowable financial premium, and in such a way that low labour productivity not be allowed.

1.1.5 Small Contractor Development Programmes

Development programmes should be geared to help small contractors in 5 main areas:

- Continuity of work
- Access to advice
- Training
- Finance
- Community Participation

The participation of local communities should become an integral part of the NPWP, as consultation was vital between the community and all the other participants in the planning and design stages of projects, thus ensuring that the infrastructure was desired and needed by the community. The community should also be involved in the construction and post construction phases of the projects. The reimbursement of community participation should become a formal part of the planning stages of projects(Philips *et al* 1995).

1.1.6 Supervision

Training of supervisory staff was of utmost importance in order to ensure that high productivity rates were obtained and assets produced were of the required standard.

Labour intensive construction methods including the setting of tasks, piecework systems of payment, the use of site management techniques such as team balancing, and the need for thorough record keeping must be taught to supervisors.

The issue of certificates through accredited training programmes offers a career structure for supervisory personnel as well as the continuity of work (Philips *et al* 1995).

1.2 EARLY APPROACH TO IMPLEMENTING RDP CWSS

DWAF appointed Implementing Agents (IAs) for projects identified by Non Government Organizations (NGOs), water boards, and the then Regional Councils.

IAs were required to produce Business Plans before funding was approved prior to 1997. Business Plans had to include capital costs of project and address sustainability of scheme by local communities.

Once funding was approved it was the IAs responsibility to implement the project. In most cases the IA chose the established routes of letting the construction work to open public tender, usually through a consulting engineer.

The scope of work encountered here was:

- Project Planning and Feasibility Study.
- Business Plan and Approval of Funding.

- Training, Capacity Building and Community Awareness Creation,
- Preliminary and Detailed Design of Optimum Scheme.
- Environmental Impact Assessment.
- Tender Documents Preparation.
- Tender Process, Evaluation and Award.
- Construction.
- Mentoring and evaluation of operational staff.
- Commissioning.
- Monitoring of the Operation and Maintenance of the asset for a period after commissioning.

The problems encountered with this process were:

- This process usually took approximately 5-6 months before construction started after Business plan approval.
- DWAF found it very difficult to spend their annual budget due to the time constraints.
- It appeared to DWAF as if the IAs were not delivering.
- It was found that IAs mostly did not have capacity to mentor the projects after completion.
- Business Plans did not allow enough money in the budget for mentoring.

The general perception amongst the public sector was that the RDP programme was not proceeding well.

1.3 THE BoTT APPROACH TO IMPLEMENTING RDP CWSS

The Department of Water Affairs and Forestry consequently introduced an alternative way to speed up delivery of services to rural communities at a more rapid rate. Build, operate, train and transfer (BoTT) was the new concept that was hoped to break through existing backlogs and streamline delivery of clean, safe water and healthy sanitation to millions of South Africans.

BoTT encompasses the basic principles of the RDP Programme. The BoTT concept was not intended to replace the current ways of implementing projects but was introduced to assist in the speeding up of the implementing process. Figure 1.1 shows the comparison between BoTT and non-BoTT time schedules.

Figure 1.1 depicts a theoretical time saved on the BoTT process in comparison with a non-BoTT process, that is the BoTT process is fast tracked due to the elimination of the tender process.

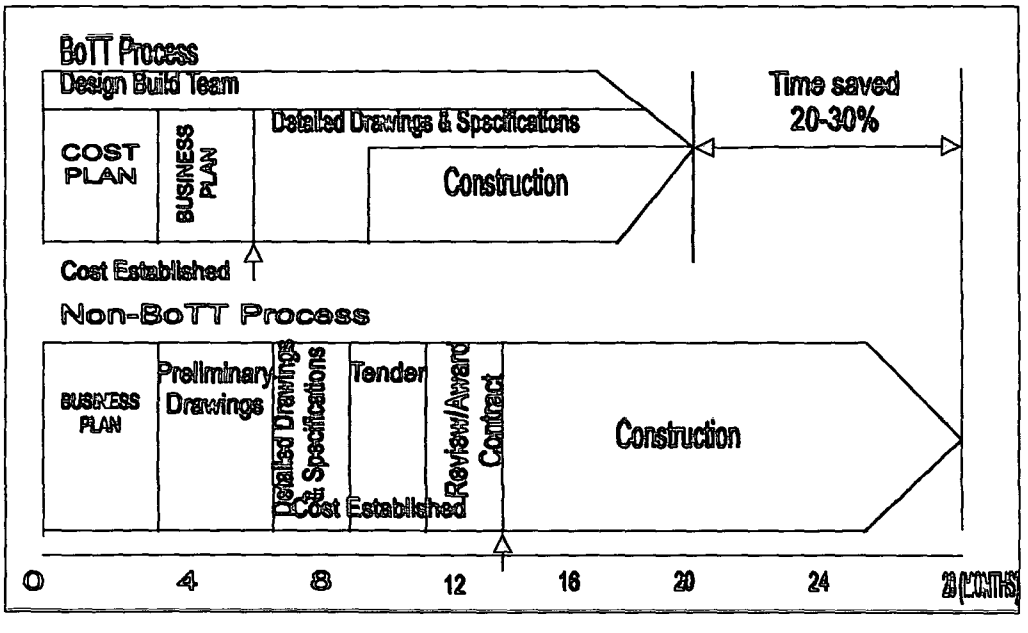

Figure 1.1: Comparison between BoTT and Non-BoTT schedules (Howe 1996)

1.3.1 What is BoTT?

The BoTT approach implemented projects through the use of a management contract ie a partnership between the Department of Water Affairs and Forestry (DWAF) and private sector consortia or groups, called Provincial Implementation Agents (PIA), with the involvement of local community and local authorities. The

principles of a public tender had not been abandoned. The main difference was that the tender procedure has only gone through once, eliminating the time spent on tendering for each project.

The main objective was to combine the skills and resources of the private sector with the vision and financial strength of the public sector. Communities were involved in decisions relating to the scale and nature of projects. People were empowered through skills training and capacity building.

The BoTT management contract covered all parts of a project. The PIA was responsible for everything, from feasibility studies to designing, building, operating the project for a limited period, training local community and local government to collect revenue, operate and maintain the infrastructure and then transfer ownership to the local authority.

The basic principles were as follows:

Build: Labour based construction methods were used in these schemes. Basic technical skills were offered to the community at large, whilst more specialized skills were offered to a select few. Entrepreneurial skills were also developed within the community from labour contracting through to specialized sub contracting to full contracting skills.

Operate: The Provincial Implementing Agent (PIA) operated and maintained the scheme after the scheme was commissioned and this support period could take up to two years. Once the support period was over, the PIA offered mentorship on the project until required. In terms of the BoTT agreement, once a project was commissioned, a two-year support period was offered to the WSA/WSP. Thereafter a mentorship period could be offered by the PIA to the WSA/WSP until such time the WSP could manage

the Operation and Maintenance confidently. The support costs were built into the contract, whilst mentorship costs were an option. The optional costs were to be borne by the District Municipality.

Train: A vital component of the programme was the institutional and social development component , which was built into the project. Nominated members of the community were also trained to operate and maintain installed infrastructure and administer the system in a sustainable way.

The adoption of the pre-payment system for water, which would ensure fair and equitable payment by members of the community for the level of service they receive, would facilitate the training of the community in the concept of payment for services provided in addition to the capacity training programme.

Transfer: Once the community and relevant Local Authority had accepted responsibility for the operation and maintenance of the project and demonstrated, through an agreed set of indicators, that they could do so, transfer of ownership could be negotiated ie the total responsibility for the operation, maintenance and repair of the scheme.

The BoTT contract included five phases:

- The Business Plan
- Organizational development
- Design and construction
- Operation and maintenance
- And project transfer to a capable operating authority

Tenders were invited for the BoTT contract and the tender for KwaZulu-Natal was won by the AquAmanzi consortium.

1.4 THE RESPONSIBILITY OF THE PROGRAMME IMPLEMENTING AGENTS

AquAmanzi in close co-operation with DWAF focused its activities in KwaZulu Natal area. AquAmanzi operated thirty projects in KwaZulu Natal and had prepared business plans for another thirty projects. The projects will improve the life of at least 150 000 households and are designed to meet the RDP target of bringing 25 litres of water per person per day to within a 200 m walking distance of each household.

AquAmanzi is divided into four components comprising institutional and social development (ISD), project design, construction, operation and maintenance.

These components are filled by:

- Wilson Bailey Holmes – Incorporating Stocks & Stocks, who are responsible for the construction of projects, involvement of emergent contractors and Small Micro and Medium Size Enterprises (SMMSE) in construction activities.
- Jeffares Green Parkman – responsible for providing the project management and engineering services. The preparation of business plans, detailed design and the monitoring of project construction.
- Geldart Mokoatsi and Associates – providing the institutional & social development services. Community facilitation and empowerment of communities to oversee projects from planning and construction to operation and maintenance phase. Communities are assisted to establish Project Steering Committees (PSCs).
- Bateman Water (Pty) Ltd incorporating Aquafund – responsible for the operation and maintenance services (O&M). This component is responsible for the training and support to project

communities and local authorities, regarding scheme administration operation and maintenance of water supply schemes, revenue collection and facilitating of project transfer.

1.4.1 How does it all work?

- DWAF, having identified a need for a water project in a particular area, issues an 8.1.1 notice to AquAmanzi to start planning the project. The 8.1.1 notice authorizes AquAmanzi to start a project. (An 8.1.1 and 8.1.2 notice are DWAF terms of reference as per the BoTT contract. An 8.1.1 notice is given to start BP preparation, and an 8.1.2 notice is given to start construction.)
- A cost plan is submitted to DWAF outlining a programme and methodology in compiling a Business Plan.
- DWAF approves the cost plan and a framework for the Business Plan is set up.
- The ISD component sets up a Project Steering Committee that is elected by the community for the project.
- Once the PSC is established, the AquAmanzi team meets with them to give an overview of the project.
- A draft of the Business Plan is then written in consultation with the PSC and the Local Authority
- The final Business Plan document is then forwarded to DWAF for approval.
- Once the Business Plan is approved an 8.1.2 notice is issued to proceed with the implementation of the project. The 8.1.2 notice authorizes AquAmanzi to commence construction of the project.

Figure 1.2 shows the action flow plan in response to an 8.1.1notice.

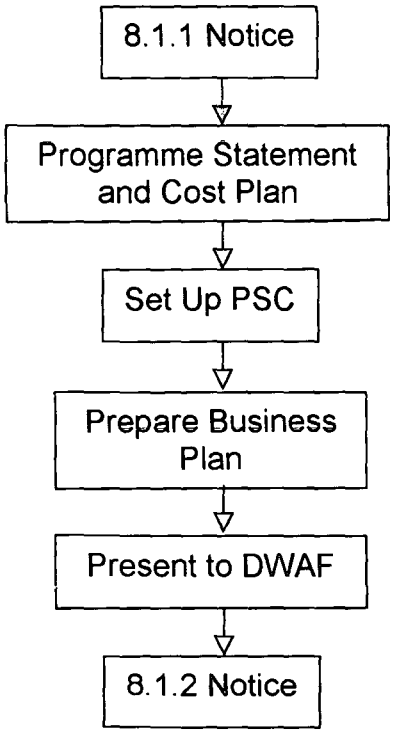

Figure 1.2: Action Plan Flow Chart in Response to 8.1.1 Notice

1.5 INCEPTION OF BoTT

The BoTT programme in KwaZulu Natal started in July 1997. DWAF identified approved Business Plans written in the non-BoTT format as projects to be included in the BoTT programme. These projects, which were Nqutu 1, Nqutu 2 and Ndatshana, were utilized to "kickoff" the BoTT programme immediately. These projects were all based in the Umzinyathi District Municipality. The non-BoTT Business Plans that were not approved were rewritten and approved in the BoTT format and implemented thereafter. It usually took a month after approval of a BoTT Business Plan to implement the project whereas a non-BoTT project can take up to six months to implement after approval of the Business Plan.

1.6 OBJECTIVES OF THE RESEARCH

The study intends to fulfill the following:

- A comparison of a non–BoTT and a BoTT Community Water Supply Scheme in order to evaluate their effectiveness.
- Gain community perceptions of their respective schemes by conducting community surveys.
- Gain feedback from Implementation Agents on their respective schemes.
- Develop a method for the best delivery of water

1.7 OVERVIEW OF THE CHAPTERS

An overview of the chapters is as follows:

- Chapter 2 is a comparison between a non–BoTT (Shemula CWSS) and a BoTT (Nqutu 2 CWSS) schemes. The setting up of each scheme is analysed and the different methods of capacity building, construction planning, operation and maintenance are highlighted to gain a better understanding of each of the schemes.
- Chapter 3 deals with community surveys. In order to evaluate the community perception of their respective schemes community surveys were undertaken. Questionnaires were compiled for completion by the community.
- Chapter 4 deals with the Implementing Agents survey. Questionnaires were compiled by the author and completed by the IAs so that their perceptions of their schemes can be analysed.
- Chapter 5 draws conclusions from the community surveys and the IAs surveys.
- Chapter 6 gives idealistic recommendations from conclusions reached.

1.8 METHODOLOGY OF RESEARCH

The need to compare the effectiveness of the Non-BoTT and BoTT approach to water supply in regard to meeting the expectations of the

community compared to the RDP principles, became necessary once the initial schemes had been completed.

Baseline surveys are conducted on BoTT projects so that the project team can gauge the needs of the community and plan their project around it. The author was able to utilize the baseline survey questionnaire as guide in preparing the questionnaires for this thesis. The questionnaire was compiled in English and presented to the community through Zulu speaking facilitators. The completed questionnaires were returned for capture on the computer and sorting into answer groups for presentation in graph form. A random ten percent sampling was taken of the actual households that benefited from these schemes.

Questionnaires were also prepared for IAs so that their perceptions of their respective schemes can be gauged. The results were then analyzed and translated for ease of reference in order to reach conclusions from which recommendations were made.

CHAPTER 2: COMMUNITY WATER SCHEMES COMPARED

In order to evaluate the effectiveness of the BoTT approach against the traditional approach, two Community Water Supply Schemes (CWSS) were considered. One was implemented through BoTT, the other a non–BoTT RDP scheme. Both these schemes were undertaken by Jeffares Green Parkman.

Both these schemes encompassed the basic RDP principles, which are:

- an assured supply of potable water, in accordance with the short-term goals of the RDP, namely a minimum demand of 25 litres per person per day within a walking distance of 200 metres from their place of residence.

To achieve the above objective the opportunity existed to enhance the skills of the local community and to meet the demand for much needed jobs within the constraints of the particular project. The focus was therefore on the following:

- To reduce unemployment through the creation of jobs, in local communities through a labour intensive approach, which is physically feasible and economically justifiable.
- To provide opportunities for, and promote the development of, local emerging contractors especially from previously disadvantaged sectors.
- To educate and train those on the project as a means of economic empowerment.
- To create and maintain physical assets that serve to meet the basic needs of communities and to promote a broad range of economic activities.
- To build the capacity of communities to manage their own affairs, strengthen local governance and generate sustainable economic development.

- To put a system in place to ensure ongoing sustainability of the operation and maintenance of the proposed community water supply and sanitation project.

2.1 SHEMULA 2 CWSS (Non-BoTT)

2.1.1 Location

The Shemula 2 CWSS is located in the Maputoland Region of KwaZulu-Natal and is an extension of the Shemula 1 CWSS, which was one of the Presidential Lead Projects (ie one of the first schemes to be constructed under the principles of the RDP). Mhlathuze Water was the IA for the Shemula projects. It should be noted that the details of the Shemula CWSS has been taken from JGP 1997.

The Shemula 2 CWSS encompasses two separate areas:

- The Ingwavuma Extension, which includes the town of Ingwavuma and surrounding peri-urban sub-wards of Magugu, Machobeni, Lundini and Okhalweni.
- The East Bank Extension, which extends some 50 km along the eastern bank of the Phongolo River and includes 14 sub-wards in the Tembe and Mashabane Tribal Authorities.

A locality plan is shown in **Appendix A**.

2.1.2 General Description of the Project

The Shemula 2 CWSS supplies water to the town of Ingwavuma and the peri-urban settlements surrounding the town, and to areas along the eastern bank of the Phongolo River. The extension along the eastern bank of the Phongolo River covers an area approximately 50 km long in the north-south direction and ranges

between 10 and 20 km across in the east-west direction. The supply area is shown on the Scheme Layout in **Appendix B**. Table 2.1 shows the design population and the projected water demand.

Area	Size (Ha)	Population		Projected Demand (m^3/day)	
		1996	2001	(1996/97)	2011
East Bank	80474	42530	61590	81	1740
Ingwavuma	1587	7840	11350	108	825

Table 2.1: Summary of the demographics of the two areas supplied by the Shemula 2 CWSS

The area served by the Shemula 2 CWSS featured scattered rural development with homesteads consisting of multiple individual dwellings. Along the eastern bank of the Phongola River people had to walk great distances each day to collect water by hand. The boreholes that existed in the region, produced generally saline water.

The assumed 2,5 percent annual growth rate of this population over the 15-year design horizon resulted in a design population for the Shemula 2 CWSS of 72 940 (Ingwavuma 11 350, East Bank 61 590) in year 2011.

Note: The Shemula 2 CWSS BP was compiled and approved for a design population of 72 940. Due to budgetary constraints, only 11 760 people received water under the scheme.

The Project Scope included:

- Project Planning and Feasibility Study.
- Business Plan and Approval of Funding.

- Training, Capacity Building and Community Awareness Creation,
- Preliminary and Detailed Design of Optimum Scheme.
- Environmental Impact Assessment.
- Tender Documents Preparation.
- Tender Process, Evaluation and Award.
- Construction.
- Mentoring and evaluation of operational staff.
- Commissioning.
- Monitoring of the Operation and Maintenance of the asset for a period after commissioning.

2.1.3 Project Infrastructure

The Shemula 1 scheme included a treatment works on the Phongolo River close to the Shemula Foot-and-Mouth control gate. Potable water was then pumped via the Shemula 1 reticulation system to a strategic reservoir that controlled the pressure in the overall system. Provision was made in the design of Shemula 1 to meet Shemula 1 and 2 future (year 2010) demands.

The Shemula 1 design criteria provided for the communities to be served by operator-manned water dispensing points, each with a $10m^3$ storage tank serving an average of some 540 people (approximately 67 households at the estimated median occupancy rate of 8 per household) at a rate of 20 litres per person per day. The dispensing points were equipped with a constant flow valve that only allowed flow into each dispensing tank at the average annual daily demand over a period of 24 hours, making it possible to design the Shemula 1 reticulation system to only cater for average daily flows, thus minimizing pipe sizes.

Due to the scattered nature of the communities in the Shemula 1 project area, the resulting number and distribution of dispensing points kiosks did not meet the RDP supply criteria of being at least within 200 metres walking distance. Due to the budgetary constraints, the communities in the Shemula 1 area accepted the lower level service of up to 2 kms walking distance.

Shemula 2, included for individual house connections for up to 10 per cent of the population. The demand on these house connections was assumed to be some 60 litres per capita per day with allowances being made for peak flows. The community of Shemula 2 accepted a walking distance of up to 1 km due to budgetary constraints.

2.1.4 Project Management

The PSC was the executive body controlling the implementation of the Project, consisting of elected Community Water Committee chairpersons, ensuring that communities' needs were reflected at the highest level of management in the Project, and that communication from and to "grassroots level" was easy and effective.

The PSC was assisted by:

- DWAF - the Funding Body,
- Mhlathuze Water - the IA,
- the Project Manager,
- the Community Representative Body (Amanzi Trust),
- the Consulting Engineers, and
- the Facilitators.

An organogram of the Shemula 2 CWSS implementation administration and management structure is shown in Figure 2.1.

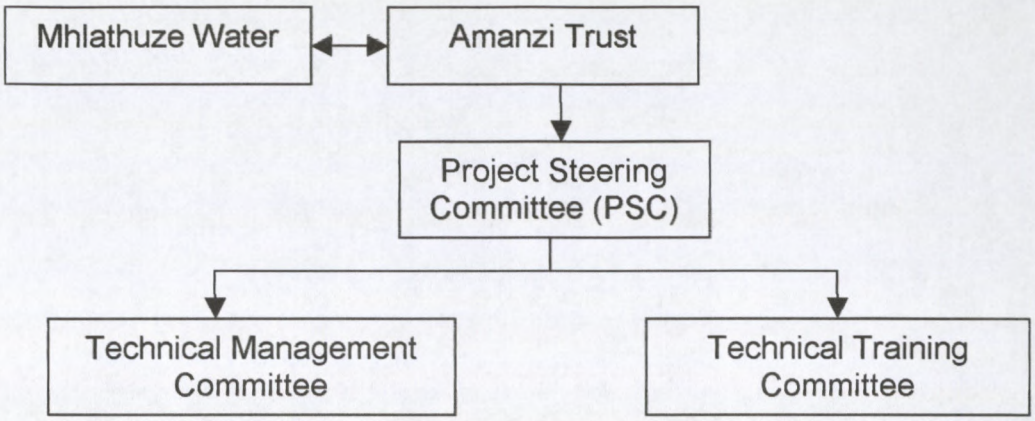

Figure 2.1: Organogram of the Shemula 2 CWSS's Administration and Management

2.1.5 Community Participation and Empowerment

The community participation and empowerment were promoted by the following:

- The communities elected the Water Committees and therefore, the PSC.
- The PSC had nominated the Service Providers.
- Introduction of community Training, Capacity Building and Community Awareness.
- Community participated in choice of laborers.
- PSC negotiated tasks and task rates for labour intensive construction.
- PSC acceptance of final reticulation layout and administration system.
- Community control of the operation and maintenance of their own asset.

2.1.6 Education, Training and Capacity Building

Training was generally provided before construction work commenced and before skills being learnt were required. The contractor allowed a period of at least three weeks in which to train sub-contractors. The contractor was also responsible for communicating with the training agent/s whilst the Engineering consultant monitored the training standards and activities. A detailed training programme was drawn up at the commencement of the Implementation Stage.

The ISD training needs were identified by the ISD facilitators for the project as given in sub-sections (a) and (b) as follows:

(a) *The PSC.*

- An understanding of basic project management skills.
- Conflict resolution skills
- Training as for the Water Committees

(b) *The Water Committees.* (Local headmen and traditional leaders were also included in order to understand the function of the Water Committees)

- Basic understanding of the technical aspects of the scheme.
- The Administration System of the scheme.
- Understanding of the task system of labour evaluation.
- Understanding of the Basic Technical Skills Training Programme.
- Labour selection.

2.1.6.1 Labour Intensity

Labour intensive construction methods were pursued under Shemula 2, with employment in accordance with the Framework Agreement for Labour Intensive Construction. The procurement procedures of Mhlathuze Water allowed for the use of emerging contractors.

Shemula 2 CWSS was designed to encourage the maximum use of labour. Tasks could not all be effectively completed by labour intensive methods. Tasks that required specialists, were difficult, not suitable to labour intensive methods, or constituted a danger to workers, were carried out using conventional construction techniques.

These included inter alia:

- Hard excavation
- Trench excavation in unstable material.
- Trench excavation deeper than 2 m.
- Trench excavation in boulder material where the boulders exceed a certain minimum size.
- Compaction of bedding.
- Carting of construction material further than 100 or up steep slopes.
- Construction of access roads

Tasks that were typically suited to the use of labour intensive methods included:

- Clearing pipeline routes
- Excavation in pickable material
- Compaction of trench inverts
- Placing and compaction of selected backfill material
- Compaction of ordinary backfill
- Building manholes and chambers

- Laying pipes

The total length of pipes used for the scheme was approximately 189 kilometres. The estimated number of tasks that were available on the project is shown in tabular form in Table 2.2.

Activity	Quantity of work involved		Assumed daily task		Estimated No of tasks	Average No tasks per year
Clearing	350000	m^2	150	m^2	2333	778
Trench excavation	85050	m^3	5	m^3	17010	5670
Placing bedding	24200	m^3	4	m^3	6050	2017
Bulk excavation for manholes, reservoirs etc.	600	m^3	3	m^3	200	67
Placing backfill	60800	m^3	4	m^3	15200	5067
Cleaning and landscaping	385000	m^3	200	m^2	1925	642
Pipe laying and testing	198000	m	50	m	3960	1320
Manholes/stand pipes	300	No	0.3	No	1000	333
Hauling material by wheel barrow	24200	m^3	4	m^3	6050	2017
Loading bedding sand	24200	m^3	4	m^3	6050	2017
Totals						19928

Table 2.2: Estimated number of tasks (person-days) generated by the Shemula 2 CWSS

An estimated 1700 community members received basic technical skills training during the implementation of the scheme.

The Table above refers specifically to work that was readily allocated to task work. Community members were also employed to perform everyday tasks related to construction and selected community members were also employed in a supervisory capacity. The amount paid in wages to the local communities for such work was not easy to quantify but was estimated at approximately between R100 000 and R150 000.

2.1.7 Employment Policy

The general employment policy was to target the most needy in the Community, such as single headed households, the unemployed, and the youth. Women were granted equal employment opportunities.

The Contractor appointed a Labour Representative for each sub-ward who then acted as a liaison between the main contractor/construction manager, sub-contractors, and labourers from those communities. Their duty was to advise them on the employment of labour and mediate on disputes that arose.

Tribal structures (isinduna) were put to extensive use in facilitating labour employment.

2.1.8 Wages and Labour Standards

The principles of labour intensive construction were explained and understood by the PSC.

In short, these were:

- Labour was employed on a temporary basis while work was available.
- Labour was paid according to the number of tasks completed.

A task was the agreed quantity of work a labourer of average ability could complete in one day. The PSC accepted, on behalf of the communities, a task rate of R25.

- Conditions of Employment generally adhered to the conditions listed.
- The Requirements of the Occupational Health and Safety Act were applied.

- Workman's compensation did apply.
- A Contract of Employment - acceptable to the PSC was signed between the Contractor and temporary employee. The Contract of Employment addressed the following issues amongst others that arose during the implementation of the Project:
- The Task Rate ie the rates for task work set by the contractor.
- The Unemployment Insurance Fund (UIF) and Workman's Compensation Act (WCA) payments. Labourers employed for 6 consecutive weeks are entitled to UIF and WCA.
- Maximum hours of work.
- The task the worker was to perform.
- Method and frequency of payment.
- Policy regarding wet weather, absence and sickness, disciplinary actions, grievances.

2.1.9 Consultants and other Service Providers

The nominated PSC was assisted by the following service providers during implementation of the Project:

- Funding Department: DWAF
- IA: Mhlathuze Water

The PSC, with guidance from the DWAF and Mhlathuze Water selected professional consultants to provide services in the following disciplines as:

- Project Manager
- Project facilitators
- Training Agent
- Engineering design and supervision.

Mhlathuze Water enacted the selection of consultants for the various disciplines for the implementation of the CWSS in

accordance with their tender procedures (as approved by the State Tender Board). The PSC and Implementing Agent reached a decision regarding the final choice of consultant. The PSC gave preference to consultants who had a functional office in KwaZulu-Natal and who had a policy of affirmative action with experience in the Zululand region. The consultants also had to be well versed in community participation as well as RDP principles. Jeffares Green Parkman met these requirements and were appointed Consulting Engineers on this project.

Professional fees were generally paid in accordance with DWAF tariff guidelines (Business Plan & Feasibility Study Stage) or a percentage fee in accordance with the appropriate South African Association of Consulting Engineers (SAACE) agreement (Design, Tendering & Construction Supervision).

2.1.10 Tender Procedures

The basic principles regarding tender procedures were that tendering was open to the public and that the tender evaluation procedure was both fair and transparent.

The PSC was aware of the normal tender procedure of open tender with the award then going to the lowest fully compliant tender. However, the PSC was also aware of the possibility that normal tendering procedures could be waived if local emerging contractors would be advantaged by a change of the normal tendering procedures, provided that this was not to the detriment of the quality and viability of the scheme. The procurement procedures of Mhlathuze Water took the above into account and were applied to this project.

The evaluation of tenders utilized preference criteria for SMMSE and took cognizance of the tenderer's affirmative action initiatives.

Tender documentation, nevertheless, allowed for capacity building within the framework of the contract. Contractors were required to provide training as part of the construction process and the extent and level of training required was written into the contract document.

The PSC was made aware of the different approaches to labour intensive construction inter alia:

(a) The Traditional Contractor Approach

The contractor employs labour and supervisory staff from the community. Apart from being trained in the practical aspects of the work, no knowledge is transferred regarding administration, estimating, tendering and other aspects concerning contracting.

The Contractor's overheads are usually lower for this approach.

(b) The Managing Contractor Approach

This approach requires that only certain work be done by subcontracting the work to members of the community.

The Contractor then trains nominated members of the community in aspects of pricing, budgeting and contract administration. The Contractor then receives tenders from those community members for the work to be done by local sub contractors. The PSC and the appointed facilitators identified suitable respondents.

The Contractor, however, remains responsible for the work performed by the subcontractors. Subcontractors are paid for the construction work completed whilst they in turn pay their employees on the Labour Intensive Construction principles.

The advantage of this approach is that Community members receive basic knowledge of the tendering procedure, budgeting, cashflow control and other aspects regarding contracting.

The Contractor's overheads are usually higher when using this approach.

(c) The Project Construction Manager Approach

This approach essentially follows the previous approach except that the Contractor is not required.

A Project Construction Manager assumes the role of the managing contractor and lets out all the work to sub contractors from the community. Work that requires more sophisticated expertise is tendered for using normal procedures.

The disadvantage of this approach is that there is no organization to take direct liability for defective construction work, as is the case with a main Contractor.

A combination of all three approaches was used on Shemula 2 CWSS.

2.1.11 The Environment

Construction work on the Project was conducted to impact as little on the environment as possible. However, the project was of such a nature that environmental impact issues were addressed during the design and construction stage.

Note: An EIA screening report became compulsory for BPs in 1999. Therefore EIA reports for Shemula 2 and Nqutu 2 CWSSs were not necessary.

2.1.12 Operation and Maintenance

Mhlathuze Water managed the treatment, pumping and bulk storage of potable water. Amanzi Trust was responsible for the distribution and sale of water to the Community. The Operating and Maintenance costs incurred by Mhlathuze Water was covered in the bulk water tariff charged to Amanzi Trust. The PSC had adopted the approach that the water tariff was not varied through the supply area and was the same for the Shemula 1 and Shemula 2 Schemes. The tariff charged for a specific level of service was assumed to be equal throughout the Shemula 1 and Shemula 2 supply areas.

Table 2.3 summarises the estimated average annual operating and maintenance costs for the Shemula 2 Community Water Supply Scheme. The Operating and Maintenance costs shown in the Table 2.3 refers to major components only that make up the bulk of the annual expenses Amanzi Trust was to have met.

Description		Amount
Bulk Water Supply from Mhlathuze Water		R 934 830.00
Distribution	Maintenance of dispensing points	R 309 380.00
	Maintenance of reticulation	
Administration Costs	Salaries of administrative personnel	R 376 860.00
	Salaries of chief bailiffs	
	Salaries of water bailiffs	R 456 100.00
Total anticipated annual current operating and maintenance costs		**R 2 077 170.00**
Cost to the consumer for a standard 25 litre container of water based on the above assumed costs *(These costs were estimates only and varied according to prevailing circumstances)*		**25c**

Table 2.3 Anticipated current annual operating, maintenance and bulk supply costs

The estimated costs were conservative and should make allowance for other minor expenses that were to have been met by Amanzi Trust.

The Community opted for controlled Automatic Dispensing Units operating under 'the user pays' basis. The ADUs are prepaid water dispensing units that operate with a token.

The feasibility study concluded that a contribution of R50 was required from each household in the Community to account for an expected shortfall of income over operating costs during the initial stages of the scheme. The feasibility study further recommended a water tariff of 25 cents for a standard 25-litre container of water collected at a dispensing point.

The PSC accepted the recommendation regarding the R50 contribution and also accepted the recommended tariff of 25 cents for a standard 25-litre container of water.

An organogram of the Shemula 2 CWSSs administration and management structure is shown in figure 2.2 .

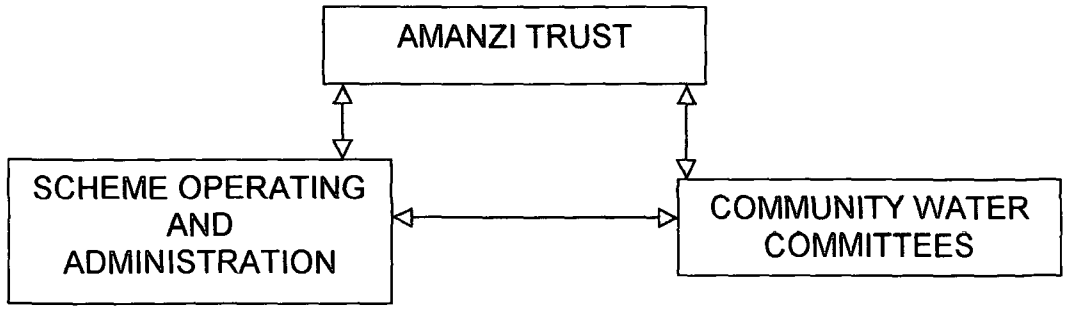

Figure 2.2: Organogram of the scheme's administration and management

Amanzi trust was the controlling body of the scheme's administration and management. The PSC, however, accepted that the function of Amanzi Trust would be reviewed when a local government structure

was in place. Mhlathuze Water, however, continues to serve as the bulk water supplier until such time as transfer of assets and responsibilities occurs.

2.2 NQUTU 2 CWSS (BoTT)

The original Business Plan in the non-BoTT format was compiled by V3 Consulting Engineers (Pty) Ltd. DWAF identified Nqutu 2 as a project to be included in the BoTT programme. It should be noted that details of the Nqutu 2 CWSS has been taken from V3 (1997) and JGP (1999a, 1999b and 1999c).

2.2.1 Location

Nqutu 2, consisting of sub-wards Vumbuka, Dlamini 2, Vuyani, Emadressini, Esidakeni, Dalala, Ngundulwana and Hlathi, are eight scattered informal rural settlements. The rural settlements had developed on either side of main road MR68 in a northerly direction towards the town of Nqutu. Nqutu is situated approximately 45 km east of Dundee and approximately 50 km south of Vryheid and is located on MR68 from Dundee to Babanango. The locations of these informal settlements are indicated in **Appendix C**.

The approximate co-ordinates of the centroid of the project are given in Table 2.4.

PROJECT	NEAREST TOWN AND DISTANCE	LATITUDE	LONGITUDE
Nqutu 2	10km West of Nqutu	28° 14' 00" S	30° 32' 00" E

Table 2.4: Project Location: Nqutu

2.2.2 Community Profile

Demographic information was obtained from aerial photographs and field visits with the assistance of the PSC. During the field visits, the extent of the project and the population count and distribution were identified. A random sample of interviews indicated that an average 8 occupants per household was typical of the area. The initial estimates were verified from the 1996 national census and aerial photographs of the area. A summary of the population distribution is set out in Table 2.5.

SUB-WARD	NUMBER OF HOUSEHOLDS	POPULATION ESTIMATE 1995
Vumbuka	60	420
Dlamini 2	91	880
Vuyani	86	710
Hlathi	105	990
Emadressini	158	1310
Esidakeni	104	850
Dalala	38	410
Ngundulwana	64	490
TOTAL		**6060**

Table 2.5: Demographic Information – Population Figures

Note:

- DWAF issued a directive that all growth rates should be 0 percent due to the AIDS epidemic.
- Nqutu 2 CWSS BP was compiled and approved for a design population of 6060. However during construction it was found that some sub - wards were omitted from the original BP. This error was rectified and 13200 people received water under this scheme.

2.2.3 Project Steering Committee

A PSC representing all of the project beneficiaries and other stakeholders had been established in 1995. The election of this

PSC was facilitated with the full co-operation of the uMzinyathi District Municipality. BoTT predecessors from the whole of the Nqutu 2 region established the original PSC. AquAmanzi was introduced to this PSC in November 1997.

The responsibility of the PSC was to guide the project through the Project Cycle (Initiation, planning & implementation) with input from the Project Implementing Agent (PIA) team. The PSC was the main link between the beneficiaries and the PIA.

2.2.4 Project Implementing Agent and Project Managers

The Project Implementing Agent (PIA) for this project was AquAmanzi Developments in accordance with the contractual agreement with the Department of Water Affairs and Forestry, the funding body. The Project Implementing Agent was responsible to the Funding Body and the Project Steering Committee for managing the process of implementation from planning through construction and operation.

AquAmanzi Developments had the professional capacity both in-house and through its associates to undertake the preparation of the feasibility studies, business plans, investigations, detailed design, engineering drawings and bills of quantities, construction as well as the operation and maintenance of the scheme, in addition to implementing the institutional, social development and mentoring of recipients, working in close collaboration with the District Municipality (DM). AquAmanzi set up, together with DM mechanisms to promote and ensure co-operation and co-ordination of activities.

2.2.5 Overall Management Organogram

The PSC was the decision making body. The Organogram given

in figure 2.3 indicates the lines of communication between DWAF, the IA, the PSC, DM, consultants, contractors and all the informal rural settlements to benefit from the project.

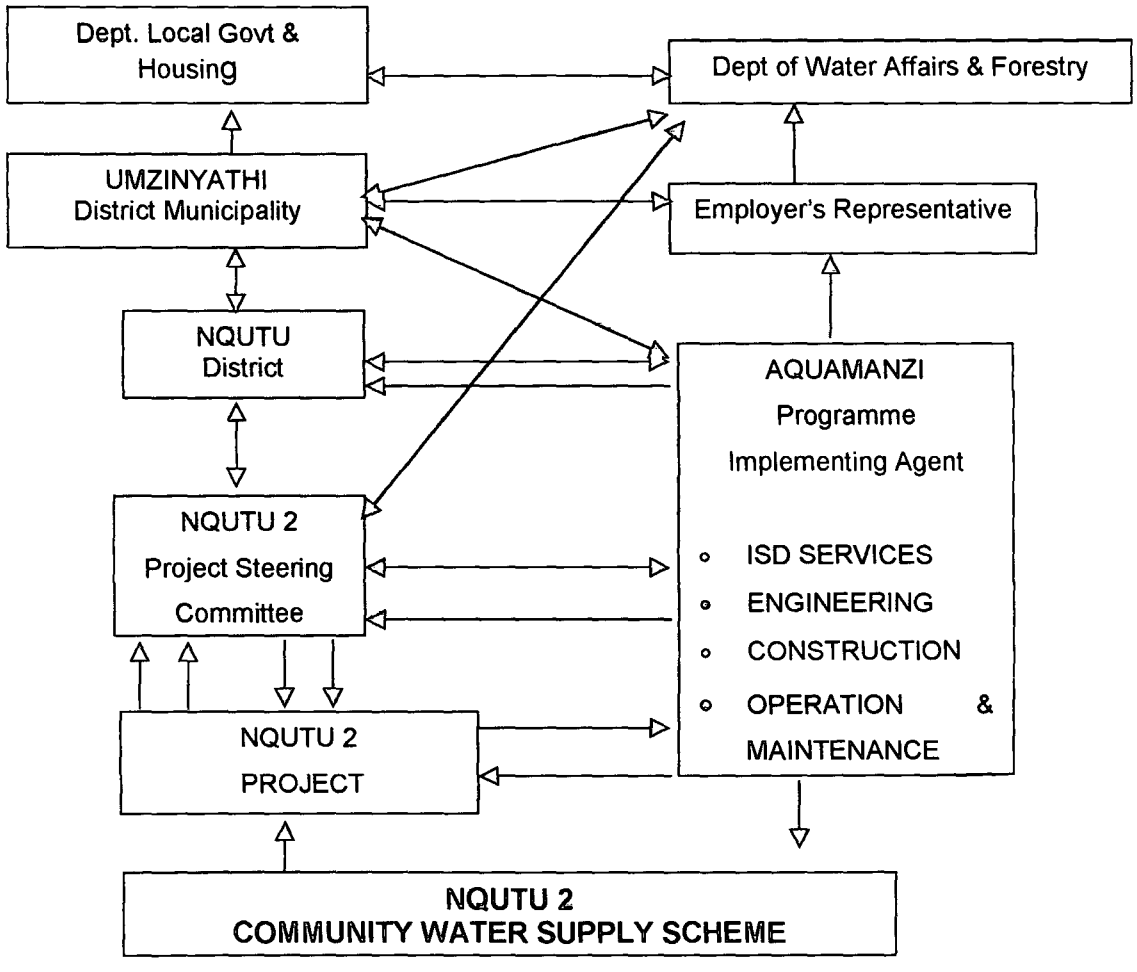

Figure 2.3: Management organogram

2.2.6 Scope of Work

2.2.6.1 Initial Situation

The 1992 survey identified the Vant's Drift Water Supply Scheme to Nqutu as a high priority with definite feasibility and justification.

The Vant's Drift Water Supply Scheme was planned during the late 1970s and constructed during the early to middle 1980s. The scheme was planned and constructed to provide water to the town of Nqutu. It was intended to provide water to meet the estimated demand for a huge population growth at Nqutu over a period of 20 years.

The expected development of Nqutu did not materialize. The scheme was therefore grossly under- utilized.

2.2.6.2 Initial Management Arrangements

The project area did not have a formal water supply scheme. The only formal water supply source was the Vant's Drift Water Supply Scheme, which supplied water to Nqutu Town. The Umzinyathi District Municipality operated the Vant's Drift Water Supply Scheme. The community elected a Project Steering Committee. The District Municipality was the Water Service Authority and it was agreed with the District Municipality and the PSC that a community based Water Service Provider could be formed to manage the reticulated areas. The Umzinyathi District Municipality based on guidelines received from the DWAF Regional office and a model constitution produced by Mvula Trust was drafting the agreement to this effect.

2.2.6.3 Technical - New Infrastructure

The water supply project to Nqutu 2 consisted of three components namely a primary and secondary bulk water supply component and reticulation components. The schematic layout is attached in **Appendix D.**

- Primary Bulk Water Supply

The primary bulk water supply component consists of a 200 mm diameter connection to the 400 mm diameter steel rising main pipeline of the Vant's Drift Water Supply Scheme, a 550 m long interconnecting 250 mm diameter bulk supply pipeline and the construction of a 750kl reservoir. The complete primary bulk component had been sized to supply the demand of the entire Nqutu 2 area, according to the design standards laid down by DWAF.

- Secondary Bulk Water Supply

The secondary bulk water supply component consists of a gravitational bulk water supply pipeline from the reservoir up to each sub-ward boundary. The reticulation of each sub-ward is connected to the secondary bulk supply pipeline with a single water connection on which a shut-off valve and water meter is installed.

- Water Reticulation

The water supply to each of the eight sub-wards starts from the connecting chamber to the secondary bulk supply pipeline. There are 128 standpipes installed in the area.

2.2.7 Existing Level of Community Awareness

The community has a democratically elected Project Steering Committee. The PSC also reports to the Nqutu District Municipality and the tribal authority.

The scope of this project included the implementation of a full-scale community awareness and capacity building programme, to replace the original level of organizational development. These structures had been in existence for some time and there had been no sign of any possible organizational tension that could undermine the sustainability of the project.

The PSC was fully aware of the details of the project and the need for project sustainability.

2.2.8 Identification of a Future Operating Authority and Service Provider

The District Municipality was the Water Service Authority (WSA) and became the Water Service Provider, as they already operated the Nqutu Regional Water Scheme. This water scheme supplied bulk water to the town of Nqutu and the District Municipality was also the WSA at Nqutu 2. The council as the Operating Authority elected to out-source under contract some of its operational functions to a Service provider. AquAmanzi was the service provider in the interim period. The Service Provider was responsible to staff, operate, run and maintain the water supply scheme which was to be carried out in such a manner as to ensure that the scheme delivers the requisite quantity of water, in accordance with its contract with the consumers, whilst maintaining the security of supply and meeting the required water quality standards. The service provider was entitled to recover costs for the provision of these services through the levying of a tariff on the sale of water.

The District Municipality and the PSC agreed that a community based Water Service Provider be used to manage the reticulated areas.

2.2.9 Establishment of a Tariff Administration and O&M Management Structure

The success and sustainability of the community water supply scheme was determined by the degree to which the Local Level Service Provider was able to manage and administer the operation of the scheme, which in turn depends on the members of the Water Committee (an interim committee) and the community achieving certain threshold levels. The threshold levels were a minimum requirement as set out by O&M guidelines to undertake the functions of revenue administration, maintenance, operations and overall management. The success and sustainability of the scheme was also dependant on the setting of an appropriate tariff structure and the ability to implement and administer that structure. The Water Committee could only perform competently if it was financially secure, which in turn depended upon a number of other parametres.

Community Awareness Programme – A vital component of the Institutional and Social Development component which was built into the project was the training of the community in the concepts of payment for services provided, the duties and responsibilities attached thereto, as well as health and hygiene awareness modules. The programme was facilitated by the adoption of the pre-payment system for water, which ensured fair and equitable payment by members of the community, for the level of service that they received. The community had endorsed the concept of pre-payment. Training was carried out by means of workshops with the community of Nqutu 2.

A suitable place was located for the administration of the water scheme. The tariff was set with the community at a workshop training meeting. The people were able to collect the necessary

cards for pre-payment of water at this administrative point. Only an indicative tariff had been discussed at that stage. It has been explained that the final tariff was dependant on the tariff policy of the District Municipality and the outcome of the Nqutu area business plan, which looked at the O&M costs for a number of projects in the Nqutu area.

Technical Skills – A full programme of technical skills, capacity building and development had been allowed for in the operation and maintenance training budgets. The numbers of people employed and the type of work that was undertaken locally was determined as an output from the training. It was the policy to outsource as much of the work as possible to members of the local community in order to promote employment opportunities.

Overall Management – The overall structure of the Operation and Maintenance unit was finalised during the Operations and Maintenance and Mentoring phase of AquAmanzi's involvement, in close conjunction with the incipient Water Committee, the Project Steering Committee and the District Municipality. The success of the technical skills training and the institutional capacity for the service providers determined it. AquAmanzi helped to put the revenue collection structure in place and also helped to maintain it. A generic unit tariff administration, operation management and maintenance structure is given in Figure 2.4.

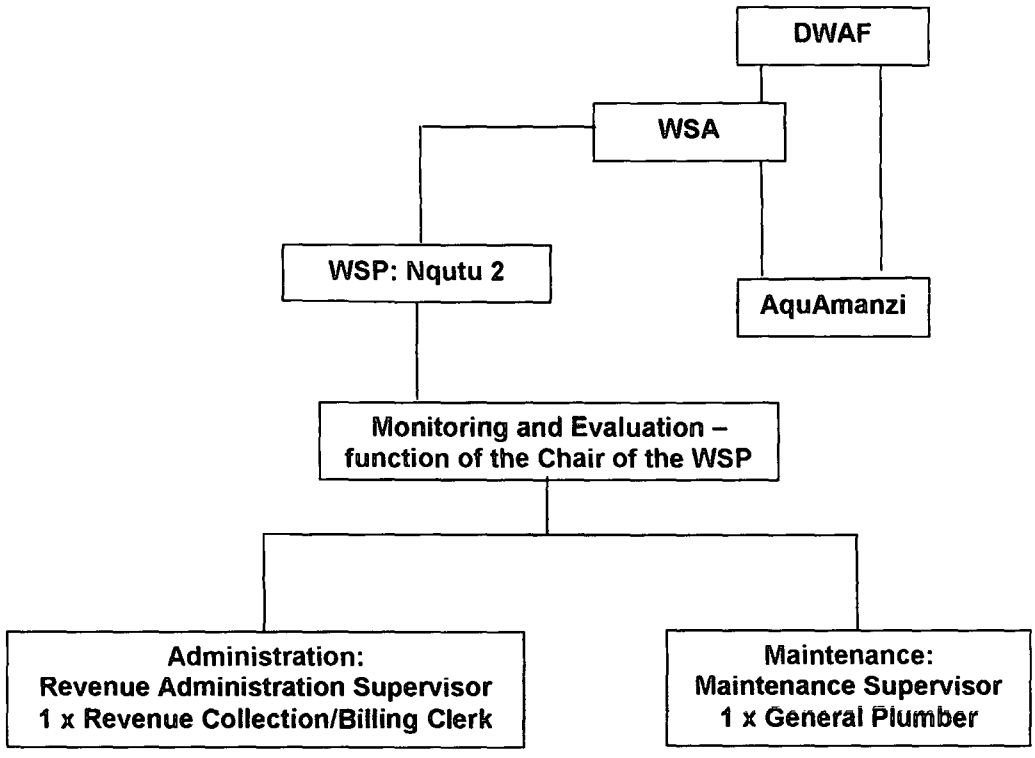

Figure 2.4: Tariff Administration and Operation, Management and Maintenance Structure

The Operation and Maintenance Methodology and tariff structure is included in **Appendix E.**

2.2.10 Training, Education and Capacity Building

It should be noted that all Training, Education and Capacity Building, which had been planned and implemented, was in accordance with the "Guidelines for Training and Capacity Building on Community Water Supply Projects"
"The Training approach" is set out in **Appendix F**.

The following main categories were embraced:

- Summary of Training Modules and criteria usage
- Skills Training Approach
- Operations and Maintenance Training Proposals

The training needs analysis was not carried out during the fieldwork for this Business Plan. This had been held over until a later phase of the project. The modules submitted by the ISD component of AquAmanzi in **Appendix F** form the framework within which the actual training was designed. The final modules were influenced to a large extent by the environment and trainees operating at the actual time of training. Thus, it was possible to cut down on unnecessary training modules and to add more (e.g. Water Services Act requirements) if required.

Details of capacity building and training are outlined in **Appendix F.**

2.2.11 Focus on Women

The PSC and other role-players pledged their commitment to focusing on women, as the center of development. Women were offered equal opportunity to participate at all levels throughout the project cycle continuing in the administration, operation and maintenance of the scheme once it has been commissioned.

The PIA was committed to making maximum use of female field staff as Capacity Building Trainers in order to ensure awareness of gender issues.

2.2.12 Labour Intensiveness

The BoTT approach made use of highly labour-intensive methods. The approach applied by AquAmanzi as regards the employment of the community was to encourage the formation of individual or grouped sub-contractors. The community "sub-contractors" were set up with his or her own equipment and protective clothing, enrolled on UIF, were given specific skills training, and paid

according to the South African Federation of Civil Engineering Contractors (SAFCEC) statutory minimum wage. When the project was completed, each community "sub-contractor" was able to offer his or her skills to other projects, (e.g. housing etc) and/or could be involved in the ongoing operation and maintenance of the project, based upon the type of training and experience that he or she had received.

2.2.13 Involvement of PDIs/PDCs

Previously Disadvantaged Communities (PDCs) and Previously Disadvantaged Individuals (PDIs) were used extensively in the ISD team. PDCs were used for training and Capacity Building and PDIs were used for facilitation and community awareness. Three PDIs were used as facilitators. One hundred people were trained in construction for the Nqutu 2 project: in excavation, pipe laying and backfilling. The more astute ones, approximately 20 people, trained in more difficult tasks and 5 were trained as section leaders. The construction team also trained one female technician.

Details of the training skills and ISD training approach are included in **Appendix F**.

2.2.14 Employment Policy

Employment was targeted at the most needy within the community as a first priority. The training component, which had been built into the project, was consequently designed to enhance skills to empower those members of the community to participate in a meaningful manner in the opportunities, which the project created. Target members were single-headed households, women, the unemployed and the youth. The employment opportunities and policies adopted locally both during and after construction were

discussed and agreed with the Project Steering Committee to ensure that the needs and expectations of the community were addressed.

2.2.15 Wages and Labour Standards

Two potential routes were examined in setting wages and labour standards namely the labour-based task route and the normal wage route.

The labour-based task approach was preferred, as it was more flexible for the community. The rate paid was related to a given realistic task for each labour intensive activity.

Labour-based work based on an hourly wage approach followed normal minimum wages as laid down for the province and specified by the Department of Labour.

The general principles of how workers were paid was discussed and agreed by the PSC.

2.2.16 Consultants and Other Service Providers

AquAmanzi had the overall responsibility under the BoTT contract to act as the consultant for the work for which it had been appointed. The consortium had to satisfy the employer that it would implement and adhere to the principles and policies of affirmative action and use of local expertise.

V3 Consulting Engineers were the "inherited" consultants on this project. They produced a business plan and a set of layout drawings. AquAmanzi formatted this Business Plan to the BoTT approach and was responsible for the detailed design on the

project and was called upon to attend to problems during construction.

2.2.17 Tender Procedures

The BoTT contract contained agreed rates for the carrying out of the various aspects of the work, for which AquAmanzi was appointed.

The preference criteria for Small Medium and Micro Sized Enterprises (SMMSE) applied were quotations or tenders were called for by AquAmanzi.

2.2.18 Operation and Maintenance Costs

The post-commissioning Operations and Maintenance support and mentoring costs for the area have been set out in **Appendix E**. A summary of these costs year by year is set out in Table 2.6. The costing was based on the implementation over a year, two-year support costs and additional five-year mentorship costs as highlighted in the definitions.

PROJECT			NQUTU 2
PROJECT No.			KN 089
Population			6060
No. of Standpipes			128
RETICULATION (Total km)			40
O&M Pre – Commissioning Budget			R 96 096.00
O&M Support Budget	Year	1	R 189 475.00
O&M Support Budget	Year	2	R 208 422.50
Mentorship	Year	3	R 42 444.60
Mentorship	Year	4	R 46 689.06
Mentorship	Year	5	R 51 357.97
Mentorship	Year	6	R 56 493.76
Mentorship	Year	7	R 62 143.14

Table 2.6: Summary of O&M Costs (Appendix E)

2.3 COMPARISON BETWEEN THE BOTT AND NON-BOTT SCHEMES

The comparison between both the schemes is shown in Table 2.7

Shemula 2 CWSS (non-BoTT)	Nqutu 2 CWSS (BoTT)
Conventional Approach	BoTT Approach
Population was very scattered	Population was more concentrated
Project based training approach	Programme based training approach
Funds for each component had to be applied for	The funds included money for each component
Walking distance due to budgetary constraints was 1 km	Walking distance in compliance with RDP standards of 200 m
Jobs of a more permanent nature were created	Jobs of a less permanent nature were created
Funds had to be applied for O&M	Adequate funds were available for O&M in terms of the BoTT contract
Community participated through PSC	Community participated through PSC
Labour intensive	Labour intensive

Table 2.7: Comparisons of the Shemula 2 and Nqutu 2 CWSSs

CHAPTER 3: COMMUNITY SURVEY

3.1 INTRODUCTION

Community surveys were conducted at Shemula and Nqutu to determine their perceptions of the Water Supply Schemes for their respective areas.

Baseline surveys are conducted on BoTT projects so that the project team can gauge the needs of the community and plan their project around it. The author was able to utilize the baseline survey questionnaire as guide in preparing the questionnaires for this thesis. The questionnaire was compiled in English and presented to the community through Zulu speaking facilitators. The questionnaires for Shemula and Nqutu were similar except that the Nqutu questionnaire had an extra section designed to ascertain whether the interviewees understood the BoTT concept. The questionnaire was designed to achieve the following:

- The awareness of the scheme questions was designed to ascertain how much was understood concerning the supply of water, maintenance and the reason for paying for the service.
- The questions concerning expectations of the scheme were intended to ascertain whether the interviewee perceived the scheme to have delivered on promises made.
- The following two questions concerned the type and appropriateness of training received.
- The next question was designed to ascertain perceived Operation and Maintenance failings of the scheme and as a check on the answers to some of the awareness and expectation questions.
- The final question for PSC members only was to compare the more informed view with the expectations of the interviewees.

The completed questionnaires were returned for capture on the computer and sorting into answer groups for presentation in graph form.

The surveys for Nqutu were carried out during weekdays whilst the surveys for Shemula were carried out during weekends. This was due to the availability of facilitators. A random ten percent sampling was taken of the actual households that benefited from these schemes.

Copies of the surveys are found in **Appendix G**.

3.2 COMMUNITY SURVEY – SHEMULA (Non-BoTT)

The community was interviewed per sub-ward in the Shemula Water project. A total of one hundred and forty seven (147) households were interviewed. The following number of households per sub-ward were interviewed (Table 3.1); Bhekabantu - forty four (44) households, Nhlonhleni South - twenty six (26), Mbangweni - seven (7), Mandlankunzi - eight (8), Nhlonhleni North - fifty one (51) and Lulwane eleven (11).

The following report was drawn up using the information provided. The first set of statistics was taken from the introductory part of the survey. Statistics were as follows:

- Of the 147 people surveyed, 41 (27.89%) were female and
- 106 (72.11%) were male.
- The age of females interviewed ranged from 23 to 60 years
- The age of males ranged from 25 to 68 years (Figure 3.1).

SUB-WARD		NUMBER INTERVIEWED	FEMALES	MALES	AGE RANGE	
1. Bhekabantu		44	11	33	23	60
2. Nhlonhleni South		26	6	20	25	68
3. Mbangweni		7	3	4	36	55
4. Mandlankunzi		8	5	3	28	48
5. Nhlonhleni North		51	13	38	26	62
6. Lulwane		11	3	8	29	55
TOTAL		147	41	106	23	68
PERCENTAGE (%)		100	27.89	72.11		
AGE RANGE	Youngest	23	23	25		
	Eldest	68	60	68		

Table 3.1: Population Representation per sub-ward

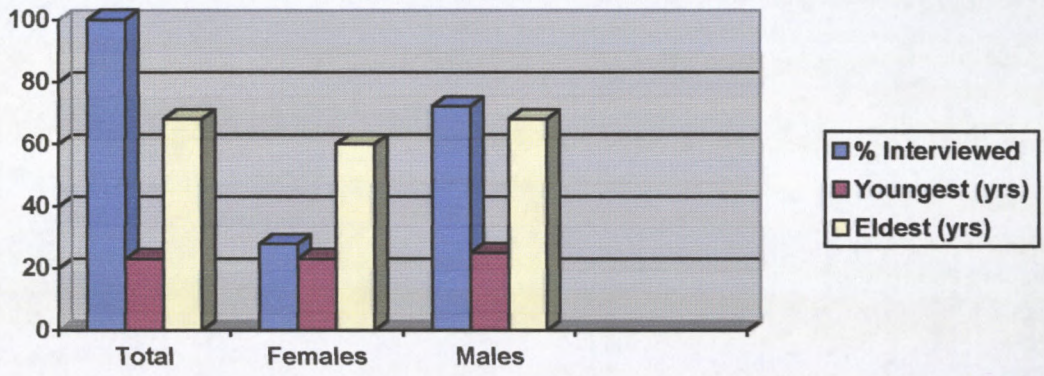

Figure 3.1: Percentage of females and males interviewed and their age range.

The second set of statistics was taken from the Awareness of the fundamentals of the scheme. Statistics were as follows:

- Respondents were asked whether they knew the origin of the water;
- how the water got to the standpipes;
- what to do when they saw a leak;
- why they must pay for water and
- who was responsible for maintaining the scheme.

In all the sub-wards our respondents indicated that:

the majority of the community (89.8%) knew the origin of the water; how the water got to the standpipes; what to do when they saw a leak; why

must they pay for water and who was responsible for maintaining the scheme (Table 3.2, Figure 3.2).

SUB-WARD		(A) Where does the water come from?	(B) How does the water get to the standpipes?	(C) What to do when you see a leak?	(D) Why must you pay?	(E) Who is responsible for maintaining the scheme?
Bhekabantu	Yes	39	44	42	42	42
	No	5	0	2	2	2
Nhlonhleni South	Yes	26	26	26	26	26
	No	0	0	0	0	0
Mbangweni	Yes	6	7	7	4	7
	No	1	0	0	3	0
Mandlankunzi	Yes	8	8	6	6	6
	No	0	0	2	2	2
Nhlonhleni North	Yes	47	51	47	45	46
	No	4	0	4	6	5
Lulwane	Yes	8	11	9	9	11
	No	3	0	2	2	0
TOTAL	Yes	134	147	137	132	138
	No	13	0	10	15	9
PERCENTAGE (%)	Yes	91.16	100	93.20	89.80	93.88
	No	8.84	0	6.80	10.20	6.12

Table 3.2: Awareness of the fundamentals of the scheme

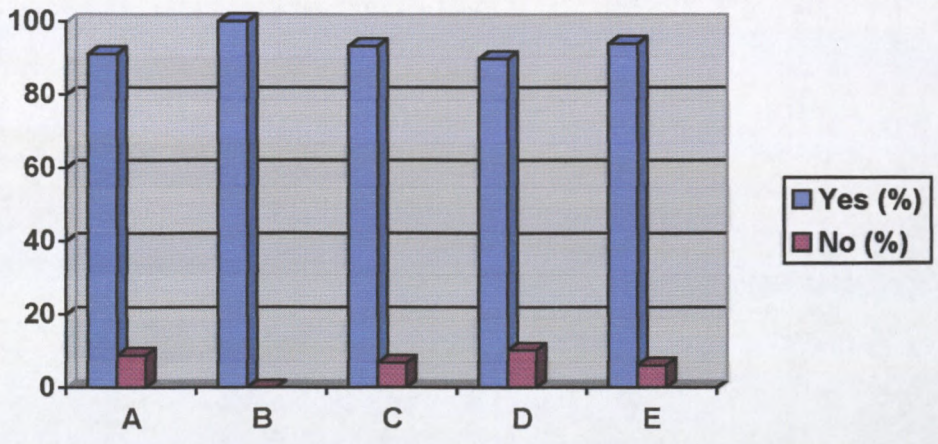

Figure 3.2: Total Percentage response to Awareness of the fundamentals of the scheme.

The third set of statistics was taken from the expectations of the scheme. Respondents were asked whether:

- the scheme delivered what they had expected

- and if not, to state whether they were unhappy with the walking distance to dispensing points and/or about paying for water.

- They were also asked, whether they believed that the scheme was going to create jobs and whether they were satisfied with the scheme.

The sub-wards all indicated that;

- the majority of the community (75 – 90%) agreed that the scheme was delivering what they had expected, believed that the scheme was going to create jobs and were satisfied with the scheme.

- 13 respondents indicated that the scheme was not delivering what they had expected, of these 5 were unhappy with the walking distance to dispensing points, 6 were unhappy about paying for water and 2 were unhappy about both (Table 3.3, Figure 3.3).

SUB-WARD		(A) Does the scheme deliver what is expected?	If no, are you unhappy			(B) Did you believe that it was going to create jobs?	(C) Are you satisfied with the scheme?
			With walking distance	About paying for water	Both		
Bhekabantu	Yes	39				43	37
	No	5	3	2	0	1	7
Nhlonhleni South	Yes	18				14	26
	No	3	0	2	1	11	0
	None	5				1	0
Mbangweni	Yes	6				5	3
	No	1	0	0	1	1	3
	None					1	1
Mandlankunzi	Yes	8				5	6
	No	0	0	0	0	3	2
Nhlonhleni North	Yes	50				35	50
	No	1	0	1	0	16	1
Lulwane	Yes	8				9	10
	No	3	2	1	0	2	1
TOTAL	Yes	129				111	132
	No	13	5	6	2	34	14
	None	5				2	1
PERCENTAGE (%)	Yes	87.75				75.51	89.80
	No	8.84				23.13	9.52
	None	3.41				1.36	0.68

Table 3.3: Expectations of the scheme

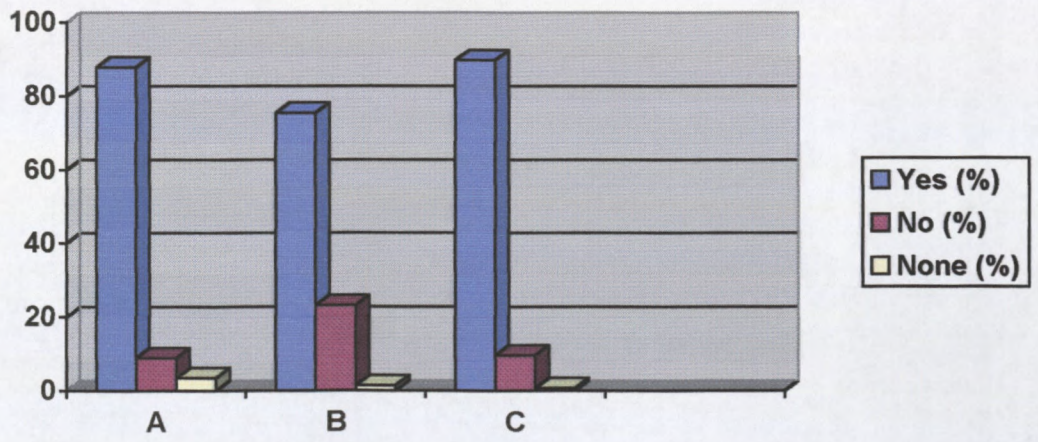

Figure 3.3: Expectations of the scheme

The fourth set of statistics was taken from the Training under the scheme. Respondents were asked whether they had received any training under the scheme and if yes, in which category ie basic pipe laying skills, block making, brick and block laying, basic plumbing, capacity building skills and/or other.

The respondents who were trained under the scheme were asked whether it was what they had expected; had it been useful and would they be able to use those skills again. The results show that:

- only 51 (34.69%) out of 147 respondents interviewed received some training under the scheme, of these,
- 44 received training in basic pipe laying skills; 1 in basic plumbing only; 6 in other (trench digging, backfilling and/or bush clearing), 8 in both basic pipe laying skills and 3 in both basic plumbing and other.
- 50 (98.04%) of the respondents trained indicated that it was what they had expected to get and they would be able to use these skills again (Table 3.4, Figure 3.4).

SUB-WARD		Number trained under the scheme	Basic pipe laying skills	Brick and block laying	Basic Plumbing	Capacity Building skills	Other
Bhekabantu	Yes	18	17		4		3
	No	26					
Nhlonhleni South	Yes	8	7				3
	No	18					
Mbangweni	Yes	1	1				
	No	6					
Mandlankunzi	Yes	1	1				1
	No	7					
Nhlonhleni North	Yes	17	15				3
	No	34					
Lulwane	Yes	6	3				4
	No	5					
TOTAL	Yes	51	44		4		14
	No	96					

Table 3.4: Training expectations under the scheme

SUB-WARD		(A) Number trained under the scheme		(B) Is it what you expected to get?		(C) Has it been useful?		(D) Would you be able to use these skills again?	
		Yes	No	Yes	No	Yes	No	Yes	No
Bhekabantu		18	26	18	0	18	0	18	0
Nhlonhleni South		8	18	7	0	7	0	7	0
Mbangweni		1	6	1	0	1	0	1	0
Mandlankunzi		1	7	1	0	1	0	1	0
Nhlonhleni North		17	34	17	0	17	0	17	0
Lulwane		6	5	6	0	6	0	6	0
TOTAL	Yes	51		50	0	50	0	50	0
	No		96						
	None		0	1		1		1	
PERCENTAGE	Yes	34.69		98.04	0	98.04	0	98.04	0
	No		65.31	0.00		0.00		0.00	
	None		0.00	1.96		1.96		1.96	

Table 3.5: Training Received

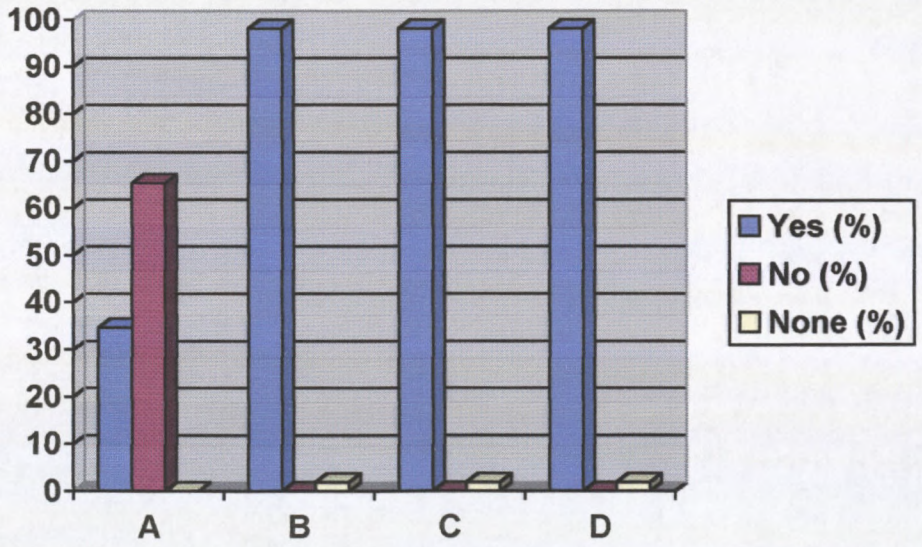

Figure 3.4: Training Received

The fifth set of statistics was taken from the Operation and Maintenance portion of the questionnaire. Respondents were asked:

- whether they were happy with Automatic Dispensing Units and

- whether they believed that the community would be able to operate and maintain the system. They were asked to state why, if they had answered in the negative.

The sub-wards all indicated that;

- the majority of the community (91.16%) was happy with Automatic Dispensing Units, but
- only 52.38% believed that the community would be able to operate and maintain the system.
- The remainder (47.62%) believed that the community would not be able to operate and maintain the system, gave the following reasons:
    - 43.54% of the respondents stated that they had not been trained in operation and maintenance,
    - 2.04% that they had no responsibility and the other 2.04% said nothing (Table 3.6, Figure 3.5).

SUB-WARD		(A) Are you happy with Automatic Dispensing Units?	(B) Do you believe the community would be able to operate and maintain the system?	If answer to (B) is "no", why?		
				(C) Not been trained	(D) No responsibility	(E) None
Bhekabantu	Yes	35	11			
	No	9	33	31	2	0
Nhlonhleni South	Yes	25	17			
	No	1	9	6	1	2
Mbangweni	Yes	6	2			
	No	1	5	4	0	1
Mandlankunzi	Yes	7	4			
	No	1	4	4	0	0
Nhlonhleni North	Yes	50	34			
	No	1	17	17	0	0
Lulwane	Yes	11	9			
	No	0	2	2	0	0
TOTAL	Yes	134	77			
	No	13	70	64	3	3
PERCENTAGE (%)	Yes	91.16	52.38			
	No	8.84	47.62	43.54	2.04	2.04

Table 3.6: Operation and Maintenance

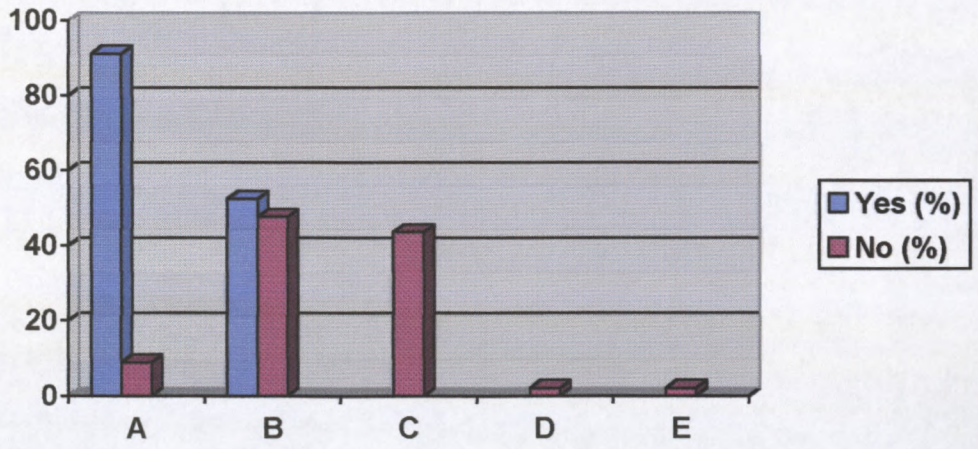

Figure 3.5: Operation and Maintenance

The final set of statistics was taken from the PSC section. Statistics were as follows:

- The PSC members were asked whether they were satisfied with the way their schemes work and if not, they were asked to state the reason.

Of the 147 respondents interviewed originally included 2 PSC members. One was satisfied and the other was not. The reason for dissatisfaction was that water was not always available.

3.3 COMMUNITY SURVEY – NQUTU (BoTT)

A total of 165 households were interviewed. The information gathered was used to draw up the following report. The first set of statistics was taken from the introductory part of the survey. Statistics were as follows:

- Of the 165 people interviewed (Table 3.7), 117 (70.91%) were female and
- 48 (29.09%) were male.
- The age of females ranged from 24 to 92 years
- Whilst males ranged from 30 to 92 years (Figure 3.6).

TOTAL		NUMBER INTERVIEWED	FEMALES	MALES
TOTAL		165	117	48
PERCENTAGE (%)		100	70.91	29.09
AGE RANGE (yrs)	Youngest	24	24	30
	Eldest	92	92	92

Table 3.7: Population Representation

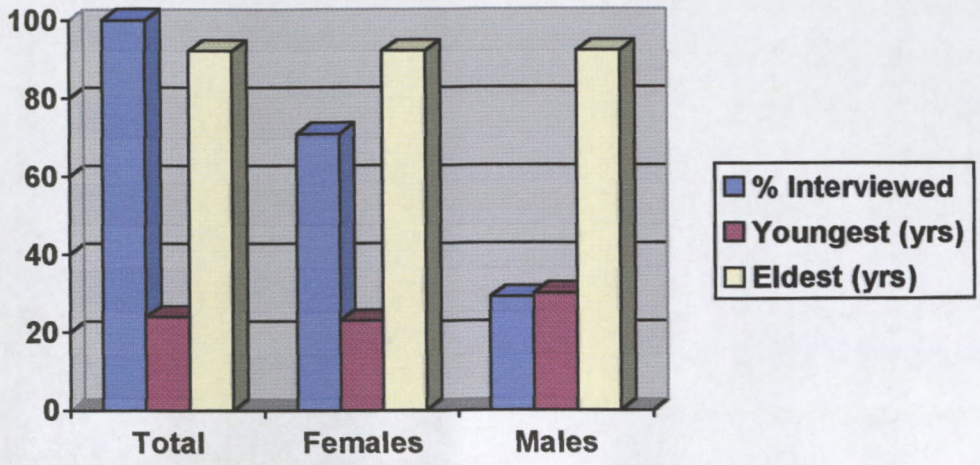

Figure 3.6: Percentage of females and males interviewed and their age range.

In the second set of statistics respondents were asked the following:

- had they heard of BoTT,
- did they know what it stood for,
- did they know how it worked and
- what was it proposed to achieve.

The respondents (Table 3.8) indicated that:

- the majority of the community had heard of BoTT (70.91%)
- 70.91% knew what it stood for
- 61.21% knew how it worked,
- while 84.85% did not know what it was proposed to achieve (Figure 3.7).

TOTAL		(A) Have you heard of BoTT?	(B) Do you know what it stands for?	(C) Do you know how it works?	(D) What it is proposed to achieve?
TOTAL	Yes	117	117	101	15
	No	46	45	59	140
	None	2	3	5	10
PERCENTAGE (%)	Yes	70.91	70.91	61.21	9.09
	No	27.88	27.27	35.76	84.85
	None	1.21	1.82	3.03	6.06

Table 3.8: The BoTT scheme awareness

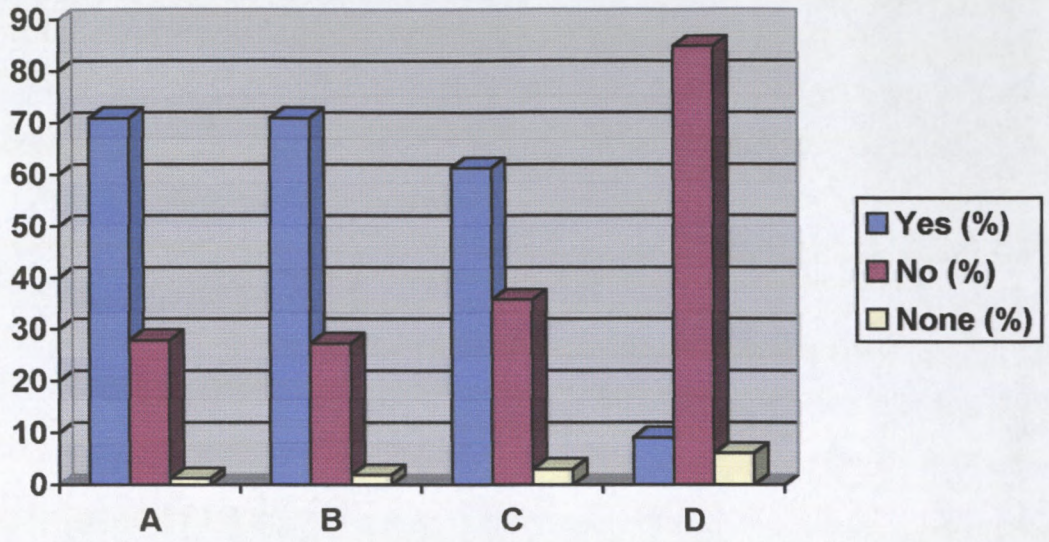

Figure 3.7: BoTT scheme awareness

The third set of statistics was taken from the Awareness of the fundamentals of the scheme. Respondents were asked:

- whether they knew the origin of the water;
- how the water got to the standpipes;
- what to do when they saw a leak;
- why must they pay for water and
- who was responsible for maintaining the scheme.

The respondents indicated that:

- the majority of the community (81.21%) knew the origin of the water.
- 53.33% knew how the water got to the standpipes;
- 41.21% knew what to do when they saw a leak;
- 51.51% understood why they had to pay for water and
- 28.48% knew who was responsible for maintaining the scheme (Table 3.9, Figure 3.8).

TOTAL		(A) Where the water comes from	(B) How the water gets to the standpipes	(C) What to do when you see a leak	(D) Why you must pay	(E) Who is responsible for maintaining the scheme
TOTAL	Yes	134	88	68	85	47
	No	26	71	91	77	110
	None	5	6	6	3	8
PERCENTAGE (%)	Yes	81.21	53.33	41.21	51.51	28.48
	No	15.76	43.03	55.15	46.67	66.67
	None	3.03	3.64	3.64	1.82	4.85

Table 3.9: Awareness of the fundamentals of the scheme

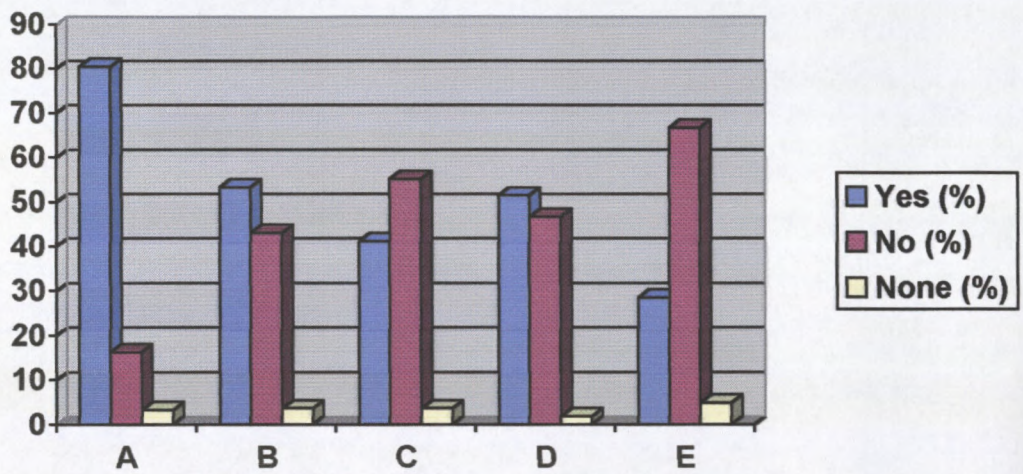

Figure 3.8: Total percentage response to awareness of the fundamentals of the scheme

The fourth set of statistics was taken from the Expectations of the scheme. Respondents were asked:

- whether the scheme delivered what they had expected.

The respondents with a negative reply were asked,

- to state whether they were unhappy with the walking distance to dispensing points and/or
- about paying for water,
- whether they believed that the scheme was going to create jobs
- and whether they were satisfied with the scheme.

The respondents indicated that:

- the majority of the community (68 – 76%), agreed that the scheme was delivering what they had expected, believed that the scheme was going to create jobs and were satisfied with the scheme (Table 3.10, Figure 3.9).
- 53 respondents indicated that the scheme was not delivering what they expected,
- 11 were unhappy with the walking distance to dispensing points,
- 15 were unhappy about paying for water,
- 8 were unhappy about both and
- 19 could not explain why (Table 3.10).

TOTAL		(A) Does the scheme deliver what is expected?	If no, are you unhappy			(B) Did you believe that it was going to create jobs?	(C) Are you satisfied with the scheme?
			With walking distance	About paying for water	Both		
TOTAL	Yes	112				115	126
	No	53	11	15	8	44	33
	None	0				6	6
PERCENTAGE (%)	Yes	67.88				69.69	76.36
	No	32.12				26.67	20.00
	None	0.00				3.64	3.64

Table 3.10: Expectations of the scheme

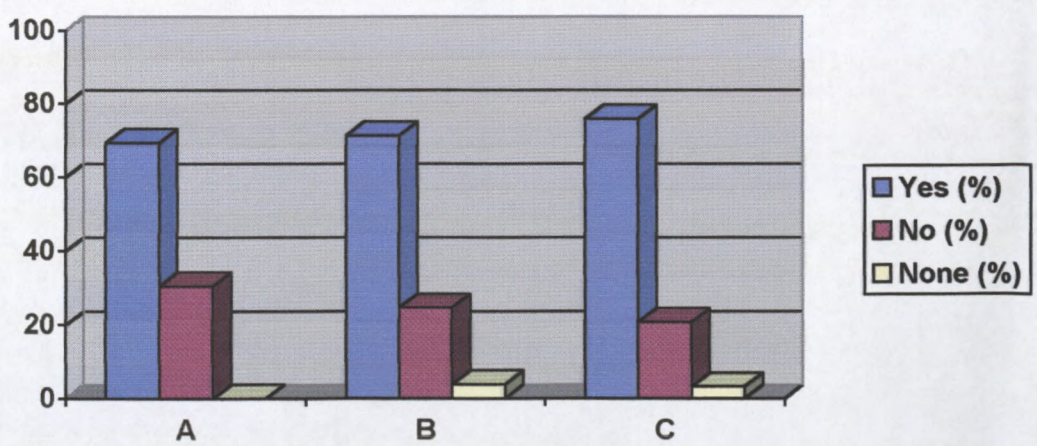

Figure 3.9: Expectations of the scheme

The fifth set of statistics was taken from the training provided under the scheme. Respondents were asked whether they had received any training under the scheme, and if so, in which category ie basic pipe laying skills, block making, brick and block laying, basic plumbing, capacity building skills and/or other. The persons trained under the scheme were asked whether it was what they had expected; had it been useful and would they be able to use those skills again. The results show that:

- only 62 (37.58%) out of 165 respondents interviewed received some training under the scheme.
- 36 received training in basic pipe laying skills;
- 30 in block making;
- 22 in brick and block laying;
- 27 in basic plumbing;
- 32 in capacity building skills and
- 10 in other (trench digging, backfilling and/or bush clearing).

The survey indicated that:

- it was what they had expected to get,
- 58.33% indicated that the training was useful and
- 49.30% indicated that they would be able to use these skills again (Table 3.12, Figure 3.10).

TOTAL	Number trained under the scheme	Basic pipe laying skills	Block making	Brick and block laying	Basic Plumbing	Capacity Building skills	Other
Yes	62	36	30	22	27	32	10
No	103						

Table 3.11: Training received under the scheme

		(A) Number trained under the scheme	(B) Is it what you expected to get?	(C) Has it been useful?	(D) Would you be able to use these skills again?
TOTAL	Yes	62	38	42	35
	No	103	31	21	23
	None		8	9	13
PERCENTAGE (%)	Yes	37.58	49.35	58.33	49.30
	No	62.42	40.26	29.17	32.39
	None		10.39	12.50	18.31

Table 3.12: Training expectations

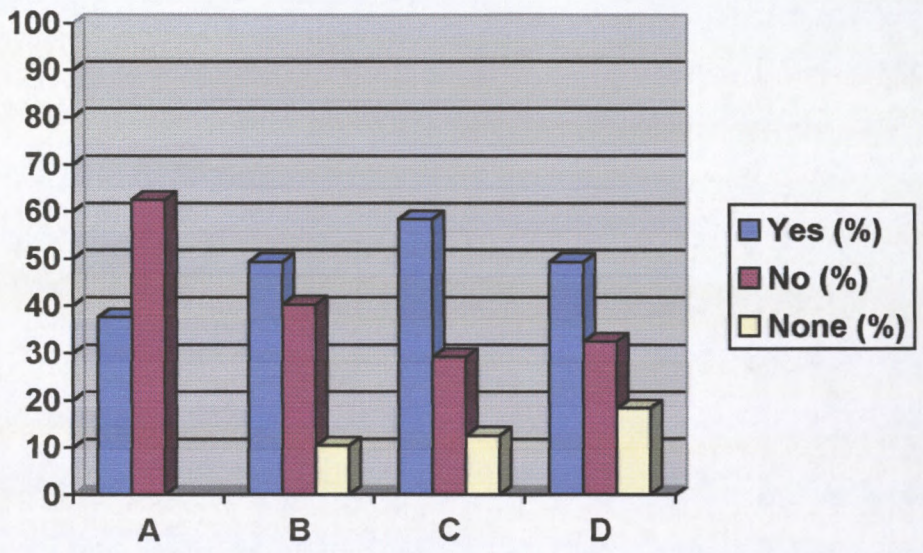

Figure 3.10: Training expectations

The sixth set of statistics concerned the Operation and Maintenance of the scheme. Respondents were asked:

- whether they were happy with Automatic Dispensing Units and
- whether they believe that the community would be able to operate and maintain the system.

The results are as follows:

The majority of the community were happy with Automatic Dispensing Units (60.61%) and an overwhelming majority (89.70%) believed that the community would be able to operate and maintain the system (Table 3.13, Figure 3.11).

		(A) Are you happy with Automatic Dispensing Units?	(B) Do you believe the community would be able to operate and maintain the system?
TOTAL	Yes	100	148
	No	61	15
	None	4	2
PERCENTAGE (%)	Yes	60.61	89.70
	No	36.97	9.09
	None	2.42	1.21

Table 3.13: Operation and Maintenance

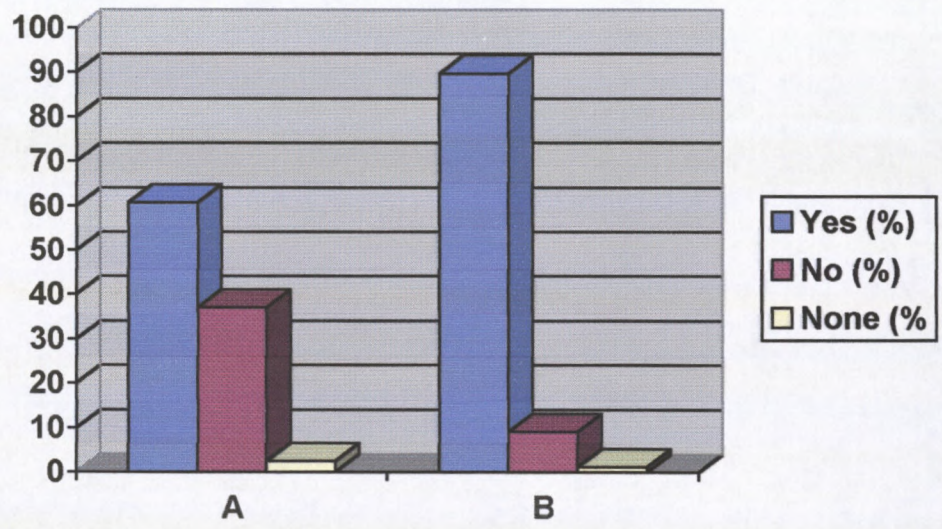

Figure3.11: Operation and Maintenance

The final set of statistics was taken from the PSC section of the questionnaire. Statistics were as follows:

- The PSC members were asked whether they were satisfied with the way their schemes work.

The original 165 respondents interviewed included 5 PSC members three of them (60%) were satisfied with the scheme.

3.4 SURVEY FINDINGS

The survey findings suggested the following:

Shemula CWSS (non-BoTT)	Nqutu CWSS (BoTT)
An overwhelming majority of the people of Shemula knew the origin of the water, knew how the water got to the standpipes, knew what to do when they saw a leak.	The majority of people in Nqutu had heard of BoTT, knew what it stood for and knew how it worked
They also understood why they must pay for water and knew who was responsible for maintaining the scheme.	The community understood why they must pay for water and knew who was responsible for maintaining the scheme

Table 3.14: Survey Findings

CHAPTER 4: IMPLEMENTING AGENT SURVEY

4.1 INTRODUCTION

The previous chapter deals with the communities' perceptions of their schemes, whilst this chapter deals with the implementing agents' perception of their schemes. The four representatives that completed the questionnaire are:

- Mr. T. Cornish, the Deputy Provincial Manager of AquAmanzi, the BoTT IA for KwaZulu-Natal.
- Mr. G. Malan of Mhlathuze Water, the IA for the Shemula CWSS,
- Mr. R. Kieck the Bulk Services Director of Umzinyathi District Municipality – representing the district municipalities. The Nqutu CWSS falls under their jurisdiction. They will be called UDM in this survey
- Mr. M. du Preez of Keeve Steyn – representing the Department of Water Affairs and Forestry for KwaZulu Natal. They will be called ER – Engineering Representative in this survey.

The Author designed the questionnaire. The Author contacted each of the representatives personally and asked them to complete the forms.

The questionnaire was structured to draw out only the relevant responses from the interviewees.

- The first question was a general question to ascertain whether the interviewee felt that BoTT was suitable to their areas.
- Questions two and three were designed to ascertain whether any shortcomings in the training were as a lack of funds or lack of practical training.

- Question four was a general question to determine whether the interviewee felt that Local Council would be able to Operate and Maintain the scheme.
- Question five was a check question to ascertain if the scheme was currently self-sustaining.
- Question six was designed to obtain an indication in which area the system was not self-sustaining, should the answer to question four be negative.
- Question seven was designed to highlight the need for more guidance in training, should the answer to questions four and five be negative.
- Question eight was designed to ascertain whether the interviewee was aware of the running costs of their schemes.
- Question nine was a check question to compare with question five.
- The monitoring of water consumption was imperative to the scheme being self-sustaining. Question 10 was designed to ascertain whether this was so.
- Question eleven was phrased in order to determine how the interviewee felt a negative answer to question four and five was addressed.
- The free 6KL per household issue was only promulgated in recent months, and this would have a detrimental effect on all CWSS's. Questions twelve and thirteen were therefore designed to ascertain whether the representative considered the effect on their scheme and made contingency plans

A copy of the questionnaire is found in **Appendix H** whilst a tabulated format of the findings is found in **Appendix I**.

4.2 FINDINGS

The following report was drawn up using the information provided in the questionnaires. Statistics were as follows:

The respondents were asked in question one whether they believed that the BoTT approach was more appropriate for rural schemes.

- Three respondents, UDM, AquAmanzi and ER, said "yes" whilst Mhlathuze Water said "no". Mhlathuze Water substantiated their answer by stating that they found the BoTT approach more expensive than the traditional approach.
- UDM approved the approach but was not happy with Operation and Maintenance of BoTT schemes.
- AquAmanzi considered the BoTT approach appropriate because of its speed of delivery, considering that there was a lack of capacity in the rural Local Government.
- The ER said that the BoTT approach was appropriate to large projects and programs, probably with a minimum value of R2 million per project.

The respondents were asked in question two whether they believed that adequate provisions had been made available in the Business Plan to empower the communities to operate and maintain the scheme. The respondents were divided on this issue; AquAmanzi and ER were positive whist the other two were not.

The respondents were asked in question three whether they believed that the communities had been adequately empowered to Operate and Maintain the Schemes. AquAmanzi and Mhlathuze Water said " yes" whilst the UDM and ER said "no". Their comments on the question were as follows:

- AquAmanzi believed that the Water Service Authority (WSA) set the level to which the communities could be involved.
- AquAmanzi and Mhlathuze Water both agreed that greater empowerment could be possible with WSA support or additional management support.

- UDM believed that communities could not be empowered to perform all functions required for sustainable services,
- The ER said that Local Government Policy had been unclear and that they had tended, so far, not to want community-based Water Service Providers (WSPs).

The respondents were asked in question four whether, in hindsight, they believed that the RDP policy adequately addressed issues of sustainability, affordability and ability of local communities to operate and maintain the scheme. All respondents were negative. They expanded further by saying:

- AquAmanzi - that a higher level of service was required to ensure sustainability.
- Mhlathuze Water - the RDP policy did not recognize the problem of management, which needs augmentation from external sources.
- The ER - the RDP policies underestimated the convenience factor in water consumption ie carrying of household water needs to 200 m is too onerous (heavy) for most women that have to fetch water for household use. Low consumption rates immediately imply high unit costs, thereby discouraging further consumption. The RDP policies have also underestimated the long-term effect of rates and tariff boycotts implemented as part of the "struggle".

The respondents were asked in question five whether either of the schemes were currently self-sustaining. UDM, AquAmanzi and Mhlathuze Water said that the schemes are currently not self-sustaining whilst the ER believed that there were non-BoTT schemes that were apparently self -sustaining.

The respondents were asked in question six what were the major contributing factors towards the non self-sustainability of the schemes. They saw the contributing factors as:

- High operation costs

- Service Support by prepayment,
- Vandalism
- The " free water" issue
- Law or "red tape"
- Unaccounted for water. This is the difference between the volume you buy or supply and the volume of water you sell.

The respondents were asked in question seven whether they believed that the Scheme could be self-sustainable. UDM, AquAmanzi and Mhlathuze Water, said" yes" whilst, the ER said "no" due to the current economic and political climate. The ER commented further by saying that:

- Household disposable income levels were too low
- Scattered nature of spatial distribution in rural communities
- Low level of skills generally available in rural areas
- Relatively high level of technology applied and
- Poor economies of scale in the Operation and Maintenance ie a basic high fixed overhead operation and maintenance cost regardless of water consumption.

- The respondents also offered the following comments:
- AquAmanzi, Mhlathuze Water and ER also believed that the schemes could be self-sustainable by increasing support.
- AquAmanzi and ER agreed that in order for the scheme to be self–sustainable, mentoring needs to be increased and staff re-trained.
- AquAmanzi and Mhlathuze Water also agreed that staff needs to be increased.
- AquAmanzi went on further to comment that individual connections would contribute towards a scheme becoming self-sustaining ie the more water sold, the quicker it becomes self-sustaining.
- Mhlathuze also believes that by reducing system pressures the scheme could become self-sustaining.

- The ER added further that there needed to be some kind of subsidy system in place for a scheme to become self-sustaining.

The respondents were asked in question eight to indicate their current water tariff. UDM and AquAmanzi both stated R 8.00/kl, Mhlathuze Water R9.43/kl for communal supply and R 8.22/kl for private-metered supply.

The respondents were asked in question nine whether consideration had been given to increase the tariff. UDM, AquAmanzi and ER said "no" whilst Mhlathuze Water said "yes".

The respondents were asked in question 10 to indicate the average water consumption. UDM recorded between 1.2 and 8 l/c/d, AquAmanzi 3 l/c/d and Mhlathuze Water was 6 l/c/d.

The respondents were asked in question 11 whether they believed that RDP should encourage the participation of private consumers in order to improve the sustainability of the scheme. The representatives all recorded an emphatic positive affirmation.

- UMD expanded by saying that RDP should allow for choices of level of service.
- The ER said that if private consumers could be served, they should be encouraged in order to improve the sustainability of rural schemes.

When asked in question 12 whether they had made contingency plans to accommodate the "free water" issue, the respondents replied that:

- UDM, Mhlathuze Water and ER had not.
- AquAmanzi said "yes" and were currently discussing the issue with Local Authorities. They believed that the trickle feed option would be most suitable for rural schemes.

- The ER expanded by saying that many rural municipalities did not have resources, even with equitable share, to provide "free" water.

The respondents were asked in question 13 how they believed that the "free water" issue would affect the sustainability of the scheme. UDM said that provided an agreement could be reached with Local Government the "free water issue" would improve the risk of the WSP not becoming self-sufficient.

- AquAmanzi said that most rural schemes would not be sustainable without support from Local Authority.
- Mhlathuze Water stated that they do not have a problem with the free water issue as long as the shortfall in income is reimbursed by the WSA.
- The ER said that the matter of "Free Basic Water" had turned things upside down with regard to sustainability.

4.3 FURTHER COMMENTS FROM THE DWAF ER

The ER expanded further on their perceptions about the BoTT approach

a) The present BoTT contract was poorly compiled.

b) In the case of ISD and O&M payment was on input rather than output.

c) The Scope of works and location was originally poorly defined and Tenderers had to tender for too many unknowns, leading to unnecessarily high rates, which then were negotiated down.

d) The contract was not well "sold" to local government who did not buy in.

e) Communications between DWAF and local government were very poor.

f) The tender was too generic for provinces and tended to ignore local or regional differences.

g) Pending legislation by DWAF was apparently ignored when the contract was compiled and let (Tender awarded July 1997, Water Services Act enacted in December 1997).

h) Political considerations sometimes overrule technical and/or financial realities. The problems can often be obviated under BoTT with guidance/advice from DWAF.

i) Working to a budget that changes annually and even within a financial year with no medium term assurance makes it difficult to plan and implement effectively.

j) Bureaucratic processes have been excessive with rules changing mid-course. The problem has really prevented an efficient BoTT process.

k) A BoTT contract will work very well if it is implemented in a limited geographical area, with pre-defined, grouped projects and clear objectives with regard to LA O&M structures, O&M policies etc.

l) A fixed programme budget over the period is very desirable.

The ER also expanded about the non-BoTT programme saying that it had some problems of its own:

a) In many cases the work is poorly monitored by client and the quality of construction and training is often of a low standard.

b) Often the consultants are poorly briefed and have to work with unrealistic budgets the result of inexperienced client representatives.

c) There is very little, if any, thought given to economies of scale - especially with respect to O&M.

d) Very little consideration given to mentoring.

e) Political considerations often overrule technical and financial realities.

f) Limited mechanism/opportunity for DWAF to ensure "value for money" or compliance with BPs.

4.4 SURVEY FINDINGS

The survey suggested the following:

- The majority believed that the BoTT approach was appropriate for rural schemes.
- Neither of the schemes were currently self-sustaining, however, an increase in tariff had not yet been considered by the majority. This could be due to the poverty of the rural communities.
- Both the schemes have shown low average water consumption. This was due to the fact that communities only purchase water for domestic use and utilise boreholes and rivers for washing purposes.
- All the respondents believe that the "free water" issue has jeopardized the sustainability of rural water schemes that were dependant on the sale of water.
- Both the IAs believed that their Communities have been adequately empowered to Operate and Maintain their schemes.
- The majority believes that the RDP policy did not adequately address the issues of sustainability, affordability and the ability of the Communities to Operate and Maintain the schemes.

- The majority, however, believe that the schemes have the ability to become self-sustainable through re-training the community, increased support and an increase in staff.

- They also believed that private consumers, ie house connections, would improve the sustainability of their schemes.

CHAPTER 5: CONCLUSIONS

The BoTT orientated Nqutu and Non-BoTT based Shemula schemes were both initiated based on the RDP programme for water supply to rural communities. The extent to which the needs and expectations of the community were met has been evaluated, resulting in the following conclusions:

1) Basic Supply

The first basic principle of RDP is a lifeline supply of 25 litres per capita per day of water within a 200 m walking distance for rural communities. Both schemes were designed to deliver 25 litres per person per day.

However, only the Nqutu CWSS was able to comply with the 200 m walking distance. In Shemula, the community agreed to a walking distance up to 1 km. This is due to the scattered nature of settlements and to ensure a wider distributed supply in the area. The results of the community surveys conducted, suggested that generally the communities are happy with the respective schemes believing that the schemes have delivered what they anticipated. A conclusion could be drawn from the above that basic walking distance of 200 m can be relaxed, so that more people can be served by the schemes. However, the inconvenience of carting water remains a problem, as it is physically very difficult to transport a family's consumption by foot. The observation is confirmed by the ERs comments and by the consumption figures.

2) Employment Creation through Labour Intensive Construction

The Nqutu and Shemula CWSSs created employment within the communities through labour intensive construction methods. However, the nature of the jobs created differed; Nqutu CWSS created temporary jobs whilst Shemula CWSS created permanent jobs. Job creation

opportunities existed under BoTT but because it was a set contract, the profit margin was low in comparison with a non-BoTT contract. Nqutu jobs were created through the employment of labour in construction, water vendors and maintenance officers for the operation and maintenance of the scheme. However, only the water vendors and maintenance officers jobs were of a permanent nature. The Shemula contractor not only employed local contractors but also trained local contractors in management skills. The local contractors were employed instead of the main contractor during the extension to the Shemula 2 contract. BoTT is a fast track approach; therefore there is little time to train communities in jobs of a more permanent nature.

3) Training

Training played a major role in both these schemes and is also the "essence" of the BoTT approach. Training in construction and operation and maintenance including institutional and social development is discussed in detail:

a) Construction

The schemes both utilized labour intensive construction in line with the current RDP policy. The communities of both the Nqutu CWSS and Shemula CWSS believed that their respective schemes would create job opportunities. Individuals were trained in basic pipe laying; block and brick laying, plumbing, capacity building and other skills. These communities both believed that the skills they have been taught could be reused, therefore the expectations of the communities were met. Although permanent job opportunities were not created, skills were transferred to the communities.

b) Operation and Maintenance including Institutional and Social Development

Each community has trained people to operate and maintain their schemes. The Nqutu community however are confident that they would be able to operate and maintain this system. The community of Shemula perceive that they will not be able to operate and maintain their scheme

because they have not been trained for it. Mhlathuze Water trained local people under Shemula 1 to attend to the operational and maintenance matters. This is done under the trusteeship of the Amanzi Trust. The client bodies ie Umzinyathi District Municipality and Mhlathuze Water believe that the communities have not had adequate training to operate and maintain their schemes. It appears, as if generally, the communities may not have the capacity or the ability to be trained adequately within the required period of time. The recommendation, therefore, is that a skills assessment be conducted in a community prior to any planning taking place and the method of operation and maintenance to be undertaken can then be planned accordingly.

4) Affordability

The Business Plans for both the projects covered affordability. The PSC for the projects accepted the proposed tariffs on behalf of their committees. The results of the surveys conducted indicate that the communities seem to have embraced the concept of "payment for water". However, implementing the concept is more difficult. The communities have a reluctance to spend a high percentage of their income on water.

5) Sustainability

The RDP principle requires water schemes to be self-sustainable. The Nqutu and Shemula CWSSs currently have not reached that goal. A cost recovery system is in place for both the schemes; however water consumption is too low to attain sustainability. The rural communities are poor as stated earlier and only tend to purchase water for drinking purposes. The RDP policy at present finances water to standpipes only and not to individual households or other users. The representatives of the two schemes believe that the participation of private users in RDP schemes would contribute towards self-sustainability. The contributory factors that have hindered these schemes from becoming self-sustainable until now are: -

- The RDP policy of a maximum 200 m walking distance was impractical. The difficulty for anybody to cart by hand 25 litres of water for each family member everyday no matter what the distance, results in the communities using as little potable water as possible and they would rather carry clothes to the river to wash.
- The schemes both use automatic dispensing units (ADUs) that are expensive to maintain compared with a normal standpipe. The reason for using ADUs was to ensure payment for water used, however, ADUs generally add to the operation cost of the schemes. The introduction of stronger community structures could lead to securing income from the scheme and if 'normal' community standpipes were used one would rely on the communities' integrity to retrieve revenue. The recurring costs, e.g. staff salaries, vehicle maintenance and repairs, operation and maintenance costs of scheme etc, are higher than the income generated from the sale of water.
- The schemes have been regularly vandalized.
- Water loss is the difference between the volume bought or supplied and the volume of water sold. Shemula CWSS has a problem with unaccounted water loss whilst Nqutu CWSS has had minor problems in this area.

The Nqutu and the Shemula CWSS are both currently not self-sustaining, the implementing agents and the district municipality are confident, however, that both schemes have the potential to become self-sustaining given the right circumstances eventually. The schemes have both the elements of reaching the status of self–sustainability.

6) Operation and Maintenance Period (O&M)

The BoTT schemes in general are financially adequately equipped in terms of the operation and maintenance of a community water scheme. The surveys conducted indicate that AquAmanzi is confident that the Nqutu community has been adequately served in terms of funding and training of the O&M period and believe that with support of the WSA, the WSP could be empowered to operate and maintain the scheme.

Shemula CWSS was not adequately provided for in terms of training and funding for the operation and maintenance of the scheme. The requirement was not fully understood in 1995 by Mhlathuze Water. They have since made provision for the operation and maintenance of the scheme and are confident that with additional management support the community could be empowered to operate and maintain the scheme. The Umzinyathi District Municipality and ER, however, do not believe that the communities are adequately empowered to operate and maintain the schemes.

The analysis of both the schemes highlight the fact that the BoTT schemes have been better equipped in terms of Operation and Maintenance; however, only time will tell whether the communities have the ability to "run" their own schemes.

7) Free Water Issue

The Minister of Water Affairs and Forestry has introduced a policy of 6kl/month water free for all households on the breadline. The concession will apply to all rural schemes, which are at the moment battling with cost recovery. The implementing agents all agree that the free water issue will impact negatively in terms of sustainability on the community water schemes.

8) Scheme Costs

The implementing agents were asked in the survey conducted whether they believed that the BoTT was more appropriate to rural schemes. Umzinyathi DM, AquAmanzi and ER believe that it is so. Mhlathuze Water believes that BoTT is more expensive. The cost implications of both these schemes were analyzed. The cost per capita for Nqutu 1 CWSS was R1378 whilst Shemula 2 CWSS was R1286. Although the Shemula 2 CWSS was less costly than the Nqutu scheme, it did not have an adequate operation and maintenance budget. Mhlathuze Water applied for and received an operation and maintenance budget later in the scheme. The additional budget added to their initial budget was equal in cost to Nqutu. The perception that BoTT is more expensive is therefore untrue.

9) Overall Perceptions of the Schemes

The communities of both Nqutu and Shemula CWSS have accepted their schemes. The community of Shemula are satisfied that their scheme does meet their expectations as presented during planning whilst the community of Nqutu are satisfied with their scheme but are battling with the fundamentals of the scheme. The Nqutu CWSS is still in its infancy. The implementing agents believe that each of their schemes have the potential to be self sustainable, it can be concluded therefore that both approaches have satisfied the communities needs and therefore both approaches are satisfactory.

The comparison between the community surveys Shemula CWSS (Non-BoTT) and the Nqutu 2 CWSS (BoTT) are summarized in Table 5.1.

Question	Shemula 2 CWSS (non-BoTT) - %		Nqutu s CWSS (BoTT) - %		Conclusions
	YES	NO	YES	NO	
1) Only for BoTT schemes					
Have you heard of BoTT?			70.91	27.88	The community of Nqutu was aware of BoTT. However, they are unaware what it was proposed to achieve.
Do you know what it stands for?			70.91	27.88	
Do you know how it works?			61.21	35.76	
What is it proposed to achieve?			9.09	84.85	
2) Awareness off the fundamentals of the scheme					
Do you know where the water comes from?	91.16	8.84	81.21	15.76	The survey shows that both communities were aware of their schemes. However, the community of Nqutu was not aware of the "working fundamentals" of their scheme. Therefore more community awareness training was required.
Do you know how the water gets to the standpipes?	100		53.33	43.03	
Do you know what to do when you see a leak?	93.20	6.80	41.21	55.15	
Do you understand why you must pay for water?	89.80	10.20	51.51	46.67	
Do you know who is responsible for maintaining the scheme?	93.88	6.12	28.48	66.67	
3) Expectations of the scheme					
Does the scheme deliver what you expected?	87.75	8.84	67.88	32.12	Both the schemes have met the expectations of the communities, thus showing that the training programme was successful.
If no - Are you unhappy with the walking distance to the dispensing points?					
If no - are you unhappy about paying for water?					

Table 5.1: Comparison of Community Surveys

Question	Shemula 2 CWSS (non-BoTT) - %		Nqutu s CWSS (BoTT) - %		Conclusions
	YES	NO	YES	NO	
Did you believe that it was going to create jobs?	75.57	23.13	69.69	26.67	
Are you satisfied with the scheme?	89.80	9.52	76.36	20.00	
4) Did you receive any training under the scheme?					
If yes, which of the following did you receive?	34.69	65.31	37.58	62.42	Only 36.14% of the people interviewed on both the schemes received training. The construction training for the community of Shemula has been successful. The community was confident that they will be able to utilise their skills again, whilst the community of Nqutu was unsure whether they would be able to utilise their skills again. Thus, more skills training was required at Nqutu.
Basic pipe laying skills					
Block making					
Brick and block laying					
Basic plumbing					
apacity building skills					
Other					
Is it what you expected to get?	98.04		49.35	40.26	
Has it been useful?	98.04		58.33	29.17	
Would you be able to use these skills again?	98.04		49.30	32.39	
5) Operation and Maintenance					
Are you happy with automatic Dispensing Units?	91.16	8.84	60.61	36.97	Both the communities were happy with their AIDUs, Shemula, more so than Nqutu.

Table 5.1: Comparison of Community Surveys (Continued)

Question	Shemula 2 CWSS (non-BoTT) - %		Nqutu s CWSS (BoTT) - %		Conclusions
	YES	NO	YES	NO	
Do you believe that the community would be able to operate and maintain the system?	52.38	47.62	89.70	9.09	The community of Nqutu was confident that they would be able to Operate and Maintain their scheme, whilst the community of Shemula was not. Therefore more Operations and Maintenance training would be required at Shemula.
If no, state why.					
6) For PSC members only					
Are you satisfied with the way your schemes work?	50.00	50.00	60.00	40.00	The PSC members at Shemula and Nqutu were unsure on whether they were satisfied with the way the scheme worked.
If no, state why.					

Table 5.1: Comparison of Community Surveys (Continued)

The comparison between Non-BoTT and the BoTT approaches are summarized in Table 5.2.

Non-BoTT approach	BoTT approach
This was the traditional method of construction	BoTT was implemented because local government and non local government organizations did not have the capacity to spend their budget allocation and RDP was losing ground
In its current form it is sometimes less costly than BoTT	In its current form it appears to be more costly than the normal approach
It is a slower method of getting capital projects under way because it needs to go to tender.	It is a "fast track" method of getting capital projects under way
It is adaptable to all sizes of schemes	In its current form it is more suitable for area schemes
It can be adapted for any type of scheme	It is too generic to cover a single large area such as KwaZulu Natal
Local authorities feel "comfortable" using this method	Local authorities have felt "bulldozed" into using BoTT
The training is adapted to whoever is appointed to train the community	The training on BoTT is standardized
The operation and maintenance aspect was inadequately addressed. However efforts are being made to address these shortcomings.	The operation and maintenance aspect is "built" into BoTT
It is a stand alone approach	Schemes can be regionalized
It is a project -based approach.	It is a programme based approach

Table 5.2: Comparison of Approaches

CHAPTER 6: RECOMMENDATIONS

The recommendations emanating from conclusions reached regarding the RDP approach for the provision of water to rural areas warrant the following considerations: -

1) The RDP policy of a 200 m walking distance was underestimated. The supply to individual consumers will help schemes become self–sustainable. This will result in more people purchasing water because of the convenience factor.

2) The current BoTT approach is too generic for the whole of KwaZulu Natal. A group of projects should be identified for a BoTT type approach and a contract drawn up accordingly.

3) The original RDP policy is commendable in empowering communities to operate self-sustainable schemes but most rural communities have a low literacy level as the more literate members migrate to towns. The ability of communities (or individuals) within should be assessed for ability to run a scheme and schemes graded accordingly.

4) A feasibility study should be undertaken to ensure that the district municipality has the necessary infrastructure before actions like the Water Act of 1998 become promulgated giving the district municipality the mandate to become Water Service Authorities (WSA) and process implemented to address if not.

5) The BoTT process can be successful, if it is restructured to more concentrated areas. Projects should be identified and then regionalised, so that it would be easier to identify costs. Small projects can be grouped together and the BoTT approach applied.

The clear message to be drawn from a comparison of the BoTT and non-BoTT approaches of water supply is that both schemes have their place in the engineering sector and it will be incumbent upon the responsible water authority to carry out a feasibility study as to which method is more appropriate for a specific project or group of projects.

Figure 6.1 depicts a flow chart for a suggested BoTT application for rural water projects.

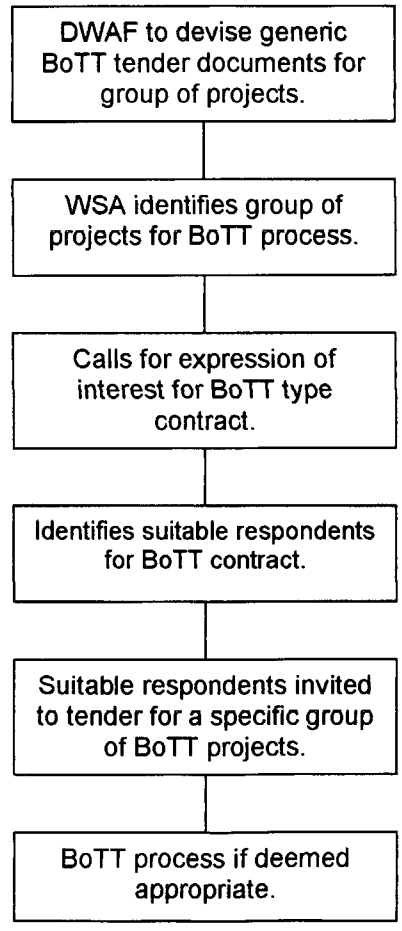

Figure 6.1: Flow Chart for a Suggested BoTT Application

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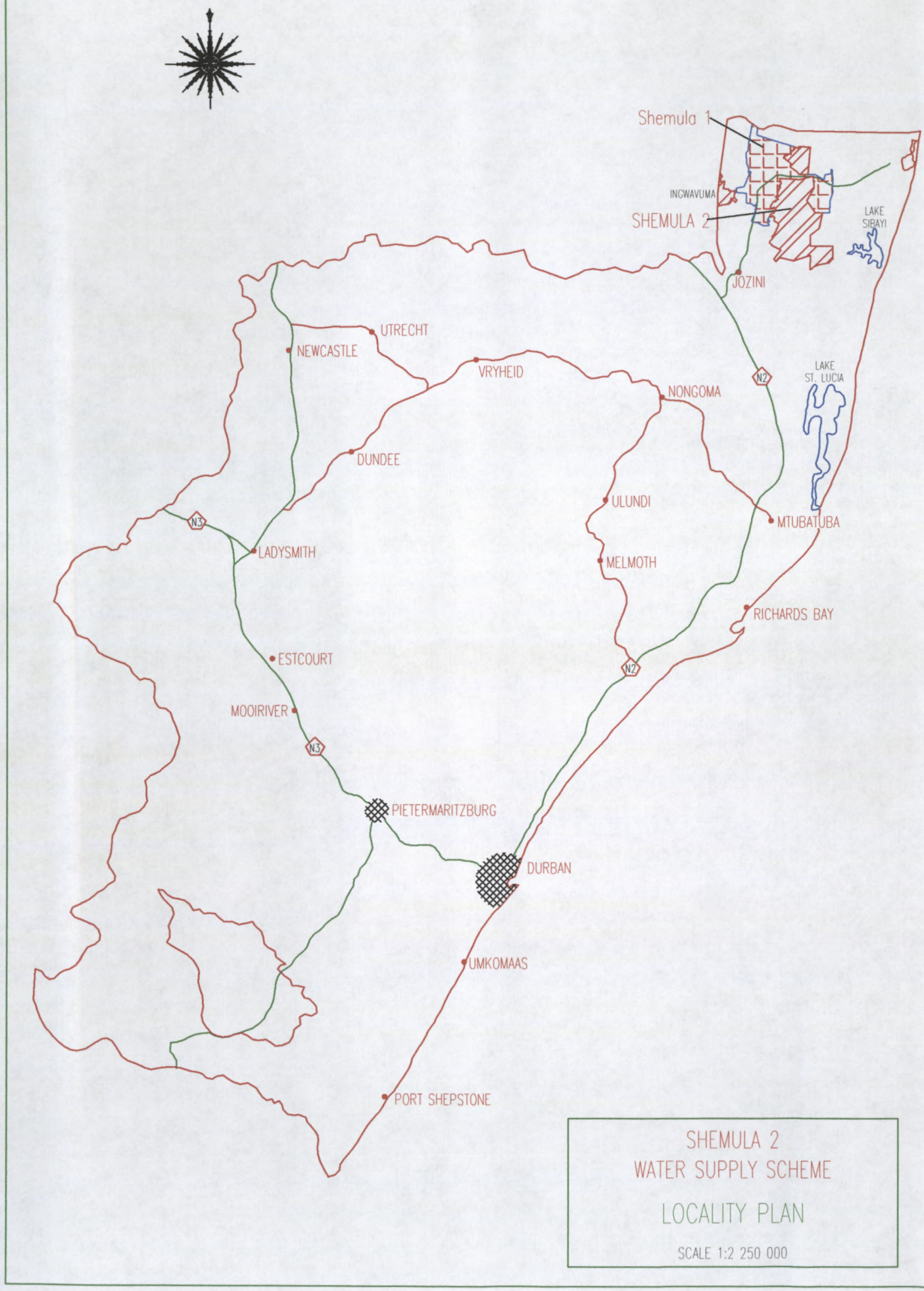
APPENDIX A
SHEMULA LOCALITY PLAN (JGP,1997)


Shemula 1
INGWAVUMA
SHEMULA 2
LAKE SIBAYI
JOZINI
UTRECHT
NEWCASTLE
VRYHEID
NONGOMA
N2
LAKE ST. LUCIA
DUNDEE
ULUNDI
MTUBATUBA
N3
LADYSMITH
MELMOTH
RICHARDS BAY
ESTCOURT
N2
MOOIRIVER
N3
PIETERMARITZBURG
DURBAN
UMKOMAAS
PORT SHEPSTONE
SHEMULA 2
WATER SUPPLY SCHEME
LOCALITY PLAN
SCALE 1:2 250 000

APPENDIX B
SHEMULA LAYOUT PLAN (JGP,1997)

LEGEND

- EXISTING WATER SCHEME
- PROPOSED WATER SCHEME
- ROADS
- RIVERS
- WARD BOUNDARIES
- NORTH / SOUTH DIVISION
- SETTLEMENTS
- CONTOURS - INTERVAL 20m
- DEVELOPMENT PHASE
- POSSIBLE FUTURE INCLUSIONS

FOR CLARITY CONTOUR INTERVAL IN THIS AREA = 40m

NDUMU
MBANGWENI CORRIDOR
TEMBE
NDUMU RESERVOIR
SHEMULA 1 WATER WORKS
LULWANE
ZAMA ZAMA
MBOZA
HLOKOHLOKO
EMBANGWENI
MADONE
SOUTHERN WATER WORKS
SIQAKATHA
MUNYU
NJAMANE
NONDABUYA
MACHOBENI
INDWAVUMA TOWN
MAGUGU
OKHALWENI
RESERVOIR & P.S.
RESERVOIR
JOZINI DAM WALL
JOZINI
KWANDABA EXTENSION
TAN

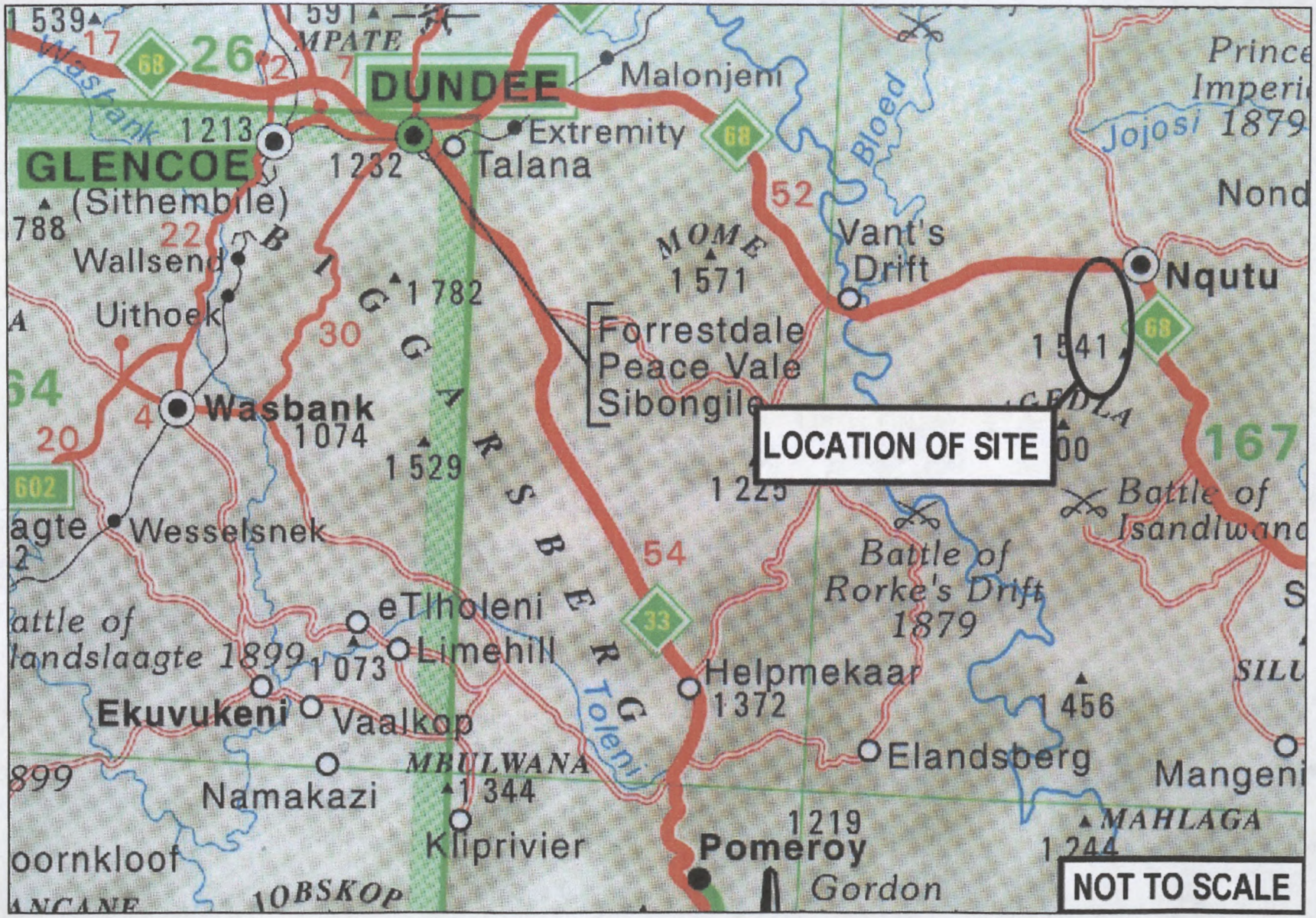
0km 2km 4km 6km 8km 10km

SHEMULA 2
COMMUNITY WATER SUPPLY SCHEME

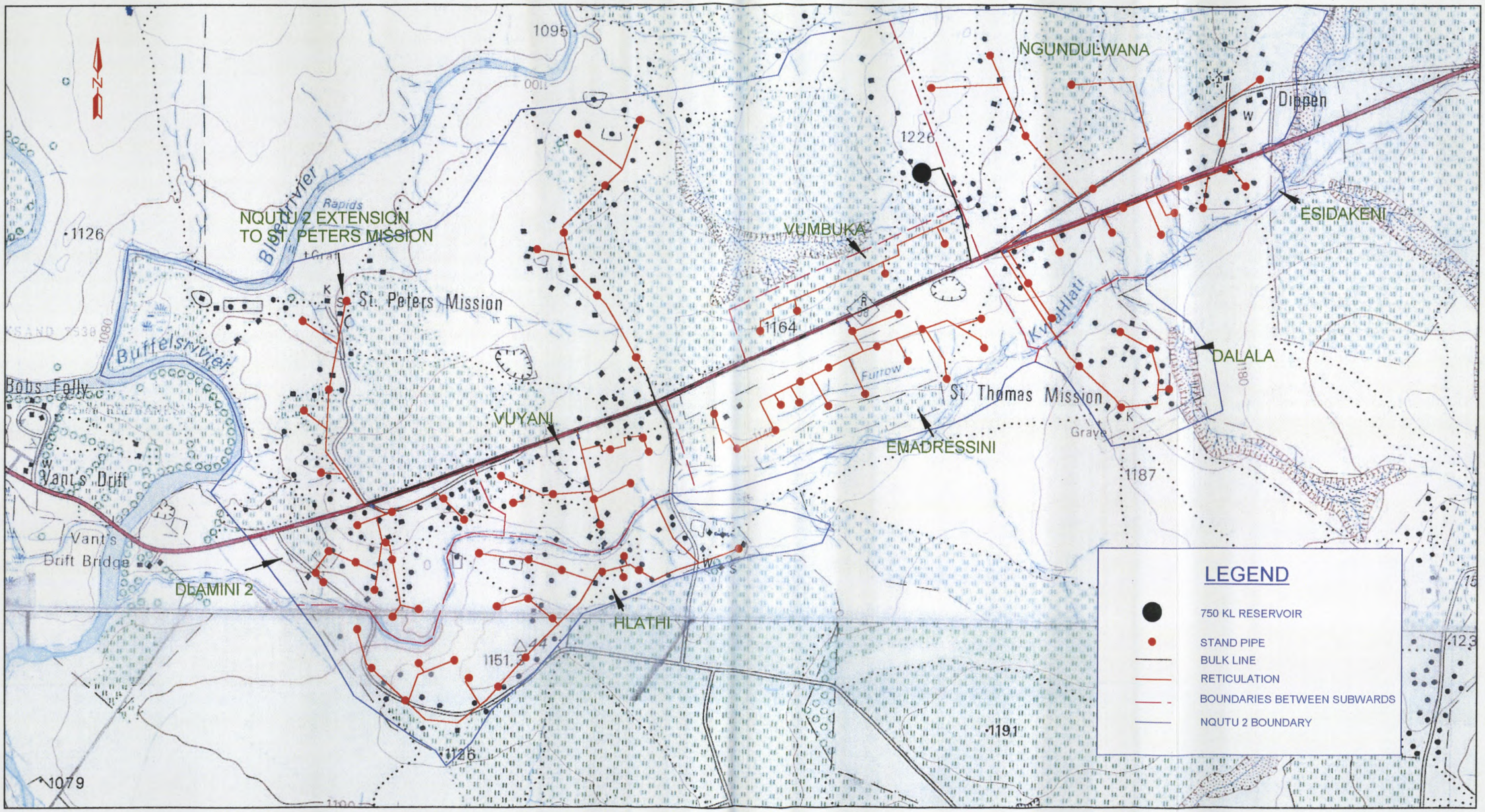
PROPOSED SCHEME LAYOUT

SCALE 1 : 75 000

APPENDIX C
NQUTU LOCALITY PLAN (JGP,1999c)


DUNDEE
GLENCOE
(Sithembile)
Wallsend
Uithoek
Wasbank
1074
Wesselsnek
Malonjeni
Extremity
Talana
1232
1213
1782
1529
1539
788
MOME
1571
Vant's
Drift
Forrestdale
Peace Vale
Sibongile
LOCATION OF SITE
Nqutu
1541
Prince
Imperi
Jojosi 1879
Nond
Bloed
Battle of
Rorke's Drift
1879
Battle of
Isandlwana
Helpmekaar
1372
1456
Elandsberg
Mangeni
MAHLAGA
1244
1219
Pomeroy
Gordon
eTholeni
Limehill
1073
Ekuvukeni
Vaalkop
Namakazi
MBULWANA
1344
Kliprivier
Tolen
oornkloof
OBSKOP
attle of
landslaagte 1899
agte
NOT TO SCALE

APPENDIX D
NQUTU LAYOUT PLAN (JGP,1999c)



LAYOUT OF NQUTU 2 CWSS

SCALE 1:25 000

APPENDIX E
O & M – NQUTU (JGP,1999c)

TABLE 1 - O&M Pre-Commissioning Budget

NQUTU 2

ITEM DESCRIPTION	UNIT	RATE	QUANTITY	AMOUNT
PRELIMINARY & GENERAL				
EQUIPMENT FOR O&M OFFICE	sum	8,000.00	1.00	8,000.00
SUPPORT PERSONNEL				
Category 1-O&M Provincial Manager	R/hr	300.00	30.00	9,000.00
Category 2 - O&M Area Manager	R/hr	150.00	100.00	15,000.00
Category 3 - Revenue Admin	R/hr	50.00	0.00	0.00
Category 4 - Provincial Training Manager	R/hr	190.00	12.00	2,280.00
Category 5 - On Site support	R/hr	50.00	30.00	1,500.00
Category 6 - Project Support	R/hr	75.00	40.00	3,000.00
Category 7 - Training manager	R/hr	120.00	20.00	2,400.00
Category 8 - Trainer	R/hr	90.00	115.00	10,350.00
Category 9 - Facilitator (ISD)	R/hr	90.00	120.00	10,800.00
REIMBURSABLES - O & M				
PASSENGER VEHICLES	R/km	1.10	5,000.00	5,500.00
LDV VEHICLE	R/km	1.65	7,800.00	12,870.00
SUBSISTENCE	day	380.00	7.00	2,660.00
VEHICLES				
BICYCLE	no	800.00	5.00	4,000.00
CONTINGENCIES	%	10%		8,736.00
TOTAL				**96,096.00**

TABLE 2 - Support and Mentoring Costs

NQUTU 2

				Support	
ITEM DESCRIPTION	UNIT	RATE	QUANTITY	Year 1	Year 2
PRELIMINARY & GENERAL					
TIME RELATED CHARGES	month	2,500.00	12	30,000.00	33,000.00
WSP/WSA SUPPORT O & M PHASE					
Category 1-O&M Provincial Manager	R/hr	300.00	30.00	9,000.00	9,900.00
Category 2 - O&M Area Manager	R/hr	150.00	340.00	51,000.00	56,100.00
Category 3 - Revenue Admin	R/hr	50.00	80.00	4,000.00	4,400.00
Category 4 - Provincial Training Manager	R/hr	190.00	24.00	4,560.00	5,016.00
Category 5 - On Site support	R/hr	50.00	100.00	5,000.00	5,500.00
Category 6 - Project Support	R/hr	75.00	80.00	6,000.00	6,600.00
Category 7 - Training manager	R/hr	120.00	12.00	1,440.00	1,584.00
Category 8 - Trainer/Water Quality Manager	R/hr	90.00	50.00	4,500.00	4,950.00
Category 9 - Facilitator (ISD)	R/hr	90.00	200.00	18,000.00	19,800.00
REIMBURSABLES - O & M					
PASSENGER VEHICLES	R/km	2.20	7,000.00	15,400.00	16,940.00
LDV VEHICLE	R/km	1.95	11,000.00	21,450.00	23,595.00
SUBSISTENCE	day	380.00	5.00	1,900.00	2,090.00
CONTINGENCIES	%	10%		17,225.00	18,947.50
TOTAL COST				189,475.00	208,422.50

		Mentorship				
ITEM DESCRIPTION	Quantity	Year 3	Year 4	Year 5	Year 6	Year 7
PRELIMINARY & GENERAL						
TIME RELATED CHARGES	0.00	0.00	0.00	0.00	0.00	0.00
WSP/WSA SUPPORT O & M PHASE						
Category 1-O&M Provincial Manager	12.00	4,320.00	4,752.00	5,227.20	5,749.92	6,324.91
Category 2 - O&M Area Manager	48.00	8,640.00	9,504.00	10,454.40	11,499.84	12,649.82
Category 3 - Revenue Admin		0.00	0.00	0.00	0.00	0.00
Category 4 - Training Manager		0.00	0.00	0.00	0.00	0.00
Category 5 - Support operator	60.00	3,600.00	3,960.00	4,356.00	4,791.60	5,270.76
Category 6 - On site support		0.00	0.00	0.00	0.00	0.00
Category 7 - Training manager		0.00	0.00	0.00	0.00	0.00
Category 8 - Trainer/Water Quality Manager		0.00	0.00	0.00	0.00	0.00
Category 10 - Facilitator (ISD)	40.00	4,320.00	4,752.00	5,227.20	5,749.92	6,324.91
REIMBURSABLES - O & M						
PASSENGER VEHICLES	2,200.00	5,808.00	6,388.80	7,027.68	7,730.45	8,503.49
LDV VEHICLE	4,500.00	10,530.00	11,583.00	12,741.30	14,015.43	15,416.97
SUBSISTENCE	3.00	1,368.00	1,504.80	1,655.28	1,820.81	2,002.89
CONTINGENCIES		3,858.60	4,244.46	4,668.91	5,135.80	5,649.38
TOTAL COST		42,444.60	46,689.06	51,357.97	56,493.76	62,143.14

TABLE 3: CONSOLIDATION - L.O.S. 2

PROJECT			**NQUTU 2**
PROJECT No.			**KN 089**
POPULATION			**6,060**
NO. OF STANDPIPES			**128**
RETICULATION (Total km)			
O&M Pre-Commissioning Budget			**R 96,096.00**
O & M SUPPORT BUDGET	**Year**	**1**	**R 189,475.00**
O & M SUPPORT BUDGET	**Year**	**2**	**R 208,422.50**
MENTORSHIP	**Year**	**3**	**R 42,444.60**
MENTORSHIP	**Year**	**4**	**R 46,689.06**
MENTORSHIP	**Year**	**5**	**R 51,357.97**
MENTORSHIP	**Year**	**6**	**R 56,493.76**
MENTORSHIP	**Year**	**7**	**R 62,143.14**

Total Support and Mentorship Cost **R 753,122.03**

Summary of shortfall calculation:

NQUTU 2	Increase	Unit	Year 1	Year 2	Year 3	Year 4	Year 5
Population	0.00%		6060	6060	6060	6060	6060
Consumption per person	0	l/c/day	10	11	12	13	14
Project Operating Expenses (Table 5)			R 97,990.40	R 109,017.09	R 116,690.41	R 124,452.61	R 132,245.40
Support/Mentorship Cost (Table 2)			R 189,475.00	R 208,422.50	R 42,444.60	R 46,689.06	R 51,357.97
Total Cost of Delivery			**R 287,465.40**	**R 317,439.59**	**R 159,135.01**	**R 171,141.67**	**R 183,603.36**
Cost of delivery:		R / kl	R 4.43	R 4.48	R 4.40	R 4.33	R 4.27
Operating Cost / hh/ month		**R/hh/m**	**R 10.78**	**R 11.99**	**R 12.84**	**R 13.69**	**R 14.55**
Consumer Tariff - Flat Rate		**R/hh/m**	**R 20.00**	**R 20.00**	**R 20.00**	**R 20.00**	**R 20.00**
Annual revenue			R 181,800.00	R 181,800.00	R 181,800.00	R 181,800.00	R 181,800.00
Surplus/Deficit			**R 83,809.60**	**R 72,782.91**	**R 65,109.59**	**R 57,347.39**	**R 49,554.60**

Table 4: **NQUTU 2**

Consumption

Year	Annual		1	2	3	4	5
Description	Increase	Unit					
Population	0.00%		6060	6060	6060	6060	6060
Consumption per person	1	l/c/day	10	11	12	13	14
Total daily Consumption		kl/day	60.60	66.66	72.72	78.78	84.84
Unaccounted for water		%	60.00%	50.00%	40.00%	30.00%	20.00%
Water supplied		Ml/year	35.390	36.496	37.160	37.381	37.160
Water Consumed		Ml/year	22.119	24.331	26.543	28.755	30.967
Consumer tariff	0.00%	R / kl	**R 20.00**	**R 20.00**	**R 20.00**	**R 20.00**	**R 20.00**
Consumer tariff		c / 25 l	50.00	50.00	50.00	50.00	50.00
Annual revenue			R 181,800.00	R 181,800.00	R 181,800.00	R 181,800.00	R 181,800.00
Annual Project Expenses			R 97,990.40	R 109,017.09	R 116,690.41	R 124,452.61	R 132,245.40
Surplus/Deficit			R 83,809.60	R 72,782.91	R 65,109.59	R 57,347.39	R 49,554.60
Cumulative Net Cash Flow			R 83,809.60	R 156,592.51	R 221,702.09	R 279,049.48	R 328,604.09

Table 4: (Continued)

Year	Annual		6	7	8	9	10
Description	Increase	Unit					
Population	0.00%		6060	6060	6060	6060	6060
Consumption per person	1	l/c/day	15	16	17	18	19
Total daily Consumption		kl/day	90.90	96.96	103.02	109.08	115.14
Unaccounted for water		%	20.00%	20.00%	20.00%	20.00%	20.00%
Water supplied		Ml/year	39.814	42.468	45.123	47.777	50.431
Water Consumed		Ml/year	33.179	35.390	37.602	39.814	42.026
Consumer tariff	0.00%	R / kl	**R 20.00**	**R 20.00**	**R 20.00**	**R 20.00**	**R 20.00**
Consumer tariff		c/25 l	50.00	50.00	50.00	50.00	50.00
Annual revenue			R 181,800.00	R 181,800.00	R 181,800.00	R 181,800.00	R 181,800.00
Annual Project Expenses			R 144,653.07	R 157,748.54	R 172,091.03	R 187,796.18	R 204,990.11
Surplus/Deficit			R 37,146.93	R 24,051.46	R 9,708.97	-R 5,996.18	-R 23,190.11
Cumulative Net Cash Flow			R 365,751.02	R 389,802.49	R 399,511.46	R 393,515.27	R 370,325.17

Table 5: **NQUTU 2**

Annual Project Expenses

Year	Annual		1	2	3	4	5
Description	Increase	Unit					
Bulk water tariff	7.00%		R 1.00	R 1.07	R 1.14	R 1.23	R 1.31
Bulk water cost			R 35,390.40	R 39,051.09	R 42,544.39	R 45,793.47	R 48,709.07
Salaries (See table 6)	3.00%		R 33,000.00	R 33,990.00	R 35,009.70	R 36,059.99	R 37,141.79
Chemicals	12.00%		R 2,400.00	R 2,688.00	R 3,010.56	R 3,371.83	R 3,776.45
WSP office overheads	8.00%		R 2,000.00	R 2,160.00	R 2,332.80	R 2,519.42	R 2,720.98
Electricity	5.00%		R 4,800.00	R 5,040.00	R 5,292.00	R 5,556.60	R 5,834.43
Telephone & Faxes	2.00%		R 2,400.00	R 2,448.00	R 2,496.96	R 2,546.90	R 2,597.84
Standpipe Maintenance	10.00%		R 1,200.00	R 3,000.00	R 3,300.00	R 3,630.00	R 3,993.00
Reticulation Maintenance	10.00%		R 2,400.00	R 4,800.00	R 5,280.00	R 5,808.00	R 6,388.80
Water Quality Management	10.00%		R 14,400.00	R 15,840.00	R 17,424.00	R 19,166.40	R 21,083.04
Total:			R 97,990.40	R 109,017.09	R 116,690.41	R 124,452.61	R 132,245.40
Cost of delivery:		R / kl	R 4.43	R 4.48	R 4.40	R 4.33	R 4.27
Cost per household per month		R	**R 10.78**	**R 11.99**	**R 12.84**	**R 13.69**	**R 14.55**
(8 people per household)							

Table 5: (Continued)

Annual Project Expenses

Year	Annual		6	7	8	9	10
Description	Increase	Unit					
Bulk water tariff	7.00%		R 1.40	R 1.50	R 1.61	R 1.72	R 1.84
Bulk water cost	0.00%		R 55,841.48	R 63,733.74	R 72,457.29	R 82,089.85	R 92,715.92
Salaries (See table 6)	3.00%		R 38,256.04	R 39,403.73	R 40,585.84	R 41,803.41	R 43,057.52
Chemicals	12.00%		R 4,229.62	R 4,229.62	R 4,229.62	R 4,229.62	R 4,229.62
WSP office overheads	8.00%		R 2,938.88	R 3,173.75	R 3,427.65	R 3,701.86	R 3,998.01
Electricity	5.00%		R 6,126.15	R 6,432.46	R 6,754.08	R 7,091.79	R 7,446.38
Telephone	2.00%		R 2,649.79	R 2,702.79	R 2,756.85	R 2,811.98	R 2,868.22
Standpipe Maintenance	10.00%		R 4,392.30	R 4,831.53	R 5,314.68	R 5,846.15	R 6,430.77
Reticulation Maintenance	10.00%		R 7,027.68	R 7,730.45	R 8,503.49	R 9,353.84	R 10,289.23
Water Quality Management	10.00%		R 23,191.34	R 25,510.48	R 28,061.53	R 30,867.68	R 33,954.45
Total:			R 144,653.07	R 157,748.54	R 172,091.03	R 187,796.18	R 204,990.11
Cost of delivery:		R/kl	R 4.36	R 4.46	R 4.58	R 4.72	R 4.88
Operating Cost / hh / month		R	**R 15.91**	**R 17.35**	**R 18.93**	**R 20.66**	**R 22.55**
(8 people per household)							

Table 6: NQUTU 2

PERSONNEL NUMBERS	**Total**
Maintenance officer cum Meter reader	5
Water Treatment Plant Operator	0
Total complement	**5**
Monthly Salaries	
Maintenance officer cum Meter reader	R 550.00
Water Treatment Plant Operator	R 1,700.00
Total staff salaries	R 2,750.00

TRAINING PROPOSAL FOR THE OPERATIONS MANAGEMENT AND MAINTENANCE PHASE OF THE CWSS PROJECTS

CONTRACT NO. W6018B

INDEX

1. INTRODUCTION

The purpose of this document is to deliver to the Employer's Representative (ER) a training proposal as devised by AquAmanzi for the second major phase of the programme cycle as stipulated in Clause 1.1.5.10 of Contract W6018B, and referred to as the "Operations Management and Maintenance Phase (O M & M)."

The basis of such training will be to install adequate capacity at the Operations Level, as well as at the Institutional Level. The latter will be developed on a time scale which will coincide with the PIA's due responsibility to transfer the scheme as stipulated in Clause 1.1.3.8 referred to as "Transfer Date," and in accordance with the overall life cycle of the project detailed in Clause 1.16 referred to as "Contract Dates."

2. TRAINING

The main training objectives for the successful implementation of the Operations, Management and Maintenance (OM&M) Phase will be guided by the following requirements as set out by the Employer:

1. The attainment of cost effectiveness.
2. The attainment of reliability of supply and continuous maintenance.
3. The attainment of cost recovery.
4. The attainment of water quality.
5. The attainment of transfer.

The ultimate responsibility therefore is to create within the Community, Local Authority and/or Operating Authority the skills, ability, confidence and capacity to take ownership and responsibility for the implementation, management and long term sustainability of water and sanitation schemes.

2.1 Primary Objectives

The primary objectives of AquAmanzi's training shall be :

2.1.1 To create an awareness regarding local service provision and the obligations for effective community water supply and sanitation development as defined within the RDP guidelines and principles.

2.1.2 To create an awareness and understanding of the elements that contribute to the sustainability of the scheme, including water scarcity, usage, responsibilities for water management.

2.1.3 To create an awareness and understanding of the prepayment options as defined within the different tariff policy approaches.

2.1.4 To create an awareness of the operations and management requirements necessary to support sustainability.

2.1.5 To create an awareness of the elements of the scheme and the O M & M requirements for these.

2.1.6 To create an awareness of the concepts, principles and implementation of O M & M.

2.1.7 To create awareness on health and hygiene associated with water usuage..

2.2 Secondary Objectives

The secondary objectives of Auafund's training shall be:

2.2.1 To create sufficient local technical skills for operations, management and maintenance.

2.2.2 To impart transferable capacity and skills to members of the Community, Local Authority and Operating Authority.

2.2.3 To enable the Operating Authority to manage the operations, maintenance, repair and tariff collection of completed schemes.

2.2.4 To meet the billing and collection targets as set out in the project business plan.

2.2.5 To create a monitoring and evaluation system for the local and/or Operating Authorities that will meet the O M & M progress reporting requirements as set out in para 7.1 Vol. 4 of contract W6018B.

The monitoring of the attainment of the above objectives shall be in accordance with the appropriate Key Performance Indicators (KPI's), as defined in Vol. 2 of Contract W6018B, and shall include in part or in whole but will not be limited to the following:

1. KPI's for attainment of Community Awareness.
2. KPI's for attainment of Training Objectives.
3. KPI's for attainment of Local Management.
4. KPI's for attainment of O M & M Financial Objectives.

3. Training Methodology

The basis on which a community training programme will be devised is that of a detailed needs assessment. The needs assessment shall be undertaken during the business plan preparation phase, and will be an accurate reflection of the training needs amongst the important community members. The assessment will also reflect existing resources and skills within the community.

It will be the responsibility of each consortium member to guide the ISD component to accurately survey for its specific requirements. Once this has been done a training programme will be devised which will address:

- Person(s) to be trained.
- A training schedule.
- Scope of the training courses.
- Description of training methods.
- Learning outcomes and performance indicators.
- A breakdown of costs.
- The level of resource sharing across projects.
- Budget for Community Awareness
  - General introduction to RDP Principles and guidelines with regard to water use, economic value and sustainability for PSC/WSA
- Labour refinement
  - Animated introduction to O M & M concepts principles and responsibilities - PSC/WSA
  - Evaluate Capacity of PSC/WSA
- Institutional Development WSP/WSA
  - Refinement of O M & M principles and responsibilities
  - O M & M Training Specialist Skills.
- Ongoing Training and support to WSP/WSA
- Mentorship – monitor and evaluate.

3.1 Community Awareness Training

In view of the requirements stipulated for the operations and management phase of the programme life cycle, AquAmanzi has devised a community awareness training package which addresses the primary objectives as set out in para. 2.1. This awareness training is split into two sections:

3.1.1 Broader introduction to O M & M as a function of the RDP principles and long term project sustainability (refer Appendix A);

3.1.2 A specific introduction to the concepts, principles and implementation of O M & M (refer Appendix B).

The above O M & M awareness programme is introduced during the ongoing facilitation process conducted by the ISD Component, and once a more formal community management structure has been established. The latter refers to those important members in the community that may eventually be incorporated into the Operating Authority.

3.2 Specialist Skills Training

The development of technical administrative and institutional skills shall be based on the fine tuning of the needs assessment and in close consultation with the communities. On approval of the Area Business Plan a detailed training plan shall be developed.

A close linkage between the training and construction project components shall be developed to ensure that the project is implemented at a pace and in a manner that is meaningful to the community.

The following breakdown describes the approach that will be taken when developing and implementing the specialist training requirements of the project:

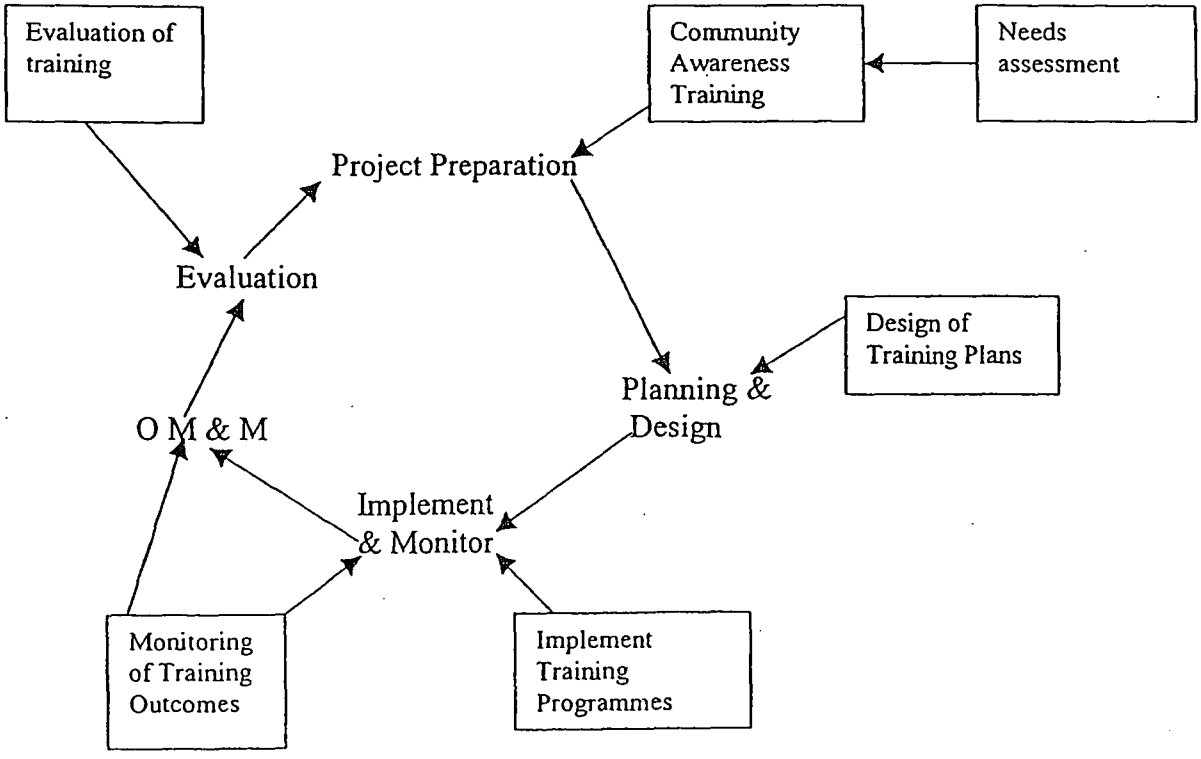


Figure 1 – Applicable to WSP and WSA

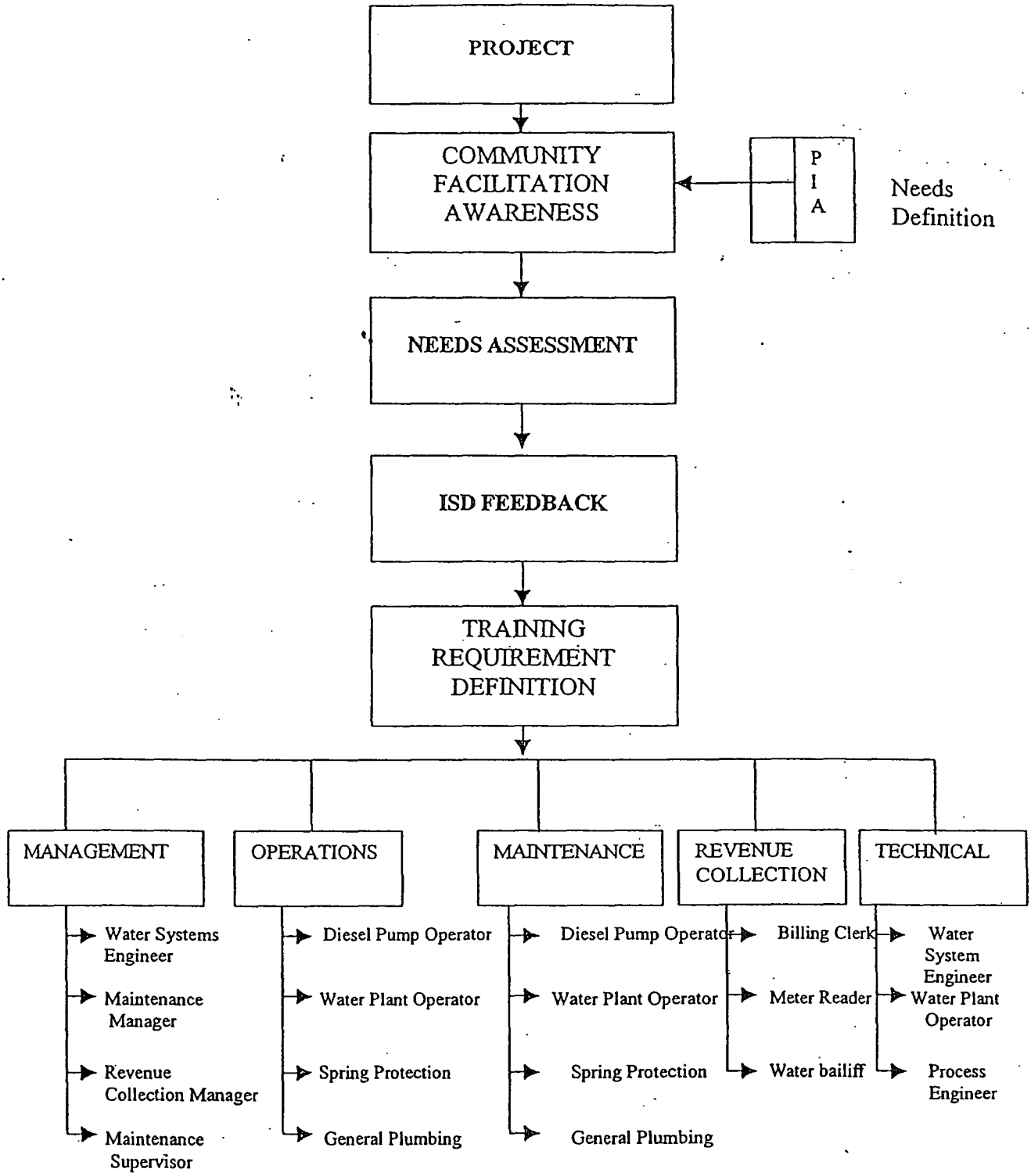
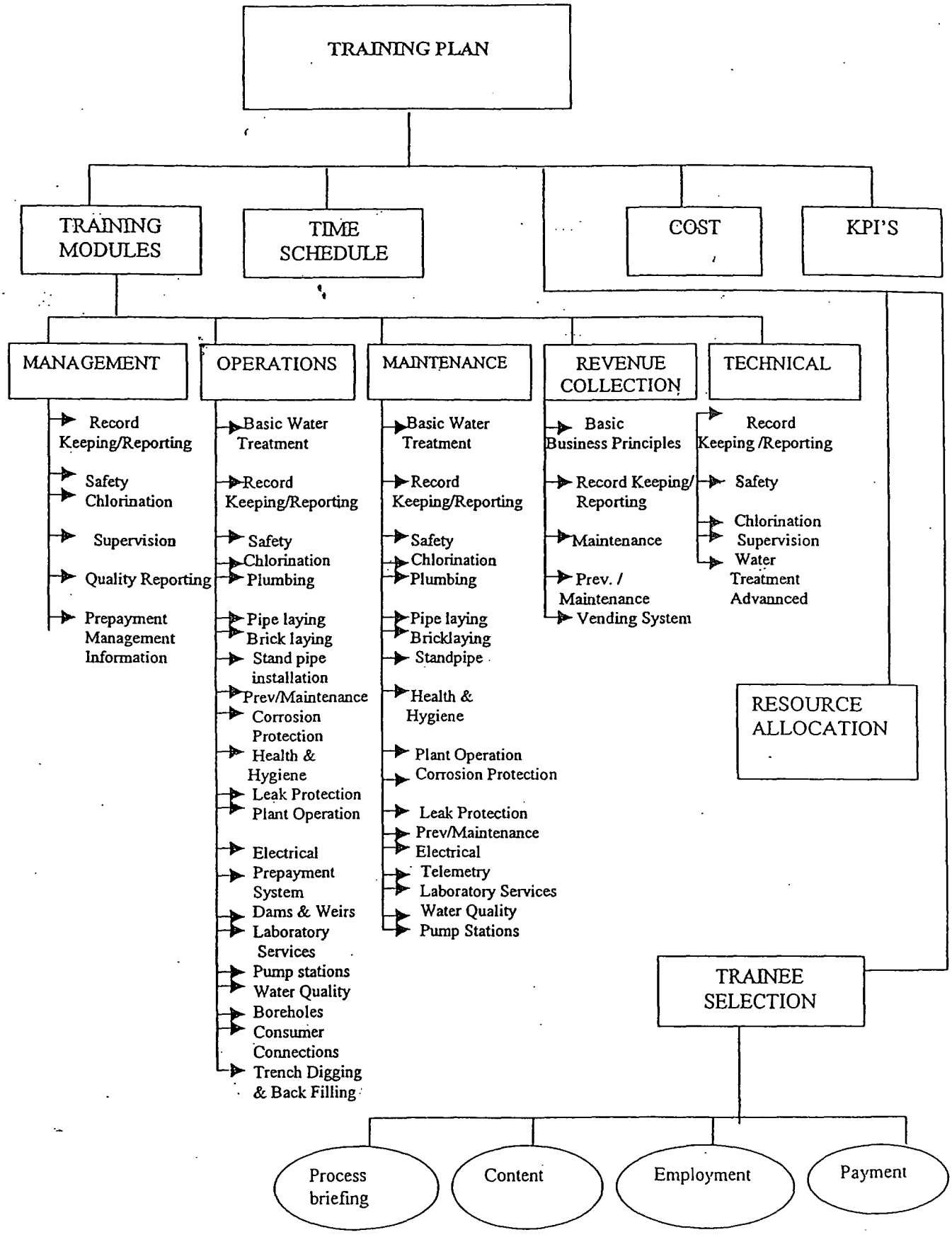

PROJECT
COMMUNITY FACILITATION AWARENESS
P
I
A
Needs Definition
NEEDS ASSESSMENT
ISD FEEDBACK
TRAINING REQUIREMENT DEFINITION
MANAGEMENT
OPERATIONS
MAINTENANCE
REVENUE COLLECTION
TECHNICAL
Water Systems Engineer
Maintenance Manager
Revenue Collection Manager
Maintenance Supervisor
Diesel Pump Operator
Water Plant Operator
Spring Protection
General Plumbing
Diesel Pump Operator
Water Plant Operator
Spring Protection
General Plumbing
Billing Clerk
Meter Reader
Water bailiff
Water System Engineer
Water Plant Operator
Process Engineer

Figure 2


TRAINING PLAN
TRAINING MODULES
TIME SCHEDULE
COST
KPI'S
MANAGEMENT
OPERATIONS
MAINTENANCE
REVENUE COLLECTION
TECHNICAL
Record Keeping/Reporting
Safety
Chlorination
Supervision
Quality Reporting
Prepayment Management Information
Basic Water Treatment
Record Keeping/Reporting
Safety
Chlorination
Plumbing
Pipe laying
Brick laying
Stand pipe installation
Prev/Maintenance
Corrosion Protection
Health & Hygiene
Leak Protection
Plant Operation
Electrical
Prepayment System
Dams & Weirs
Laboratory Services
Pump stations
Water Quality
Boreholes
Consumer Connections
Trench Digging & Back Filling
Basic Water Treatment
Record Keeping/Reporting
Safety
Chlorination
Plumbing
Pipe laying
Bricklaying
Standpipe
Health & Hygiene
Plant Operation
Corrosion Protection
Leak Protection
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Water Quality
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Basic Business Principles
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Maintenance
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Vending System
Record Keeping /Reporting
Safety
Chlorination
Supervision
Water Treatment Advannced
RESOURCE ALLOCATION
TRAINEE SELECTION
Process briefing
Content
Employment
Payment

Figure 3

TRAINING PLAN

A Training Plan (TP) will be formulated for each project in accordance with the training requirements definition (TRD) as illustrated in Fig. 2. The TRD will dictate the contents and make-up of the TP. The training package will be developed within the framework of Fig. 3, and as dictated by the project, area and community.

3.2 Training Modules

A complete list of training modules envisaged for the five main functional requirements of O M & M are listed in Fig. 3. Based on the TRD an appropriate selection will be made from this list.

3.3 Time Schedule

The training methodology described in par. 3 requires training to be undertaken at two levels which are limited to two different time slots within the project cycle. The sequencing of the training described in par. 3.1 (refer Appendices A & B) and par. 3.2 (refer Appendix C) respectively is shown in the following generic Gantt Chart. The Chart is based on an assumption of a project which extends over twelve months from date of issuing the 8.1.1 notice to commissioning. The subsequent O M & M period is limited to 12 months only (note that this period may be a maximum of 36 months).

4.3 Resource Allocation

The nature of the project, and the availability of suitable trainees, dictate that a particular resource can not be utilised 100% of the time; or that the skills requirement is spread across several functional areas but also not on a 100% utilization basis. AquAmanzi will therefore indicate to what extent such an allocation has been based, and will address its training accordingly. This implies that the training will be adopted to cover all labour elements; or that a consolidation process will be used. Such approaches will be clearly spelt out in the project specific proposal.

4.4 Trainee Selection

The selection of trainees shall be undertaken through a consultative process on the basis of criteria which both reflects potential and ability to perform and candidates role or potential role in local organisations. The trainee selection process will address the issues of:

- Process briefing – The trainee is made fully aware of the project and the various process requirements.
- Training Content – The trainee is instructed on the contents of the training modules to be undertaken.
- Employment – The trainee is made aware of the employment opportunities associated with the training.
- Payment – The trainee realises that he will receive payment for services rendered as a result of his responsibilities towards the sustainability of the project.

4.5 Training Cost

The training cost will be calculated in accordance with the training package formulated and within the context of the overall training plan. The training budget and associated activities will be presented for each project.

4.6 Key Performance Indicators

The monitoring of the training outcome, shall be in accordance with the following KPI's.

SKILLS REQUIREMENT	2.5.2 TRAINING GUIDELINE
Operations	KPI's for the attainment of cost effectiveness
Maintenance	KPI's for the attainment of assurance and reliability of supply and continuous maintenance
Revenue Collection	KPI's for the attainment of cost recovery
Technical	KPI's for the attainment of water quality
Institutional/Management	KPI's for the attainment of scheme transfer

In view of the above table the following functional KPI's will be applicable.

Institutional/Management : -

- Budgeting and Financial Tools.
- Cost Effective Objectives.
- Costing System.
- Tariff Setting Procedures.
- Cost Recovery (Billing & Collection System).
- Water Loss Management System.
- Water Quality, Facilities & Procedures.
- Procedures for the Procurement of Spares and Repairs.
- Preventive Maintenance Systems.
- Support Infrastructure (Transport, Chemicals, Consumables, Spares).
- Training and Capacity Building Plan. (Leadership, Decision making, Negotiation skills).
- Management and Staffing Procedures.
- Communication and Computer Facilities.
- Banking and Insurance Facilities.
- Prepayment and Management Information Systems.
- Legal Matters.
- Invoicing.
- Tender Procedures.
- Quality Monitoring System.
- OSH Act.
- Employment Policy.
- Supervision.
- Industrial Relations.
- Conflict Management.
- Trouble Shooting.

Operations

- Maintenance Problems.
- Documentation of Effective Planned maintenance Systems.
- Maintenance Strategy:
  - Policy.
  - Preventative.
  - Corrective.
- Setting up effective maintenance systems.
- Measuring planned maintenance systems effectively.
- Engineering stores and Spare Parts Management.
- Application of Work study to maintenance.
- Conditioned based maintenance.
- Safety and maintenance management.
- Functional Leadership.
- Basic Water Treatment, Pipelaying and Bricklaying according to a accredited Syllabus.
- Prepayment Systems.
- Pollution Control Procedures.
- Laboratory Services.
- Random Water Testing Procedures.
- Disinfection Systems.
- Achievement of Water Quality Standards.
- Consumer Connections.
- Trench Digging and Back Filling Procedures.

Maintenance

- Maintenance Problems.
- Documentation of Effective Planned maintenance Systems.
- Maintenance Strategy:
  - Policy.
  - Preventative.
  - Corrective.
- Setting up effective maintenance systems.
- Measuring planned maintenance systems effectively.
- Engineering stores and Spare Parts Management.
- Application of Work study to maintenance.
- Conditioned based maintenance.
- Safety and maintenance management.
- Functional Leadership.
- Basic Water Treatment, Pipelaying and Bricklaying according to a accredited Syllabus and Evaluation.
- Prepayment Systems.
- Pollution Control Procedures.
- Laboratory Services.
- Random Water Testing Procedures.
- Disinfection Systems.
- Achievement of Water Quality Standards.
- Consumer Connections.
- Trench Digging and Back Filling Procedures.

Revenue Collection

- Basic Economic Principles.
- Budgeting Formats.
- Contingency Planning.
- Cost Recovery Targets.
- The Business Concept.
- Collection and Administration of Tariffs.
- Prevention of Vandalism.
- Safety in the Workplace.
- Environmental Regulations.
- Vending Systems.

Technical

- Advance Water Treatment course according to an accredited Syllabus.
- Supervision.
- Disinfection System.
- Pollution Control.
- Vending Systems.
- Prepayment Systems.
- Upgrading of Systems and Capacity Evaluation.

AQUAMANZI DEVELOPMENT (Pty) Ltd

O M & M COMMUNITY AWARENESS PROGRAMME

COURSE CONTENT

Introduction (10 min)

History of water development in South Africa (10 min)

Briefing information (1hr 10 min)
- water as a natural resource
- surface water
- groundwater
- water quality
- water rights and the Law
- the present situation
- ownership of water
- rights of different consumer categories
- situation in previous homelands
- revision of water legislation

Development approach (15 min)
- Reconstruction and Development

Basic principles of RDP (20 min)
- The integrated and sustainable programme
- Peace and security for all
- Nation building
- The democratisation of South Africa

- **Programme of the RDP** (15 min)
- Meeting the basic needs
- Building the economy
- Implementing the RDP

Policy principle (1hr 30 min)
- Development should be demand
- Basic services are a human right
  "Some for all" rather than "All for some"
- Equitable regional allocation of development resources
- Water has economic value
- The user pays
- Integrated development
- Environmental integrity
  - in the long term
  - in the medium term
  - in the short term

Institutional frame work (50 min)

- The role of the national water advisory council
- The role of private sector (Aquamanzi)
- Capital and maintenance
- Training and capacity building and organisational development
    - financing and commercial services
    - the role of the professions
    - the role of non-governmental organisation (NGO's)

Water supply (1 hr 30 min)

- Quantity
- Cartage
- Availability
- Assurance of supply
- Quality
- Upgradability
- Capacity building, education and training

Training and capacity building (40 min)

- Scale
- Categories of training required
- the establishment of a national community water and sanitation institute

Prepayment (1hr 30 min)

- Tariff policy
- Operating and maintenance costs
- Uniform tariffs
- Wife - line (social) tariff
- Sliding tariff
    - a life-line or social tariff
    - normal tariff
    - marginal tariff
- Marginal tariffs and the re-evaluation of capital costs
- Improvement in water supply and sanitation
    - tariffs and service choice
    - non-payment for water
    - unauthorised connections

Local water communities supporting the development of the local democracy (10 min)

Supplementary Policy (1 hr 15 min)

- Women - the focus of development
- Water and the environment
- conservation and demand management

Summary (30 min)

- Policy principles

Fundamental principles and objectives for a new Water law in SA (1 hr 15 min)

- Water cycle
- Water resource management priorities
- Water Institutions
- Water resource management approaches
- Water services

The CA programme will take place over 2 training days. Representatives from the WSA, WSP and the community will be selected to attend the program.

O M & M Awareness, Concepts Principles and Implementation

(A cartoon animation is currently being prepared to assist with the communication of the above, and will be included in this Appendix when available)

AQUAMANZI DEVELOPMENT (Pty) Ltd

SPECIALIST SKILLS TRAINING PROGRAMME

Course	Code	Module	Duration (Days)
Literacy (In addition to ongoing work groups)	LT1	Basic	30
	LT2	Intermediate	30
	LT3	Advance	30
General Course	G1	Record Keeping	1
	G2	Safety	2
	G3	Chlorine (Disinfection)	2
	G4	Sampling	0.5
Water Course	W1	Definitions	0.5
	W2	Calculations	0.5
	W3	Plant Introduction & Raw Water	1
	W4	Flocculation	1
	W5	Sedimentation	1
	W6	Filtration	1
	W7	Stabilisation	0.5
	W8	Distribution	0.5
Water Water Course	S1	Definitions	0.5
	S2	Calculations	0.5
	S3	Plant Introduction & Raw Water	0.5
	S4	Elementary Water Biology	0.5
	S5	Industrial Effluents	0.5
	S6	Primary Treatment	1
	S7	Sedimentation	1
	S8	Activated Sludge	2
	S9	Biofiltration	1
	S10	Anaerobic Digestion	1
	S11	Sludge Disposal	0.5
	S12	Tertiary Treatment	0.5
	S13	Stabilisation & Maturation Ponds	0.5
	S14	Trouble Shooting (Interpretation of Results)	1
	S15	Operational Procedures (A/S)	1
	S16	Trouble Shooting (A/S)	1
	S17	Operational Procedures (B/F)	1

Course	Code	Module	Duration (Days)
Plant Operation Course	P1	Chemistry	1
	P2	Calculations	1
	P3	Pipes	1

	P4	Valves	0.5
	P5	Pumps	0.5
	P6	Water Treatment	0.5
	P7	Fire	0.5
Plumbing	B1	Basic	2
	B2	Intermediate	2
	B3	Advance	2
Pipelaying	L1	Basic	2
	L2	Intermediate	2
	L3	Advance	2
Building	U1	Basic	2
	U2	Intermediate	2
	U3	Advance	2
Business Principals	BP1	Basic	2
	BP2	Intermediate	2
	BP3	Advance	2
Maintenance			
Windmills	WM1	Basic	2
Pumps	MP1	Basic	2
Boreholes	MB1	Basic	1
General Supervisor	GS1	Basic	2
	GS2	Intermediate	2
	GS3	Advance	2
Plant Supervisor	PS1	Basic	4
	PS2	Intermediate	4
	PS3	Advance	4
Plant Manager	PM1	Basic	2
	PM2	Intermediate	2
	PM3	Advance	2
Mentorship	M1	Basic	2
	M2	Intermediate	2
	M3	Advance	2
Train the Trainer	TT1	Basic	3
Health & Hygiene	HH1	Basic	2
	HH2	Intermediate	2
	HH3	Advance	2
Other Course (As and when required)	OC	Basic	-

The Department of Labour has approved all the above courses.

APPENDIX F
TRAINING MODULES – NQUTU (JGP,1999c)

AVAILABLE INSTITUTIONAL AND SOCIAL DEVELOPMENT

TRAINING MODULES.

In an attempt to determine the level of capacity of stakeholders at the project level, some probing and leading questions are asked. The table below highlights the relevant questions asked and relates those to specific training modules which have been designed and are available.

Probing Questions	Targeted Project Level Stakeholders	Module Number and Name
- Who is the funder and who is the implementer of the development process? - Who is to benefit from the process? - Who owns the development process and the product thereof? - Should the development process be managed/maintained? - Who should manage the development process?	- general community members - development committees within project area - Traditional Authorities in the project area - Project steering committees	MODULE NUMBER 1 SETTING THE SCENE
- What is a development committee? - Does it exist within the project area? - How is it constituted? - What is its role?	- general community members - development committees within the project area - PSC	MODULE NUMBER 2 THE DEVELOPMENT COMMITTEE & IT'S ROLE
- What is a committee? - What are the roles of a committee? - who are the office bearers of a committee, what are their roles and responsibilities?	- general community members - development committees within the project area - PSC	MODULE NUMBER 3 THE ROLE OF COMMITTEES
- what is a constitution? - why is it needed? - how is it drafted?	- development committees within the project area - PSC	MODULE NUMBER 4 THE CONSTITUTION
- how often do committees report to their constituencies? - how often do committees hold their meetings? - who records and distribute minutes?	- development committees - project steering committee within the project area - project steering committee	MODULE NUMBER 5 MEETINGS

- how is a cheque or savings account opened? - who is responsible for opening and administering these? - how is a cheque or savings account operated? - is there a need to open any of these accounts in the project?	- development committees - project steering committee - entrepreneurs within the project area	MODULE NUMBER 6 OPENING A CHEQUE OR SAVINGS ACCOUNT
- how are incomes and expenditures recorded (CashBook)? - How are these records drawn up? - What is a sales journal and how is it drawn up? - What is a petty cash book and how is it drawn up?	- development committees - project steering committee - entrepreneurs within the project area	MODULE NUMBER 7 BASIC FINANCIAL MANAGEMENT
- what is a bank reconciliation and why is it necessary? - What documents are required to complete a bank reconciliation?	- development committees - PSC - entrepreneurs	MODULE NUMBER 8 BANK RECONCILIATION
- what is a water project cycle? - what is a project business plan? - Who drafts the project business plan? - What roles do project stakeholders play in the drafting of the business plan?	- project steering committee - project area stakeholders	MODULE NUMBER 9 PROJECT PLANNING
- what are the employment and labour recruitment policies? - how will labour recruitment and selection be done? - what will the conditions of employment be?	- project steering committee - Local Traditional Authorities	MODULES NUMBER 10&11 EMPLOYMENT POLICY & CONDITIONS OF EMPLOYMENT LABOUR RECRUITMENT & SELECTION
- who will recruit labour? - who will administer labour affairs? - what is a labour desk and what are its functions?	- Project steering committee - PSC sub-committees	MODULE NUMBER 12 ESTABLISHMENT OF A LABOUR DESK

- What criteria will be used in the selection of labour desk candidates? - What will their functions be? - How often will the labour desk meet and how often will they report? - What skills are required for the labour desk?	- Project steering committee - PSC sub-committees	MODULE NUMBER 13 NEGOTIATION & CONFLICT RESOLUTION SKILLS TRAINING
- What is the community's water supply, maintenance and management policy? - Who is the consumer?	- PSC - Water Service Authority - Water Service Provider	MODULE NUMBER 14 WATER MANAGEMENT
- Who will maintain the small petrol or diesel engines used in the pumping of water? - Who will maintain the water treatment facility? - Who maintains the manual borehole pumps? - Who maintains the protected spring?	- PSC - Technically oriented community members	MODULE NUMBER 15 MAINTENANCE OFFICER
- Who controls water points? - What are the daily procedures? - When and how are routine checks made? - How are the consumption records kept?	- PSC - Water Service Authority - Water Service Provider	MODULE NUMBER 16 WATER MANAGERS & BAILIFFS
- What is an office and what does it do? - What is needed to run an office? - What skills are required to administer an office?	- PSC - PSC sub-committees - Water Service Authority - Water Service Provider	MODULE NUMBER 17 OFFICE SETUP AND ADMINISTRATION
- Who keeps records of attendance and how do they do it? - Who keeps records of earnings and how do they do this? - Who pays and controls wages?	- PSC - PSC sub-committees - Water Service Authority - Water Service Provider	MODULE NUMBER 18 TIME, WAGE RECORDS AND MAKING PAYMENTS

- Who prepares proposals, business letters, reports and how are records of these kept?	- Office administrative staff	MODULE NUMBER 19 LETTER, REPORT WRITING & RECORD KEEPING
- Who monitors hygiene practices within the project area? - What messages need to be sent out for the observation of these practices? - How to obtain supporting documents etc.?	- PSC - Water Service Authority - Water Service Provider - Health and hygiene committee - Sanitation committee	MODULE NUMBER 20 ENVIRONMENT HEALTH AND HYGIENE

In order to further capacitate project stakeholders, a choice can be made from the following seventeen (17) available modules :

- MODULE 21 BASIC COST RECOVERY
- MODULE 22 BUDGETING
- MODULE 23 COSTING EXERCISE
- MODULE 24 EXPENDITURE ANALYSIS
- MODULE 25 PURCHASING
- MODULE 26 DISTRIBUTION
- MODULE 27 STOCK CONTROL
- MODULE 28 LEADERSHIP DEVELOPMENT
- MODULE 29 LOCAL GOVERNMENT
- MODULE 30 FUND RAISING
- MODULE 31 COMMUNITY WORKSHOPS
- MODULE 32 MANAGEMENT OF COMMUNITY RESOURCES
- MODULE 33 YOUR BOREHOLE
- MODULE 34 UPGRADING A BOREHOLE
- MODULE 35 EDUCARE (CHILD MINDING CENTRES)
- MODULE 36 RESOURCE BROKERAGE
- MODULE 37 HOUSING

It is extremely important (and it cannot be stressed any further) to determine the profile of project stakeholders one deals with. Determining the academic profiles of potential candidates; their work or post school experience; their experience in development projects; and their current level of activity in development projects usually achieve this. This information, together with information included in the table above should be sufficient to enable one to draw up an informed training plan.

SUMMARY OF MODULES

MODULE 1 SETTING THE SCENE

Who is funding the development process
Who will benefit from the process
Who owns the development
Why should development practice be managed/maintained
Who should manage the development practice/process

MODULE 2 THE ROLE OF COMMITTEES

What is a committee
The role of a committee
The office bearers of the committee, their responsibilities and duties

MODULE 3 THE DEVELOPMENT COMMITTEE AND ITS ROLE

What it is
How it is constituted
The role of the Development Committee

MODULE 4 THE CONSTITUTION

How it is drafted
Work shopping different examples

MODULE 5 MEETINGS

Notice of meeting
The agenda
The meeting
The minutes

MODULE 6 OPENING A CHEQUE OR SAVINGS ACCOUNT

Who is responsible
How to open a cheque or savings account
How to operate a cheque or savings account

MODULE 7 BASIC FINANCIAL MANAGEMENT

The function of a Cash Book
How to draw up a Cash Book
How to draw up a Sales Journal
How to draw up a Petty Cash Book

MODULE 8 BANK RECONCILIATIONS

What documents are required to complete a Bank Reconciliation
What to look out for in order to reconcile a Bank Statement
Why a Bank Reconciliation is necessary

MODULE 9

What is a water project cycle?
What is a project business plan?
What roles do project stakeholders play in the drafting of the business plan?

MODULE 10 CONDITIONS OF EMPLOYMENT

The conditions that determine what and how you work on a project.

MODULE 11 RECRUITMENT AND SELECTION

What is recruitment
How is selection done

MODULE 12 ESTABLISHMENT OF A LABOUR DESK

Who will administer labour affairs?
What is a labour desk and what are its functions?

MODULE 13 NEGOTIATION & CONFLICT RESOLUTION SKILLS TRAINING

Assessing your attitudes
Managing anger and emotions
Responding to negative and anger in others
Conflict management strategies
Communicating though conflict
Building successful relationships

MODULE 14 WATER MANAGEMENT

Who is the consumer
What is the community's water supply, maintenance and management policy.

MODULE 15 MAINTENANCE OFFICER

The training of community members to maintain small petrol and diesel engines for pumping purposes
The training of community members to maintain manual borehole pumps
The training of community members to maintain protected springs

MODULE 16 WATER MANAGERS AND BAILIFFS

Who controls each water point
What is the daily procedure
Who supervises the Water Bailiffs
When and how are checks made
Collections, etc.

MODULE 17 OFFICE SET UP AND ADMINISTRATION

What is an office and what does it do
What is needed to run an office]
Administration skills

MODULE 18 TIME, WAGE RECORDS AND MAKING PAYMENTS

How to keep a record of attendance
How to keep a record of earnings
Method of control and payments of wages

MODULE 19 LETTER AND REPORT WRITING

How to prepare and write:

a) a proposal
b) a business latter
c) reports

MODULE 20 ENVIRONMENT HEALTH/HYGIENE

Hygiene
Prime messages
Supporting information

MODULE 21 BASIC COST RECOVERY

Why recover costs
How can this be done
Linking this function with the duties of the Treasurer
How much should be collected
Other advantages of cost collecting

MODULE 22 BUDGETING

What is a budget
How to prepare a budget
What is the importance of a budget

MODULE 23 COSTING EXERCISE

What is costing
The difference between a Costing Exercise for a Business and a Project
Actual cost, estimated cost and unit cost
Costing exercise examples

a) an existing project
b) a proposed small business

MODULE 24 EXPENDITURE ANALYSIS

Where is the money going
Is it being spent according to plan
What is the advantage of an Expenses Analysis Report

MODULE 25 PURCHASING

A purchasing plan which includes
a) placing of orders
b) supply selection
Terms of payment
Method of recording purchases

MODULE 26 DISTRIBUTION

How to deal with the goods
The problem of tools and materials left on site

MODUEL 27 STOCK CONTROL

How to keep a record of incoming and outgoing goods
How to use the information for budgeting and control

MODULE 28 LEADERSHIP DEVELOPMENT

What is leadership
Responsibilities of a leader
Democracy and leadership

MODULE 29 LOCAL GOVERNMENT

What is local government
Why local government
Function / role of local government
Typical example of a local government structure
Applicable legislation to local government
Achieving local government
Summary of achieving local government
Why local government elections
Local government finance / service charges
Service charges - recovery
Local government budgets
Local government estimates
Auditors - public accountability
Local economic development

MODULE 30 FUND RAISING

What is fund raising
Who is responsible for fund raising
Why fund raising
Methods of fund raising
How to write a fund raising proposal

MODULE 31 COMMUNITY WORKSHOPS

What is a workshop
How is it run
Management technique
Goal and purpose
Identifiable Results

MODULE 32 MANAGEMENT OF COMMUNITY RESOURCES / FACILITIES

Your resource / facility
Managing your resource / facility
Management technique
Goal and purpose
Identifiable result

MODULE 33 YOUR BOREHOLE

What is ground water
How to decide where to drill
The Driller and what you should know about him
How to safeguard your borehole

MODULE 34 UPGRADING A BOREHOLE

Installing a borehole pump
Testing the yield of the borehole
Upgrading a borehole

MODULE 35 EDU-CARE (CHILD MINDING CENTRES)

How the community can run the centre
Getting premises
Getting registered and subsidised
Looking after money
Employing staff
Running the edu-care centre

MODULE 36 RESOURCE BROKERAGE

Identify areas of own interest
Identify available resources / skills
Offer / market resource skills
Register with development agencies

MODULE 37 HOUSING

Masakane

The peoples' housing process
Role players in the housing process
Home ownership - responsibilities of a homeowner
Building a home
Buying a home
Land suitability
Levels of land services
Housing subsidies:

a) project linked subsides
b) individual subsidies
c) consolidation subsidies

MODULE 38 MOTIVATION

Be "pro-active"
Begin with the end in mind
Put "first" things "first"
Think "win win"
Seek first to understand, then to be understood
Synergize
Sharpen the saw

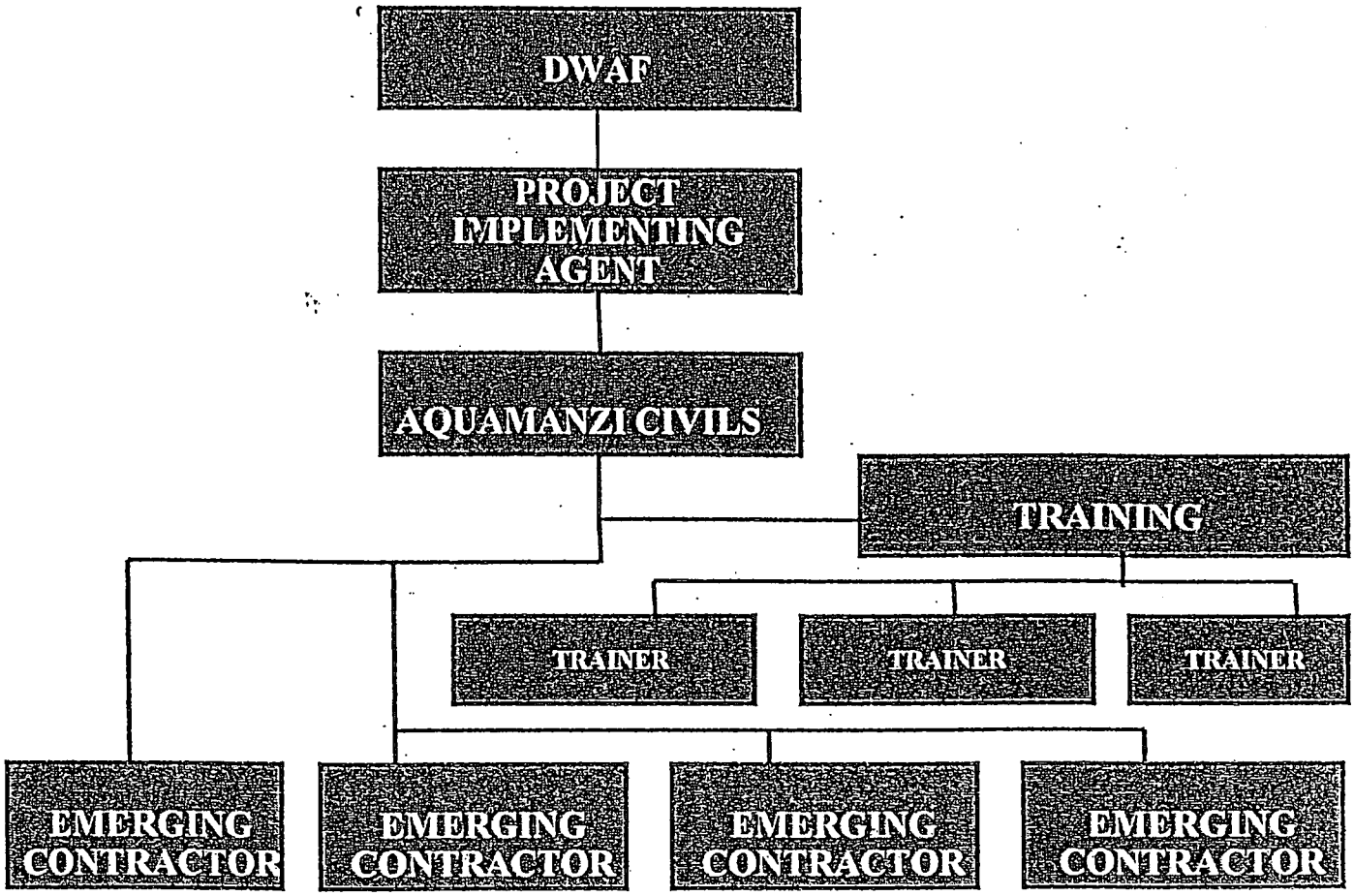
CONSTRUCTION SKILLS TRAINING APPROACH

BASIC CONSTRUCTION SKILLS AND CONSTRUCTION MANAGEMENT TRAINING

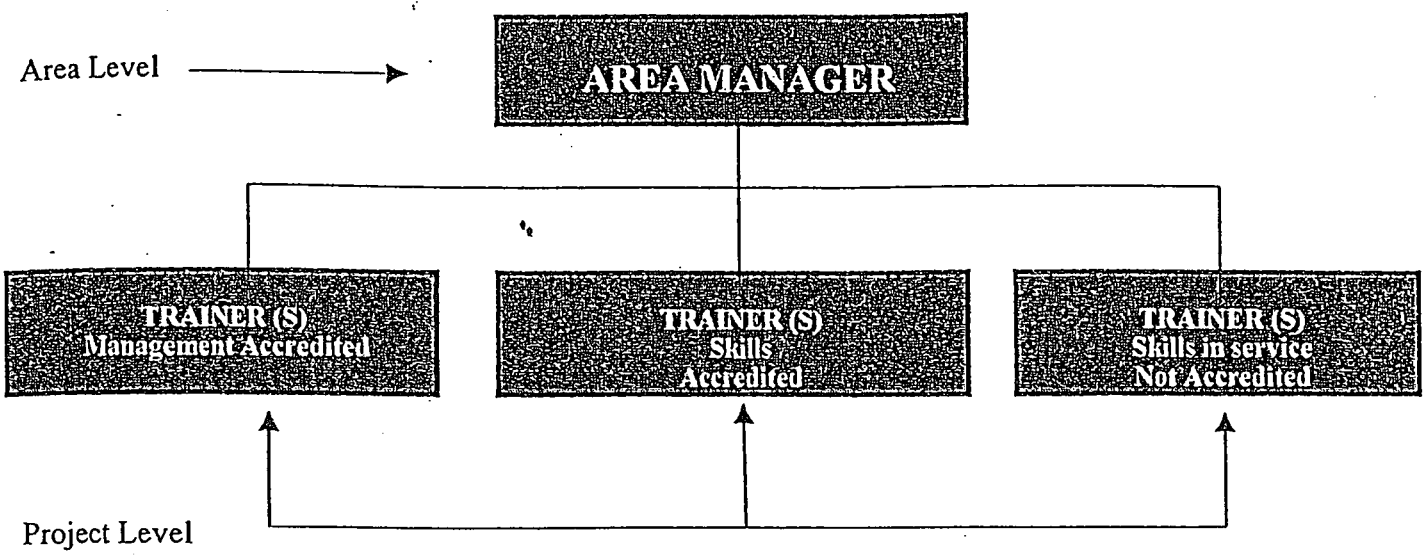
1. OBJECTIVES

(a) To enhance the local population with basic skills in water reticulation type construction projects.
(b) Community empowerment through community participation and training in the construction process.
(c) To increase productivity through training.
(d) To create opportunities for the previously disadvantaged in the short, medium and long term.
(e) To provide training that is linked to this construction project.
(f) To develop new firms through work experience, training and mentoring.
(g) To facilitate mentorship through the construction process.
(h) To practice participative management principles as part of the mentoring process.
(i) To contribute to the process of ensuring that the Civil Engineering Industry becomes representative of the population as a whole.

2. CONSTRUCTION ORGANOGRAM



3. TRAINING ORGANOGRAM



4. ROLE AS IMPLEMENTING AGENT FOR CAPACITY BUILDING AND TRAINING

The area manager will form part of the project team with the following functions:-

(a) After consultation with the contractors, assess what skills are required
(b) In consultation with the PSC and labour desk do a capacity assessment
(c) Do training need analysis
(d) Do training budget and get approval
(e) Implement training on project level
(f) Co-ordinate training on project level to ensure that training is cost effective
(g) Monitor training budgets
(h) Program the training
(i) Quality control on training
(j) Appoint training agencies
(k) Report on training to the P.I.A./Contractor
(l) Organise training facilities/equipment
(m) Other management functions

5. CAPACITY ASSESSMENT AND CAPACITY PLANNING APPROACH

(a) Capacity assessment will be done through the project steering committee and other structures in the communities. A questionnaire on existing skills will be formalised to be completed by all interested community members.

(b) Who will be trained:-

- Emergent contractors
- Supervisors
- Work force

(c) Who will undertake the training:-

Accredited trainers, except for the informal on site training, which will be undertaken by experienced foremen (Managing Contractor personnel).

(d) Scope of the training courses:-

- Accredited formal skills training
- Supervisory training (various modules)
- Construct a brick manhole
- Pipelaying operations
- Excavate, backfill and compact a trench
- Shuttering skills
- Small concrete works
- Lay watermains
- Install connections

Other relevant skills training are available if required.

Maximum number of students will be 12 per class and no allowance has been made for refreshments or the payment of students during training.

(e) On site non accredited skills transfer:-

Training (mentoring and assistance) will be undertaken by experienced foremen (managing contractor personnel).

(f) Accredited formal emerging contractor development training

One of the major problems experienced by the emerging contractor is the lack of management skills. The emerging contractor development course was designed and is accredited by CEITS and consists of the following modules:-

- Basic Business Appreciation
- Conditions of Contract and Specifications
- Estimating and Tendering
- Employment of Labour
- Safety, Health and Environment

- Planning and Organising
- Basic Man Management
- Quality and Production Control
- Interpretation of Drawings
- Setting Out
- On the Job Training
- Site Administration

The duration of the course is 25-32 days, depending on the ability of the students.

On completion of the modules, tests are written. A certificate will be issued indicating the modules passed by the students. Training is undertaken on site. Handout material and visual aids will be used.

Number of students per course will be 15 per class and no allowance has been made for refreshments or the payment of students during training.

6. DESCRIPTION OF TRAINING METHODS AND MATERIALS

Training methods followed are formal classroom combined with practical applications. Apart from handout material, construction material and visual aids are used. All materials are accredited by CEITS.

7. LEARNING OUTCOMES AND KEY PERFORMANCE INDICATORS

(a) Skills Training

Individual evaluation once basic training is complete which will be ongoing during the mentorship process.

(b) Management Training

With proper time allowance, mentoring and job opportunities, emerging contractors can eventually enter conventional contracting.

8. SELECTION OF TRAINEES

A transparent system designed with the assistance of Industrial Psychologists and approved by CEITS is available for the selection of trainee subcontractors and the workforce. This process will take one (1) day depending on the number of candidates.

9. WHERE WILL THE TRAINING TAKE PLACE

All construction training offered, as per the proposal, will take place in the respective communities (on site).

10. MENTORING OF TRAINEES

Interaction between trainer and managing contractor is essential to implement a successful mentoring program. The training function is not only a formal one, but also to monitor implementation of skills to adjudicate on competency. It is therefore the intention to put in place a mentoring system in consultation with the managing contractor. For the system, the following is suggested:-

- A practical quality control system
- Implementation of standard simple production monitoring systems
- Material management systems
- Costing systems
- Administration systems
- Any other systems needed in consultation with the managing contractor

By having the systems implemented, mentoring becomes controllable and measurable and performance can be evaluated.

APPENDIX G
COMMUNITY SURVEYS

APPENDIX G
COMMUNITY SURVEY

SHEMULA

SURVEY RECORDS

COMMUNITY SURVEY AT SHEMULA

Name of Head of Household:.	Date of Survey:	
Male/Female: AGE:		
	Yes	No
1) Awareness of the fundamentals of the scheme		
Do you know where the water comes from?		
Do you know how the water gets to the standpipes?		
Do you know what to do when you see a leak?		
Do you understand why you must pay for water?		
Do you know who is responsible for maintaining the scheme?		
2) Expectations of the scheme		
Does the scheme deliver what you expected?		
If no - Are you unhappy with the walking distance to dispensing points?		
If no - Are you unhappy about paying for water?		
Did you believe that it was going to create jobs?		
Are you satisfied with the scheme?		
3) Did you receive any training under this scheme?		
If yes which of the following did you receive?		
Basic pipe laying skills		
Block making		
Brick and block laying		
Basic Plumbing		
Capacity Building skills		
Other		
4) Training		
Is it what you expected to get?		
Has it been useful?		
Would you be able to use these skills again?		
5) Operation and Maintainance		
Are you happy with Automatic Dispensing Units?		
Do you believe that the community would be able to operate and maintain the system?		
If no state why		
6) For PSC members only		
Are you satisfied with the way your schemes work?		
If no, state why		

Community Survey - Shemula

	Head of Household		Subward	Gender	Age	Awareness of the fundamentals of the scheme - Do you know/understand					Expectations of the scheme				Did you receive any training under this scheme?							Training			Operation and Maintenance			For PSC members only	
						Where the water comes from	How the water gets to the standpipes	What to do when you see a leak	Why you must pay for water	Who is responsible for maintaining the scheme	Does the scheme deliver what you expected?	If no	Did you believe that it was going to create jobs?	Are you satisfied with the scheme?	Yes/No	Basic pipe laying skills	Block making	Brick and block laying	Basic plumbing	Capacity Building skills	Other	Is it what you expected to get?	Has it been useful?	Would you be able to use these skills again?	Are you happy with Automatic Dispensing Units	Do you believe that the community would be able to operate and maintain the system?	If no, why	Are you satisfied with the way your scheme work?	If no, why?
1	Sipho	Khumalo	Nhlonhleni South	M	28	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	No										Yes	Yes			
2	Mali	Gwala	Nhlonhleni South	M	37	Yes	Yes	Yes	Yes	Yes	Yes		No	Yes	Yes	Yes					Driver				Yes	No			
3	Thabisile	Mthombeni	Nhlonhleni South	F	33	Yes	Yes	Yes	Yes	Yes	Yes		No	Yes	No										Yes	No	They have not been trained		
4	Phenius	Mthembu	Nhlonhleni South	M	32	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	No										Yes	No			
5	Mseshi	Khumalo	Nhlonhleni South	M	43	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	No										Yes	No	They have not been trained		
6	Busisiwe	Mdluli	Nhlonhleni South	F	38	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes						Yes	Yes	Yes	Yes	Yes	If trained in doing so		
7	Jozini	Malinga	Nhlonhleni South	M	44	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	No										Yes	No	They have not been trained		
8	Joyini	Gumede	Nhlonhleni South	M	68	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	No										Yes	Yes			
9	Dodi	Mabika	Nhlonhleni South	M	50	Yes	Yes	Yes	Yes	Yes	Yes			Yes	No										Yes	Yes			
10	Alpheus	Mtshali	Nhlonhleni South	M	56	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	No										Yes	Yes			
11	Fakazile	Mkimbo	Nhlonhleni South	F		Yes	Yes	Yes	Yes	Yes			Yes	Yes	No										Yes	No	They have not been trained		
12	Amos	Ndlazi	Nhlonhleni South	M	42	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes					Trench digging	Yes	Yes	Yes	Yes	Yes			
13	Thembinkosi	Mpontshane	Nhlonhleni South	F	36	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes						Yes	Yes	Yes	Yes	No	They have not been trained		
14	Magowe	Diamini	Nhlonhleni South	M	29	Yes	Yes	Yes	Yes	Yes			No	Yes	No										Yes	Yes			
15	Mary	Tembe	Nhlonhleni South	F	38	Yes	Yes	Yes	Yes	Yes			No	Yes	No										Yes	Yes			
16	Julias	Khumalo	Nhlonhleni South	M	35	Yes	Yes	Yes	Yes	Yes			Yes	Yes	Yes						Digging and backfilling	Yes	Yes	Yes	No	Yes			
17	Elijah	Tembe	Nhlonhleni South	M	39	Yes	Yes	Yes	Yes	Yes			Yes	Yes	Yes	Yes						Yes	Yes	Yes	Yes	Yes			
18	Joseph	Ndlazi	Nhlonhleni South	M	49	Yes	Yes	Yes	Yes	Yes	Yes		No	Yes	No										Yes	Yes			
19	Magali	Mthembu	Nhlonhleni South	M	45	Yes	Yes	Yes	Yes	Yes	Yes		No	Yes	No										Yes	Yes			
20	Nomthanda	Gumede	Nhlonhleni South	M	38	Yes	Yes	Yes	Yes	Yes	No	unhappy with the walking distance and paying for water	No	Yes	No										Yes	Yes			
21	Nomithi	Mabika	Nhlonhleni South	F	35	Yes	Yes	Yes	Yes	Yes	Yes		No	Yes	No										Yes	Yes			
22	Bongani	Ndimande	Nhlonhleni South	M	28	Yes	Yes	Yes	Yes	Yes	No	unhappy about paying for water	No	Yes	No										Yes	No	They have not been trained		
23	Thembinkosi	Gwala	Nhlonhleni South	M	36	Yes	Yes	Yes	Yes	Yes	No	unhappy about paying for water	No	Yes	No										Yes	Yes			
24	John	Tembe	Nhlonhleni South	M	25	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes						Yes	Yes	Yes	Yes	No	They have no responsibility		
25	George	Shabalala	Nhlonhleni South	M	32	Yes	Yes	Yes	Yes	Yes	Yes		No	Yes	No										Yes	Yes			
26	Bongani	Gumede	Nhlonhleni South	M	28	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes						Yes	Yes	Yes	Yes	Yes			
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Community Survey - Shemula

	Head of Household	Subward	Gender	Age	Awareness of the fundamentals of the scheme - Do you know/understand					Expectations of the scheme				Did you receive any training under this scheme?							Training			Operation and Maintenance			For PSC members only	
					Where the water comes from	How the water gets to the standpipes	What to do when you see a leak	Why you must pay for water	Who is responsible for maintaining the scheme	Does the scheme deliver what you expected?	If no	Did you believe that it was going to create jobs?	Are you satisfied with the scheme?	Yes/No	Basic pipe laying skills	Block making	Brick and block laying	Basic plumbing	Capacity Building skills	Other	Is it what you expected to get?	Has it been useful?	Would you be able to use these skills again?	Are you happy with Automatic Dispensing Units	Do you believe that the community would be able to operate and maintain the system?	If no, why	Are you satisfied with the way your scheme work?	If no, why?
1	Triphinah Tembe	Bhekabantu	F	60	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes					Digging and backfilling	Yes	Yes	Yes	Yes	No	They have not been trained		
2	Aron Mahlangu	Bhekabantu	M	34	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	No									Yes	No	They have not been trained		
3	P.S. Tembe	Bhekabantu	M	39	Yes	Yes	Yes	Yes	Yes	Yes		Yes	No	No									Yes	No	They have not been trained		
4	Taxon Duze	Bhekabantu	M	38	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes			Yes		Yes	Yes	Yes	Yes	Yes			
5	Mwayi Tembe	Bhekabantu	M	55	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes					Yes	Yes	Yes	Yes	No	They have not been trained		
6	Patricia Zikhali	Bhekabantu	F	44	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	No									Yes	No	They have not been trained		
7	B.M. Gumede	Bhekabantu	M	50	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes					Yes	Yes	Yes	No	No	They have not been trained	No	Water is not always available
8	Emel Mdluli	Bhekabantu	F	38	No	Yes	No	Yes	Yes	Yes			No	No									Yes	No	They have not been trained		
9	Vusi Msweli	Bhekabantu	M	28	Yes	Yes	Yes	Yes	Yes	No	Unhappy about paying for water	Yes	No	No									Yes	No	They have not been trained		
10	Vumenjani Masuku	Bhekabantu	M	30	No	Yes	Yes	Yes	Yes	Yes		Yes	Yes	No									Yes	No	They have not been trained		
11	Sifiso Ndlazi	Bhekabantu	M	40	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	No									No	Yes			
12	Jayile Mkhumbuz	Bhekabantu	M	50	No	Yes	No	No	Yes	Yes		Yes	Yes	Yes	Yes					Yes	Yes	Yes	Yes	Yes			
13	Kheras Mthembu	Bhekabantu	M	38	No	Yes	Yes	No	No	No	Unhappy about paying for water	Yes	Yes	No									Yes	Yes			
14	Lotas Vilane	Bhekabantu	M	29	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes				Bush clearing	Yes	Yes	Yes	Yes	Yes			
15	Vincent Duze	Bhekabantu	M	37	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	No									Yes	Yes			
16	Mafodana Tembe	Bhekabantu	M	45	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	No									Yes	Yes			
17	Innocent Tembe	Bhekabantu	M	38	Yes	Yes	Yes	Yes	Yes	Yes		No	Yes	Yes	Yes			Yes		Yes	Yes	Yes	Yes	No	They have not been trained		
18	Mkhisumuzi Ndlazi	Bhekabantu	F	59	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	No									Yes	Yes			
19	Joseph Nyathi	Bhekabantu	M	38	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	No									No	No	They have no responsibility		
20	Phenius Mafuleka	Bhekabantu	M	33	Yes	Yes	Yes	Yes	Yes	Yes		No	Yes	No									No	No	They have not been trained		
21	Thokozani Mathenjwa	Bhekabantu	M	35	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	No									Yes	No	They have not been trained		
22	Johannes Mdluli	Bhekabantu	M	40	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	No									No	No	They have not been trained		
23	T.N. Mathe	Bhekabantu	M	49	Yes	Yes	Yes	Yes	Yes	No	unhappy with the walking distance	Yes	Yes	Yes	Yes			Yes		Yes	Yes	Yes	Yes	No	They have not been trained		
24	George R. Duze	Bhekabantu	M	44	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	No									No	No	They have not been trained		
25	Robert Khumalo	Bhekabantu	M	39	Yes	Yes	Yes	Yes	Yes	No	unhappy with the walking distance	Yes	No	No									Yes	No	They have not been trained		
26	Simon Ndlazi	Bhekabantu	M	38	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes					Yes	Yes	Yes	Yes	No	They have not been trained		
27	Mgezi Tembe	Bhekabantu	M	45	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes			Yes		Yes	Yes	Yes	No	Yes			
28	Kholiwe Vumase	Bhekabantu	M	38	Yes	Yes	Yes	Yes	No	Yes		Yes	Yes	Yes	Yes					Yes	Yes	Yes	Yes	No	They have not been trained		
29	Nelisiwe Tembe	Bhekabantu	M	32	Yes	Yes	Yes	Yes	Yes	Yes		Yes	No	Yes	Yes					Yes	Yes	Yes	No	No	They have not been trained		
30	J. Myeni	Bhekabantu	M	58	Yes	Yes	Yes	Yes	Yes	Yes		Yes	No	No									Yes	No	They have not been trained		
31	Siziwe Ngwanya	Bhekabantu	F	29	Yes	Yes	Yes	Yes	Yes	No	unhappy with the walking distance	Yes	No	Yes	Yes					Yes	Yes	Yes	Yes	No	They have not been trained		
32	Simale Tembe	Bhekabantu	F	23	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes					Yes	Yes	Yes	No	No	They have not been trained		
33	Sindi Gumede	Bhekabantu	F	25	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes					Yes	Yes	Yes	Yes	No	They have no responsibility		
34	Sarafinah Njokweni	Bhekabantu	F	28	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes					Yes	Yes	Yes	Yes	No	They have not been trained		
35	Idah Mawukuza	Bhekabantu	F	29	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes				Supervisor in digging of trench	Yes	Yes	Yes	Yes	No	They have not been trained		
36	Ngadi Khumalo	Bhekabantu	M	58	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes					Yes	Yes	Yes	Yes	No	They have not been trained		
37	John Tembe	Bhekabantu	M		Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	No									Yes	No	They have not been trained		
38	Jobe Mhlongo	Bhekabantu	M	37	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	No									Yes	No	They have not been trained		
39	Bongani Tembe	Bhekabantu	M	40	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	No									Yes	No	They have not been trained		
40	Dumisani Ntimbane	Bhekabantu	M		No	Yes	Yes	Yes	Yes	Yes		Yes	Yes	No									Yes	Yes			
41	Wilson M. Bhanda	Bhekabantu	M	42	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	No									Yes	No	They have no responsibility		
42	Andreas Gwala	Bhekabantu	M	37	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	No									Yes	No	They have not been trained		
43	Eunice Mhlongo	Bhekabantu	F	39	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	No									Yes	No	They have not been trained		
44	Nkima Mkhabela	Bhekabantu	F	44	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	No									Yes	Yes			
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						Where the water comes from	How the water gets to the standpipes	What to do when you see a leak	Why you must pay for water	Who is responsible for maintaining the scheme	Does the scheme deliver what you expected?	If no	Did you believe that it was going to create jobs?	Are you satisfied with the scheme?	Yes/No	Basic pipe laying skills	Block making	Brick and block laying	Basic plumbing	Capacity Building skills	Other	Is it what you expected to get?	Has it been useful?	Would you be able to use these skills again?	Are you happy with Automatic Dispensing Units	Do you believe that the community would be able to operate and maintain the system?	If no, why	Are you satisfied with the way your scheme work?	If no, why?
1	Magali	Mthembu	Mbangweni	M		Yes	Yes	Yes	No	Yes	Yes		Yes	Yes	No										Yes	No	They have not been trained		
2	Ntandane	Mdluli	Mbangweni	F	37	Yes	Yes	Yes	No	Yes	Yes		No	Yes	No										Yes	Yes			
3	Thembi	Khumalo	Mbangweni	F	36	Yes	Yes	Yes	No	Yes	Yes				No										Yes	No			
4	Mvubu	Tembe	Mbangweni	M	50	Yes	Yes	Yes	Yes	Yes	No	unhappy with the walking distance and paying for water	Yes	Yes	No										No	No	They have not been trained		
5	France	Tembe	Mbangweni	M	55	No	Yes	Yes	Yes	Yes	Yes		Yes	No	No										Yes	No	They have not been trained		
6	Thomas	Mbambo	Mbangweni	M	36	Yes	Yes	Yes	Yes	Yes	Yes		Yes	No	No										Yes	No	They have not been trained		
7	Fesina	Dlamini	Mbangweni	F	38	Yes	Yes	Yes	Yes	Yes	Yes		Yes	No	Yes	Yes						Yes	Yes	Yes	Yes	Yes			
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					Where the water comes from	How the water gets to the standpipes	What to do when you see a leak	Why you must pay for water	Who is responsible for maintaining the scheme	Does the scheme deliver what you expected?	If no	Did you believe that it was going to create jobs?	Are you satisfied with the scheme?	Yes/No	Basic pipe laying skills	Block making	Brick and block laying	Basic plumbing	Capacity Building skills	Other	Is it what you expected to get?	Has it been useful?	Would you be able to use these skills again?	Are you happy with Automatic Dispensing Units	Do you believe that the community would be able to operate and maintain the system?	If no, why	Are you satisfied with the way your scheme work?	If no, why?
1	Mary Ndimande	Mandlankunzi	F	28	Yes	Yes	Yes	Yes	Yes	Yes		Yes	No	No									No	No	They have not been trained		
2	Sibongile Mlambo	Mandlankunzi	M	39	Yes	Yes	Yes	Yes	Yes	Yes		Yes	No	No									Yes	No	They have not been trained		
3	Nompondo Tembe	Mandlankunzi	F	48	Yes	Yes	No	No	No	Yes		No	Yes	No									Yes	Yes			
4	Njobe Khumalo	Mandlankunzi	M	35	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes				Trench digging	Yes	Yes	Yes	Yes	No	They have not been trained		
5	Ntandane Khumao	Mandlankunzi	F	43	Yes	Yes	No	No	No	Yes		No	Yes	No									Yes	Yes			
6	Nkunzana Tembe	Mandlankunzi	M	36	Yes	Yes	Yes	Yes	Yes	Yes		No	Yes	No									Yes	Yes			
7	Lina Mthembu	Mandlankunzi	F	40	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	No									Yes	No	They have not been trained		
8	Phumzile Mthembu	Mandlankunzi	F	29	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	No									Yes	Yes			
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						Where the water comes from	How the water gets to the standpipes	What to do when you see a leak	Why you must pay for water	Who is responsible for maintaining the scheme	Does the scheme deliver what you expected?	If no	Did you believe that it was going to create jobs?	Are you satisfied with the scheme?	Yes/No	Basic pipe laying skills	Block making	Brick and block laying	Basic plumbing	Capacity Building skills	Other	Is it what you expected to get?	Has it been useful?	Would you be able to use these skills again?	Are you happy with Automatic Dispensing Units	Do you believe that the community would be able to operate and maintain the system?	If no, why	Are you satisfied with the way your scheme work?	If no, why?
1	Elias	Mpontshane	Nhlonhleni North	M	28	Yes	Yes	Yes	Yes	Yes	Yes		No	Yes	No									Yes	No	They have not been trained		
2	Phineas	Mlambo	Nhlonhleni North	M	59	Yes	Yes	No	Yes	Yes	Yes		No	Yes	No									Yes	Yes			
3	Erick	Gumede	Nhlonhleni North	M	50	No	Yes	No	No	No	Yes		No	Yes	No									Yes	Yes			
4	Busisiwe	Mdluli	Nhlonhleni North	F	39	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes						Yes	Yes	Yes	Yes	No	They have not been trained		
5	M.	Mkhabela	Nhlonhleni North	M	39	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	No										Yes	Yes		Yes	
6	Simon	Tembe	Nhlonhleni North	M	37	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	No										Yes	Yes			
7	Michael	Khumalo	Nhlonhleni North	M		Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	No										Yes	Yes			
8	Alphios	Mtshali	Nhlonhleni North	M	39	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes						Yes	Yes	Yes	Yes	Yes			
9	Elias	Mthembu	Nhlonhleni North	M	29	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes						Yes	Yes	Yes	Yes	No	They have not been trained		
10	John	Khumalo	Nhlonhleni North	M	45	Yes	Yes	Yes	Yes	Yes	Yes		No	Yes	No										Yes	Yes			
11	Petros	Mthembu	Nhlonhleni North	M	29	Yes	Yes	Yes	Yes	Yes	Yes		No	Yes	No										No	No	They have not been trained		
12	Moses	Ndlazi	Nhlonhleni North	M	43	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes						Yes	Yes	Yes	Yes	No	They have not been trained		
13	Ntandani	Mdluli	Nhlonhleni North	M	40	Yes	Yes	Yes	Yes	Yes	Yes		No	Yes	Yes	Yes						Yes	Yes	Yes	Yes	No	They have not been trained		
14	Amos	Khumalo	Nhlonhleni North	M	48	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	No										Yes	Yes			
15	Moses	Ndlazi	Nhlonhleni North	M	45	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	No										Yes	No	They have not been trained		
16	Sipho	Tembe	Nhlonhleni North	M	34	Yes	Yes	Yes	Yes	Yes	Yes		No	Yes	Yes	Yes						Yes	Yes	Yes	Yes	Yes			
17	Fanayakhe	Mthembu	Nhlonhleni North	M	37	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	No										Yes	Yes			
18	Nkosinathi	Mngomezulu	Nhlonhleni North	M	29	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes						Yes	Yes	Yes	Yes	No	They have not been trained		
19	Derrick	Mlondo	Nhlonhleni North	M	45	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	No										Yes	Yes			
20	Pheneas	Mhlongo	Nhlonhleni North	M	36	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	No										Yes	No	They have not been trained		
21	Dumisani	Mthembu	Nhlonhleni North	M	38	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	No										Yes	Yes			
22	Hloniphani	Khumalo	Nhlonhleni North	F	27	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes						Yes	Yes	Yes	Yes	Yes			
23	Mpobela	Khumalo	Nhlonhleni North	F	56	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	No										Yes	Yes			
24	Xoshiwe	Gumede	Nhlonhleni North	F	39	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	No										Yes	Yes			
25	Judas	Mpanza	Nhlonhleni North	M	38	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	No										Yes	Yes			
26	Fanini	Gumede	Nhlonhleni North	F	40	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes						Trench digging	Yes	Yes	Yes	Yes	Yes			
27	Mduduzi	Myeni	Nhlonhleni North	M	47	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	No										Yes	No	They have not been trained		
28	Thembisile	Sibiya	Nhlonhleni North	F	60	Yes	Yes	No	No	No	Yes		Yes	Yes	No										Yes	Yes			
29	December	Mthombeni	Nhlonhleni North	M	59	No	Yes	No	No	Yes	Yes		No	Yes	No										Yes	Yes			
30	Thobo	Sangweni	Nhlonhleni North	F	29	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes						Yes	Yes	Yes	Yes	No	They have not been trained		
31	Norah	Tembe	Nhlonhleni North	F	39	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	No										Yes	Yes			
32	Thembisile	Ncube	Nhlonhleni North	F	38	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes						Digging and backfilling	Yes	Yes	Yes	Yes	No	They have not been trained		
33	Johnson	Khumalo	Nhlonhleni North	M	58	Yes	Yes	Yes	Yes	Yes	Yes		No	Yes	No										Yes	Yes			
34	Aron	Mpanza	Nhlonhleni North	M	52	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	No										Yes	No	They have not been trained		
35	Julias	Khumalo	Nhlonhleni North	M	49	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	No										Yes	Yes			
36	Amos	Tembe	Nhlonhleni North	M	51	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	No										Yes	Yes			
37	Felicia	Moyana	Nhlonhleni North	F	48	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes						Yes	Yes	Yes	Yes	No	They have not been trained		
38	James	Mhlanga	Nhlonhleni North	M	62	Yes	Yes	Yes	No	No	Yes		No	Yes	No										Yes	Yes			
39	Dumisani	Tembe	Nhlonhleni North	M	50	Yes	Yes	Yes	No	No	Yes		No	Yes	No										Yes	Yes			
40	Mzamani	Khumalo	Nhlonhleni North	F	33	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes						Yes	Yes	Yes	Yes	Yes			
41	Julius	Gwala	Nhlonhleni North	M	42	No	Yes		Yes	Yes	Yes		Yes	Yes	No										Yes	Yes			
42	Samson	Gumede	Nhlonhleni North	M	30	Yes	Yes	Yes	Yes	No	No	Unhappy about paying for water	No	No	No										Yes	Yes			
43	Mnoyi	Tembe	Nhlonhleni North	F	40	No	Yes	Yes	No	Yes	Yes		No	Yes	No										Yes	Yes			
44	Sibusiso	Tembe	Nhlonhleni North	M	26	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	No										Yes	No	They have not been trained		
45	David	Zikhali	Nhlonhleni North	M	29	Yes	Yes	Yes	Yes	Yes	Yes		No	Yes	Yes	Yes					Digging and backfilling	Yes	Yes	Yes	Yes	Yes			
46	Nkosinathi	Ntuli	Nhlonhleni North	M	28	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes						Yes	Yes	Yes	Yes	No	They have not been trained		
47	July	Tembe	Nhlonhleni North	M	50	Yes	Yes	Yes	Yes	Yes	Yes		No	Yes	No										Yes	Yes			
48	Mbabani	Mpanza	Nhlonhleni North	M	29	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes						Yes	Yes	Yes	Yes	Yes			
49	Elijah	Tembe	Nhlonhleni North	M	37	Yes	Yes	Yes	Yes	Yes	Yes		No	Yes	No										Yes	Yes			
50	Loslinah	Mthembu	Nhlonhleni North	F	35	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes						Yes	Yes	Yes	Yes	No	They have not been trained		
51	Andreas	Gwala	Nhlonhleni North	M	58	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	No										Yes	Yes			

Community Survey - Shemula

	Head of Household	Subward	Gender	Age	Awareness of the fundamentals of the scheme - Do you know/understand					Expectations of the scheme				Did you receive any training under this scheme?							Training			Operation and Maintenance			For PSC members only	
					Where the water comes from	How the water gets to the standpipes	What to do when you see a leak	Why you must pay for water	Who is responsible for maintaining the scheme	Does the scheme deliver what you expected?	If no	Did you believe that it was going to create jobs?	Are you satisfied with the scheme?	Yes/No	Basic pipe laying skills	Block making	Brick and block laying	Basic plumbing	Capacity Building skills	Other	Is it what you expected to get?	Has it been useful?	Would you be able to use these skills again?	Are you happy with Automatic Dispensing Units	Do you believe that the community would be able to operate and maintain the system?	If no, why	Are you satisfied with the way your scheme work?	If no, why?
1	John Tembe	Lulwane	M	44	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes				Trench digging	Yes	Yes	Yes	Yes	Yes			
2	Mankulumani Tembe	Lulwane	M	55	Yes	Yes	Yes	Yes	Yes			Yes	Yes	No									Yes	Yes			
3	Sibaba Khumalo	Lulwane	M	46	No	Yes	No	Yes	Yes	No	unhappy with the walking distance	Yes	Yes	Yes	Yes					Yes	Yes	Yes	Yes	Yes			
4	Buhlahlu Gumede	Lulwane	F	47	No	Yes	No	No	Yes	Yes		No	Yes	No									Yes	Yes			
5	Nkonyela Mabika	Lulwane	M	52	No	Yes	Yes	No	Yes	Yes		Yes	Yes	No									Yes	Yes			
6	Paulinah Gumede	Lulwane	F	35	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes					Bush clearing and diggin	Yes	Yes	Yes	Yes	Yes			
7	Mfana Gumede	Lulwane	M	32	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes					Yes	Yes	Yes	Yes	Yes	If trained		
8	Molweni Ndlazi	Lulwane	M	41	Yes	Yes	Yes	Yes	Yes	No	unhappy about paying for water		Yes	Yes					Digging and backfilling	Yes	Yes	Yes	Yes	No	They have not been trained		
9	Siphiwe Ndlazi	Lulwane	F	35	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	No									Yes	Yes			
10	Hlolo Khumalo	Lulwane	M	45	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes					Trench digging	Yes	Yes	Yes	Yes	Yes			
11	Mphikwa Ndebele	Lulwane	M	29	Yes	Yes	Yes	Yes	Yes	No	unhappy with the walking distance	No	No	No									Yes	No	They have not been trained		
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APPENDIX G
COMMUNITY SURVEY

NQUTU

SURVEY RECORDS		
COMMUNITY SURVEY AT NQUTU		
Name of Head of Household:.	Date of Survey:	
Male/Female:	AGE:	
	Yes	No
1) Only for BoTT schemes		
Have you heard of BoTT?		
Do you know what it stands for?		
Do you know how it works?		
What is it proposed to achieve?		
2) Awareness of the fundamentals of the scheme		
Do you know where the water comes from?		
Do you know how the water gets to the standpipes?		
Do you know what to do when you see a leak?		
Do you understand why you must pay for water?		
Do you know who is responsible for maintaining the scheme?		
3) Expectations of the scheme		
Does the scheme deliver what you expected?		
If no - Are you unhappy with the walking distance to dispensing points?		
If no - Are you unhappy about paying for water?		
Did you believe that it was going to create jobs?		
Are you satisfied with the scheme?		
4) Did you receive any training under this scheme?		
If yes which of the following did you receive?		
Basic pipe laying skills		
Block making		
Brick and block laying		
Basic Plumbing		
Capacity Building skills		
Other		
5) Training		
Is it what you expected to get?		
Has it been useful?		
Would you be able to use these skills again?		
6) Operation and Maintainance		
Are you happy with Automatic Dispensing Units?		
Do you believe that the community would be able to operate and maintain the system?		
If no state why		
7) For PSC members only		
Are you satisfied with the way BoTT schemes work?		

Community Survey - Nqutu

	Head of Household	Subward	Gender	Age	Only for BoTT schemes				Awareness of the fundamentals of the scheme - Do you know/understand					Expectations of the scheme				Did you receive any training under this scheme?							Training			Operation and Maintenance			For PSC members only
					Heard of BoTT	What BoTT stands for	How BoTT works	What is BoTT proposed to achieve	Where the water comes from	How the water gets to the standpipes	What to do when you see a leak	Why you must pay for water	Who is responsible for maintaining the scheme	Does the scheme deliver what you expected?	If no	Did you believe that it was going to create jobs?	Are you satisfied with the scheme?	Yes/No	Basic pipe laying skills	Block making	Brick and block laying	Basic plumbing	Capacity Building skills	Other	Is it what you expected to get?	Has it been useful?	Would you be able to use these skills again?	Are you happy with Automatic Dispensing Units	Do you believe that the community would be able to operate and maintain the system?	If no, why	Are you satisfied with the way BoTT schemes work?
1	Sbongile J. Dlamini	Nqutu	F	36	Yes	Yes	No	No	Yes	No	Yes	No	No	Yes		Yes	Yes	No					Yes				Yes	Yes			
2	Bongekile Madela	Nqutu	F	48	Yes	Yes	Yes	No	Yes	No	No	No	No	No		Yes	No	Yes	Yes	Yes		Yes				No	Yes	Yes			
3	Phumzile Mtshali	Nqutu	F	27	No	Yes	No	No	Yes	No	No	No	Yes	No	unhappy with the walking distance	No	Yes	Yes			Yes					No	No	No	No	No		
4	Hamilton Mhlungu	Nqutu	F	29	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	No	Yes		Yes	Yes	No									Yes	No			
5	Millicent Ngcobo	Nqutu	F	45	Yes	Yes	Yes	No	No	No	No	No	No	Yes		Yes	No	No									Yes	Yes			
6	Virginia Nzima	Nqutu	F	40	Yes	Yes	Yes	No	Yes	No	No	No	No	Yes		Yes	No	Yes	Yes			Yes				Yes	No		No	No		
7	Agrinett Skhosana	Nqutu	F	40	Yes	Yes	Yes	No	Yes	Yes	No	Yes	No	No		Yes	No	No											No			
8	Rose Ntuli	Nqutu	F	49	Yes	Yes	Yes	No	No	No	No	No	Yes	No	unhappy with the walking distance	Yes	Yes	No				Yes							Yes	Yes		
9	Agrinett Thusini	Nqutu	F	70	Yes	Yes	Yes	No	Yes	Yes	No	No	No	Yes		Yes	No	Yes	Yes			Yes				No	Yes		No	Yes		
10	Welcome Mtshali	Nqutu	M	33	Yes	Yes	Yes	No	Yes	Yes	No	No	No	Yes		Yes	No	Yes	Yes	Yes	Yes	Yes	Yes			No	Yes	No	No	No		
11	Buyile Zulu	Nqutu	F	44	Yes	Yes	Yes	No	No	No	No	No	No	No		No	Yes	No											Yes	Yes		
12	Christinah Ndlovu	Nqutu	F	58	Yes	Yes	Yes	No	Yes	No	No	No	No	No	Unhappy about paying for water		Yes	Yes	Yes			Yes			Yes	No	Yes	Yes	Yes			
13	Florence Kheswa	Nqutu	F	38	No	No	Yes	Yes	Yes	Yes	No	Yes	No	No	Unhappy about paying for water			No											No	No		Yes
14	Maria Mathe	Nqutu	F	43	Yes	Yes	Yes	No	Yes	Yes	No	Yes	No	Yes																		
15	Gladness Mthembu	Nqutu	F	32	No	No	No	No	Yes	No	Yes	No	No	No	unhappy with the walking distance	No	No	No											No	No		
16	Nomusa R. Molife	Nqutu	F	54	Yes	Yes	No	Yes	No	No	Yes	Yes	Yes	No	Unhappy about paying for water	Yes	No	Yes											No	No	The system is unreliable	
17	Cecilia Hlatshwayo	Nqutu	F	61	No	No	No	No	Yes	Yes	Yes	Yes	Yes	No	unhappy with the walking distance	Yes	Yes	Yes	Yes							Yes	Yes	Yes	Yes	Yes		
18	Elsie Buthelezi	Nqutu	F	72	No	No	No	No	No	Yes	Yes	Yes	No	No		No	Yes	No											No	Yes		
19	E. Cebekhulu	Nqutu	F	40	No	No	No	No	Yes	No	No	No	No	Yes		No	No	No											Yes	No	Others cannot afford to pay	
20	Maphilibane Buthelezi	Nqutu	M	54	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes		No	Yes	No											Yes	Yes		
21	A.S. Ngwenya	Nqutu	M	53	No	No	No	No	Yes	No	No	Yes	Yes	No	Unhappy about paying for water	Yes	No	No											No	Yes		
22	Skhumbuzo Mazibuko	Nqutu	M	34	Yes	No		Yes	Yes	Yes	No	Yes	No	Yes			Yes	No												Yes		
23	Rose Sikhakhane	Nqutu	F	48	No	No	No	No	Yes	Yes	Yes	No	No	No	unhappy with the walking distance	Yes	Yes	No											Yes	Yes		
24	C.M. Sithole	Nqutu	M	33	No	No	No	No	Yes	Yes	No	Yes	No	Yes		Yes	Yes	No											Yes	Yes		
25	Musawenkosi Mabaso	Nqutu	F	34	Yes	Yes	No	No	Yes	Yes	No	Yes	No	Yes			No	No											No	Yes		Yes
26	E.N. Zulu	Nqutu	F	82	No	No	No	No	Yes	Yes	Yes	Yes	Yes	No		Yes	Yes	No											Yes	Yes		
27	L.J. Majozi	Nqutu	M	48	No	Yes	No	No	No	No	No	Yes	No	Yes		Yes		No											Yes	Yes		
28	Thandazile Gumbi	Nqutu	F	24	No	No	No	No	No	No	No	No	No	No		No	No	No											Yes	Yes		
29	V.P. Msomi	Nqutu	F	58	No	No	No	No	No	No	No	Yes	No	Yes		No	Yes	No											Yes	Yes		
30	L.L. Xaba	Nqutu	F	65	No	No	No	No	Yes	Yes	Yes	Yes	No	Yes		Yes	Yes	No											Yes	Yes		Yes
31	M.G. Zondi	Nqutu	M	84	No	No	No	No	No	No	No	Yes	Yes	Yes		Yes	Yes	No											Yes	Yes		
32	S.S. Sibiya	Nqutu	M	78	No	No	No	No	Yes	Yes	Yes	Yes	No	Yes		Yes	Yes	No											Yes	Yes		No
33	L.M. Zondi	Nqutu	F	55	No	No	No	No	Yes	Yes	Yes	Yes	No	Yes		Yes	Yes	No											Yes	Yes		Yes
34	V.Z. Sibiya	Nqutu	M	45	No	No	No	No	Yes	Yes	Yes	Yes	No	Yes		Yes	Yes	No											Yes	Yes		Yes
35	S.M. Thusini	Nqutu	F	35	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes		Yes	Yes	No											Yes	Yes		
36	P.X. Ntombela	Nqutu	M	48	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	No											Yes	Yes		Yes
37	S.B. Mhlongo	Nqutu	M	52	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes		Yes	Yes	No											Yes	Yes		No
38	J.B. Ntuli	Nqutu	M	63	Yes	Yes	No	No	Yes	Yes	Yes	No	No	Yes		No	No	No											Yes	Yes		Yes
39	M.M. Zulu	Nqutu	M	72	Yes	Yes	Yes	No	No	No	Yes	Yes	Yes	Yes		Yes	Yes	No											Yes	Yes		No
40	Z.P. Buthelezi	Nqutu	M	53	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	No	Yes		No		No											Yes	Yes		Yes
41	T.S. Zulu	Nqutu	M	43	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	No	Yes		Yes	No	No											Yes	Yes		No
42	E.M. Nkosi	Nqutu	M	48	No	No	No	No	Yes	Yes	Yes	Yes	No	Yes		Yes	Yes	No											Yes	Yes		Yes
43	B.S. Zulu	Nqutu	M	30	No	No	No	No	Yes	Yes	Yes	Yes	No	Yes		Yes	Yes	No											Yes	No		
44	T.M. Zulu	Nqutu	F	44	Yes	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes		No	Yes	No											Yes	Yes		Yes
45	L.M. Nkosi	Nqutu	F	92	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes		No	Yes	No											Yes	Yes		No
46	S.E. Mkhize	Nqutu	M	42	Yes	Yes	Yes	Yes	Yes	No	No	No	Yes	Yes		No	Yes	No											Yes	Yes		Yes
47	N.S. Ximba	Nqutu	M	35	No	No	No	No	Yes	Yes	No	Yes	No	Yes		Yes	Yes	No											Yes	Yes		
48	T.B. Zwane	Nqutu	M	45	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	No											Yes	Yes		No
49	L.G. Zondo	Nqutu	M	49	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	No											Yes	Yes		Yes
50	B.C. Zondi	Nqutu	M	92	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	No											Yes	Yes		Yes
51	Teresia N. Masikane	Nqutu	F	37	Yes	Yes	Yes	No	No	Yes	No		No	No	Unhappy about paying for water	No	Yes	No											No	Yes		
52	Nokuthula Hlongwane	Nqutu	F	36	Yes	Yes	Yes	No	Yes	Yes	No	Yes	No	No	Unhappy about paying for water	No	Yes	No											No	Yes		
53	Tonny	Nqutu	M	48	Yes	Yes	Yes	No	Yes	Yes	No	Yes	No	Yes		Yes	Yes	Yes	Yes							No	Yes	Yes	No	No		No
54	Margaret Sibiya	Nqutu	F	33	No				Yes	Yes	Yes	No		No	Unhappy about paying for water	Yes		Yes	Yes								No			Yes		
55	Thabisile Buthelezi	Nqutu	F	27	Yes	Yes	Yes	No	Yes	No	No	No	No	No	Unhappy about paying for water	Yes	Yes	No											No	No		Yes
56	Zandile Dlamini	Nqutu	F	36	Yes	Yes	No		Yes	No	No	No	No	Yes		No	Yes	No											No	Yes		No
57	Zandile Buthelezi	Nqutu	F	25	Yes	Yes	Yes	No	Yes	Yes	No	No	Yes	Yes		Yes	Yes	Yes		Yes	Yes					Yes	Yes	Yes	No	Yes		Yes
58	W. Gubevu	Nqutu	F	56	Yes	Yes	Yes	No	Yes	No	Yes	Yes	No	No	unhappy with the walking distance and paying for water	No	Yes	Yes					Yes			Yes	Yes	Yes	No	No		No
59	Pikile	Nqutu	F	33	Yes	Yes	Yes	No	Yes	Yes	No	No	No	No	Unhappy about paying for water	No	No	No											Yes	No	Because people are not active	No
60	Simon B. Sibiya	Nqutu	M	37	Yes	Yes	Yes	No	Yes	No	No	No	No	Yes		Yes	Yes	No											Yes	Yes		
61	Betty Mjiyakho	Nqutu	F	30	Yes	Yes	Yes	Yes	Yes	No	No	No	No	Yes		No	Yes	Yes					Yes			Yes	No	Yes	No	Yes		

Community Survey - Nqutu

	Head of Household		Subward	Gender	Age	Only for BoTT schemes				Awareness of the fundamentals of the scheme - Do you know/understand					Expectations of the scheme				Did you receive any training under this scheme?							Training			Operation and Maintenance			For PSC members only
						Heard of BoTT	What BoTT stands for	How BoTT works	What is BoTT proposed to achieve	Where the water comes from	How the water gets to the standpipes	What to do when you see a leak	Why you must pay for water	Who is responsible for maintaining the scheme	Does the scheme deliver what you expected?	If no	believe that it was going to create jobs?	Are you satisfied with the scheme?	Yes/No	Basic pipe laying skills	Block making	Brick and block laying	Basic plumbing	Capacity Building skills	Other	Is it what you expected to get?	Has it been useful?	Would you be able to use these skills again?	Are you happy with Automatic Dispensing Units	Do you believe that the community would be able to operate and maintain the system?	If no, why	Are you satisfied with the way BoTT schemes work?
1	J.C.	Zulu	Nqutu	F	42	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	No					Yes						Yes	Yes		No
2	D.T.	Khumalo	Nqutu	M	39	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	No											Yes	Yes		
3	S.B.	Zungu	Nqutu	F		No	No	No	No	Yes	Yes	Yes	Yes		Yes		Yes	Yes	No											Yes	Yes		Yes
4	J.P.	Zuma	Nqutu	M	40	No	No	No		Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	No											Yes	Yes		No
5	L.S.	Mazibuko	Nqutu	M	43	No	No	No	No	Yes	Yes	Yes	Yes	No	Yes		Yes	Yes	No											Yes	Yes		
6	J.P.	Buthelezi	Nqutu	F	39	No	No	No	No	Yes	Yes	Yes	Yes	No	Yes		Yes	Yes	No											Yes	Yes		
7	M.M.	Mazibuko	Nqutu	F	43	No	No	No	No	Yes	Yes	Yes	Yes	No	Yes		Yes	Yes	No											Yes	Yes		
8	P.B.	Sithole	Nqutu	F	56	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	No											Yes	Yes		No
9	Z.B.	Mazibuko	Nqutu	F	34	No	No	No	No	Yes	Yes	Yes	Yes	No	Yes		Yes	Yes	No											Yes	Yes		Yes
10	C.J.	Shabalala	Nqutu	F	38	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	No											Yes	Yes		Yes
11	S.P.	Ntuli	Nqutu	M	82	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	No											Yes	Yes		Yes
12	B.S.	Mbambo	Nqutu	F	30	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	No											Yes	Yes		
13	T.G.	Zondi	Nqutu	M	53	No	No	No	No	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	No											Yes	Yes		
14	H.N.	Vilakazi	Nqutu	F	54	No	No	No	No	Yes	Yes	Yes	No		Yes		Yes	Yes	No											Yes	Yes		
15	J.V.	Khumalo	Nqutu	F	62	No	No	No	No	Yes	Yes	Yes	Yes	No	Yes		Yes	Yes	No											Yes	Yes		
16	Ivy	Modi	Nqutu	F	42	Yes	Yes	Yes	No	Yes	Yes	No	No	No	Yes		No	Yes	Yes						Other	No	Yes	Yes	No	Yes		
17	Mkhipheni	Hadebe	Nqutu	M	48					No	Yes	No	Yes	No	Yes		No	Yes	No											Yes	Yes		No
18	Mhlengeni	Ngcobo	Nqutu	M		No	Yes	Yes	No	Yes		No	Yes	No	Yes		No	Yes	No											No	Yes		No
19	Bongekile	Khanyile	Nqutu	F	32	Yes	No	No	No	Yes					No	unhappy with the walking distance and paying for	No	Yes	Yes							No	Yes	Yes	Yes	Yes			No
20	Lawrence	Buthelezi	Nqutu	M	49	Yes	Yes	Yes	No	Yes	No	No	No	No	Yes		No	Yes	Yes		Yes					No	Yes	Yes	Yes	Yes			Yes
21	Wilson	Khumalo	Nqutu	M	65	Yes	Yes	Yes	No	Yes	Yes	Yes	No	No	Yes		Yes	Yes	No											Yes	Yes		
22	Eunice	Hadebe	Nqutu	F	39	Yes	Yes		No	Yes	Yes	No	Yes	Yes	No	unhappy with the walking distance and paying for	Yes	Yes	Yes		Yes	Yes	Yes	Yes		Yes	Yes	Yes	No	Yes			Yes
23	Ntombikayise	Khoza	Nqutu	F	64	No	No	No	No	No	No				Yes		No	No	Yes	Yes						Yes	No	No	No	Yes			Yes
24	Sthembile	Xulu	Nqutu	F	38	No	No	No	No	No	No	No	No	No	No		No	No	No											Yes	Yes		
25	Phumzile	Buthelez	Nqutu	F	72	Yes	Yes	Yes	No	Yes	Yes	No	Yes	No	No	unhappy with the walking distance and paying for	Yes	Yes	No											Yes	Yes		Yes
26	Zanele	Biyela	Nqutu	F	26	Yes	Yes	Yes	No	Yes	Yes	No	No	Yes	Yes		No	Yes	No											Yes	Yes		Yes
27	Joyce	Shongwe	Nqutu	F	60	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes		Yes	No	No		Yes			Yes		No		No	No	No	Because of criminals in the area		
28	Busisiwe	Ndlovu	Nqutu	F		Yes	Yes	Yes	No	Yes	Yes	No	No	No	Yes		Yes	Yes	No		Yes		Yes			Yes	Yes	Yes	No	Yes			
29	Gatsha A.	Zulu	Nqutu	M	33	Yes	Yes	Yes	No	Yes	No	No	No	No	Yes		Yes	Yes	No			Yes	Yes	Yes		Yes	No	No	No	Yes			
30	B.	Mpanza	Nqutu	F	40	Yes	Yes	No	No	Yes	No	Yes	No	No	No		No	Yes	No			Yes				No	No	No	No				
31	Lindiwe	Mpanza	Nqutu	F	42	Yes	Yes	Yes	No	No		No	No	No	Yes		Yes	No	Yes			Yes		Yes		Yes	Yes	No	No	Yes			
32	Ednah	Mtshali	Nqutu	F	34	Yes	Yes	Yes	No	Yes	Yes	No	No	No	Yes		Yes	Yes	Yes						Yes	No	Yes	Yes	Yes	Yes			
33	Thembeni	Ndlovu	Nqutu	F	46	Yes	Yes	Yes	No	Yes	Yes	No	No	No	Yes		Yes	Yes	No				Yes	Yes		Yes	No	Yes	Yes	Yes			
34	Elizabeth	Ximba	Nqutu	F	70	Yes	Yes	Yes	No	Yes	No	Yes	Yes	No	No	Unhappy with the walking distance	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	No			Yes	Yes			
35	David	Ngobese	Nqutu	M	56	Yes	Yes		No	Yes	No	Yes	No	No	No		Yes	No	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	No	Yes			
36	Nonhlanhla	Nkosi	Nqutu	F	37	Yes	Yes	Yes	No	Yes	Yes	No	No	No	Yes		Yes	Yes	No	Yes						No	No		Yes	Yes			
37	Gladys	Thwala	Nqutu	F	60	Yes	Yes	No	No	Yes	No	No	Yes	No	Yes		Yes	Yes	No										Yes	Yes			
38	Thobile	Zuma	Nqutu	F	48	Yes	Yes	Yes	No	Yes	No	No	No	No	No	unhappy with the walking distance and paying for	Yes	Yes	No										No	Yes			
39	Fikelephi	Zulu	Nqutu	F	57	Yes	Yes	Yes	No	Yes	No	No	No	No	No	Unhappy with the walking distance	Yes	Yes	Yes	Yes						Yes	Yes	No	Yes	Yes			
40	Wilson	Ndlovu	Nqutu	M	52	Yes	Yes	Yes	No	Yes	No	No	No	No	No		Yes	No	Yes	Yes	Yes		Yes	Yes		No	No		No	Yes			
41	Goodness	Mchunu	Nqutu	F	53	Yes	Yes	Yes	No	Yes	Yes	No	Yes	No	Yes		Yes	Yes	Yes							Yes	Yes	Yes	Yes	Yes			
42	Thabo	Mthombeni	Nqutu	M	52		Yes			Yes	Yes		Yes	Yes	Yes		Yes	Yes	Yes	Yes		Yes		Yes		No	Yes	Yes	Yes	Yes			
43	Khethiwe G.	Sibiya	Nqutu	F	42	Yes	Yes	No	Yes		Yes	No	No	Yes	Yes		No	Yes	Yes		Yes		Yes		Yes	No	Yes	Yes	Yes	Yes			
44	Nonhlanhla	Nyathi	Nqutu	F	35	Yes	Yes	No	No	Yes	No	No	No		Yes		Yes	No	Yes	Yes	Yes					Yes	No	No	No	Yes			
45	Witness	Mbatha	Nqutu	F		Yes	Yes	Yes	No	Yes	No	No	No	No	Yes		Yes	Yes	Yes	Yes			Yes			Yes	Yes	Yes	No	Yes			
46	Melu	Mpanza	Nqutu	M	58	Yes			Yes	No	No		Yes	Yes	Yes		No	Yes	Yes			Yes	Yes	Yes		Yes	No		Yes	Yes			
47	Ntombenhle	Zondi	Nqutu	F	47	Yes	Yes	Yes	No	Yes	No	Yes	Yes	Yes	No	unhappy with the walking distance and paying for	Yes	No	Yes	Yes						Yes			Yes	Yes			
48	Minah	Mkhwanaz	Nqutu	F	46	Yes	Yes	Yes	No	Yes	No	No	Yes	No	No		Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes	No	Yes	No	Yes			
49	Ester	Mngadi	Nqutu	F	36	Yes	Yes	No			No	No	Yes	No	Yes		Yes		No			Yes				No		Yes	No	Yes			
50	Muzi	Mbatha	Nqutu	M	43	Yes	Yes	No	No	Yes	No	No	No	No	No		Yes	Yes	Yes				Yes	Yes	Yes	Yes	Yes	No	No	Yes			
51	Rhoda	Khumalo	Nqutu	F	39	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes	Yes		Yes	Yes	No											Yes	Yes		Yes
52	Lindiwe	Majola	Nqutu	F	37	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes	Yes		Yes	Yes	No											Yes	Yes		Yes

Community Survey - Nqutu

	Head of Household		Subward	Gender	Age	Only for BoTT schemes				Awareness of the fundamentals of the scheme - Do you know/understand					Expectations of the scheme				Did you receive any training under this scheme?							Training			Operation and Maintenance			For PSC members only
						Heard of BoTT	What BoTT stands for	How BoTT works	What is BoTT proposed to achieve	Where the water comes from	How the water gets to the standpipes	What to do when you see a leak	Why you must pay for water	Who is responsible for maintaining the scheme	Does the scheme deliver what you expected?	If no	believe that it was going to create jobs?	Are you satisfied with the scheme?	Yes/No	Basic pipe laying skills	Block making	Brick and block laying	Basic plumbing	Capacity Building skills	Other	Is it what you expected to get?	Has it been useful?	Would you be able to use these skills again?	Are you happy with Automatic Dispensing Units	Do you believe that the community would be able to operate and maintain the system?	If no, why	Are you satisfied with the way BoTT schemes work?
1	Ester	Zwane	Nqutu	F	72	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes					Yes			No	Yes			
2	Makhosazane	Ndima	Nqutu	F	38	Yes	Yes	Yes	No	Yes	No	Yes	Yes	No	Yes		Yes	Yes	Yes	Yes				Yes	Yes	No	Yes	No	Because of criminals in the area		
3	Muzi	Mbatha	Nqutu	M	43	Yes	Yes	Yes	No	Yes	No	No	Yes	No	Yes		Yes	No	No								No	Yes			
4	Nokuthula	Mncube	Nqutu	F	40	Yes	Yes	Yes	No			No	No		Yes		Yes	Yes	No								No	Yes			
5	Goodness	Mdocka	Nqutu	F	45	Yes	Yes	Yes	No	Yes	No	Yes	Yes	No	Yes		Yes	Yes	Yes	Yes				Yes			No	Yes			
6	Fikile	Mdunge	Nqutu	F	40	Yes	Yes	Yes	No	No		Yes	No	No	Yes		Yes	Yes	Yes		Yes				No	Yes	Yes	Yes			
7	Thokozani	Kunene	Nqutu	F	39	Yes	Yes	Yes	No	Yes	No	No	Yes	No	Yes		No	Yes	No								No	Yes			
8	Hendry	Mbatha	Nqutu	M	69	Yes	Yes	Yes	No	Yes	No	No	No	No	Yes		Yes	Yes	Yes		Yes				Yes	Yes	No	Yes	Yes			
9	Ester	Makhoba	Nqutu	F	40	Yes	Yes	Yes	No		No	Yes	No	Yes	Yes		Yes	Yes	Yes			Yes	Yes	Yes	No	Yes	No	Yes	Yes			
10	Goodness	Mazibuko	Nqutu	F	46	Yes	Yes	Yes	No	Yes	No		No	No	No	unhappy about paying for water		No	Yes						No	Yes		Yes	Yes			
11	Ambrose	Mtshali	Nqutu	M	50	Yes	Yes	Yes	No	Yes	No	Yes	Yes	No	No	unhappy with the walking distance	Yes	No	No		Yes				Yes	Yes	No	No	Yes			
12	Alice	Makhubu	Nqutu	F	44	Yes	Yes	Yes	No	Yes	No	No	No	No	No	unhappy with the walking distance	Yes	No	Yes	Yes	Yes			Yes				Yes	Yes	Yes	Yes	No	Yes		
13	Ntombeyiningi	Mbhele	Nqutu	F	34		Yes	Yes	Yes	No	Yes	No	No	No	No		Yes	Yes	No									Yes	Yes			
14	Makhosazane	Mazibuko	Nqutu	F	33	Yes	Yes	Yes	No	Yes	Yes	No	No	No	No		Yes	Yes	No									Yes	Yes			
15	Wilmot	Mbhele	Nqutu	M	35	Yes	Yes	Yes	No	Yes		No	Yes	Yes	No	Unhapy about paying for water	Yes	Yes	Yes		Yes		Yes		Yes	Yes	Yes	No	Yes			
16	Phumzile	Manyath	Nqutu	F	48	Yes	Yes	Yes	No	Yes	No	Yes	Yes	No	No		Yes	No	Yes	Yes	Yes	Yes			No	No	No	Yes	Yes			
17	B.G.	Mazibuko	Nqutu	F	42	Yes	Yes	Yes		No	Yes	Yes	No	No	Yes		No	Yes	Yes	Yes	Yes	Yes			No	Yes	Yes	Yes	Yes			
18	Fikile	Nxumalo	Nqutu	F	42	Yes	Yes	No	No	No	No	No	Yes	No	Yes		Yes	Yes	Yes			Yes		Yes	No	Yes	No	No	Yes			
19	Annah	Skhosana	Nqutu	F	26	Yes	Yes	Yes	No	Yes	No	No	No	No	No		Yes	Yes	No										Yes			
20	Dumile	Ntshanga	Nqutu	F	30	Yes	Yes	Yes	No	Yes	Yes	No	No	Yes	No		No	Yes	No									Yes	Yes			
21	Mildred	Mbatha	Nqutu	F	38	Yes	Yes	Yes	No	Yes	No	No	No	No	Yes		Yes	No	Yes	Yes	Yes		Yes		Yes	Yes		No	Yes			
22	Trysihah		Nqutu	F	82	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes	No	Yes				Yes
23	Ahad	Jali	Nqutu	M	44	Yes	No	Yes		Yes	Yes	No	No	No	No	Unhappy about paying for water	No	Yes	No										Yes				Yes
24	Thengani	Buthelezi	Nqutu	F			Yes	Yes	Yes	No	Yes	Yes	No	Yes	No	walking distance and paying for water	No	No	No									No	Yes			
25	Princess	Buthelezi	Nqutu	F	28	Yes	Yes	Yes	No	Yes	Yes		No	No	Yes		Yes	Yes	No									Yes	Yes			Yes
26			Nqutu	F	47	Yes	Yes	Yes	No	Yes	Yes	No	No	No	No		No	Yes	Yes	Yes	Yes			No	Yes	No	No	Yes				No
27	Nomasonto	Mthembu	Nqutu	F		Yes	Yes	Yes	No	Yes	No	No	No	No	Yes		Yes	Yes	Yes	Yes				Yes	Yes	No	Yes	Yes				
28	Grace	Mthembu	Nqutu	F		Yes	Yes	Yes	No	No	No	No	No	Yes	Yes		No	Yes	No								Yes	Yes				
29	Adnah	Mtshali	Nqutu	F		Yes	Yes	Yes	No	No	No	Yes	Yes	No	No	unhappy about paying for water	Yes	Yes	No								Yes	Yes				
30	Mbuyiseni	Ndima	Nqutu	M	39	Yes	Yes	No	No	Yes	Yes	Yes	Yes	Yes	No	unhappy with the walking distance	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes		Yes	Yes	Yes				
31	Rose	Ntuli	Nqutu	F		Yes	Yes	Yes	No	Yes	Yes	No	No	No	Yes		Yes	Yes	Yes		Yes		Yes		Yes	No	Yes	No	Yes				
32	Sipho	Phakathi	Nqutu	M	42	Yes	Yes	Yes	No	Yes	No	No	No	No	Yes		Yes	Yes	No									No	Yes			
33	Phiwokuhle	Zulu	Nqutu	F	43	Yes	Yes	Yes	No	Yes	No	No	No	No	Yes		Yes	Yes	No										Yes			
34	Busisiwe	Mpanza	Nqutu	F	58	Yes	Yes	Yes		No	Yes	No	No	Yes	Yes		Yes	Yes	No									Yes	Yes			
35	Mpumelelo	Ngcobo	Nqutu	F	41	Yes	Yes	No	No	Yes	No	No	No	No	Yes		No	Yes	No									Yes	Yes			
36	Rebecca	Sibaya	Nqutu	F	49	Yes	Yes	Yes	No	Yes	No	No	Yes	No	No	Unhappy with the walking disatnce and paying for	No	Yes	Yes	Yes				Yes			No	Yes	No	No	Yes			
37	Beauty	Mpanza	Nqutu	F	42	Yes	Yes	Yes	No	Yes	Yes		No	No	Yes		No	No	Yes	Yes	Yes	Yes	Yes	Yes			No	Yes	Yes	No	Yes			
38	Christopher	Nxusa	Nqutu	M	40	Yes	Yes	Yes	No	Yes	No	No	No	No	Yes		Yes	Yes	No									No	Yes			
39	Joyce	Zwane	Nqutu	F	32	Yes	Yes	Yes	No		No	No	Yes	No	No	Unhappy about paying for water	Yes	Yes	Yes	Yes							Yes	No	Yes	No	Yes			
40	Thomas	Dlamini	Nqutu	M	52	Yes	Yes	Yes	No	Yes	No	Yes	Yes		No	unhappy about paying for water	Yes	No	Yes		Yes	Yes	Yes	Yes			Yes	Yes	Yes	No	Yes			
41	Victoria	Moloi	Nqutu	F	76	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes		Yes		Yes	Yes	Yes	Yes	Yes			
42	Witness	Zikode	Nqutu	F	70	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No	Yes		Yes	Yes	Yes	Yes	Yes		Yes		Yes	Yes	Yes	Yes	Yes	Yes	Yes			
43	Nonhlanhla	Kheswa	Nqutu	F	42	Yes	Yes	Yes	Yes	No	No	Yes	No	Yes	Yes		No		Yes	Yes				Yes	No	Yes	No	No	No	They want keys for payment		
44	Thuli	Ngobese	Nqutu	F	32	Yes	Yes	Yes	No	No	Yes	Yes	No	Yes	Yes		Yes	Yes	Yes		Yes	Yes	Yes	Yes	Yes	No	Yes	Yes				
45	Themba	Ndunge	Nqutu	F	49	Yes	Yes	Yes	No	Yes	No	No	No	No	No	unhappy with the walking distance	Yes	No	Yes	Yes		Yes				Yes	Yes	No	No	Yes			
46	Makhosi	Mazibuko	Nqutu	F	32	Yes	Yes	Yes	No	Yes	No	No	No	No	Yes		No	Yes	Yes						No	Yes	Yes	Yes	Yes			Yes
47	Zodwa	Msimang	Nqutu	F	34	Yes	Yes	Yes		Yes	No	No	No	No	No		No	Yes	Yes	Yes					Yes	Yes	Yes	Yes	Yes			Yes
48	Elizabeth	Makhoba	Nqutu	F	42	Yes	Yes	Yes	No	Yes	Yes	No	Yes	No	Yes		No	Yes	No									Yes	Yes			
49	Catherine	Ndlovu	Nqutu	F	78	Yes	Yes	Yes	No	Yes	Yes	Yes	No	No	Yes		Yes	Yes	No									No	Yes			No
50	Maria	Mathe	Nqutu	F	43	Yes	Yes	Yes	No	Yes	Yes	No	Yes	Yes	Yes		Yes	Yes	No									Yes	Yes			Yes
51	Princess	Buthelezi	Nqutu	F	34	No	No	Yes	No	Yes	No	No	No	Yes	Yes		Yes	Yes	No									Yes	Yes			
52	P.M.	Phakathi	Nqutu	F	33	No	No	No	No	Yes	Yes	Yes	Yes	No	Yes		Yes	Yes	No									Yes	Yes			

APPENDIX H
IMPLEMENTING AGENTS SURVEY

QUESTIONAIRE FOR AQUAMANZI – NQUTU CWSS

(Please expand on your answer where appropriate)

1. Do you believe that the BoTT approach is more appropriate for rural schemes? Yes/No

2. Do you believe that adequate provisions had been made available in the Business Plan to empower the communities to operate and maintain the scheme? Yes/No

3. Do you believe that the community has been adequately empowered to Operate and Maintain the Schemes? Yes/No

4. In hindsight do you believe that the RDP policy adequately addressed issues of sustainability, affordability and the ability of local communities to the operate and maintain the scheme? Yes/No

5. Is the scheme self sustaining currently? Yes/No

6. If No – what are the major contributing factors towards this eg. Unaccounted for water, staff salaries, overheads and general maintenance?

7. Do you believe that the Scheme can be self-sustainable? Yes/No
   - By increasing mentoring
   - By increasing support
   - By re-training staff

- By increasing staff

8. What is the current water tariff?

_____

_____

9. Has consideration been given to increase the tariff.? Yes / No

_____

_____

10. What is the average water consumption? (l/c/d)

_____

_____

11. Do you believe that RDP should encourage the participation of private consumers in the order to improve the sustainability of the scheme? Yes/No

_____

_____

12. Have you made contingency plans to accommodate the "free water" issue? Yes/No

- Trickle feed
- Daily allocation
- Step tariff
- Will depend on equitability
- Other – share policy to cover expense

13. How do you believe that the "free water" issue will affect the sustainability of the scheme?

_____

_____

APPENDIX I
IMPLEMENTING AGENTS - FINDINGS

OPERATION AND MAINTENANCE - SURVEY

NO.	QUESTIONS	NAME OF REPRESENTATIVE				TOTAL	
		Umzinyathi District Municpality	**AquAmanzi**	**Mhlathuze Water**	**DWAF – ER**	YES	NO
1	Do you believe that the BoTT approach is more appropriate for rural schemes?	Yes, but has struggled with O&M	Yes, because of the speed of delivery required and lack of capacity in rural Local Government	No, more expensive than normal approach	Yes, appropriate to large projects and programmes, probably minimum value of plus/minus R2 million/project	3	1
2	Do you believe that adequate provisions had been made available in the Business plan to empower the communities to operate and maintain the scheme?	No	Yes	No, this requirement was not fully understood by 1995	Yes, if the policy is for the communities to do the full O & M of the projects, the BP format does allow for it	2	2
3	Do you believe that the community has been adequately empowered to Operate and Maintain the Schemes?	No, communities cannot be empowered to perform all function required for sustainable services	Yes, because the level to which the community can be involved is et by the W.S.A. – greater empowerment could be possible with W.S.A. support	Yes, with additional management support	No, because local government policy has been unclear and they have tended so far not to want community based WSP's	2	2
4	In hindsight, do you believe that he RDP policy adequately addressed issues of sustainability, affordability and ability of local communities to operate and maintain the scheme?	No	No, a better level of service is required to ensure sustainability	No, the RDP Policy did not recognise the problem of management which needs augmentation from external sources	No, RDP policies underestimated the convenience factor in water consumption – carry 25l/day for up to 200 m is too onerous for most women that have to fetch water for household use. Low consumption rates immediately imply high unit costs, thereby discouraging consumption further. Have also underestimated the long-term effect of rates and tarrifs boycotts implemented as part of the "struggle".	0	4
5	Is the scheme self sustaining currently?	No	No	No, it has the potential to break-even in 2-3 years – thereafter sustainable	Yes, there are non-BoTT schemes that are apparently self-sustaining	1	3
6	f No, what are the major contributing factors toward this?	1. Service Support by prepayment expensive : 2. Overheads; 3. Vandalism; 4. Free Water Policy	1. Staff Salaries & poor payment; 2. Free water issue; 3. Vandalism	1. Law; 2. High operational cost item; 3. Vehicle repairs	1. Staff salaries; 2. Maintenance costs; 3. Overheads; 4. Unaccounted for water		

OPERATION AND MAINTENANCE - SURVEY

NO.	QUESTIONS	NAME OF ENGINEER				TOTAL	
	Do you believe that the Scheme can be self-sustainable?	Yes	Yes	Yes	No, very few rural schemes can be self-sustaining in the current economic and policy climate. Household disposable income levels are too low, local government salaries relatively high compared to house hold income in rural area, spatial distribution of rural communities	3	1
7	- By increasing mentoring	No	Yes	No	Yes	2	2
	- By increasing support	No	Yes	Yes	Yes	3	1
	-By re-training staff	No	Yes	Yes	Yes	3	1
	-By increasing staff	No	Yes	Yes	No	2	2
	Other		By expanding to individual connections	Reducing system pressures	Needs to be some kind of subsidy system in place		
8	What is the current water tarrif (R/kl)	R8.00	R8.00	R9.43 for communal supply; R8.22 for private metered supply			
9	Has consideration been given to increase the tariff?	No	No	Yes	No	1	3
10	What is the average water consumption? (l/c/d)	1.2-8	3	6			
11	Do you believe that RDP should encourage the participation of private consumers in order to improve the sustainability of the scheme?	Yes, should allow for choices of level of service	Yes	Yes	Yes, if private consumers can be served they must be encouraged to improve the sustainability of rural schemes	4	0
	Have you made contingency plans to accommodate the "free water" issue	No, in process	Yes, currently discussing with Local Authorities	No	No, many rural municipalities do not have resources, even with equitable share, to provide "free" water	1	3
	-Trickle feed	More complex than just dealing with Free water at a project / scheme level	Most Likely				
12	-Daily allocation						
	-Step tariff						
	-Will depend on equitability						
	-other –share policy to cover expense						
13	How do you believe that the "free water" issue will affect the sustainability of the scheme?	Provided that agreement can be reached with the Local Government, it will improve risk of the W.S.P	Most rural schemes will not be sustainable without support from the Local Authority	Not unless the shortfall in income is not reimbursed by the W.S.A	The matter of "Free basic Water" has turned things upside down with regard to sustainability		