Trends in the Insight into the Growing South African Municipal Water Service Delivery Problem

Report to the
Water Research Commission

edited and compiled

by

SG Hosking and KT Jacoby
Department of Economics,
Nelson Mandela Metropolitan University

WRC Report No. 2087/1/P/13
ISBN 978-1-4312-0406-9

APRIL 2013

OBTAINABLE FROM

Water Research Commission
Private Bag X03
GEZINA, 0031

orders@wrc.org.za or download from www.wrc.org.za

This report forms part of a series of two reports. The other report is *Perspectives on the Market Processes Followed in Setting South African Water Services Tariff* (WRC Report No. 2087/2/P/13).

EXECUTIVE SUMMARY

The sustainability of South Africa municipal water services provision is being challenged by the desire of government to extend high quality services from a relatively small portion of the population to the whole. Evidence of failures in delivery are mounting and many reasons for this have been identified, including a lack of political will at local government levels, low budget priority, insufficient capital, lack of capacity and skill and flawed tariff and accounting structures.

This study generates new perspectives by surveying selected but representative, South African municipalities in their capacities as water service authorities (WSAs) on a range of financial sustainability issues – including cost burden on users, cross sub-subsidisation and cost calculations to set tariffs. The study is part of a wider investigation into the setting of tariffs that cover costs and satisfy demand, funded and advised by the Water Research Commission (WRC). The conclusions and recommendations of this study aim to contribute to the following areas:

1. The choice of water service provider, including the private utility option;
2. Market vulnerabilities in water service provision under alternate models of supply;
3. The determination and realisation of full cost recovery;
4. Demand responsiveness/sensitivity of local government supply;
5. The increasing block tariff (IBT) tariff structure; and
6. Abuse of dominance in the market process.

Given the limited perspective (i.e. a focus on WSAs), some important national water sustainability issues are given less prominence, e.g. raw water availability and national government capacity to subsidise water service delivery. The key water service sustainability elements on which attention was focused in this study are:

- Backlogs in the water service coverage and infrastructure rehabilitation and maintenance.
- Standard of water service indicators.
- Relative importance of the provision of water services in water service authorities' strategy and implementation (including budget and risk).
- Adequacy of skills to provide a sustainable water service.
- Budgeting and planning for the sustainability of the water service.
- Adequacy of the costing and tariff setting nexus, with particular attention paid to method and principle.

A survey was used to elicit information from selected municipalities.

South African municipalities face enormous challenges to sustain water service delivery in order to fulfill the desire of government to extend high quality services from a relatively small portion of the population to the whole. Evidence of failures in delivery are mounting, including a lack of political will at local government levels, low budget priority, insufficient capital, lack of capacity and skill and flawed tariff and accounting structures.

These challenges take place within an institutional setting, defined by the Constitution of South Africa Act (Act 108, 1996) and a number of supporting Acts. The Constitution identifies

municipalities as the key role players in the delivery of water service – potable water and waste water management. This water service delivery and planning is regulated by the Local Government Municipal Systems Act (2000), which requires, inter alia, that municipalities formulate a Water Service Development Plan, and implement a tariff structure that recovers costs and takes other social objectives into account. The standards of water service provided are regulated by the Water Services Act (1997) and the latter identifies the National Department of Water Affairs as the lead setting and monitoring agent in this connection. Ring-fencing of water accounts is an implicit requirement of the Water Services Act (1997).

The pursuit of the objective of increasing welfare under a cost recovery constraint through the use of the IBT, inevitably leads to a mismatch problem in tariffs set and demand satisfied. The strongest case for the increasing bock tariff (IBT) is to be built when the cost recovery is abandoned as a constraint and instead adopted as an objective, for example in the form of minimising the shortfall in cost recovery, subject to the tariff structure not distorting price signals (at least not any more than linear tariffs would). In terms of this objective, the IBT structure has considerable merit. The reason why it has considerable merit is that in many instances the national government has inadvertently set up a mismatch between service supplied and willingness to pay, making it unlikely that cost recovery can be realised, other than through distorting production and consumption in the economy. The IBT is the most feasible tariff structure for minimising the inevitable revenue shortfall.

An important, but neglected (in Africa), type of efficiency/equity analysis of water service provision in South Africa is that of the efficiency in mix of water service output. It has the aim of getting the right product mix. An analysis of efficiency in the mix of water service output is one that aims to match demand to the service produced. It is inefficient to produce a mix of outputs that the recipients cannot afford. A possible way forward to address water tariff efficiency/equity complications is through giving this mix more attention in future.

The main findings of the survey were as follows:

(a) Many municipalities are unable to address backlogs in infrastructure asset maintenance and rehabilitation – leading to the number of potable water interruptions and days of failed sanitation services.

(b) The current infrastructure of the municipalities is over-utilised and is reflected in a depressed DRC/CRC ratio negatively.

(c) Municipal failures to rate risk of water service infrastructure, conduct water meter audits and record water interruptions and days of failed sanitation services.

(d) The sampled municipalities' water service had a vacancy rate of 34% and high ratios of water service employee to population served. Water service engineers served up to 78 861 members of the population, which could be reduced to 57 629 if all vacancies were filled.

(e) The total debt outstanding for the water service in the 2009/10 financial year for the sample of municipalities was R5 890 million, which is high.

(f) Municipalities frequently underspend on the capital budgets. For instance, the Steve Tshwete Local Municipality only spent 24.40% of its water service capital budget in 2009/10.

(g) In many cases water services are not ring-fenced in municipal accounts, complicating the scope for accurate cost pricing and allocating water service costs into fixed and variable components.
(h) Municipalities were inconsistent in the way they classify costs between fixed and variable.
(i) The maintenance of the asset registers was undertaken with regular updates and adequate information being presented, inconsistencies in the application of the accumulated depreciation makes it difficult to determine the DRC/CRC ratio. The information declared by this sample of municipalities suggested a DRC/CRC ratio of 75%.
(j) The municipalities were aware that the waste water function leads to external costs for the environment but do not estimate the value.
(k) The municipalities forecast demand for water service based on past trends rather than from information collected from their water service customers or service models and modelling.

It was concluded that under-recovery of costs occurs for many reasons. Inter alia, it occurs because there are insufficient transfers to cover the costs of those who do not pay, from central government grant assistance to the poor, there is inadequate provision for replacement and maintenance costs (also called rehabilitation cost or deferred maintenance) and external costs are being omitted.

The problem of inadequate provision for replacement and maintenance costs should not occur if generally acceptable accounting principles for depreciation and maintenance are applied. Straight line depreciation of water infrastructure assets should in principle over-estimate depreciation where there is adequate maintenance renewal, because renewal has the effect of keeping infrastructure value somewhere between 65% and 95% of replacement value. The problem that is arising is that there is inadequate maintenance (renewal and rehabilitation), resulting in the current value (condition) of infrastructure falling below this proportion. It has been estimated that the current depreciated replacement cost to current replacement cost (DRC/CRC) for water and sanitation infrastructure has declined to about 52%.

Based on the outcome from this study the following recommendations are made:
(a) The Department of Water Affairs (DWA) accept that South Africa faces a mounting challenge to water service delivery under the current institutional arrangements, and that these may need urgent review if serious adverse economic consequences are to be averted.
(b) There is an urgent need to clarify economically what the municipalities are trying to achieve through the tariff setting arrangements linked to water service delivery. To avert serious distorting effects, there needs to be more attention paid to demand, and this, in turn, requires that municipalities put more effort into generating knowledge about this demand.
(c) The IBT can play a potentially very important positive role, but not within the current DWA framework for tariff setting. The DWA need to change the model to one of minimising cost recovery shortfall, subject to the constraint of attaining a given level of social welfare and satisfying economic demand (as opposed to political demand).
(d) Regulations by the DWA should consider benchmarks for water service provision at the local government level and review the national department's monitoring and oversight over water service provision.
(e) The DWA and Water Boards must be transparent when determining tariffs to be charged to municipalities for either raw or potable water.

(f) Municipalities must record water service interruptions and waste water failures diligently in order to raise the risk profile of the water service.

(g) Municipalities must prioritise achieving the blue drop quality status and green drop status and such priority must be reinforced in the service delivery mandate of municipalities.

(h) Municipalities must ring-fence the water service in their accounts and apply financial modelling in order to determine tariffs that recover costs. Such modelling and forecasting must be supported by a sound costing methodology and be linked to the WSDP and WMP.

(i) Municipalities must implement strategies that reduce the excess burden of transfer costs by setting in place strategies to recover debt from consumers that can afford to pay, and by reducing cross-subsidisation of other municipal services from the water service.

(j) Municipalities must explore enterprise asset management models that provide for the full life cycle of an infrastructure asset. Such a life cycle starts with the asset to be acquired and ends with the disposal of the asset. The asset management models are able to record and predict the repairs and maintenance needs of the infrastructure used to support the water service and must be used to motivate for further repairs and maintenance allocations in the operating budget and rehabilitation allocations in the capital budget. The enterprise asset management model must be built on the foundation of an accurate asset register linked to WSDP and WMP.

(k) Municipalities need to ensure that strategies are developed to spend both the operating and capital budget allocated. These may include the employment of project management skills or more efficient supply chain management policies and/or supply chain management capacity.

(l) Municipalities must develop tariff structures that will recover the cost of the water service.

The consideration of the study recommendations as well as the detailed study analysis and review of a sample of South African municipalities will actively assist to address the growing water service delivery problem. This will in turn support the growth and development of South Africa, its people and economy.

ACKNOWLEDGEMENTS

The guidance of the reference group and funding of the WRC are gratefully acknowledged, as are all the staff at municipalities and other water service related organisations who kindly contributed through their willingness to respond to the questions put to them by the members of this research project team. The reference group responsible for this project was made up of the following members:

Mr JN Bhagwan	Prof SG Hosking
Ms J Dugard	Prof H Kasan
Mr K Jacoby	Mr R Norden
Mr V Naoben	Ms NM Ngomane
Ms K Gull	Ms K Eales
Mr R Gillmer	Dr D Mullins
Mr W Moraka	Prof J Blignaut
Mr G Mwlinga	Ms JG Hosking

Other significant contributors were:

- Specialist support of Kevin Gillmer that resulted in a successful return of completed survey documentation from the sample municipalities.

- The consolidation of the responses from the sample municipalities and the editing of the work, undertaken during the drafting of this report by Liesel Jacoby.

- In particular, the support of the project manager, Mr Jay Bhagwan, is acknowledged.

- The following student participated in this study and is in the process of contributing a masters dissertation on the topic: Kevin Jacoby (see Appendix D).

TABLE OF CONTENTS

CHAPTER 4
COMPOSITION OF THE SURVEY

CHAPTER 5
SURVEY RESULTS

CHAPTER 6
CONCLUSIONS AND RECOMMENDATIONS

ANNEXURES

LIST OF TABLES

LIST OF FIGURES

LIST OF ACRONYMS

ABC	Activity Based Costing
AC	Average cost
AFF	Asset Financing Fund
ASGISA	Accelerated and Shared Growth Initiative for South Africa (The Presidency 2006)
CIDB	Construction Industry Development Board
COID	Compensation for Occupational Injury and Diseases
CRR	Capital Replace Reserve
CRC	Current replacement cost
CSIR	Council for Scientific and Industrial Research
CV	Compensation variations
DBSA	Development Bank of Southern Africa
DBT	Decreasing Block per unit Tariff
DPLG	Department of Provincial and Local Government
DPW	Department of Public Works
DRC	Depreciated replacement cost
DWA	Department of Water Affairs
DWAF	Department of Water Affairs and Forestry
FC	Fixed Cost
FT	Fixed Tariff
GGR	Government Grant Receipts
GIAMA	Government Immovable Asset Management Act (Act 19 of 2007)
GST	Goods and Services Tax
IAM	Infrastructure asset management
IBT	Increasing Block per unit Tariff
IDP	Integrated development plan (municipal)
IIMM	International Infrastructure Management Manual
IMESA	Institute of Municipal Engineering of Southern Africa
IWA	International Water Association
IWC	International Water Commission
LAC	Long-run average cost
LT	Linear Tariff
M&E	Monitoring and evaluation
MC	Marginal cost
MFMA	Municipal Finance Management Act (Act 56 of 2003)
MIG	Municipal Infrastructure Grant
MSA	Municipal Systems Act
MSP	Municipal services partnership
MTREF	Medium term revenue and expenditure frameworks
NIMS	The National Infrastructure Maintenance Strategy (DPW et al 2006)
NMBM	The Nelson Mandela Bay Municipality
NRW	Non-revenue water
NWRS	National Water Resource Strategy
O&M	Operation and maintenance

PFMA	Public Finance Management Act (Act 1 of 1999)
PPE	Plant, Property and Equipment
PPP	Private Public Partnership
R&D	Research and development
SAC	Short-run average cost
SAICE	South African Institution of Civil Engineering
SALGA	South African Local Government Association
SAMWU	South African Municipal Workers Union
SDF	Spatial Development Framework
SFWS	Strategic Framework for Water Services
SMP	Sanitation Master Plan
SWWCU	Water Sector Support Coordination Unit (of DWAF)
T	Tariff
TC	Total cost
TR	Total revenue
USDG	Urban Settlements Development Grant
VAT	Value Added Tax
VC	Variable cost
WfSGD	Water for Sustainable Growth and Development
WISA	Water Institute of Southern Africa
WMP	Water Master Plan
WRC	Water Research Commission
WS	Water services (water supply services and sanitation services)
WSA	Water services authority
WSDP	Water services development plan (municipal)
WSI	Water services institution
WSP	Water services provider
WTP	Water treatment plant

CHAPTER 1

THE GROWING SOUTH AFRICAN MUNICIPAL WATER SERVICE DELIVERY PROBLEM

1.1 THE CHALLENGE OF WATER SERVICE SUSTAINABILITY AND AIM OF THIS STUDY

The benchmarks for municipal water service provision in South Africa have been set nationally and with reference to the level of income of the community in an urban settlement (Department of Water Affairs (DWA), 2009a). A better service is being provided to the well-off sections of communities than to the poor sections of communities (Hosking, 2011a). The municipal water service provision benchmark (standard) is set for the well off and is comparable with best international standards (Department of Water Affairs, 2009a).

Historically these users (the well-off) were required to pay for the cost of providing the service and were concentrated in relatively small urban areas (Hosking, 2011a). The tariff structure they faced was flat and determined with reference to a diverse range of accounting principles and practices (Hosking, 2011a). The burden of covering the cost of provision was averaged over the well-off users, proportional to use (Hosking, 2011a).

During the last decade there have been several important changes, including a national government led increase in the level of service provided to the poor (towards a uniform service for all) and a movement away from a flat tariff structure to an increasing block tariff structure (Hosking, 2011a). The latter was motivated partly by the objective of managing demand to the available supply and partly by the desire to redistribute the cost of providing a water service to the more well off users (rich households) of the service (Hosking, 2011a).

Along with all these changes, new concerns have emerged over the sustainability of the provision of municipal water services at the levels set by government for itself (Segal, 2009). The challenge of sustainability has been argued to be partly due to the limit of freshwater availability in South Africa, partly due to reduced hiring of personnel with the required competencies and partly due to failures to collect sufficient revenue to cover the costs of providing and managing water services to users and distortions induced by the way of revenue is collected (Segal, 2009). The latter problem is related to the way the tariff structure is set – sometimes insufficiently high to cover the full costs of water service provision and sometimes in ways that undermine consumer welfare.

Getting the South African municipal water service tariff structure right is crucial – not only from a sustainability perspective, but also because it is the key determinant of water service allocation between the various urban water service consumers (Department of Water Affairs, 2009a). The tariff structure should encapsulate the primary objectives of society and sensitivity to consumers, but often does not do so, because the tariff setters and policy designers are poorly informed about the effects of alternative tariff structures on consumer behavior (Whittington, Boland and Foster

2002; Banerjee, et al, 2010)[1] . Getting the tariff structure right requires accurate information – about what costs need to be incurred and what costs are incurred. It also requires commitment to achieve targeted water service standards.

To what extent is this accurate information generated and is there the required commitment present?

This report aims to address this question through an analysis of the water service provision sustainability challenge and surveys of key financial matters that influence the sustainability of the municipal water service provided and underlie the water tariff (price) municipalities charge in their capacity as water service authorities (WSAs). It is part of a wider ranging project investigating the setting of water tariffs that cover costs and satisfy demand, funded and advised by the Water Research Commission (WRC). The conclusions and recommendations of the WRC Project K3/2087 (Hosking, 2011b) are to address:

- The choice of water service provider, including the private utility option;
- Market vulnerabilities in water service provision under alternate models of supply;
- The determination and realisation of full cost recovery;
- Demand responsiveness/sensitivity of local government supply;
- The increasing block tariff (IBT) tariff structure; and
- Abuse of dominance in the market process.

The commitment to achieve water service standards is a daunting one. Municipalities face significant demand for investments in infrastructure from (at least) three sources. Firstly, they must address backlogs in poor households' access to basic municipal services. Secondly, they must address the infrastructure needs of a growing economy, where firms and households are seeking additional infrastructure services. Thirdly, they must refurbish or replace infrastructure that has outlived its design life (National Treasury, 2008:142).

In rising up to the challenge municipalities have to perform a balancing act. They not only have to invest in infrastructure relating to water, but also sanitation, electricity, solid waste and transportation. These investments are intended to address basic community needs and support economic activity. Public investment that is targeted to meet these objectives can take a number of forms, depending on the needs of a particular locality or function. It may involve the construction of new assets, or extension, replacement, refurbishment and maintenance of existing assets (National Treasury, 2008:141).

The effectiveness of public sector infrastructure investment in supporting and guiding growth and combating poverty, depends firstly on, the effectiveness with which infrastructure assets are managed, secondly, on the capacity of public institutions to plan and guide the process of special development and thirdly, on the ability of the public sector to co-ordinate its investments to deliver

[1] This report will not address the national level of water allocation. It also will not address allocation within the environment, for instance, between competing river and catchment system demands, including for forestry and recreation, nor allocation within the agricultural sector. It will only address allocation within one sector, urban settlements. At the national level water services are allocated between the environment, agriculture and urban settlements. In this allocation, tariff structures play very little (if any) part, although social marginal values may play a partial role.

positive developmental outcomes and guide future fixed investment across the public and private sectors (National Treasury, 2008:141).

Between the financial years 2003/04 and 2007/08 the water sector was the largest beneficiary of the increase in municipal capital spending. Water services received an average of 29 percent of the total capital budgets of municipalities for this period (National Treasury, 2011a).

The water services sector in South Africa has infrastructure assets of a replacement value of several hundred billion rand. During the next decade more infrastructure will need to be provided, yet many municipalities, in their capacities as water services authorities (WSAs) pay scant attention to existing infrastructure asset management and provide minimal budget for it (Department of Water Affairs and Forestry (DWAF), 2005c:1). The focus of attention, both in research and in policy making, has been more on the extension of users served by the water infrastructure, than on the quality of this infrastructure – that is on quantity rather than quality (Fourie, 2007).

1.2 FALLING BEHIND IN MEETING THE CHALLENGE OF SERVICE PROVISION

1.2.1 Backlogs in municipal service delivery

Residents in long established formal residential areas typically have easy access to services, with infrastructure of a very high standard. Residents of townships and informal settlements within the same municipality have far lower levels of access to services and infrastructure of a significantly lower standard. Assessing the cost of addressing backlogs in basic services has usually involved estimating the number of poor households requiring services, the rate of household growth and the average costs of providing a basic level of access to the service function (National Treasury, 2008:142).

The estimate of required municipal infrastructure investment to meet remaining backlogs in water and sanitation services in the year 2005 was R12.8 billion for potable water and R18.4 billion for sanitation. The cost per capita was R1 470 for potable water and R8 000 for sanitation (DWAF, 2005b).

Backlogs were reduced by 56 percent in the water sector from the financial year 1994/95 to 2006/07 and sanitation backlogs had decreased by 32 percent for the same period. It was estimated in 2007 that 14.4 percent of the population in South Africa still did not have access to water and 29.50 percent of the population did not have sanitation services (National Treasury, 2008:142-143).

The formation of new enterprises and the expansion of the productive capacity of existing firms creates additional demand for municipal infrastructure services. The failure of municipalities to keep pace with demand in one year does not dissipate. It is rolled over and magnified in succeeding years. It also leads to congestion and over-utilisation of existing infrastructure assets. This accelerates the deterioration in the condition of these assets, bringing forward the date at which they need to be replaced (National Treasury, 2008:143).

The rate at which municipal capital expenditure has grown has fallen below the rate of increase in the value of buildings completed since 2003 (National Treasury, 2008:143). In 2006 municipal capital expenditure had fallen to less than 75 percent of the value of new buildings completed (National Treasury, 2011a).Backlogs in demand are experienced in the greater congestion and over-use of existing assets – circumstances that sometimes lead to firms deferring decisions to expand their productive capacity (National Treasury, 2008:144).

1.2.2 Poor maintenance of water service infrastructure

The delivery of services does not end with commissioning of the infrastructure. Once it has been commissioned, the activities necessary to ensure that it continues to perform its function must be carried out. Delivery needs to be universally understood as embracing, not just the placing in service of infrastructure and facilities, but the management of that infrastructure or facility for its designed life (DWAF, 2005a).

The need for maintenance of infrastructure differs between sectors and depends on the initial quality of infrastructure installed. As a general rule, the higher initial investment, the longer the period before significant maintenance is required, but maintenance needs will also vary with how intensely the infrastructure is used (National Treasury, 2008:144).

It was estimated by the Council for Scientific and Industrial Research (CSIR) and the Construction Industry Development Board (CIDB) that in 2007 the total water services municipal asset replacement value was R180 billion and annual maintenance expenditure requirements R7.2 billion.

So severe is the water service asset maintenance problem that the National Treasury has expressed concern about the low levels of expenditure on repairs and maintenance and the renewal of existing infrastructure in most municipalities and provided the following direction (National Treasury, 2011b:7):

- Where a municipality allocates less than 40 percent of its 2011/12 capital budget to the renewal of existing assets it must provide a detailed explanation and assurance that the budgeted amount is adequate to secure the ongoing health of the municipality's infrastructure, supported by reference to its asset management plan;
- Where the budgeted amounts for repairs and maintenance are less than 8 percent of the asset value (write down value) of the municipality's Plant, Property and Equipment (PPE) as reflected in the municipality's 2009/10 annual financial statements, the municipality must provide a detailed explanation and assurance that the budgeted amount is adequate to secure the ongoing health of the municipality's infrastructure supported by reference to its asset management plan; and
- In the case of a municipality that received an audit qualification related to its assets register, where the budgeted amounts of repairs and maintenance reflected less than 10 percent of the municipality's operating expenditure, the municipality must provide a detailed explanation and assurance that the budgeted amount is adequate to secure the ongoing health of the municipality's infrastructure supported by references to its asset management plan (National Treasury, 2011b:7).

A failure to adequately maintain assets can lead to service delivery disruptions and the need to replace assets before the end of their design lives. The need for expenditure on asset maintenance depends on where the municipality is in its asset management life cycle. A municipality with a comparatively new infrastructure network will require less maintenance expenditure (National Treasury, 2008:144).

Few municipalities have put enough of their budgets aside for infrastructure management. The focus of attention of municipalities is often more on the construction and commissioning of new infrastructure than on the operations and maintenance of existing infrastructure (DWAF, 2005a:28).

The inadequate maintenance of water service infrastructure is evident at the delivery 'coal face'. In 2004, a total of 37 percent of households had interrupted water services, mainly for technical reasons (South African Institution of Civil Engineering, 2006). Over 50 percent of the South African Institution of Civil Engineering's (SAICE's) sample of 30 municipalities reported leakages at levels above international norms. In 2005, 63 percent of municipalities did not meet water quality standards, although by 2007 this had improved to 72 percent (SAICE, 2006). Leakage of already treated water is a serious problem, with municipalities reporting more than 30 percent water loss in some instances (SAICE, 2006).

A nationwide sanitation sustainability audit was undertaken in 2004/2005 to ascertain the functionality of sanitation projects completed since 1994. The audit found that 28% of households' sanitation facilities had failed or were in the process of failing (SAICE, 2006).
Non-functioning infrastructure constitutes a costly investment that is not providing a service or delivering a return. Such infrastructure can directly cause unsafe or unhealthy conditions (not just to persons or to institutions, but also to the natural environment), or costly stoppages of economic production, and other unfavourable consequences. The unreliability of infrastructure can also induce wasteful duplication of infrastructure investment, for example, institutions have to purchase a generator or water storage tanks as stand-by facilities for use on those occasions when infrastructure fails (DWAF, 2005a:21).

1.3 REASONS FOR BACKLOG BUILD-UPS AND INADEQUATE MAINTENANCE OF INFRASTRUCTURE

1.3.1 Political will at the local government level

Political short-term imperatives within the municipality result in less money being spent on the management of assets (DWAF, 2005a:1). It becomes a vicious circle once infrastructure is allowed to deteriorate. Expensive refurbishment becomes necessary and there is even less money for ongoing maintenance. In addition, deteriorating infrastructure leads to poor service delivery and reduced payment by consumers, exacerbating lack of cost recovery (DWAF, 2005a:1).

The Strategic Framework for Water Services requires water services authorities to maintain a register of water services infrastructure assets and put in place a system to manage these assets in the form of a maintenance and rehabilitation plan. This plan is based on the principle of preventative

maintenance and should be part of the Water Services Development Plan (WSDP). Assets are supposed to be rehabilitated and/or replaced before the end of their economic life and the necessary capital funds are supposed to be allocated for this purpose (DWAF, 2005c).

1.3.2 Low budget priority

Research shows that insufficient attention is being paid by the majority of South African water services authorities to manage their infrastructure (DWAF, 2005a:1). Some waste-water treatment works run by municipalities in Gauteng were releasing effluent that was indistinguishable from the raw sewage that flows into the works. A reason for this frequently includes gross under-budgeting by the municipality for waste-water (Wall, 2005). The competing demands made on limited operational budgets, staff and other resources, severely constrain the proper management of infrastructure by water services authorities (DWAF, 2005a:1).

1.3.3 Insufficient capital

Collectively, the resources required to finance infrastructure demands far outstrip the actual availability of resources at the municipal level (National Treasury, 2008:146). Various sources of finance are available to municipalities to assist them to meet demands for infrastructure investment. These include private funding, transfers from national government and municipal own revenues. The municipal infrastructure grant (MIG) is the single largest external contributor of finance for municipal infrastructure investment. This national government grant is intended to supplement municipal budgets for infrastructure and ensure a focus of attention on the provision of basic infrastructure for poor households (National Treasury, 2008:146).

1.3.4 Lack of capacity and skill

In 2005, a study by the Council for Scientific and Industrial Research (CSIR) on behalf of DWA revealed there was a direct impact of skills resources and the state of water service infrastructure (DWAF, 2005a:18). A 2009 study conducted by Marin Philippe on behalf of the World Bank regarding Public-Private Partnerships for Urban Water Utilities also highlighted the favourable impact of skills and labour productivity on the management of water services infrastructure assets (Philippe, 2009).

The loss of the “intellectual assets” is a major threat to effective infrastructure management and hence to compliance with water service standards. The loss of key technical staff, and their non-replacement, or replacement by others less qualified, is inhibiting infrastructure management, and in many cases can be identified as the main reason for breakdown of the service (DWAF, 2005a:18; Lawless, 2007).

The loss (departure) of significant numbers of highly skilled and experienced staff over a short period negatively affects service delivery due to (DWAF 2005a:18-19):

- The loss of skills and of institutional memory;
- The loss of mentors; and

- The appointment of non-technical personnel to management positions requiring technical experience.

The shortfall in technical expertise at some municipalities is not only manifesting itself in terms of current operational and maintenance practices, and hence in current non-compliance, but is a direct and substantial contributor to future problems (DWAF, 2005a:19).

Only 13 out of the 47 district municipalities (28 percent) and 42 out of the 231 local municipalities (18 percent) have members of the Institute of Municipal Engineering of Southern Africa (IMESA) among their senior management (Gibson, 2004:47).

1.3.5 Flawed water service tariff and accounting structures

Municipalities are supposed to ensure that:

- Water services tariffs are fully cost-reflective, including the cost of maintenance and renewal of purification plants and water networks, and the cost of new infrastructure;
- Water services tariffs are structured to protect basic levels of services; and
- Water services tariffs are designed to encourage efficient and sustainable consumption (National Treasury, 2011b:5).

Too many municipalities are failing in these respects. If a municipality's water service tariffs are not fully cost reflective, the municipality should develop a pricing strategy to phase-in the necessary tariff increases in a manner that spreads the impact on consumers over a reasonable period of time. All municipalities should aim to have appropriately structured, cost-reflective water service tariffs in place by 2014 (National Treasury, 2011b:5).

To mitigate the need for water tariff increases, municipalities must put in place an appropriate strategy to limit water losses. In this regard, municipalities must ensure that water used by its own operations is charged to the relevant service, and not simply attributed to water 'losses' (National Treasury, 2011b:5).

Municipalities must calculate and report water losses in accordance with the International Water Association (IWA) standards as required by the Department of Water Affairs (DWA) (National Treasury, 2011b:5).

In order to achieve this compliance in all these spheres, sound accounting and economic principles must be followed, but all too often they are not followed (National Treasury, 2011b).

1.4 METHODOLOGY

There are two main research paradigms available to a researcher, quantitative and qualitative research. The distinction between quantitative and qualitative research is not always clear. Qualitative research is any kind of research that produces findings not arrived at by means of statistical procedures or other means of quantification (Strauss and Corbin, 1990). Quantitative

methods are used chiefly to test or verify theories or explanations, identify variables to study, relate variables in questions or hypotheses, use statistical standards of validity and reliability, and employ statistical procedures for analysis (Creswell, 2009). Qualitative research methods apply value judgments to generate insights. Both research paradigms are employed in this report.

The tariff structure and accounting problem are the major focus of attention in this study. The primary method of research into these problems was the use of surveys to elicit information. Surveys are pre-formulated written sets of questions to which respondents record their responses. They can be administered personally, mailed or electronically distributed to respondents (Collis & Hussey, 2003: 173-177). Surveys form part of the quantitative research paradigm.

In this study, a survey was used to elicit information from selected municipalities in South Africa about the extent of financial cost under-recovery and extent of omitted external costs for water services. Of particular interest in the survey was the provision for depreciation and maintenance for water infrastructure assets. Pre-survey investigations suggested there was an under-recovery problem – deduced by using an accounting framework based on the sum of costs, including capital consumed, plus return on capital (Lambrechts, 2006; Boshoff & Childs, 2009).

One part of the focus of attention of the survey was drawn to the features of, and reasons for, under-recovery of costs of the water service problem, where it occurs. Cost under-recovery may occur for any one of several reasons. For instance, it may occur because there are insufficient transfers (central government grant assistance to the poor) to cover the costs of those who do not pay, or because there is inadequate provision for replacement and maintenance costs (also called rehabilitation cost or deferred maintenance) or because of external costs being omitted.

Another part of the focus of attention of the survey was on the application of generally acceptable accounting principles for depreciation and maintenance and economic principles to guide objectives in tariff setting for water services. Straight line depreciation of water infrastructure assets, although a generally accepted accounting standard, can over-estimate depreciation where there is adequate maintenance renewal (Burns, 2002). Renewal has the effect of keeping infrastructure value somewhere between 65% and 95% of replacement value (Burns, 2002). A problem arises when the current value (condition) of infrastructure drops below this proportion, for instance, because there is inadequate maintenance (renewal or rehabilitation). This problem may have developed in South Africa. It has been estimated that the current depreciated replacement cost to current replacement cost (DRC/CRC) for water and sanitation infrastructure is about 52% (Boshoff and Childs, 2009). The economic principle applied to guide tariff setting includes efficiency, welfare and equity. The analysis of policy in terms of the various principles forms part of the qualitative research paradigm.

1.5 STRUCTURE OF THE REPORT

Chapter 1 identifies the sustainability problem in municipal water service delivery and identifies the methodology to be applied to investigate it. Chapter 2 describes the institutional arrangements in the water services sector, the legal mandate of water service provision and the scope to sustainably deliver on the legal mandate. Chapter 3 explains the theory of tariff setting for cost recovery of

water service provision. Chapter 4 outlines the design of the survey used to assess the sustainability of municipal water service infrastructure and cost recovery. Chapter 5 reports on the survey results. Chapter 6 draws conclusions and provides recommendations.

1.6 CONCLUSION

The sustainability of South Africa's municipal water services provision is being challenged by the desire of government to extend high quality services from a small portion of the population to the whole of it. There is evidence of failures in delivery and many reasons have been identified by a range of sources, including lack of political will at local government levels, low budget priority, insufficient capital, lack of capacity and skill and flawed tariff and accounting structures.

In particular, this study aims to generate new perspectives on tariff and accounting structures – by surveying selected, but representative South African municipalities, on a range of financial sustainability issues – including cost burden on users, cross sub-subsidisation and cost calculations to set water tariffs.

CHAPTER 2

INSTITUTIONAL ARRANGEMENTS IN THE WATER SERVICES SECTOR

2.1 INTRODUCTION

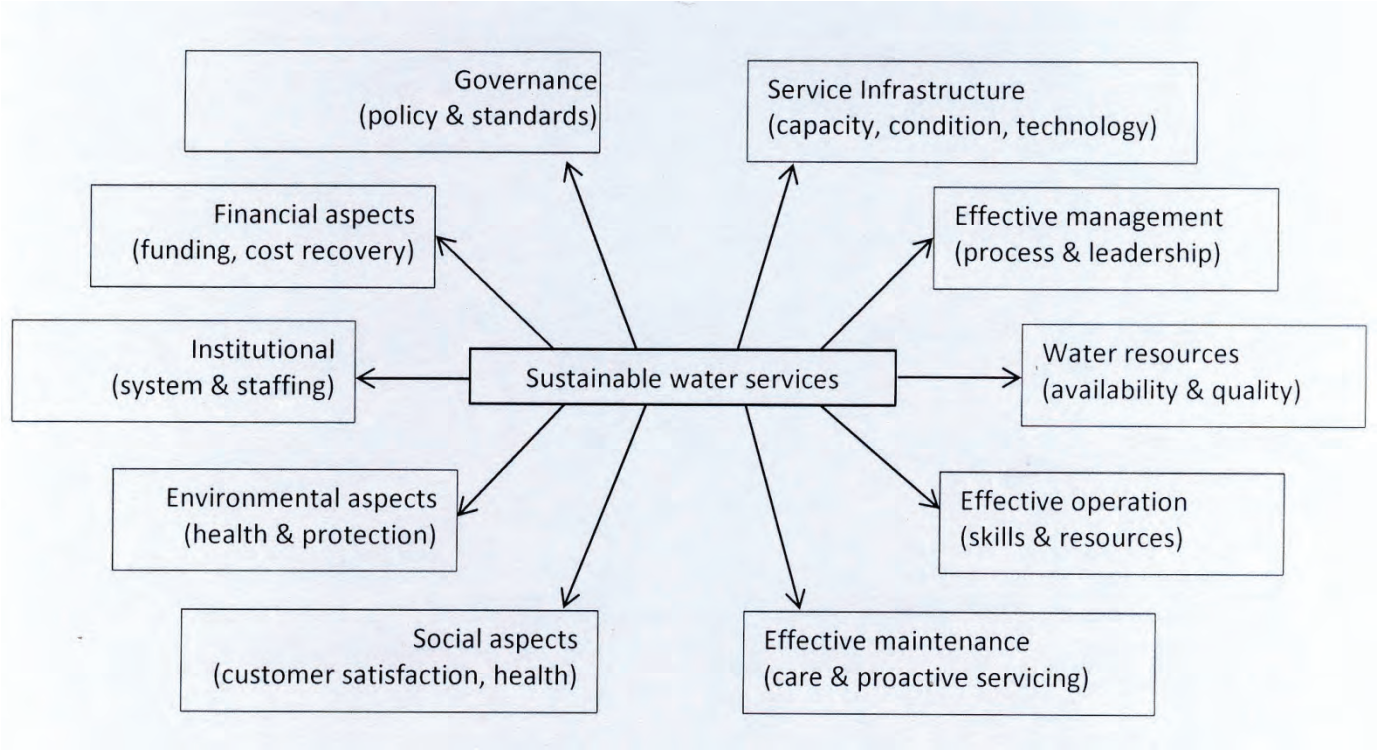
Water is an indispensable natural resource – vitally necessary to sustain life, the environment, food production, hygiene and power generation. Prosperity in South Africa depends, among other things, on the sound management of water (National Treasury, 2008:89). Water sources include rivers, streams, groundwater and rainfall. In order to facilitate the use of this water it is captured and contained in dams. Municipalities take this water to treatment plants to make it ready for use. South Africa's tap water is typically of a high quality (by international standards) but there are areas and periods when this quality has lapsed (National Treasury, 2008:89).

So important is water that the Bill of Rights in the Constitution of South Africa Act (Act 108, 1996) gives great prominence to it, requiring that there be:

- *"Equitable access to water and to the benefits from the use of water resources;*
- *Sustainable use of water by making progressive adjustments to water use with the objective of striking a balance between water availability and legitimate water requirements and by implementing measures to protect water resources;*
- *Efficient and effective water use for optimum social and economic benefit"*

In South Africa, the management of water resources is an exclusive national competency, with the local level of government the leading agent tasked with the delivery of water services (Water Services Amendment Act 108, 1997).

In order to provide sustainable water services there are many functions that need to be successfully carried out – see Figure 2.1 below.



(adapted from DWAF 2006 : 3)

Figure 2.1: Key elements to ensure sustainable water services

2.2 THE WATER SECTOR PLAYERS

There are a number of institutions tasked with ensuring the sustainability of water services – the Department of Water Affairs and Forestry, water boards and municipalities. Water services refer to water supply and sanitation services and include regional water schemes, local water schemes, on-site sanitation and the collection and treatment of waste-water.

Section 4B of the Constitution of South Africa (1996) lists potable water supply systems and domestic waste-water and sewage disposal systems as a local government function.

A two-tiered local government system requires the powers and functions be divided between categories B (local municipality) and C (district municipality) to avoid duplication and co-ordination problems. An asymmetric approach has been followed in relation to water and sanitation authority. All category A municipalities (metropolitan municipalities) are water service authorities (WSAs), category B municipalities are also WSAs and in certain instances so are category C municipalities (The Local Government Structures Act 117, 1998 and The Intergovernmental Relations Framework Act 13, 2005).

2.3 THE LEGAL AND PLANNING FRAMEWORK FOR PROVIDING MUNICIPAL WATER SERVICES

Section 25 of the Local Government Municipal Systems Act (MSA) (Act 32, 2000) makes it a legislative imperative that a municipality must adopt an Integrated Development Plan (IDP). This plan remains in place for the duration of a Municipal Council, being five years, and is reviewed on an annual basis, as per Section 34 of the MSA (2000). The IDP is the core strategic planning document of a municipality and provides direction for the compilation of the medium term budget, which covers a period of three years.

A number of sector plans are developed and used to direct the strategy of a municipality. One such sector plan is the Water Services Development Plan (WSDP). The WSDP is a water services management and planning tool. It should serve as proof to other spheres of government that a municipality is exercising due diligence in managing its water services. The WSDP presents a medium-term planning horizon. A municipality adopts a Water Master Plan (WMP) and Sanitation Master Plan (SMP) in addition to the WSDP. These two plans provide for a long-term planning horizon, 20 to 30 years. Such long-term planning is necessary considering the time lags in developing of water services infrastructure and the increasing scarcity of the natural resource. The WMP and the SMP cascade down from the IDP, WSDP and the Spatial Development Framework (SDF) of a municipality and provide detailed plans for implementation that are closely linked to the resources available. The SDF has a spatial planning focus. Spatial planning is a public sector activity that creates a public investment and regulatory framework within which private sector decision making and investment occurs.

The MSA (Act 32, 2000:80), section 73 (2), deals with matters relating to municipal services. A municipal service must:

(a) be equitable and accessible;
(b) be provided in a manner that is conducive to-
    (i) the prudent, economic, efficient and effective use of available resources; and
    (ii) the improvement of standards of quality over time;
(c) be financially stable;
(d) be environmentally sustainable;
(e) be regularly reviewed with a view to upgrading, extension and improvement.

The MSA (Act 32, 2000:80), section 74, further provides that a municipality must adopt and implement a tariff policy on the levying of fees for municipal services provided by the municipality. The tariff structure must satisfy the following requirements:

(a) Users of municipal services must be treated equitably in the application of tariffs.
(b) The amount individual users pay for services must generally be in proportion to their use of that service.
(c) Poor households must have access to at least basic services through –
    (i) tariffs that cover only operating and maintenance costs;
    (ii) special tariffs or life line tariffs for low levels of use or consumption of services or for basic levels of service; or

(iii) any other direct or indirect method of subsidization of tariffs for poor households.

(d) Tariffs must reflect the costs reasonably associated with rendering the service, including capital, operational, maintenance, administration and replacement costs, and interest charges.
(e) Tariffs must be set at levels that facilitate the financial sustainability of the service, taking into account subsidization from resources other than the service concerned.
(f) Provision may be made in appropriate circumstances for a surcharge on the tariff for a service.
(g) Provision may be made for the promotion of local economic development through special tariffs for the categories of commercial and industrial users.
(h) The economical, efficient and effective use of resources, the recycling of waste and other appropriate environmental objectives must be encouraged.
(i) The extent of subsidization tariffs for poor household and other categories of users should be fully disclosed.

Section 10 of the Water Services Amendment Act (Act 108, 1997), addresses the norms and standards of water tariffs. In accordance with the Act, a municipality, in its capacity as a Water Services Provider (WSP), must apply a tariff for water services which is not substantially different from any norms and standards which the Minister of Water Affairs, with the concurrence of the Minister of Finance, has prescribed in terms of the Act.

Section 21 of the Water Services Act (Act 108, 1997), deals with matters relating to by-laws, whereby a municipality, in its capacity as a WSA, must adopt by-laws which contain conditions for the provision of water services, and which provide for, at least, the following (inter-alia):
(a) the standard of service;
(b) the technical conditions for supply;
(c) the determination and structure of tariffs in accordance with section 10 of the Water Services Amendment Act (Act 108, 1997).

With respect to the latter, ring-fencing is required in order to comply with the Water Services Act (Act 108, 1997). When performing the functions of a Water Services Provider the Act requires a Water Service Authority to manage and account for these functions separately. The accounting statements must reflect own assets, liabilities, operational costs and income.

The Compulsory National Standards for Quality of Potable Water (SABS 241-2001) deals with the quality of water exiting a water treatment works and entering the municipal reticulation system.

The National Water Act of 1998 provides for varying standards of effluent discharged to public watercourses. The receiving water quality objectives are determined by the procedures to assess effluent discharge impacts (DWAF and WRC, 1995).

There are a number of strategies and plans that have cascaded from legislation dealing with water service matters. The diagram attached as Annexure A provides an overview of how all the strategies and plans of both the enablers and implementers are integrated.

2.4 PLANNING

The primary planning tools for the water services of a municipality are the WMP and the SMP (both are cascaded from the WSDP). These plans formalize the level of service provision, assess and determine the backlog (maintenance and coverage) in service level, determine the cost of achieving the service level and define a strategy of eradicating backlogs (maintenance and coverage). The WSDP must allow for the assessment of all water related infrastructure, and must reflect on the socio-economic profile of the municipal area, including consumer, service, water resource, customer service and financial profiles. The WSDP further takes stock of the water balance (International Water Association (IWA)) and provides for strategies on how to reduce unaccounted for, or alternatively, non-revenue water.

2.5 CONCLUSION

Owing to the prominence of water services provision in the Constitution of South Africa Act (Act 108, 1996) a number of supporting Acts have been drafted and approved to support the institutional arrangements of the water service. The Constitution identifies municipalities as the key role players in the delivery of water service – potable water and waste water management. This water service planning is regulated by the Local Government Municipal Systems Act (Act 32, 2000), which requires that, inter alia, municipalities formulate a Water Services Development Plan, and implement a tariff structure that recovers costs and takes other social objectives into account. The standards of water services provided are regulated by the Water Services Amendment Act (Act 108, 1997) and the latter identifies the National Department of Water Affairs as the lead setting and monitoring agent in this connection. Ring-fencing of water accounts is an implicit requirement of the Water Services Act.

CHAPTER 3

TARIFF SETTING FOR COST RECOVERY OF WATER SERVICES PROVISION

3.1 INTRODUCTION

Chapter Three outlines the choices that influence the cost of service provided, the revenue raising options available to municipalities to recover their costs, ethical considerations and criteria relevant to setting water tariffs and it also debates the merit of the preferred option, viz. the increasing block tariff structure.

3.2 THE WATER TARIFF STRUCTURE

There are a number of different water tariffs – each relating to a different stage in the water pricing structure (Water Services Amendment Act (Act 108, 1997). These are:

- raw water tariffs (water resources development charge);
- bulk water tariffs;
- retail water tariffs;
- sanitation charge;
- bulk waste-water tariff; and
- waste water discharge charge.

In order to set a cost recovering tariff for each stage, a cost calculation must be made for that stage. Except for the waste water discharge charge, the cost for the former stage is an input into the cost of the subsequent stage in the pricing structure. For this reason, if efficient pricing is to be attained, it is essential that the costs at each stage are accurately calculated.

3.2.1 The raw and bulk water tariffs

The Department of Water Affairs is the custodian of all raw water resources, and owns most major dams. The Department sells raw water to either a water board or to the water service authority, i.e. the municipality. Certain municipalities operate their own dams. Municipalities that purchase raw water directly from the department are responsible for purifying the water.

In most cases, water boards purchase raw water from the department, purify and refine it and then sell the purified water to municipalities. The tariff charged by water boards to municipalities is regulated by the department. Several factors influence the tariffs that each water board charges. These include the actual purchase price of the raw water, the methods and cost of the purification of water and the cost of the capital investment requirements of the water board. Prices for treated bulk water impact directly on municipalities' retail water tariffs, as bulk water forms a large proportion of the overall retail tariff.

3.2.2 Retail water tariffs

The Department of Water Affairs prescribes norms and standards for water services tariffs in terms of section 10 of the Water Services Amendment Act (Act 108, 1997). These are aimed at promoting equitable, financially viable and environmentally sustainable tariffs. The regulations apply to all water services institutions and they may not use a tariff that is substantially different from any of the prescribed norms and standards. The Department of Water Affairs monitors all tariffs along the water provisioning cycle, including water management charges, raw water tariffs, water board tariffs and the municipal tariffs for domestic, commercial and industrial users.

3.2.3 Sanitation charge

In setting the tariff for sanitation, municipalities need to take a number of issues into account. The servicing of on-site sanitation systems is not a monthly activity and is also highly dependent on the type of sanitation system installed, the households' responsibilities for maintaining the system and the accepted final disposal method of the wastes. An investigation of the emptying of pit latrines, for example, has indicated that these should be scheduled for emptying once every five to eight years and will cost between R600 and R1 200 each to empty (2007 prices). The approach to collecting tariffs for providing such a service may either be built into the water bill, to charge a fee for emptying or a number of other alternatives.

3.2.4 Bulk waste-water tariff

In setting the waste water discharge charge, the bulk waste-water tariff is considered as an input cost.

3.2.5 Waste water discharge charge

A waste water discharge charge must consider sustainable development and efficient use of water resources, promote the internalisation of environmental costs by impactors, create financial incentives for dischargers to reduce waste and use water resources in a more optimal way, and recover the costs of mitigating the impacts of waste discharge on water quality.

3.3 CHOOSING THE COST OF SERVICE FOR RETAIL POTABLE WATER AND SANTITATION TARIFF SETTING

3.3.1 Steps in the process

The first step in the process of setting full cost recovery tariffs is forecasting demand (Q_1) for the target period (t_0t_1) – as shown in Figure 3.1 below (Hosking, 2010).

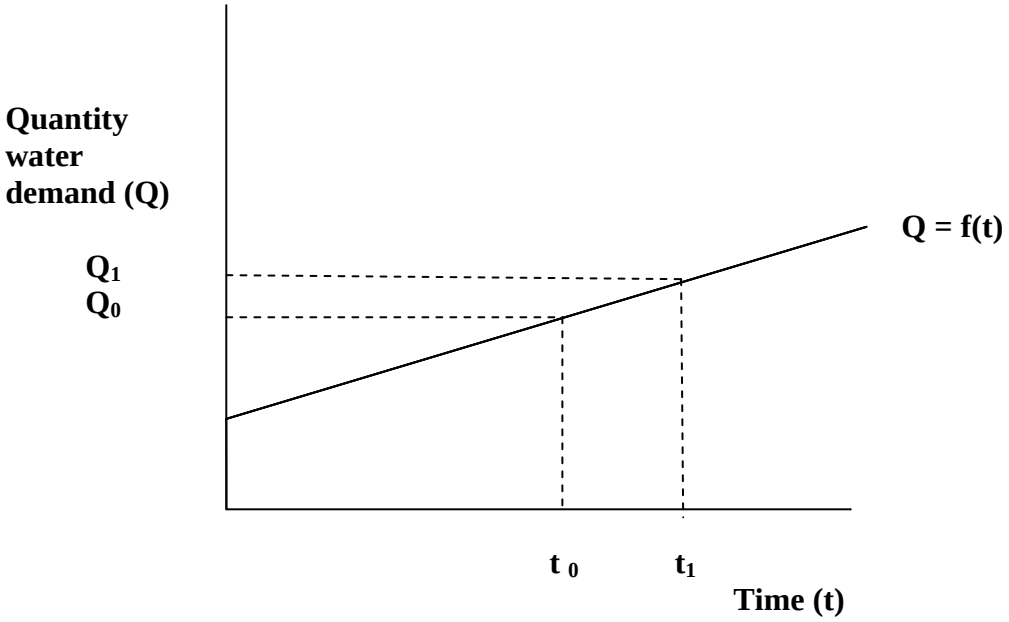


Figure 3.1: Forecasting demand for potable water

The second step in the process is choosing the investment in water services infrastructure. There are a number of features municipalities need to take into account when making these choices:

- Exploiting (choosing) lower average cost infrastructure options (sometimes called unit reference values) before the higher average cost ones. There are economies of scale in choice of water supply scheme and associated declining short run marginal costs (the short run marginal costs are typically lower than the short run average costs for a given scheme);
- Exploiting higher quality sources of water for treatment before lower quality sources (because the latter are more costly to treat);
- In the sanitation of waste-water there are both economies of scale plus high external diseconomies.

For these reasons, the long-run average cost (LAC) increase and the supply infrastructure invested to meet a demand of Q_1 (forecast demand – see figure 3.1) is that relating to schemes 0 and 1 (see short-run average cost SAC_0 and SAC_1 in Figure 3.2). The subscript of the SAC and MC curves indicates the water supply scheme to which they are relevant. It makes no sense for a municipality to choose only scheme 0 because it will produce insufficient water. Nor does it make sense to choose scheme 2 (in addition to 0 and 1) because it would incur additional costs needlessly.

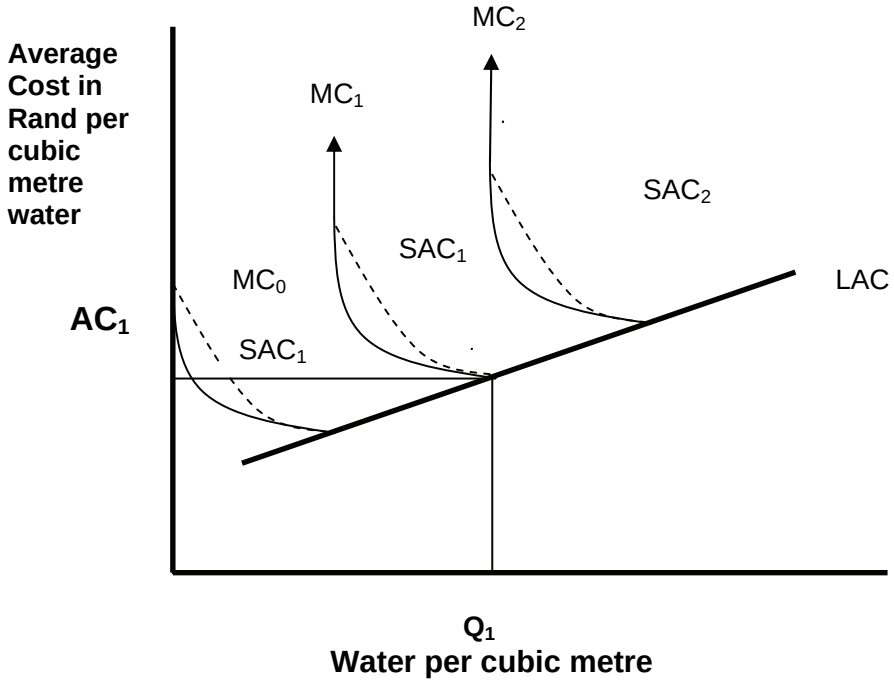


Figure 3.2: Choosing the investment/scale in supply infrastructure

Total cost determination, given the choice of infrastructure schemes 0 and 1, is determined by adding the treatment and distribution costs to the production cost:

TC = potable water production cost + waste treatment cost + distribution cost
where,
distribution cost = reticulation + metering + management costs.

When a dual tariff structure is adopted, with separate tariffs for access and use, the third step in the process is fixed cost and variable cost determination. Fixed costs are those of providing access to the potable water distribution network and to the sewerage/outflow management infrastructure. They usually make up the bigger proportion of total cost (so identifying them is important). Variable costs are for the use of potable water and outflow management capacity, and usually make up the smaller proportion of the total cost (Hosking, 2010). Variable costs differ with a unit of measure (charge) and fixed costs are incurred irrespective of a unit of measure, for example, salaries of staff maintaining the infrastructure and finance charges.

It may not be efficient to calculate and distinguish fixed and variable costs. It is inefficient where the extra accounting cost of making the calculation exceeds the benefit that can be achieved in the use made of municipal water services. When it is very costly to provide access it may be efficient (but not necessarily equitable or welfare improving) to signal this fact through separate tariffs for access and use (Hosking, 2010).

The fourth step in structuring the tariffs to recover costs entails setting total costs equal to total revenue:

$$TC = TR \text{ (payments by users for water services)} \quad (3.1)$$

$$TC/Q = TR/Q \quad (3.2)$$

$$\text{So,} \begin{cases} TC/Q = AC \\ TR/Q = T \\ AC = T \end{cases} \quad (3.3)$$

where,
T is the tariff per cubic metre of water paid for by the users.

The fifth step is to adjust the tariff structure according to other sources of income, the circumstances of the user and other social objectives. Before determining the tariff/s, other revenue sources, besides the revenue from consumption must also be taken into account, for example, nationally-funded subsidies for infrastructure and ongoing services to poor households, revenue from water and sewage connections, water delivery by tankers, search fees, meter testing, etc. For the purposes of this study, such income will be referred to as other income (the focus of the research is on tariffs associated with consumption rather than once off revenue).

3.3.2 South African Treasury requirements

Steps one to five in the cost recovery tariff setting process are reflected in the South African Treasury requirements in tariff calculation (Hosking, 2010). South African municipalities consider set National Treasury parameters during the determination of the municipal budget strategy, which is duly proposed to Council for adoption. This strategy, in addition to the Treasury parameters, considers the cost drivers within a budget, and any unique circumstances over the medium term and economic and other growth factors, for instance, service expansion programmes.

During the determination of the costs of providing a service, a municipality is required to take into consideration (DWAF, 2002):

- The cost of bulk purchases of water from DWA, when the municipality does not have its own water resource, or augments its own water resource with a bulk purchase from a DWA owned resource;
- Raw water extraction costs from own source;
- Distribution costs to the consumer,
- Distribution losses;
- Maintenance of infrastructure (pump stations, pipelines, reservoirs) and other fixed assets (vehicles, plant and equipment);
- Administrative and service costs, including but not limited to:
    - Interdepartmental costs (Budget and Treasury, Corporate Service, legal costs, etc.);
    - Provision for non-payment of services by consumers (provision for bad debts);
    - All other ordinary overhead costs such as electricity, stationery, insurance, licensing of vehicles, purchase of chemicals, etc.
- The intended surplus or loss to be reflected as an operating result for the period under consideration, depending on whether the service is managed as a trading, economic or subsidised service;

- Contribution to the Asset Financing Fund (AFF), which is used as a reserve to provide for the replacement, refurbishment and extension of water services (infrastructure and other fixed assets);
- The costs of approved indigency relief measures when assisting the poor;
- Finance charge costs associated with the repayment of any external loan funding or other instrument used to fund capital expenditure;
- Depreciation costs;
- Cross-subsidisation to other services, for example, the Rate and General account.

The service costs of the municipality are typically estimated with reference to the level and growth trends, previous year's consumption trends. (Figure 3.1), as well as climatic and storage circumstances (droughts and dam levels). The result of this evaluation is used as a base for tariff application in order to recover the costs of providing the service.

3.4 OPTIONS FOR ADJUSTING COST RECOVERING TARIFF STRUCTURES TO ADDRESS SOCIAL OBJECTIVES (STEP 5)

3.4.1 Four tariff schedule options

Retail water service tariff structures are made up of combinations of one or more of the following four kinds of schedules:

- Fixed Tariff (FT): setting a fixed payment for the water service that does not vary with the amount of service received (typically for access and availability);
- Linear (or flat) per unit Tariff (LT): charging a constant per unit tariff that does not change with the number of units purchased;
- Increasing Block per unit Tariff (IBT): charging successively higher tariffs for additional units of water purchased;
- Decreasing Block per unit Tariff (DBT): charging successively lower tariffs for additional units of water delivered.

The tariff structures described above relate to both the potable water supply service and the managing and treating outflow (sewerage) water services.

The FT requires no metering to implement, but the latter three tariff structures do, because they are volumetric based, that is, are determined with reference to the volume of water received (therefore requiring this volume to be measured). The extent of metering of potable water services is extensive in Africa and South Africa specifically (Banerjee et al, 2010). In the majority of African countries on-site sanitation is used because sewerage infrastructure is unavailable, however in South Africa on-site sanitation is extensively available in most urban areas. As it is much easier to measure the potable water service provided than it is to measure the waste water service provided, the latter volume is typically estimated as a fixed proportion of the former. In a sample of 27 African utility companies, Banerjee et al (2010) found the sanitation charge ranged from 30 to 85% of the potable water charge, with an average of 53%.

When a cost recovery (from revenue collected) requirement is imposed as a constraint of the tariff structure, the average cost of all water service supplied, or tariff level, becomes a useful benchmark. Under the full financial cost requirement, a flat per unit tariff structure would relate to the tariff level in the following way:

$$T = TC/Q_R = LT \quad (3.4)$$

where,
T is the tariff level, TC is the total financial cost, Q_R is the revenue water, $Q_R < Q$, the total volume of water service supplied, and LT is the Linear Tariff. A combination of a FT and a volumetric tariff is very common among South African municipalities. Under such an arrangement the fixed charge, often called availability charge, is for the fixed part of operation, maintenance costs plus (possibly) some capital costs. The separate charging for this part of costs serves the efficiency purpose of reducing the difference (distortion) between the short-run marginal cost and the volumetric charge. The volumetric charge is to cover the variable operation and maintenance costs.

In order to implement this dual tariff system, the fixed cost (FC) component must be distinguished from the variable cost (VC) in the total financial cost (TC):

$$TC = FC + VC \quad (3.5)$$

The dual tariff structure is formulated as follows:

Fixed charge (or minimum consumption charge) for consumer i, is a_iFC

and

Variable charge (or extra above minimum consumption charge) for consumer i is T_iQ_{Ri}

where,
a_i is the share of the total infrastructure access provided to consumer i and T_i is the tariff rate charged for revenue water category Q_{Ri}.

The accounting method used to estimate the depreciation (capital consumption) cost is frequently based on historical investment cost, even though the more appropriate method to base it on is replacement cost plus the maintenance and rehabilitation cost (Boshoff, 2009b).

Whether volumetric or flat, all cost-recovery models depend on ring-fencing for their calculation, i.e. the isolation of costs and revenue associated with a given service and the removal of subsidies in or out of that sector. Ring-fencing means that resources, be they human or capital, cannot be shared between different service sectors unless they are paid for on a cost-recovery basis to the unit that provided them. The intention of ring-fencing is to ensure that a service provider knows all its fixed and variable costs and is therefore able to apply the preferred cost-recovery structure pricing to its consumers (Pape and McDonald, 2002:18).

3.4.2 The efficiency and welfare merit of the four tariff options

All of the described water service tariff structures have merit within specific contexts, but not in a general context. The FT is the cheapest to administer because it does not require the cost of metering to be incurred, but is also the least efficient because the users are encouraged to consume the service until they enjoy zero marginal benefit, no matter how high the marginal cost of production. The LT maximises consumer surplus, but is inefficient. Efficiency is only achieved when the marginal social benefit of additional service enjoyed is brought into equivalence with the marginal social cost of providing that service. In order to achieve this, the tariff would have to set equal to the marginal social cost. The market process would not permit this result under a cost covering LT and where short-run marginal costs of provision decline (as would be expected), because the marginal cost price would be reduced to below the LT at the market equilibrium. Two further efficiency complications are tax wedges and externalities. If a tax wedge was imposed between the producer and the purchaser, such as Value Added Tax (VAT)[2], the two marginal values could not be brought into equivalence. If there is a positive externality of providing a basic (minimum) level of this service to all, private willingness to pay will be less than the marginal social benefit, and the market would equate willingness to pay with the LT and not the marginal social benefit.

To the extent that the marginal benefit of water service is a declining function in quantity consumed and the marginal cost of production is also a declining function in water supplied to a specific consumer, the DBT structure is the most efficient because it best aligns the tariff paid with the declining marginal benefit and marginal cost of production (functions). However, it is also potentially the most regressive with respect to the level of household income. To the extent that rich households purchase more water than poor households, the DBT structure decreases the average cost per unit of service to rich households relative to poor households. For this reason it has the least social 'equity' appeal (providing an equivalent minimum service for all).

The IBT maximises producer surplus and revenue collection, but most reduces consumer surplus. It is the least efficient in the sense that it maximises the difference between the marginal benefit and the actual marginal cost of production and is the most likely to induce potentially inefficient substitutions in water supply, such as drilling of personal boreholes, own rain water tank storage and pumping systems and vehicle transported river water. The IBT structure is potentially progressive with respect household income. To the extent that rich households purchase more water than poor households, the IBT structure increases the average cost per unit of service to rich households relative to poor households. If this extra income received from rich households, is used to subsidise poor households, the former are made worse off and the latter better off. This cannot be efficient because there are losers (rich households), but the resultant redistribution makes it the most appealing promoter of social 'equity'.

The welfare claim for price discrimination embodied in the IBT in water service provision is that there is no loss of surplus – consumer surplus is either appropriated as producer surplus or is

[2] The latter reduces the affordability of water services to purchasers but it does not add to revenues of the provider and so assist them to recover the costs water service provision.

redistributed between the water service receivers – with the higher service users in effect subsidising the lower service users. This is of course only true if there is no reduction in demand among consumers faced with the higher tariffs. If there is a cut back in demand, there must be a deadweight loss, because consumer surplus is lost in such a way that it is not possible for any surplus to be gained. The consumer surplus component of any discouraged demand is clearly a cost of the IBT.

For this reason there is an important empirical element to the debate about the net welfare consequences of an IBT – whether it reduces the quantity demanded or not. This requirement is a problematic aspect of the welfare case for the IBT, because one of primary (other) virtues claimed for it is that it effects just that – a reduction in demand (a tool of demand management).

The welfare cost of the single product type water service with full financial cost recovery and a redistributive tariff structure is demonstrated below in Figure 3.3 (cross-hashed area).

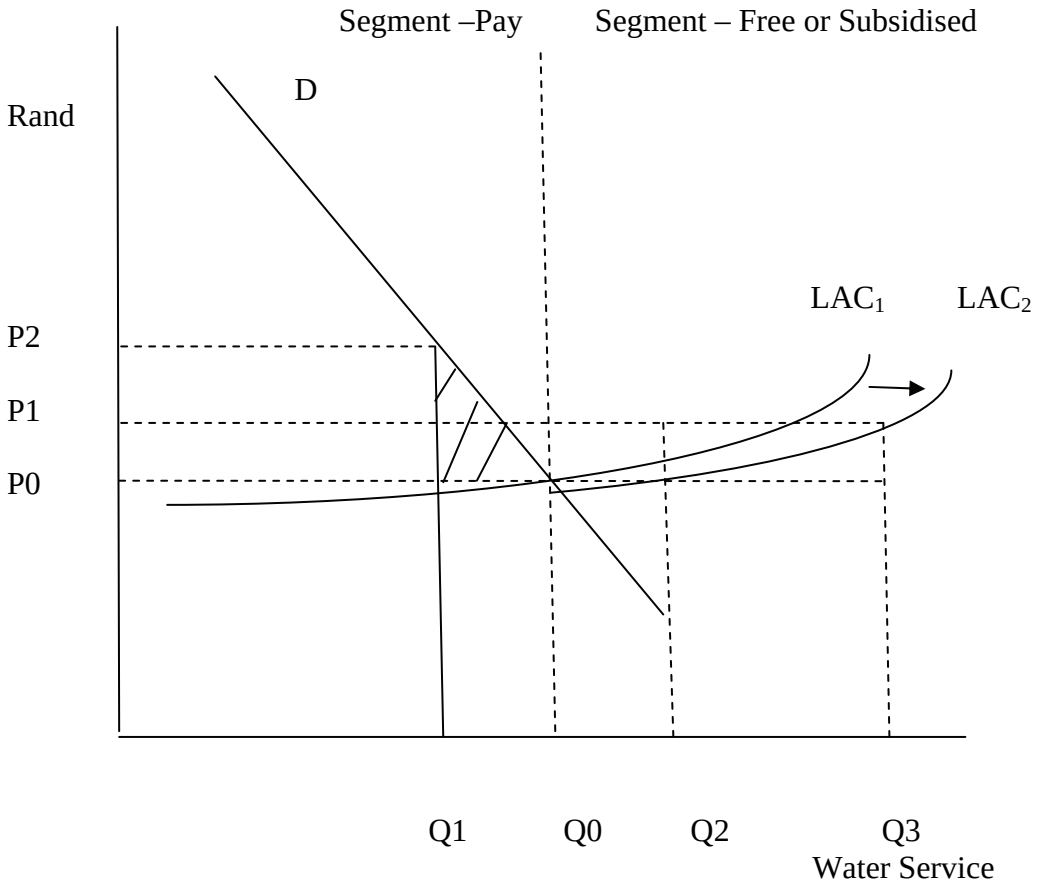


Figure 3.3: The welfare costs of under supply due to diversion of resources and increased supply of free water

In this model demand is shown by the D curve and the long run average cost by LAC_1. At a tariff of P0 there would be Q0 supplied and cost recovery would be achieved. Those who would not pay P0 would not receive it, i.e. supply above Q0. In a simple 2-sector model comprised of two consumer groups, those required to pay (up to Q0) and those not (above Q0 who qualify for free

service), cost recovery can only be achieved by charging the paying sector some price above P0, e.g., P2. If a price of P2 was set, a per unit revenue surplus of P0P2 could be made on the Q1 service that would be demanded at this price. The price increase above P0P2 would cause a Q1Q0 reduction in service demanded (and possible use made of alternative sources of water). The extra revenue thereby earned can be re-allocated to consumers in the 'new' free supply sector Q0Q2. The long run average cost relating to the free service sector (after taking into account the lost demand of Q1Q0 within the pay sector) is LAC_2.

Under a cost recovery constraint, the quantity of service that could be provided to the free segment would be limited to the revenue surplus made on the Q1 water service sold to the pay segment consumers.

Three important lessons about the tariff setting problem may be learned from this model:

- if the level of service provision allocated to the free segment exceeds Q0Q2 (which equals Q1Q0) long-run average costs increase. For instance, if Q0Q3 is supplied to the free segment the average costs increase from P0 to P1, making it necessary to raise even greater surpluses in the pay segment.
- the welfare gains of consumers in the free sector are at the expense of greater welfare losses of consumers in the pay sector (by, at least, the cross-hashed area), and there exists the potential for each of these welfare impacts to be associated with distorting consumer behaviour. Two types of distortion behaviour are: the adoption of relatively expensive water service substitute purchases by consumers in the pay segment and wasteful use by consumers in the free segment.
- raising the tariff charged for the water service will reduce demand in the long run, but increases in revenue from water sold will be achieved so long as the price elasticity of demand is inelastic. However, why would a government want to exploit inelasticity of demand? As one moves up a demand curve, water is likely to become more and more a necessity. The welfare case for increasing the tariffs and taxes varies inversely with elasticity – an insight known as the Ramsey Rule (see below) (Ramsey, 1927).

For most normal goods, uniform commodity taxation (flat rates) is advocated in South Africa. The previous Goods and Services Tax (GST), and currently applied VAT type commodity taxation schemes, apply uniform rates (currently a flat rate of 14%). Support for this uniform principle comes in the form of a massive volume of microeconomic literature arguing that the lowest efficiency cost (excess burden) is achieved with fewest distortions to relative prices (tax neutrality) and minimisation of the administration costs of taxation schemes (Salim, 2006).

However, Ramsey (1927) argued that losses in the utility of the consumer induced by the government raising a given level of revenue were minimized by setting different tax rates for 'different' goods, rather than by setting a uniform rate. The principle he mooted has become known as the Ramsey Rule, and has been advanced by the South African National Treasury as a welfare justification for the high tax rates levied on commodities such as cigarettes and alcoholic beverages. More recently it has been mooted as a justification for applying the IBT to local government supplied water services (Donaldson, 2010).

The rule may be derived from the first order conditions for minimising the loss in consumer welfare subject to the raising of a given level of revenue (R_1). In a model of two goods, X and Y, with losses experienced due to per unit commodity taxes on them of t_X and t_Y measured by compensation variations CV_X and CV_Y, and assuming that demand for each of the taxed goods is independent of the prices of other taxed goods, the minimisation problem may be expressed by the following Lagrangian:

$$L(t_X, t_Y, \lambda) = CV_X + CV_Y - \lambda(t_X X + t_Y Y - R1) \quad (3.6)$$

where

$$CV_X = \int_{PX}^{PX+tX} X(P_X)dP_X \quad (3.7)$$

and

$$CV_Y = X(P_Y)dP_Y. \quad (3.8)$$

given the fundamental theorem of calculus that the derivative of an integral of a function is the function itself, that

$$\frac{\partial CVX}{\partial tX} = X(P_X + t_X) \quad (3.9)$$

and

$$\frac{\partial CVY}{\partial tY} = Y(P_Y + t_Y) \quad (3.10)$$

On the other hand, the first order conditions for optimal tax rates are:

$$\frac{\partial CVX}{\partial tX} = \lambda(X + t_X \frac{\partial X}{\partial tX}) \quad (3.11)$$

and

$$\frac{\partial CVY}{\partial tY} = \lambda(Y + t_Y \frac{\partial Y}{\partial tY}) \quad (3.12)$$

Equating equations (3.9) and (3.11) and (3.10) and (3.12):

$$(\lambda - 1)X = -\lambda t_X \frac{\partial X}{\partial tX}) \quad (3.13)$$

and

$$(\lambda - 1)Y = -\lambda t_Y \frac{\partial Y}{\partial tY}) \quad (3.14)$$

or in elasticity form

$$-(\lambda - 1) = \lambda \frac{tX}{PX} \left(\frac{\partial X}{\partial PX} \frac{PX}{X}\right) \quad (3.15)$$

where the change in P_X is the same as the change in t_X, i.e. $\partial P_X = \partial t_X$

and

$$-(\lambda - 1) = \lambda \frac{tY}{PY} \left(\frac{\partial Y}{\partial PY} \frac{PY}{Y}\right) \quad (3.16)$$

where the change in P_Y is the same as the change in t_Y, i.e. $\partial P_Y = \partial t_Y$.

Rearranging the terms and substituting $\eta_X = \frac{\partial X}{\partial PX} \frac{PX}{X}$ and $\eta_Y = \frac{\partial Y}{\partial PY} \frac{PY}{Y}$ for the respective elasticities:

$$t_X/P_X = -(\lambda - 1)/ (\lambda \eta_X) \quad (3.17)$$

and

$$t_Y/P_Y = -(\lambda - 1)/ (\lambda \eta_Y) \quad (3.18)$$

which implies that the proportions that tax rates to prices of commodities X and Y should vary inversely with their respective price elasticities of demand, so that:

if $\eta_X > \eta_Y$ it follows that $t_X/P_X < t_Y/P_Y$. (3.19)

Ramsey (1927) argued that the optimal tax rate policy was one that was inversely related to demand elasticity. It prescribes setting tax rates (prices) in an inverse relation to the elasticity of demand of the goods. (A more generalised derivation can be found in Coady and Dreze, 2002).

The ethical appeal of applying of the Ramsey Rule (Inequality 3.19) to the cases of cigarettes and alcoholic beverages is that one can infringe minimally on the consumer enjoyment of smokers and drinkers while raising a target level of revenue, however what is entirely unclear is how this rule can serve to add to the ethical appeal of the IBT for water services. Notwithstanding the strong arguments for <u>not distorting prices</u> (as outlined earlier), the rule may be applicable to water services, to the extent that this service can be separated into 'different goods' with different elasticities. Under such circumstances, the rule would prescribe that the service with the more highly elastic demand should be taxed at a lower rate than that with the less inelastic demand.

What does this imply? *A priori*, the first units of water received are more necessary than subsequent units, and so would have a lower price elasticity. Letting water-the-necessity be good X and water-the-luxury be good Y, it follows that one would expect:

$\eta_X < \eta_Y$ it to follow that $t_X/P_X > t_Y/P_Y$,

so that a decreasing block tariff should be applied to tax water services.

3.4.3 Toward a new tariff policy setting framework

As an alternative to making cost recovery a *constraint* and seeming towards undefined social welfare, cost recovery can be pursued as an *objective*, by adopting the objective of minimising the shortfall in cost recovery subject to attaining some given social welfare targets. Under this model, the IBT structure has much greater appeal. Where the cost of the service supplied exceeds the willingness to pay, the IBT is the most feasible tariff structure for minimising the inevitable revenue shortfall. If the maximum tariff is not set higher than the average financial cost of water service sold, the IBT maximum is no less efficient than the LT structure and may recover more of the cost of the service than the LT, after taking into account bad debt and collection costs (Olivier, 2006).

Within this revised (preferred) policy model, three key features of the IBT can be identified: the volumetric size and tariff associated with the first block, the number of blocks and the threshold volume (point) and tariff associated with the last block. The size of the first block and scale of tariff under-recovery identifies the degree of under-cost recovery that has been adopted as a social objective (the subsidisation of basic water services). The number of blocks signal the degree of heterogeneity among the consumer population with respect to willingness to pay for water services. The threshold volume of the last block identifies the users at which cost recovery is estimated to be most feasible and the tariff associated with this block identifies the tariff level (average cost). The aim of such a system over time would be to reduce the differences between the block tariffs and thereby minimise the shortfall in cost recovery.

3.4.4 The equity merit of alternative tariff schedules

Equity in the provision of water services may be interpreted in different ways. For instance, equity may be thought of:

- as equivalent minimum level of water service provided to all people
  or
- as receiving of water service commensurate with what is paid for it (also known as the equivalence principle of public finance). This principle requires that there be an equivalence maintained between the tariff charged for a service and the service provided.

3.4.4.1 Equivalent basic level of service provision for all

The guarantee of provision of an equal basic level of water service can be considered as fair and therefore socially equitable, but given the (constraint of the) equivalence principle (see next sub-section), such a guarantee is unaffordable in many (African) economic environments (Banerjee, et al, 2010).

South African Law and government policy favours the equivalent basic level version of equity. It bestows on people (as members of household clusters) rights to receive specified water services and imposes reciprocal obligations on others to provide, viz. municipalities and tax payers. Under this

dispensation, the two most popular municipal mechanisms by which to implement cost recovery to meet this equity obligation are:

- a revenue collection arrangement that identifies those who cannot afford to pay and uses tax revenue to cover their cost
- a structure of tariffs that charges consumers who have lower incomes less for their water service than consumers with higher incomes.

The IBT structure fits in with this equity interpretation. The key criteria by which one may judge compliance with this model of equity are:

- the waiving of the fixed charge because it can be regressive and exclude consumers (Banerjee, et al, 2010),
- setting the first block size and tariff rate so that they do not exclude consumers who are too poor to pay, with a minimum (basic) level of service required to ensure healthy human survival,
- setting the subsequent block sizes and tariffs so that consumers with higher incomes pay more for their water service, under the assumption that consumers with higher incomes consume more water. If one pays progressively higher marginal rates for one's water service, one's average tariff rate is increased.

3.4.4.2 Receiving water service commensurate with what one pays (customer satisfaction)

Ratepayer and consumer associations interpret equity in terms of the level of customer satisfaction with the service provided to them. Proponents of this form of equity hold as their reference the alternative service they could receive if increased competition were permitted in the supply of water services, or what is provided by other water service entities elsewhere, especially by private utility companies. If operating and maintenance costs are not recovered, there will be a reduction in finances available for the development of basic services. It is inequitable for any community not to pay for the recurring cost of its services (Pape and McDonald, 2002: 23).

3.4.4.3 Providing a guarantee of basic service provision and the problem of bad debts

The problem of providing a guarantee of basic service (as the equity objective) is that it invites in (if not made inevitable) social 'failure' and bad debt. The argument below will demonstrate how it causes these negative consequences.

Assuming that a basic minimum level of potable water and waste management service can be agreed upon (there may be debate about this), the provision of a guarantee that this minimum be provided, requires the funding to be found to cover the costs of this guarantee, and more specifically, to cover the costs of those who do not contribute to cost recovery. There are two types of non-contributors:

- those unable to pay the full cost of service provided because they are too poor (involuntary), but willing to pay a portion of it, and

- those who choose not to pay (voluntary), but have the means. In the strict economic sense they are free-riders, but this group may also include many elements that face similar conditions and hardships to the group unable to pay the full cost.

These similarities is a situation between those receiving free service and those paying, giving rise to the complicating problem of perceived 'closeness' in meriting equity- linked reduced payment advantages. Under an equity rationale for providing service to the poor, those falling within this group, who consider themselves as 'close enough' in the condition or circumstance of the poor, will feel that they merit equivalent advantageous treatment to the poor. This complication highlights that it is technically easy to draw up precise rules (for instance, based upon asserted total income earned) for dividing up society into those who qualify for favoured treatment and those who do not, however in practice these divisions will inevitably be adjudged to be arbitrary by many of its elements, due to perceived socio-economic circumstances differing only minimally. Under such circumstances, many of those near-but-not-qualifying, may deem dispensations motivated by equity to be, in fact, inequitable.

This problem may be reduced, but not eliminated, by introducing sliding scales of favoured treatment with small differences in favoured treatment differentiating the various groups. In support of such a sliding scale, it must be remembered that almost all of the poor are willing to pay something towards the cost of their service, just not the full average or marginal cost of service.

If the redistributions are to be incorporated into the social contract, the people from whom the transfers are to be made would need to agree upon:

- the scale of the guaranteed minimum basic level of service (what would be 'reasonable'), and
- the shortfall in ability or willingness to contribute to cost of basic level of service.

One departs from the equity rationale if nothing is collected from the poor or the group unhappy to pay because of 'closeness-to-the-equity' benefactors (presumably most of the bad debt portion). Moreover, the total subsidy (transfer) requirement will escalate sharply under these circumstances – perhaps more than double the subsidy that could legitimately expected under an equity rationale (see figure 3.3). Of this greater (than equity based) sum, only a portion could be considered a voluntary redistribution. The remainder would be a political 'taking' (Mueller, 2006:103). It follows that, under an equity rationale, the casual drawing up of rules for qualifying for transfer benefits, can very easily lead to the potential abuse of the people from whom the transfers are targeted, and to a sharp increase in the proportion of the total cost for which cross-subsidisation must be found.

3.4.5 Select findings for Africa and South Africa

3.4.5.1 Elasticity of demand for water

Empirical evidence on the price elasticities of potable water estimated for different groups in South Africa show them to differ minimally, with price elasticity of demand slightly lower for the lower income group, as would be expected, *a priori* (Veck and Bill, 2000). Veck and Bill (2000) applied the contingent valuation approach to estimate the short term residential price elasticity of demand

for water in well-off areas (Alberton) and poor areas (Thokoza). They found the average demand for water to be inelastic (-.17), with a slightly higher absolute figure for the upper income group (-0.19) than for the lower income group (-0.14). They also found long run demand to be inelastic but less inelastic than the short run, -0.73 for Alberton, similar to Dockel's (1973) estimate for Gauteng (-0.69).

Under the Ramsey Rule, the implication of their findings was that (a) the necessity (poor) consumers should be charged more than the luxury (rich) ones but (b) that the difference should (in any case) be very small.

3.4.5.2 Equity based tariff block setting in Africa and South Africa

The variable tariff rate (T_i) adopted in Africa typically varies in blocks, rather than by a formula, and most often the IBT is adopted (Banerjee, et al, 2010). In a sample of 36 African utilities in Africa, Banerjee et al (2010) found the average size for the first block of IBT structures to be about 9.3m^3 and the average number of blocks to be about 3, increasing to 4.4 for middle income level countries. The starting size for the last block in a sample of 40 African utilities was found to vary considerably, from as little as 5 m^3 in some cases, to a 1000 m^3 in others, with an average of 106 m^3.

In the case of South Africa, the most common size selected for the first block was found to be 6m^3 and there was found to be assistance provided to those who cannot pay, or no tariff is levied for this level of water service provision (Banerjee, et al, 2010). The cost of connecting to the water service infrastructure can be a very substantial portion of income in poor areas, making this a barrier to use of this service. On average the connection charge is 28% of gross national income per capita in Africa (Banerjee, et al, 2010). Within South Africa this proportion is typically less than 10%, but is higher in the poorer rural areas.

There are substantial differences between South Africa's different municipalities in the threshold volume at which the water tariff level is applied. Common features are the size of the first tariff block and the associated tariff and the use of many tariff blocks (indicating heterogeneity in population). The initial block is frequently between 6 and 8 m^3 per household per month and free for poor households. A municipality, such as Drakenstein, has as many as seven tariff blocks, however six blocks is more common, e.g., for Johannesburg and Tygerberg. This number is well above the average of just above three in Africa as a whole (Banerjee, et al, 2010). The threshold volume, at which the tariff level is applied, varies from 1000 m^3 in the case of Drakenstein to 30 m^3 in the case of eThekwini (Banerjee, et al, 2010). There is a similar extensive variation in maximum tariffs associated with these threshold volumes.

3.4.5.3 Realising cost recovery

Th**e**re are two types of problem in realising full financial cost recovery in African countries:

- inaccurate financial cost calculation, and

- provision of a level of service that exceeds what many (sometimes most) of the consumers are willing to pay (Banerjee, et al, 2010).

3.4.5.4 DWA tariff setting policy

South Africa's Department of Water Affairs recommended guidelines for the setting of the water tariff level are not based upon the objective (model) of minimising the cost recovery shortfall, but the objectives of promoting social welfare objectives and conservation of water resources within the constraint of cost recovery. They recommend discriminatory pricing in the form of an increasing block tariff structure (DWAF, 2002; DWA, 2010). Initially their blocks were identified as follows – one for free basic water, one the 'normal' consumption use of water, and another for 'luxury consumption' of water. The latter two were distinguished by volume – with consumption above some arbitrary volume being defined as luxury. No guidance was provided as to what this volume was or why it could be defined as luxury demand. In this weakly motivated policy schedule, so-called normal consumption should be charged at the actual or average cost of water (DWAF, 2002). A premium was recommended to be charged for the luxury consumption, above average cost, to allow for the cross subsidization of other consumption and to promote conservation (DWAF, 2002). Later, on further reflection, they realised that Water Service Providers could extract even more revenue by having more blocks. The result was they abandoned the 'luxury' consumption recommendation in favour of (what was presumably closer to their intention all along all along) a scheme to maximise revenue appropriation (DWA, 2010).

As could be expected, it is not a policy model that is as ethically appealing and coherent as one based on minimising the cost recovery shortfall. The claim that the increasing block tariff structure promotes conservation is based on the hypothesis that it reduces demand, thereby enabling the government agency providing the water service to delay the implementation of new supplementary water service supply schemes. This advantage is not to be confused with the signaling of scarcity. The latter requires that the real full cost of water be reflected in the tariff charged. The purpose of increasing the water tariff to reduce demand is not aimed at reflecting real full cost, but rather to postpone capital cost. However, unless this higher tariff price does actually reflect the marginal cost of the water service, this practice, has a cost. It reduces social welfare and is therefore, a type of government failure (Hosking, 2011a).

3.5 THE PROBLEM OF OMITTING EXTERNAL COSTS IN TARIFF SETTING

Being a financial rather than economic calculation, the Formula 3.3 (AC = T) makes no provision for the inclusion of external costs. It is not permissible to draw efficiency conclusions on the basis of financial costs and revenues (Whittington, Boland and Foster, 2002). The external costs and benefits as a result of the service have to be incorporated into the tariffs before such conclusions can be drawn.

The main negative consequence of this omission is that it this creates the scope for cost shifting. For instance, by under-providing waste water management services, the financial cost recovery wastewater management tariff may be reduced to water service users, but at the cost to others, e.g.,

those using river systems for recreation. The problem with the omission of external costs in the calculations is that it artificially reduces the water service charge, by transforming waste water management costs into external cost impositions onto recreational users and others.

3.6 CONCLUSION

South African municipalities follow various steps in determining costs and setting tariff structures to recover costs of which the IBT structure is favoured. However, under a cost recovery constraint the case for IBTs is weak. It is inefficient and only equitable from a narrow perspective. The strongest case for the IBT is to be built when the cost recovery is abandoned as a constraint and instead adopted as an objective, for example, in the form of minimising the shortfall in cost recovery, subject to the tariff structure not distorting price signals (at least not any more than linear tariffs would). In terms of this objective, the IBT structure for setting potable water and waste water tariffs has considerable merit. The reason why it has considerable merit is that, in many instances, the national government has inadvertently (politically) set up a mismatch between service supplied and willingness to pay, making it unlikely that cost recovery can be realised, other than through distorting production and consumption in the economy. The IBT is the most feasible tariff structure for minimising the inevitable revenue shortfall.

The IBT cost recovery "objective" model is not the one currently favoured by South Africa's Department of Water Affairs. They favour a model of promoting social welfare and equity within constraints. Their model has as its objective maximising the number of consumers included in the service and is subject to the triple constraints of: meeting defined quality standards for all aspects of the service, full cost recovery and satisfaction of politically driven aspirations for service. It is a model that inevitably leads to a mismatch problem, to political demand for subsidies and to failures (compromises) in satisfying the constraints.

An important, but neglected (in Africa), type of efficiency/equity analysis of water service provision in South Africa is that of the efficiency in mix of water service output. It has the aim of getting the right product mix. An analysis of efficiency in the mix of water service output is one that aims to match demand to the service produced. It is inefficient to produce a mix of outputs that the recipients cannot afford. A possible way forward to address water tariff efficiency/equity challenges may yet be found through giving this mix more attention in future.

CHAPTER 4

THE COMPONENTS OF THE SURVEY OF SELECTED SOUTH AFRICAN MUNICIPALITIES ON SUSTAINABLE PROVISION OF WATER SERVICES

4.1 INTRODUCTION

Chapter one argues that South Africa faces a sustainability challenge in the provision of water services. How is such a hypothesis to be tested? Chapter Four describes the design of a survey to test this hypothesis. The survey was designed to address the following questions:

- Is there a backlog in the service coverage and infrastructure rehabilitation and maintenance? What is the extent?
- Is the water service a sub-standard service? If so, what are the indicators?
- Is the provision of water services prioritised by water service authorities?
- Is there a monitoring effort by the water service authorities?
- Are there adequate skills to provide a sustainable water service?
- Do water service authorities adequately plan for the sustainability of the service?
- What proportion of the total municipal capital budget is allocated to the sustainability of the water service? What is the funding mix for the capital budget?
- Are water service costs correctly classified to allow for the determination of cost recovery tariffs?
- Are water service budgets compiled using renowned budget forecasting methodologies and accurate trends in water consumption?
- Is the water service ring-fenced and are proven costing methodologies used?
- What asset valuation methods are used to determine asset replacement costs and depreciation?
- Is there under recovery of financial costs because of inadequate provisions for depreciation and maintenance of infrastructure (Boshoff, 2009a; 2009b)?
- Does existing pricing policy incorporate the full financial costs of managing water?
- Are economic costs taken into account in the pricing of water services?

4.2 ANALYSIS OF COSTS

The financial classification of operating variable and fixed costs, as well as the identification of the transfer (redistribution) cost, applied in the survey is outlined in Table 4.1.

Table 4.1: Analysis of the variable and fixed costs and cost transfers

COST DESCRIPTION	VAR COST	FIX COSTS	TRANS-FERS	COMMENTS
Bulk water costs		X		Cost of the purchase of water either purified or raw from various sources – dams, canals, pipes
ATTP cost of relief			X	Cost varies with consumption. The cost is offset against the government grant which is recorded as an income
Contribution to the capital replacement reserve		X		The annual contribution to the capital replacement reserve is used as a source finance to either rehabilitate or acquire new assets. The cost does not vary directly with service consumption
Repairs and maintenance of infrastructure and other fixed assets	X			Does vary with service consumption
Assets as a result of public contributions and donations			X	Assets associated with new developments including infrastructure extension to cater for development. The cost does not vary directly with service consumption – from non-tariff sources
Administrative and service costs, incl. interdepartmental costs (Budget and Treasury, Corporate Services, Legal, etc.)	X			Can be expected to vary directly with service consumption. Costs are allocated to ensure "ring-fencing" of services
Provision for bad debts			X	Costs amount to transfers from those who do pay
Administrative overheads		X		A cost not dependent on consumption of services – Salaries, insurance, etc.
Finance charge costs		X		Loan charges, not linked at all to service consumption
Depreciation		X		Not directly linked to service consumption
Cross-subsidisation			X	Pre-determined cross allocations before determining consumptive income.
Planned result			X	Pre-determined cross allocations before determining consumptive income.

4.3 SURVEY DESIGN AND QUESTIONNAIRE

The survey design consisted of three sections. The first two sections consisted of questions requiring responses and the third consisted of a financial template that had to be completed. All financial and other data was extracted for the 2009/10 financial year and in some instances for a three year period (2007/8 to 2009/2010). The first section questions were about the standard of water service provision and the second section questions were about financial cost estimation processes. The financial template section was a summary analysis of the municipalities costs incurred and income derived from the water service.

4.3.1 Section one of the survey

An indication of the standard of water service provision was elicited from the municipalities, viz.:

- The value of the backlogs in water service maintenance/rehabilitation and service/coverage for three financial years (2007/08, 2008/09 and 2009/10);
- The number of potable water service interruptions recorded/experienced in 2009/10 (number of households without water for longer than a day);
- The number of days household sanitation services failed in 2009/10; and
- Whether the water authority achieved the DWA blue drop quality certification for water and a DWA green drop quality certification for sanitation services.

The potential consequence of sub-standard water service provision is the impact it has on economic development. A proxy for economic development is the value of building plans approved by a municipality compared to the total municipal capital budget. The value of building plans approved by the municipality was collected for three financial years (2007/08, 2008/09 and 2009/10).

Reasons for sub-standard water service provision were collected from the sample group by eliciting information on the prioritisation of the water service by the municipality in the planning for

operational readiness, whether there was a monitoring effort and water meter audits being conducted, skills adequacy and planning effort, and whether the water service authority had a formalised WSDP and master plan for water and sanitation services.

The first section of the survey also elicited information with the intention of shedding light on potential excess burden of cost recovery. If revenue is collected from too limited a base, it imposes an unsustainable burden on those levied. Data elicited included:

- Type of water service provided (free and revenue water provided make up the total water served, measured in cubic metres);
- Total property tax raised;
- A breakdown within the municipality of transfer payments for water services;
- The percentage of all money owed for all services collected by the municipality for the years 2007/08, 2008/09 and 2009/10;
- The actual value of outstanding debt for water services in years 2007/08, 2008/09 and 2009/10.

An assessment of the management of water service capital budget required that information be collected on the sources of capital funding and the proportion of each funding source of the total capital budget, the total capital budget, the total water services capital budget and the percentage of the total water services budget spent. The total water services capital budget was split between external grant funding and other sources. The latter was apportioned to:

- Rehabilitation of water service infrastructure;
- New capital: networks;
- New capital: sanitation facilities;
- New capital: bulk water supply and bulk sewage.

Information regarding water service support options was also collected.

4.3.2 Section two of the survey

The second section of the survey comprised of questions aimed at assessing the accuracy of financial cost estimation and therefore the scope to determine the correct cost recovery target.

The accounting integrity of the water service was tested by gathering information on:

- The ring-fencing of the water service;
- If not ring-fenced, whether the cost of the service would easily be determined;
- The internal costing methodology used;
- The percentage of raw water supplied by various institutions, the cost per cubic meter and how the price per cubic meter was determined;
- The estimate of the percentage breakdown of costs of water services provision into fixed and variable costs; and
- The estimate of the percentage breakdown of costs between the various types of water service provided.

Information on the adequacy of depreciation was also elicited by establishing asset valuation methods used (replacement or historical values), the comprehensiveness of the municipal asset register (extent, age, value and state of municipal assets), the depreciation method applied (straight line, asset consumption or other), the value of accumulated depreciation of water service assets, the CRC of water service assets and the DRC of water service assets.

Information was also collected to determine whether sample municipalities were water scarcity and environmental cost conscious, including the estimated cost per cubic meter of water of the next major potable water supply scheme for the municipality and whether an estimation was made of the total environmental cost of failed waste water service provided.

4.3.3 Section three of the survey – Financial template

Each sample municipality also completed a financial template that apportioned operating costs to variable, fixed and operating costs and apportioned operating income to consumptive income, transfer receipts and other (as per Table 4.2). The operating costs and income were provided per water service (potable water service and sanitation). Budget and actual information at the end of the financial year was requested. The financial data collected allowed the researcher to determine variations between budget and actual outcomes, proportions and other important trends to determine the level of financial management taking place in the financial administration of water service. Accurate cost determination, consumption volumes and effluent released to the sanitation service influence the determination of cost recovery tariffs.

Table 4.2: Financial template

2009/10 FINANCIAL YEAR	TOTAL		TOTAL						TOTAL
	Water Actual	Sanitation Actual	Water - Original Budgeted	Sanitation- Original Budgeted	% Potable water budget spent	% Sanitation budget spent	Water Actual as % Exp/Inc of Total Exp/Inc	Sanitation Actual as % Exp/Inc of Total Exp/Inc	Water + Sanitation Actual as % Exp/Inc of Total Exp/Inc
Operating Costs									
Variable Costs									
Repairs and maintenance of infrastructure and other fixed assets									
Administrative and service costs									
Interdepartmental costs (Budget and Treasury, Corporate Service, legal costs, etc)									
Contribution to the self insurance fund									
Transfer to COID									
Fixed Costs									
Bulk Water costs									
Contribution to the capital replacement reserve									
Administrative overheads									
Finance charge costs									
Depreciation costs									
Cost of transfers									
ATTP cost of relief - varies according to consumption									
Assets as a result of public contributions and donations									
Contribution to GGR - Assets									
Provision for non-payment of services by consumers									
Cross-subsidisation (Rate and General or other service)									
Planned result (surplus/loss/break even)	-	-	-	-					
TOTAL OPERATING EXPENDITURE [A]	-	-	-	-					
Proportion of Total Service									
Operating Income									
Consumptive Income									
Availability Charges									
Kouga Municipality									
Metered when not categorised									
Metered Charges Within - Commercial									
Metered Charges Within - Industrial									
Metered Charges Within - Residential									
Metered Charges Outside Industry and Commerce									
Metered Charges Outside - Residential									
Other Consumers									
Reclaimed Water									
Interest Earned - Outstanding Debtors									
Government Grants and Subsidies National Government -E-share ATTP									
Government Grants and Subsidies National Government - GGR Revenue									
Government Grants and Subsidies National Government - DWAF									
Rental of facilities and equipment									
Other Income									
Sundry Income									
Public contribution & Donations Revenue									
Internal charges Distribution Statements									
Other Internal service Charges									
Future Depreciation -CR & DPC									
Contribution from the self insurance fund									
Transfer from COID									
GGR depreciation									
Pail Service									
Trade Effluent									
TOTAL OPERATING INCOME [B]									
Profit/ (Loss)									

4.4 CONCLUSION

Chapter one asserts that South African municipalities are facing a challenge of sustainability in the provision of water services. To test this assertion and related questions it is necessary to survey different municipalities with respect to this service. The type of survey required needs to focus attention on indicators of standard service and other potential failures. Chapter 4 shows the kind of survey content required, while Chapter 5 provides an analysis of the survey results.

CHAPTER 5

SURVEY RESULTS

5.1 INTRODUCTION

The survey was administered to selected municipalities that are water service authorities in South Africa. A covering letter (Annexure B) contextualising and outlining the study, including indicating the reasons for the data request and survey (Annexure C) were emailed to municipal staff members of 40 municipalities. The reason for approaching municipal staff directly was to encourage a quicker turnaround time of the data collection. The municipal staff obtained data required from financial statements, medium term revenue and expenditure frameworks (MTREF) and technical reports.

The covering letter included the contact details of the researcher and staff member at the Nelson Mandela Metropolitan Municipality who was available to assist with the completion of the survey.

A range of Category A, B and C municipalities are water service authorities. Category A municipalities are Metropolitan Municipalities, Category B municipalities are Local Municipalities and Category C municipalities are District Municipalities. These categories of municipalities are found in each of the provinces of South Africa. The sample of municipalities that was selected for the study is representative of the provinces of South Africa and also the various categories of municipalities that are water service authorities.

Of the 40 selected municipalities, a total of 15 municipalities fully completed the survey (see list in Table 5.1 below):

Table 5.1: List of municipalities that completed the survey

No.	Name of Municipality	Category	Province
1	Nelson Mandela Bay Metropolitan Municipality (NMBM)	A	Eastern Cape
2	Ekurhuleni Metropolitan Municipality	A	Gauteng
3	eThekwini Metropolitan Municipality	A	KwaZulu-Natal
4	Cape Town Metropolitan Municipality	A	Western Cape
5	Buffalo City Metropolitan Municipality	A	Eastern Cape
6	George Municipality	B	Western Cape
7	uMhlathuze (Richards Bay) Municipality	B	KwaZulu-Natal
8	Steve Tshwete (Middleburg) Municipality	B	Mpumalanga
9	Kouga Municipality	B	Eastern Cape
10	Sol Plaatjie (Kimberley) Municipality	B	Northern Cape

No.	Name of Municipality	Category	Province
11	Polokwane Municipality	B	Northern Cape
12	Stellenbosch Municipality	B	Western Cape
13	Overstrand Municipality	B	Western Cape
14	Midvaal Municipality	B	Gauteng
15	Amathole District Municipality	C	Eastern Cape

Chapter five reports responses to questions about the state of the water service the 15 municipalities provide, focusing particular attention on the presence of backlogs and adequacy of infrastructure and operational administration.

5.2 STANDARD OF WATER SERVICE PROVISION

Indicators of the standard water service delivery were: the backlog of water service infrastructure maintenance and rehabilitation and the capital cost of addressing the service coverage backlog for those households that do not benefit from the water service, the number of potable water service interruptions recorded or experienced, the number of days that household sanitation services failed and whether the water authority had achieved a DWA blue drop quality certification for water and a DWA green drop quality certification for sanitation services.

5.2.1 Backlog of water service infrastructure maintenance and rehabilitation

A failure to adequately maintain infrastructure assets can lead to service delivery disruptions and the need to replace assets before the end of their design lives (National Treasury, 2008:144). A backlog of water service infrastructure maintenance or infrastructure rehabilitation is the value of maintenance or rehabilitation that cannot be undertaken due to a lack of financial or other capacity constraints.

Backlog infrastructure maintenance and rehabilitation information were collected from 10 sample municipalities. This information is reflected in Table 5.2. The total backlog of the potable water infrastructure maintenance and rehabilitation for the 10 sample municipalities was R1 206 million, as at the 2007/08 financial year, and R1 163 million as at the 2009/10 financial year, a decrease of R43 million. The total backlog of the sanitation infrastructure maintenance and rehabilitation for the 10 sample municipalities was R4 841 million, as at the 2007/08 financial year, and R5 129 million as at the 2009/10 financial year, an increase of R288 million.

Table 5.2: Backlog of water service infrastructure maintenance and rehabilitation

DETAIL	NMBM	Ethekwini	Ekurhuleni	Midvaal	Sol Plaatjie	Amathole	Polokwane	Buffalo City	Kouga	Cape Town	TOTAL OVERALL	Incr/decr	TOTAL METROS	Incr/decr
	R '000	R '000	R '000	R '000	R '000	R '000	R '000	R '000	R '000	R '000	R '000	%	R '000	%
Water														
Year 07/08	302 889	165 100	392 000	400	8 000	150 000	92 000	69 771	7 500	18 511	1 206 170		948 270	
Year 08/09	274 107	187 100	392 000	450	11 000	150 000	96 600	66 248	8 100	67 803	1 253 408	4%	987 258	4%
Year 09/10	206 683	228 700	338 000	500	11 000	150 000	123 000	81 922	9 000	14 541	1 163 346	-7%	869 846	-12%
Sanitation/Sewerage														
Year 07/08	77 758	97 500	3 856 000	800	28 000	50 000	32 000	631 000	9 700	59 152	4 841 911		4 721 411	
Year 08/09	87 703	101 400	3 856 000	900	32 000	50 000	45 000	725 650	10 600	48 864	4 958 117	2%	4 819 617	2%
Year 09/10	66 481	123 400	3 833 000	1 000	34 000	50 000	47 000	841 754	12 000	120 619	5 129 253	3%	4 985 253	3%
Population (Statssa 2001)	1 100 000	3 090 117	2 480 282	64 642	201 462	1 664 482	508 271	724 300	80 500	2 893 251	12 807 307		10 287 950	
Backlog/capita														
	Rand/ capita	Rand/ capita	Rand/ capita	Rand/ capita	Rand/ capita	Rand/ capita	Rand/ capita	Rand/ capita	Rand/ capita	Rand/ capita	Rand/ capita	Incr/decr %	Rand/ capita	Incr/decr %
Water														
Year 07/08	275	53	158	6	40	90	181	96	93	6	1 000		590	
Year 08/09	249	61	158	7	55	90	190	91	101	23	1 025	3%	583	-1%
Year 09/10	188	74	136	8	55	90	242	113	112	5	1 023	0%	516	-11%
Sanitation/Sewerage														
Year 07/08	71	32	1 555	12	139	30	63	871	120	20	2 913		2 549	
Year 08/09	80	33	1 555	14	159	30	89	1 002	132	17	3 109	7%	2 686	5%
Year 09/10	60	40	1 545	15	169	30	92	1 162	149	42	3 305	6%	2 850	6%
Avg cost/per capita														
											Rand/ capita	Incr/decr %	Rand/ capita	Incr/decr %
Water											94		92	
Year 07/08											98	4%	96	4%
Year 08/09											91	-7%	85	-12%
Year 09/10														
Sanitation/Sewerage											378		459	
Year 07/08											387	2%	468	2%
Year 08/09											400	3%	485	3%
Year 09/10														

Note: Ekurhuleni was assumed to have the same level of backlog between 07/08 and 08/09 in order not to disrupt the trend analysis

The backlog information shown in Table 5.2 reflects that the backlog in maintenance and rehabilitation of the water service infrastructure increased for both the potable water infrastructure and sanitation infrastructure respectively, by 4% and 2%. The backlog in maintenance and rehabilitation of the sanitation infrastructure grew by 3% in the 2009/10 financial year, while the backlog in maintenance and rehabilitation of the potable water infrastructure decreased by 7% during the same period.

Sample municipalities with aggressive funding programmes to reduce the backlog in maintenance and rehabilitation of the water service infrastructure, were Nelson Mandela, Ekurhuleni and Cape Town Metropolitan Municipalities. These metropolitan municipalities were able to reduce the collective backlog for potable water service infrastructure maintenance and rehabilitation by 12% between the 2008/09 and 2009/10 financial years. There was however, an increase of 3% in the backlog for sanitation infrastructure, maintenance and rehabilitation.

If population statistics (Census 2001[3], Statistics South Africa) for the respective municipalities are used to determine a per capita cost of the backlog water service infrastructure maintenance and rehabilitation, the results differ slightly between the services and category of municipality.

The per capita cost of the backlog potable water infrastructure maintenance and rehabilitation decreases from R94 to R91 for the sample municipalities from the 2007/08 to the 2009/10 financial

[3] The Census 2001 data was the only official current national population statistics available at the time of the study (at the time, the next Census was planned for 2011).

year. The sample metropolitan municipalities had a slightly more aggressive maintenance programmes. The per capita cost decreases from R92 to R85 for the same period. The Cape Town Metropolitan Municipality backlog cost per person for potable water was (as low as) R5 as at 2009/10. The Polokwane Local Municipality had a backlog cost per person for potable water of R242 for the same period. The per capita cost of backlog potable water infrastructure maintenance and rehabilitation assessment reflects that only sample metropolitan municipalities were able to invest sufficient funds to address the increase in backlog cost. The Nelson Mandela Metropolitan Municipality was able to decrease this backlog per capita cost from R275 to R188 respectively, for the 2007/08 and 2009/10 financial years.

The per capita cost of the backlog sanitation sewerage infrastructure and rehabilitation increased from R378 to R400, for the sample municipalities between the 2007/08 and 2009/10 financial years. Within the sample metropolitan municipalities, this respective backlog increased from R459 to R485 for the same period. The Midvaal Local Municipality only required an investment of R15 per person to address the backlog in infrastructure maintenance and rehabilitation for the sanitation service in 2009/10. For the Ekurhuleni Metropolitan Municipality an investment of R1 545 per person was to address the backlog for the 2009/10 financial year. The Buffalo City Metropolitan Municipality had the second highest per capita cost required to eliminate the backlog for 2009/10, namely R1 162.

Assessing the backlogs of water service infrastructure maintenance and rehabilitation is reliant on asset management systems. In the absence of the required technology, the assessment of the backlog is expensive and labour intensive, requiring a specialist set of skills. For this reason backlog information is typically not updated annually by municipalities.

5.2.2 Capital cost of addressing the service coverage backlog

There is legislative and social pressure to increase the standard of services provided to the poor. One way to assess the cost of addressing backlogs in basic services is to estimate the number of poor households requiring services, the rate of household growth and the capital cost of addressing these backlogs (see Table 5.3). Of the 10 municipalities the Steve Tshwete and Midvaal municipalities provided data relating to the sanitation service and not the potable water services.

Table 5.3: Backlog of water service coverage

DETAIL	NMBM	Ethekwini	Ekurhuleni	Midvaal	Sol Plaatjie	Amathole	Polokwane	Steve Tshwete	Buffalo City	Kouga	TOTAL OVERALL	Incr/decr	TOTAL METROS	Incr/decr
	R '000	R '000	R '000	R '000	R '000	R '000	R '000	R '000	R '000	R '000	R '000	%	R '000	%
Water														
Year 07/08	1 089 131	130 500	1 001 000	0	12 000	1 000 000	1 403 000	0	350 920	70 000	5 056 550		2 290 631	
Year 08/09	1 076 998	111 600	1 001 000	0	9 500	1 000 000	1 473 000	0	293 684	73 000	5 038 782	0%	2 262 598	-1%
Year 09/10	1 042 152	156 000	954 000	0	9 800	1 000 000	1 546 000	0	272 147	80 000	5 060 098	0%	2 232 152	-1%
Sanitation/sewerage														
Year 07/08	1 089 131	803 000	2 067 000	1 300	42 000	1 000 000	344 000	6 000	110 000	175 000	5 637 431		4 134 131	
Year 08/09	1 076 998	686 600	2 067 000	1 500	56 000	1 000 000	660 000	6 600	133 000	180 000	5 867 698	4%	4 010 598	-3%
Year 09/10	1 042 152	959 800	2 026 000	2 000	64 000	1 000 000	664 000	7 000	148 000	196 000	6 108 952	4%	4 223 952	5%
Population (Statssa 2001)	1 100 000	3 090 117	2 480 282	64 642	201 462	1 664 482	508 271	142 770	724 300	80 500	10 056 826		7 394 699	
Backlog/capita														
	Rand/ capita	Rand/ capita	Rand/ capita	Rand/ capita	Rand/ capita	Rand/ capita	Rand/ capita	Rand/ capita	Rand/ capita	Rand/ capita	Rand/ capita	Incr/decr %	Rand/ capita	Incr/decr %
Water														
Year 07/08	990	42	404	0	60	601	2 760	0	484	870	6 211		2 305	
Year 08/09	979	36	404	0	47	601	2 898	0	405	907	6 277	1%	2 326	1%
Year 09/10	947	50	385	0	49	601	3 042	0	376	994	6 443	3%	2 376	2%
Sanitation/Sewerage														
Year 07/08	990	260	833	20	208	601	677	42	152	2 174	5 957		4 257	
Year 08/09	979	222	833	23	278	601	1 299	46	184	2 236	6 701	12%	4 271	0%
Year 09/10	947	311	817	31	318	601	1 306	49	204	2 435	7 019	5%	4 510	6%
Avg cost/per capita														
											Rand/ capita	Incr/decr %	Rand/ capita	Incr/decr %
Water											503		310	
Year 07/08											501	0%	306	-1%
Year 08/09											503	0%	302	-1%
Year 09/10														
Sanitation/Sewerage											561		559	
Year 07/08											583	4%	542	-3%
Year 08/09											607	4%	571	5%
Year 09/10														

Note: Ekurhuleni was assumed to have the same level of backlog between 07/08 and 08/09 in order not to disrupt the trend analysis

For all the 10 municipalities surveyed there was a consolidated total of R5 060 million service coverage backlog for potable water services for the 2009/10 financial year. The service backlog coverage for potable water did not increase significantly over the 3 financial years for which data was collected.

The service coverage backlog for sanitation services of all 10 municipalities was R5 637 million for the 2007/08 year. This total increased by 4% per year to R6 109 million in 2009/10.

The service coverage backlog for potable water services for metropolitan municipalities decreased by 1% year-on-year for the 3 year period. Both the Nelson Mandela and the Ekurhuleni Metropolitan Municipalities experienced decreased service coverage backlog costs for potable water services, while the eThekwini Metropolitan Municipality experienced an increase in backlog costs. The latter municipality's service coverage backlog cost for sanitation first decreased by 3% between the 2007/08 and 2008/09 financial years and increased by 5% during the 2009/10 financial year. This fluctuation was caused by the capital programmes implemented by the eThekwini Metropolitan Municipality. An expansive capital programme by the respective municipality reduced the backlog by R 116 million in the second year.

The cost per capita to address the backlogs in coverage for water and sanitation services in 2005 was R1 470 for water and R8000 for sanitation (DWAF 2005b).

The cost per capita to address the backlogs in coverage for water and sanitation service in 2009/10 for the 10 sample municipalities was R503 for water and R607 for sanitation. The cost per capita for the whole sample metropolitan municipalities to address the coverage backlog was R302 for water and R571 for sanitation. The sanitation service coverage backlog cost grew by 5% between the 2008/09 and 2009/10 financial years. The potable water service coverage backlog cost decreased by 1% for the same period.

Additional indicators of the standard of water service provision are potable water service interruptions recorded or experienced the amount of days that household sanitation services failed and whether the water authority had achieved a DWA blue drop quality certification for water and a DWA green drop quality certification for sewage services.

A consolidation of additional indicators of the standard of water service provision data received from 14 of the sample group of municipalities is shown in Table 5.4. The uMhlatuze Municipality did not respond to the particular survey question, and was thus excluded from further comparisons.

Table 5.4: Indicators of the standard of water service provision

	NMBM	Ethekwini	Ekurhuleni	Midvaal	Sol Plaatjie	Stellen-bosch	Amathole	Polokwane	Steve Tshwete	Buffalo City	George	Kouga	Overstrand	Cape Town	TOTALS
Number of potable water service interruptions in 2009/10	0	7 200	2 000	0	1 500	0		0	0	0	0	150	0	113474	**124 324**
Not recorded							√								
Number of days: failed sanitation services in 2009/10	0	0	15	0	5	0		0	2	0	0	2	0		**24**
Not recorded							√								**1** √
DWA blue drop quality achieved in 2009/10															
Yes		√	√			√	√	√	√	√	√			√	**9** √
No	√			√	√							√	√		**5** √
DWA green drop quality achieved in 09/10															
Yes	√	√	√								√			√	**5** √
No				√	√	√	√	√	√	√		√	√		**9** √

Note: uMhlatuze Municipality did not respond to this particular survey question
Note: 0 = Nil

5.2.3 Potable water service interruptions

A total of 124 324 potable water service interruptions were recorded by the sample group of municipalities for the 2009/10 financial year. Service interruptions were not recorded by Amathole District Municipality and 8 of the sample group municipalities record nil interruptions. Only 5 sample group municipalities provided data that indicated that potable water service interruptions are recorded. A total of 122 674 interruptions were recorded by the sample metropolitan municipalities. The remaining interruptions were recorded by the local municipalities. The Cape Town Metropolitan Municipality has the lowest backlog in water service infrastructure maintenance and rehabilitation compared to the other metropolitan municipalities (Table 5.2), but reported the highest number of potable service interruptions for the 2009/10 financial year. Differences in recording processes explain the differences and anomaly.

5.2.4 Days of failed sanitation services

A total of 24 days of failed sanitation services were recorded by the sample of municipalities for the 2009/10 financial year. Days of failed sanitation services were recorded by Amathole District Municipality and 9 of the sample group municipalities recorded nil days of failed sanitation services. The recorded days of failed sanitation services were provided by 4 sample municipalities (refer Table 5.4). A total of 15 days of failed sanitation services were recorded by the sample metropolitan municipalities. The 15 days of failed sanitation for the 2009/10 financial year all occurred at the Ekurhuleni Metropolitan Municipality. The backlog in water service infrastructure maintenance and rehabilitation (Table 5.2) reveals that the Ekurhuleni Metropolitan Municipality had the highest recorded cost for sanitation backlog infrastructure maintenance and rehabilitation. A total backlog cost in infrastructure of R3 833 million was reported in the 2009/10 year by this municipality.

5.2.5 DWA blue drop quality

The DWA blue drop quality is a measure of South African drinking water quality management performance. The Drinking Water Quality regulation programme focuses attention on the manner in which potable water quality is being managed by municipalities.

The DWA blue drop quality status was achieved by 9 of the sample municipalities for the 2009/10 financial year. The Nelson Mandela Metropolitan Municipality was the only metropolitan municipality that did not achieve the DWA blue drop quality status. The blue drop quality status was also not achieved by 4 of the local municipalities in the sample.

5.2.6 DWA green drop quality

The DWA green drop quality is a measure of South African wastewater quality management performance. The Green Drop quality programme seeks to identify and develop core competencies to sustainably improve the level of wastewater management.

The DWA green drop quality status was achieved by only 5 of the municipalities in the sample for the 2009/10 financial year.

The sanitation service backlog infrastructure maintenance and rehabilitation is the largest portion of the total backlog (Table 5.2).

5.3 POTENTIAL CONSEQUENCES OF SUB-STANDARD WATER SERVICE DELIVERY

An expanding local economy creates additional demand on municipal infrastructure. Failure of municipalities to keep pace with demand can lead to congestion and over-utilisation of existing infrastructure assets. This accelerates the deterioration in the condition of these assets (National Treasury, 2008:143).

A comparison of the value of building plans with the municipal capital expenditure reported indicates if capital expenditure on economic infrastructure has increased to accommodate economic growth within the municipal area. The Rand value of building plans approved over a three year period are reported in Table 5.5.

Table 5.5: Total value of building plans approved over a 2 year period

DETAIL	NMBM	Ethekwini	Ekurhuleni	Midvaal	Sol Plaatjie	Stellenbosch	Polokwane	Steve Tshwete	Buffalo City	George	Kouga	Cape Town	TOTAL OVERALL	TOTAL METROS
	R'000 000	R'000 000	R'000 000	R'000 000	R'000 000	R'000 000	R'000 000	R'000 000	R'000 000	R'000 000	R'000 000	R'000 000	R'000 000	R'000 000
Year 07/08	10 070	6 366	20 543	984	214	2 391	931	752	2 154	2 960	466	0	47 830	39 133
Year 08/09	5 446	3 218	15 026	514	240	2 873	1 277	478	1 915	2 052	257	10 649	43 947	36 255
Year 09/10	5 710	3 196	12 993	1	278	2 405	1 328	827	1 887	1 696	212	8 958	39 491	32 744

Note: Amathole District Municipality does not consider and approve business plans. This function being a function of metropolitan and local municipalities

As mentioned previously, in 2006, the municipal capital expenditure had fallen to less than 75% of the value of buildings completed (National Treasury 2011a).

Of the 15 sample municipalities surveyed, 12 municipalities provided the value of building plans. The Amathole District Municipality did not have the function of approving building plans and two others did not provide the data. The Cape Town Metropolitan Municipality provided the data for a 2 year period instead of the 3 year period requested. A total of R47 830 million worth of building plans were approved by 11 sample municipalities (excluding Cape Town Metropolitan Municipality) for the 2007/08 financial year. The value of building plans approved by the sample municipalities decreased to R43 947 million during 2008/09 (including the R10 649 million building plans approved by the Cape Town Metropolitan Municipality). A significant decrease in the value of building plans approved by municipalities was experienced by all of the sample municipalities except for the Sol Plaatjie, Stellenbosch and Polokwane Local Municipalities. The total value of building plans approved decreased to R39 491 million during the 2009/10 financial year. The highest value of building plans approved was recorded at sample metropolitan municipalities, at which R32 744 million were approved for the 2009/10 financial year, compared to R39 491 million for all the sample municipalities.

The decrease in the value of building plans approved by the sample municipalities was partly a reflection of the business cycle and the impacts of the global economic crisis being experienced. In the same period the total capital expenditure budget for the sample municipalities was R19 329 million and for the sample metropolitan municipalities R16 970 million (Table 5.6).

Table 5.6: Capital budget in the 2009/2010 financial year

DETAILS	NMBM	Ethekwini	Ekurhuleni	Midvaal	Sol Plaatjie	Stellenbosch	Amathole	Polokwane	Steve Tshwete	Buffalo City	George	uMhlatuze	Kouga	Overstrand	Cape Town	ALL SAMPLE MUNIS:	METRO TOTALS
	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000
Municipality's total capital budget in the 2009/2010 year	2 911 819	5 450 704	2 268 470	77 686	113 199	223 303	248 603	609 054	375 399	736 423	243 090	286 309	68 169	114 415	5 602 499	19 329 143	16 969 915

Capital expenditure, as a proportion of the total value of building plans, fell to 49% in the 2009/10 financial year for the sample municipalities and 52% for the sample metropolitan municipalities, compared to the 75% in 2006.

5.4 STANDARD OF WATER SERVICE PROVISION

5.4.1 Prioritisation of the water service by municipalities

A municipality approves an IDP for a 5 year period the plan is reviewed annually and it compiles a risk register annually. The IDP informs and links to the operating and capital budgets of the municipality. The risk register identifies the main risks facing the municipality. The risk is not being able to achieve the IDP objectives. In response to the identified risks, the municipality is expected to develop mitigating actions, including controls. Risks are prioritised.

The operational readiness of the water service infrastructure was not included in the risk register of three sample municipalities, namely the Ekurhuleni Metropolitan Municipality, the Sol Plaatjie Municipality and the Kouga Local Municipality.

Table 5.7: Operational readiness of water service infrastructure identified in the risk portfolio

DETAIL	NMBM	Ethekwini	Ekurhuleni	Midvaal	Sol Plaatjie	Stellenbosch	Amathole	Polokwane	Steve Tshwete	Buffalo City	George	Kouga	Overstrand	CapeTown	TOTAL OVERALL	TOTAL METROS
Incl. in risk register?																
Yes	√	√		√		√	√	√	√	√	√		√	√	10√	4√
No			√		√							√			3√	1√
Priority rating																
High		√				√				√					3√	2√
Med-Hight									√						1√	0
Medium							√								1√	0
Low																

A high risk priority rating for the operational readiness of the water service infrastructure was reported by three of the municipalities in the sample, a medium-high risk by one local municipality medium risk by one.

5.4.2 Monitoring effort by municipalities

The sustainability of the water service is dependent on the accurate billing of consumers of the service. A meter audit must be conducted (at least) annually to support the accuracy of consumption data used to bill consumers of the water service. Inaccurate consumption data will contribute to the municipality not being able to determine cost recovery tariffs. A meter audit is part of the annual water audit used to determine non-revenue water. An annual water audit is a legislative requirement (National Treasury, 2011b). The annual water audit standard used by South African municipalities is prescribed by the International Water Association (IWA).

The number of years since the last water meter audit is shown in Table 5.8 for the sample municipalities. The average number of years since the last water meter audit was 4 years. Water meter audits were undertaken annually by 6 of the sample municipalities. The Polokwane Local

Municipality had not undertaken a water meter audit for 15 years and the Kouga Local Municipality for 10 years.

Table 5.8: Number of years since the last water meter audit

DETAILS	NMBM	Ethekwini	Ekurhuleni	Midvaal	Sol Plaatjie	Stellenbosch	Amathole	Polokwane	Buffalo City	George	Kouga	Overstrand	CapeTown	AVERAGE ALL	AVERAGE METROS
No. of years	1	1	5	1	3	0	1	15	1	7	10	0.50	1	4	2

The average number of years between meter audits by the metropolitan municipalities was 2 years.

5.4.3 Skills adequacy

Skills adequacy has a direct impact on the standard of water service provision. The skills data provided by the sample municipalities is shown in Table 5.9a. The assessment of skills included the professional skill categories of engineers, technologists and technicians. The sample municipalities provided information on how many posts exist on the water services organogram and how many of these were filled. This information was also compared to the Statistics South Africa 2001 Census population statistics relevant to the sample of municipalities to determine benchmarks and trends.

Table 5.9a: Analysis of skilled staff at sample municipalities in 2009/10

	NMBM	Ethekwini	Ekurhuleni	Midvaal	Sol Plaatjie	Stellenbosch	Polokwane	Steve Tshwete	Buffalo City	George	uMhlatuze	Kouga	Overstrand	TOTALS
Total no. of posts	**112**	**448**	**164**		**23**	**13**	**33**	**10**	**83**	**7**	**57**	**17**	**11**	**978**
Total no. employed	**67**	**274**	**140**	**21**	**21**	**11**	**32**	**10**	**65**	**7**	**48**	**12**	**10**	**996**
Total no. vacant	**45**	**174**	**24**	**1**	**2**	**7**	**1**	**6**	**18**	**6**	**9**	**5**	**1**	**299**
Engineers total no. of posts	23	43	58		1	3	0	2	10	1	10	1	2	**154**
Employed	12	29	48	2	1	3	0	2	8	1	6	0	2	**149**
Vacant	11	14	10	0	0	1	0	1	2	0	4	1	-	**44**
Technologists total no. of posts		35	70	0	3	0	4	2	0	3	0	1	-	**118**
Employed		30	65	0	3	0	4	2	0	3	0	1	-	**155**
Vacant		5	5	0	0	0	0	2	0	0	0	0	-	**12**
Technicians total no. of posts	89	370	36		19	10	29	6	73	3	47	15	9	**706**
Employed	55	215	27	19	17	8	28	6	57	3	42	11	8	**692**
Vacant	34	155	9	1	2	6	1	3	16	6	5	4	1	**243**
Population (Statistics SA 2001)	1 100 000	3 090 117	2 480 282	64 642	201 462	117 704	508 271	142 770	724 300	135 415	289 186	80 500	55 451	**13 547 833**
PER CAPITA EMPLOYED														
Per captia: Total	16 418	11 278	17 716	3 078	9 593	10 700	15 883	14 277	11 143	19 345	6 025	6 708	5 545	13 602
Per captia: Engineers	91 667	106 556	51 673	32 321	201 462	39 235	0	71 385	90 538	135 415	48 198	0	27 726	90 925
Per capita: Technologists	0	103 004	38 158	0	67 154	0	127 068	71 385	0	45 138	0	80 500	0	87 405
Per capita: Technicians	20 000	14 373	91 862	3 402	11 851	14 713	18 153	23 795	12 707	45 138	6 885	7 318	6 931	19 578

Of the13 sample municipalities for which data were reported, there were 299 vacant posts in the water service, i.e. 31% of water service posts were vacant.

The sample municipalities had 149 engineers, 155 technologists and 692 technicians in their employ in 2009/10. The professional category of technicians had 243 vacancies, excluding Amathole District and Cape Town Metropolitan Municipalities.

In the 2009/10 financial year, a water service skilled staff member was servicing an average of 13 602 members of the population. Engineers were servicing an average of 90 925 members of the population, and technologists and technicians respectively were servicing an average of 87 405 and 19 578 members of the population. These statistics differ per municipality. The highest number of local population served by skilled staff of a municipality was in the George Local Municipality (19 345 members of the population are served by skilled staff). A high number of members of the population were being served by sample Metropolitan Municipality skilled staff in the water service compared to the balance of the sample municipalities. The sample metropolitan municipalities' average population served for skilled staff member ranged from 17 716 (Ekurhuleni Metropolitan Municipality) to 11 278 (eThekwini Metropolitan Municipality). A population in excess of 13 million (Statistics SA, 2001) was served by 149 engineers employed in the water service of the sample municipalities.

Sample municipalities that provided incomplete information were excluded from Table 5.9b. By excluding these municipalities from the sample, it was possible to determine the population served by skilled staff when all vacant posts are filled. If all the posts were filled, an average of 8 990 members of the population would be served by a water service skilled professional, instead of 12 521 actually served in the 2009/10 financial year. The total population served by water service engineers would decrease from 78 861 to 57 629, water technologists from 83 242 to 76 187 and the water service technicians from 18 125 to 12 383 members of the population.

Table 5.9b: Analysis of skilled staff at sample municipalities in 2009/10 (excluding incomplete surveys)

	NMBM	Ethekwini	Ekurhuleni	Midvaal	Sol Plaatje	Stellenbosch	Polokwane	Steve Tshwete	Buffalo City	George	uMhlatuze	Kouga	Overstrand	TOTALS
PER CAPITA EMPLOYED														
Per captia: Total	16 418	11 278	17 716	3 078	9 593	10 700	15 883	14 277	11 143	19 345	6 025	6 708	5 545	12 521
Per captia: Engineers	91 667	106 556	51 673	32 321	201 462	39 235	0	71 385	90 538	135 415	48 198	0	27 726	78 861
Per capita: Technologists	0	103 004	38 158	0	67 154	0	127 068	71 385	0	45 138	0	80 500	0	83 242
Per capita: Technicians	20 000	14 373	91 862	3 402	11 851	14 713	18 153	23 795	12 707	45 138	6 885	7 318	6 931	18 125
PER CAPITA TOTAL POSTS														
Per captia: Total	9 821	6 898	15 124	2 938	8 759	9 054	15 402	14 277	8 727	19 345	5 073	4 735	5 041	8 990
Per captia: Engineers	47 826	71 863	42 763	32 321	201 462	39 235	-	71 385	72 430	135 415	28 919	80 500	27 726	57 629
Per capita: Technologists	-	88 289	35 433	-	67 154	-	127 068	71 385	-	45 138	-	80 500	-	76 187
Per capita: Technicians	12 360	8 352	68 897	3 232	10 603	11 770	17 527	23 795	9 922	45 138	6 153	5 367	6 161	12 383

5.4.4 Planning effort

The planning effort of the sample municipalities is shown in Table 5.10. WSDPs were approved at 14 of the sample municipalities (of those that provided the information). This sample had 12 municipalities with approved master plans that were in place. Sample municipalities that did not have water service master plans were the Midvaal and Steve Tshwete Local Municipalities.

Table 5.10: Planning effort for the 2009/10 financial year

	NMBM	Ethekwini	Ekurhuleni	Midvaal	Sol Plaatjie	Stellenbosch	Amathole	Polokwane	Steve Tshwete	Buffalo City	George	Kouga	Overstrand	CapeTown	TOTAL OVERALL	TOTAL METROS
WSDP																
Yes	√	√	√	√	√	√	√	√	√	√	√	√	√	√	14√	2√
No															Nil	Nil
MASTER PLANS																
Yes	√	√	√		√	√	√	√		√	√	√	√	√	2√	2√
No				√					√						2√	Nil

5.5 EXCESS BURDEN OF COST RECOVERY?

The consumer base from which revenue is collected is limited, so that if this base shrinks to too small a proportion of the total served, an unsustainable burden may be imposed on those paying for their service. This problem is aggravated by high levels of non-revenue water (the loss of water in distribution), large transfer costs (including the provision for bad debt), low debt collection percentages and a net increase in the water service debtors. Each aggravating element is discussed separately below.

5.5.1 Non-revenue water

Municipalities must use the IWC calculation to determine non-revenue water. Non-revenue water includes unbilled standpipes, unbilled low cost houses, unbilled indigent, metering inaccuracies including theft and illegal use, mains leaks and bursts, reservoir overflows and leakages, and service connection leaks. Non-revenue water is considered as a cost of providing the water service. The statistical information on non-revenue water received from 11 sample municipalities is shown in Table 5.11.

Table 5.11: Non-revenue water in the 2009/10 financial year of 11 sample municipalities

DETAILS	NMBM	Ethekwini	Ekurhuleni	Midvaal	Stellenbosch	Amathole	Steve Tshwete	Buffalo City	George	Overstrand	CapeTown	TOTALS	TOTALS METROS
Cubic meters (m^3)	m^3	m^3	m^3	m^3	m^3	m^3	m^3	m^3	m^3	m^3	m^3	m^3	m^3
Free water (non revenue) - bursts, reservoir overflows & leakage													
Amount of water (m3)	35 552 270	124 829 322	105 735 243	14 400	2 057 808	16 589 254	3 975 000	25 031 372	518 271	2 366 561	77 663 419	394 332 920	368 811 626
Revenue (charged for) water													
Amount of water (m3)	58 484 000	208 137 661	214 012 502	272 473	10 448 963	5 533 121	11 584 000	37 620 667	9 206 929	6 262 242	253 299 069	814 861 627	771 553 899
Total water served (outflow from purification works)													
Amount of water(m3)	94 036 270	332 966 983	319 747 745	286 873	12 506 771	22 122 375	15 559 000	62 652 039	9 725 200	8 628 803	330 962 488	1 209 194 547	1 140 365 525
Percentage non-revenue water (%)	38%	37%	33%	5%	16%	75%	26%	40%	5%	27%	23%	33%	32%

A total of 1 209 million m^3 of potable water was served by 11 sample municipalities during the 2009/10 financial year. Of the total amount of potable water served, 815 million m^3 was billed to consumers who were expected to pay for the consumption of the service. Non-revenue water amounted to 394 million m^3. Of the water purified, 33% represented non-revenue water for the 2009/10 financial year (Table 5.11). High levels of non-revenue water were also reported by the 5 sample metropolitan municipalities (369 million m^3 in 2009/10). The sample municipality with the highest non-revenue water was the Amathole District Municipality. This municipality did not bill consumers for 75% of the potable water served in the 2009/10 financial year. The George and Midvaal Local Municipalities had the lowest non-revenue water, only 5%.

Non-revenue water does not only influence the potable water component of the water service but also the sanitation component. The reason for the additional loss in sanitation service lies in the linked nature of the tariff structure. Municipalities predominantly use a hydraulic application of determining the bill for sanitation services. The hydraulic application of a tariff structure is where the water consumption for a fixed period is discounted by 20% (for example) prior to applying the sanitation tariff structure. For this reason, non-revenue water influences the sustainability of the sanitation service, as the wastewater not billed still requires purification by the wastewater treatment works.

5.5.2 Transfer costs, debt collection and growth in net debt owed for water services

During the determination of a tariff structure to achieve the cost recovery of the water service, a municipality also has to take into account transfer costs. Transfer costs consist of indigent consumer subsidization, public contributions and donations, contributions to Government Grant Reserves (GGR), provision for non-payment of services by consumers (provision for bad debt) and cross-subsidisation of other municipal services, for example, Rate and General Services. All these costs place an additional burden on the water service as the cost must be considered when calculating the tariff to cover the cost of the service.

The transfer costs, debt collection and growth in net debt owed for water services are shown for 11 sample municipalities in Table 5.12 for a period 2007/08 to 2009/10.

Table 5.12: Transfer costs and consumer debt related information

DETAILS	NMBM	Ethekwini	Ekurhuleni	Midvaal	Stellenbosch	Amathole	Steve Tshwete	Buffalo City	George	Overstrand	CapeTown	TOTALS	TOTALS METROS
TRANSFER COSTS	**Rands**	**Rands**	**Rands**	**Rands**	**Rands**	**Rands**	**Rands**	**Rands**	**Rands**	**Rands**	**Rands**	**Rands**	**Rands**
ATTP cost of relief - varies according to consumption	114 607 644	0	0	0	0	0	0	0	0	0	-		
Assets as a result of public contributions and donations	0	0	0	0	0	0	0	0	0	0	2 527 054	2 527 054	2 527 054
Contribution to GGR and DPC - Assets	229 880 874	0	0	0	0	0	0	0	0	0	174 535 690	404 416 564	404 416 564
Provision for non-payment of services by consumers (provision for bad debts)	97 031 618	185 711 874	278 970 875	2 800 000	1 775 297	53 244 004	636 130	7 037 703	10 803 593	0	202 783 450	840 794 544	771 535 520
Cross-subsidisation (Rate and General or other service)	41 605 080	-112 424 529	0	0	0	0	0	0	0	0	-		
TOTALS	**483 125 215**	**73 287 345**	**278 970 875**	**2 800 000**	**1 775 297**	**53 244 004**	**636 130**	**7 037 703**	**10 803 593**	**0**	**379 846 194**	**1 247 738 162**	**1 178 479 137**
DEBT COLLECTION PERCENTAGE (cash collected as a percentage of consumption billed)													
Year 07/08	98.60%	100.21%	88.39%	98.80%			102.22%	94.61%	90.00%	98.67%	90.03%	78%	94%
Year 08/09	91.70%	94.49%	89.60%	95.02%		30.00%	100.74%	93.84%	98.00%	95.37%	91.08%	80%	92%
Year 09/10	93.75%	96.31%	91.08%	96.70%	95.00%	43.00%	99.80%	93.58%	97.00%	98.78%	91.97%	91%	93%
OUTSTANDING DEBT FOR WATER SERVICES													
	Rands	**Rands**	**Rands**	**Rands**	**Rands**	**Rands**	**Rands**	**Rands**	**Rands**	**Rands**	**Rands**	**Rands**	**Rands**
Water													
Year 07/08	327 365 000	978 257 000	1 650 904 706	13 190 090	10 586 360	49 025 392	4 465 330	134 126 486	15 838 067	9 403 983	651 053 000	3 844 215 414	3 741 706 192
Year 08/09	270 277 147	1 040 110 000	1 639 375 140	21 255 901	16 395 844	74 029 898	4 275 575	154 053 324	14 165 313	11 549 807	747 902 000	3 993 389 949	3 851 717 611
Year 09/10	312 342 601	984 806 000	1 798 859 518	19 147 821	18 824 155	91 679 582	4 441 040	181 669 440	15 746 199	12 861 515	808 196 000	4 248 573 871	4 085 873 559
Sanitation/Sewerage													
Year 07/08	162 896 000	9 583 000	448 457 086	7 412 160	6 231 072	47 040 390	2 862 262	76 637 557	10 067 797	4 636 018	483 307 000	1 259 130 342	1 180 880 643
Year 08/09	158 872 205	11 347 000	467 776 252	9 208 415	9 671 991	62 777 018	2 968 197	80 960 178	9 642 133	6 290 461	800 337 000	1 619 850 850	1 519 292 635
Year 09/10	128 621 154	11 155 000	511 287 467	10 127 793	6 206 290	77 182 029	3 129 253	90 261 814	12 881 246	6 774 919	783 610 000	1 641 236 965	1 524 935 435
TOTAL													
Year 07/08	490 261 000	987 840 000	2 099 361 792	20 602 250	16 817 432	96 065 782	7 327 592	210 764 043	25 905 864	14 040 001	1 134 360 000	5 103 345 756	4 922 586 835
Year 08/09	429 149 352	1 051 457 000	2 107 151 392	30 464 316	26 067 835	136 806 916	7 243 772	235 013 502	23 807 446	17 840 268	1 548 239 000	5 613 240 799	5 371 010 246
Year 09/10	440 963 755	995 961 000	2 310 146 985	29 275 614	25 030 445	168 861 611	7 570 293	271 931 254	28 627 445	19 636 434	1 591 806 000	5 889 810 836	5 610 808 994

The sample municipalities reported a total of R1 248 million transfer costs for the 2009/10 financial year. Of the amount provided for transfer costs R 841 million was for the cost of those consumers

that do not pay for the service (bad debts). The provision for non-payment is informed by the debt collection rate (cash collected divided by the total amount of debt accrued). In the 2009/10 financial year the average debt collection rate for all services provided by the sample municipalities was 91%. Other transfer costs reported were R2.5 million for assets as a result of public contributions and donations, and R404 million for contributions to the GGR and DPC. Contributions to the GGR and DPC are used for infrastructure investment involving either new infrastructure or infrastructure to be maintained or rehabilitated.

The Cape Town Metropolitan Municipality had the highest level of consumption income from water service tariffs. It also reported a provision for non-payment of R203 million. The provision for non-payment is influenced by the debt collection rate of 91.97% recorded by the municipality. Ekurhuleni Metropolitan Municipality provided the most for non-payment, a total of R279 million. The debt collection rate for Ekurhuleni Metropolitan Municipality was almost 2% less than the Cape Town Metropolitan Municipality for the same period.

The Amathole District Municipality's debt collection rate was 40% for the 2009/10 financial year. Although very low, the collection rate was an improvement from the 33% collection rate recorded in the previous financial year.

The Nelson Mandela and Cape Town Metropolitan Municipalities provided for the highest water service infrastructure investment from national government grants (transfer cost). A total of R404 million was invested in water services infrastructure from the recorded transfer costs in the 2009/10 financial year.

The total debt owed to the 11 sample municipalities (net of the provision for non-payment) grew from 2007/08 to 2009/10 (Table 5.12). A growth in outstanding debt is an indicator that the provision for non-payment of debt is inadequate and that the actual cost of the water service is underestimated when determining the tariff structure for the service.

The sample municipalities' information provided reflects that there had been a significant increase in the outstanding debt for potable water services. A total of R3 844 million was outstanding during the 2007/08 financial year. The outstanding debt increased to R4 249 million during the 2009/10 financial year, of which R4 086 million was for the sample metropolitan municipalities.

The same comparison for the sanitation services also shows a significant increase in the outstanding debt for this service. A total of R1 259 million was outstanding during the 2007/08 financial year for this service, increasing to R1 614 million during the 2009/10 financial year, of which R1 525 million was for the sample metropolitan municipalities.

5.6 MANAGEMENT OF CAPITAL

Municipalities have various sources of funding to support infrastructure asset coverage (new infrastructure) and infrastructure maintenance and rehabilitation. One such source is accrued operating income in excess of the operating costs. If collected, the excess operating income is used to make contributions to the Capital Replacement Reserve (CRR). A contribution to the CRR is a

means of funding infrastructure from internally generated income. Infrastructure funded from internally generated income serves as a tax on a current generation.

Apart from internally generated funds (above) there are various other asset investment funding sources, for example, allocations from either the provincial or national government fiscus. A municipality may also raise external loans as a funding source for an infrastructure investment programme.

Grant and internal funding options do not result in operating cost apart from providing for the rehabilitation, maintenance or replacement of the asset. External loans, on the other hand, need to be repaid. Financing costs need to be covered by the tariff structure aligned to the consumption of the water service.

The water service competes with all the other municipal services for its capital funding needs.

5.6.1 Source of funding for the overall capital budget

The sources of funding of the sample municipalities' capital budgets are internal sources, the Municipal Infrastructure Grant (MIG), direct Department of Water Affairs (DWA) Grants, external loan funding, donor funding, developer's contributions and other minor sources. The MIG grant was replaced by the Urban Settlements Development Grant (USDG) during the 2010/11 financial year for the metropolitan municipalities.

The source of funding for the capital budget has a direct impact on consumers of services. If capital is funded from internal sources, the consumer is paying a consumption tariff that includes a contribution to the capital budget. If capital is funded from national or provincial government grant funding, it is derived from nationally applied taxes. External loan funding provided by banks must be repaid together with interest. The period for repayment of the loan is linked to the life span of the asset that has been funded by the loan. The finance costs for the current capital provided are paid by future generations. Donor funding and developer's contributions are the cheapest sources of capital funding. Donor funding is predominantly provided by international donors. The consumers benefiting from the donor financed infrastructure will only pay for the operational costs associated with the new infrastructure and would not have contributed to the infrastructure financing in the past. The depreciation of assets financed from donor funding will increase the cost of providing the service in the future and must be recovered by the tariff structure.

Developer's contributions are paid by developers changing the use of surveyed property within a municipality. For example, if agricultural land in a municipality is rezoned to accommodate a dense town house development, a developers' levy is charged because specific additional infrastructure would be required to support the rezoning, or the outcome of the rezoning is that the bulk infrastructure of the municipality will be utilised at a higher level. A higher utilization of the bulk infrastructure will decrease the useful life of the infrastructure and require earlier replacement than planned for.

A depreciation cost is taken into consideration when determining the tariff to support a particular service. The cost of depreciation is included in the operating costs and is an accounting standard

that allows for the tariff of the related service to collect income to fund the replacement of the asset, once it has reached its useful life. The source of capital funding has a significant influence on the cost of depreciation. If capital is funded from internal sources, the cost of depreciation is not considered when determining the related service tariffs. The capital component of the finance cost for external loan funding is assumed to be the depreciation of the externally loan funded capital. Donor funding, on the other hand, results in a direct depreciation charge being included in the operating costs of the various services and included in the tariff calculation.

During the 2009/10 financial year the sample municipalities, collectively, financed their overall capital budgets from internal sources (17%), grants (45%), developers' contributions (1%), external loan funding (34%) and other (4%), as shown in Table 5.13.

The 5 sample metropolitan municipalities financed their overall capital budgets from internal sources (6%), grants (50%), developers' contributions (2%), external loan funding (42%) and other (0%).

The sources of capital funding differ according to the category of the municipality. Sample metropolitan municipalities funded less of the capital budgets from internal sources compared with the overall sample municipalities. Only 6% of the capital budget was funded from internal sources for sample metropolitan municipalities, compared to the 17% by the sample of all municipalities.

External loan funding from banks was used as an alternate funding source by the sample metropolitan municipalities. The sample collectively utilised 34% external loan funding as a source to fund their overall capital budgets. Sample metropolitan municipalities funded 42% of their overall capital budgets through external loans.

Table 5.13: Key sources of capital and the management of the municipal infrastructure assets

DETAILS	NMBM	Ethekwini	Ekurhuleni	Midvaal	Sol Plaatjie	Stellenbosch	Amathole	Polokwane	Steve Tshwete	Buffalo City	George	uMhlatuze	Kouga	Overstrand	CapeTown	ALL SAMPLE MUNIS.	METRO TOTALS
Population (Statssa 2001)	**1 100 000**	**3 090 117**	**2 480 282**	**64 642**	**201 462**	**117 704**	**1 664 482**	**508 271**	**142 770**	**724 300**	**135 415**	**289 186**	**80 500**	**55 451**	**2 893 251**	**13 547 833**	**10 287 950**
Sources of capital funding (funding source proportion (%))																	
Internal Sources	1.2%	0.80%	4.86%	11.80%	64.74%	29.00%		17.60%	88.50%	19.14%	5.00%	0.0001%		9.90%	5.97%	17%	6%
Municipal Infrastructure Grant		22.90%	9.30%	38.00%	10.00%	14.00%	100.00%	82.40%	0.00%	74.39%	9.00%	30.00%	100.00%	5.10%	31.04%	35%	28%
Direct Dept of Water Affairs Grants			0.00%	8.80%	12.95%	5.00%		0.00%	0.00%	0.48%				10.00%	60.92%	7%	12%
Loan funding	48.8%	76.30%	75.82%	41.40%	12.31%	43.00%		0.00%	11.50%	5.99%	46.00%	69.00%		75.00%	2.07%	34%	42%
Donor funding			0.00%	0.00%		4.00%		0.00%	0.00%	0.00%		1.00%		0.00%	0.00%	0%	0%
Other:											40.00%			0.00%	0.00%	3%	0%
Urban Settlements Development Grant	50.0%															3%	10%
Developers Contributions			10.02%													1%	2%
Department of Agriculture						5.00%										0%	0%
Total	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Municipality's total capital budget 09/10 (in Rands)	2 911 819 420	5 450 704 000	2 268 469 866	77 685 850	113 199 216	223 303 414	248 603 250	609 054 000	375 399 382	736 422 501	243 090 437	286 309 000	68 169 000	114 414 965	5 602 498 787	19 329 143 088	16 969 914 574
Municipality's total water services capital budget 09/10 (in Rands)	264 379 480	1 174 740 000	90 996 423	22 525 000	15 446 549	29 177 000	142 964 800	209 601 000	47 751 967	70 678 037	138 606 500	107 695 520	3 800 000	24 756 000	642 842 825	2 985 961 101	2 243 636 765
Percentage of total capital budget (%)	9%	22%	4%	29%	14%	13%	58%	34%	13%	10%	57%	38%	6%	22%	11%	15%	13%
Per capita investment in water service (in Rands)	240	380	37	348	77	248	86	412	334	98	1 024	372	47	446	222	220	218
Percentage of the total water services capital budget spent	81.5%	145.00%	101.00%	75.50%	95.00%	72.00%	100.00%	47.21%	24.40%	72.00%	88.00%	111.00%	69.00%	97%	88.83%	84%	98%
Allocation of water services budget																	
Rehabilitation of water services infrastructure																**32.27%**	**35.96%**
External grant funding proportionate split (%)	0.00%	31.30%	64.50%	22.90%	25.00%	100.00%	3.33%	0.00%	0.00%	64.00%	40.00%	56.52%		8%	9.31%		
Other sources funding proportionate split (%)	42.02%	59.90%	48.87%	24.81%	0.00%	91.23%	0.00%	31.00%	16.00%	2.00%	25.00%	67.74%		0%	37.73%		
New capital: networks																**26.21%**	**35.07%**
External grant funding proportionate split (%)	98.23%	40.30%	6.68%	39.30%	0.00%	0.00%	65.56%	62.00%	0.00%	1.00%	2.00%			0%	7.14%		
Other sources funding proportionate split (%)	54.80%	14.50%	7.54%	75.19%	0.00%	0.00%	0.00%	23.00%	9.00%	98.00%	21.00%			60%	22.46%		
New capital: sanitation facilities																**15.04%**	**7.32%**
External grant funding proportionate split (%)	0.00%	23.40%	0.00%		75.00%	0.00%	30.00%	16.00%	0.00%	1.00%	2.00%			0%	23.62%		
Other sources funding proportionate split (%)	0.00%	3.20%	3.91%		100.00%	0.00%	0.00%	32.00%	48.00%	0.00%	30.00%			0%	18.04%		
New Capital: bulk water supply and bulk sewerage																**25.95%**	**20.21%**
External grant funding proportionate split (%)	1.77%	5.00%	28.82%	37.80%	0.00%	0.00%	1.11%	22.00%	0.00%	34.00%	56.00%	43.48%	100.00%	92%	59.93%		
Other sources funding proportionate split (%)	3.18%	22.40%	25.23%		0.00%	8.77%	0.00%	14.00%	27.00%	0.00%	24.00%	32.26%		40%	21.77%		
Building and equipment																**0.54%**	**1.45%**
External grant funding proportionate split (%)																	
Other sources funding proportionate split (%)			14.45%														
Control %																	
External grant funding % of water service budget	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**
Other sources % of water service budget	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**
External grant funding proportion between:																	
Rehabilitation of water services infrastructure %	0.00%	31.30%	64.50%	22.90%	25.00%	100.00%	3.33%	0.00%	0.00%	64.00%	40.00%	56.52%	0.00%	8.00%	9.31%	28%	34%
New capital: networks %	98.23%	40.30%	6.68%	39.30%	0.00%	0.00%	65.56%	62.00%	0.00%	1.00%	2.00%	0.00%	0.00%	0.00%	7.14%	21%	31%
New capital: sanitation facilities %	0.00%	23.40%	0.00%	0.00%	75.00%	0.00%	30.00%	16.00%	0.00%	1.00%	2.00%	0.00%	0.00%	0.00%	23.62%	13%	10%
New Capital: bulk water supply and bulk sewerage %	1.77%	5.00%	28.82%	37.80%	0.00%	0.00%	1.11%	22.00%	0.00%	34.00%	56.00%	43.48%	100.00%	92.00%	59.93%	37%	26%
Building and equipment %																	
Total	100%	100%	100%	100%	100%	100%	100%	100%	0%	100%	100%	100%	100%	100%	100%	100%	100%
Other sources proportion split between:																	
Rehabilitation of water services infrastructure %	42.02%	59.90%	48.87%	24.81%	0.00%	91.23%	0.00%	31.00%	16.00%	2.00%	25.00%	67.74%	0.00%	0.00%	37.73%	37%	38%
New capital: networks %	54.80%	14.50%	7.54%	75.19%	0.00%	0.00%	0.00%	23.00%	9.00%	98.00%	21.00%	0.00%	0.00%	60.00%	22.46%	26%	39%
New capital: sanitation facilities %	0.00%	3.20%	3.91%	0.00%	100.00%	0.00%	0.00%	32.00%	48.00%	0.00%	30.00%	0.00%	0.00%	0.00%	18.04%	20%	5%
New Capital: bulk water supply and bulk sewerage %	3.18%	22.40%	25.23%	0.00%	0.00%	8.77%	0.00%	14.00%	27.00%	0.00%	24.00%	32.26%	0.00%	40.00%	21.77%	17%	15%
Building and equipment %	0.00%	0.00%	14.45%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1%	3%
Total	100%	100%	100%	100%	100%	100%	0%	100%	100%	100%	100%	100%	0%	100%	100%	100%	100%

The eThekwini and Ekurhuleni Metropolitan Municipalities funded 75% of their capital budget from external loan financing.

Such reliance on external loans to fund the capital programme may not be sustainable, especially if there is no direct return on investment. An additional burden will be created for future consumers without improving the quality of service to this group.

5.6.2 Portion of the overall capital budget allocated to water services

The overall capital budget for the sample municipalities during the 2009/10 financial year was R19 329 million (Table 5.13), of which R2 986 million was allocated to water services (15% of the overall capital budget). The metropolitan municipalities provided less of the total capital budget to fund water service capital needs. The overall capital budget for the 5 sample metropolitan municipalities amounted to R16 970 million of which R2 244 million (13%) was allocated to water services.

5.6.3 Significance of the water service capital budget

Utilising the 2001 Census population statistics of the sample municipalities (Statistics South Africa, 2001), per capita investment in water services was R220 for the 2009/10 financial year, and R218 for the sample metropolitan municipalities.

The per capita investment includes the investment in the rehabilitation of water service infrastructure, new infrastructure assets for networks, sanitation facilities, bulk water supply and bulk sanitation/sewerage treatment.

5.6.4 Allocation of the water services capital budget

The annual water services capital budget is allocated to rehabilitation of water service infrastructure, new infrastructure assets for networks, sanitation facilities, bulk water supply and bulk sanitation/sewerage treatment.

The water services capital budget allocation for the 2009/10 financial year is shown in Table 5.13. Of the total water services capital budget for the sample municipalities, 32.27% was allocated to rehabilitation of water service infrastructure, 26.21% to new infrastructure assets for networks, 15.04% to new capital for sanitation facilities and 25.95% to new capital to support bulk water and sanitation/sewerage.

Of the total water service capital budget for the sample metropolitan municipalities, 35.96% was allocated to rehabilitation of water service infrastructure, 35.07% to new infrastructure assets for networks, 7.32% to new capital for sanitation facilities and 20.21% to new capital to support bulk water and sanitation/sewerage.

The sample metropolitan municipalities allocated more of the water service funding to maintenance and rehabilitation of water service infrastructure assets than the overall sample of municipalities. A total of 35.96% was allocated by the sample metropolitan municipalities to backlogs compared to

the 32.27% allocated by the overall sample of municipalities. The second highest funding priority for the sample metropolitan municipalities was new network infrastructure assets. A total of 35.07% was allocated by sample metropolitan municipalities to new network infrastructure assets compared to the 26.71% allocated by the overall sample municipalities. Investments of this nature rarely produce a return on capital to support the sustainability of the water service.

Less capital was allocated to new sewerage/sanitation, bulk water supply and bulk sanitation/sewerage by the sample metropolitan municipalities compared to the overall sample of municipalities. A total allocation of 27.53% (7.32% + 20.21%) was made by the sample metropolitan municipalities to this specific infrastructure need as against 40.99% (15.04% + 25.95%) by the overall sample of municipalities.

5.6.5 Analysis of water services capital funding allocations

External grant funding has the lowest impact on the operating cost of the service. External grant funding supporting the water service capital needs of the sample municipalities was allocated to rehabilitation of water service infrastructure (28.32%), new capital for networks (21.48%), sanitation facilities (13.16%) and new bulk infrastructure for water and sanitation/sewerage (37.07%), (see Table 5.13).

The sample metropolitan municipalities allocated external grant funding for water services to rehabilitation of water service infrastructure (33.82%), new capital for networks (30.67%), sanitation facilities (9.6%) and new bulk infrastructure for water and sanitation/sewerage (25.90%).

The remaining sources of funding have varying cost impacts on the operating budget of the water service. The more expensive sources of capital funding were allocated by the sample municipalities to rehabilitation of water service infrastructure (37.19%), new capital for networks (25.70%), sanitation facilities (19.6%) and new bulk infrastructure for water and sanitation/sewerage (16.82%).

The sample metropolitan municipalities allocated the more expensive sources of funding for water services to rehabilitation of water service infrastructure (38.10%), new capital for networks (39.46%), sanitation facilities (5.03%) and new bulk infrastructure for water and sanitation/sewerage (14.52%).

5.6.6 Spending of the capital budget for water services

The spending of a capital budget is a proxy indicator of whether the infrastructure is in place or not to support the water service plans adopted by a municipality.

The sample municipality’s water service capital budget spending levels for the 2009/10 financial year are shown in Table 5.13. During this financial year, 84% of the capital budget of the sample municipalities was spent, however sample metropolitan municipalities were able to spend 98% of the capital budget for the same year.

Although the sample metropolitan municipalities were able to record a high level of spending of the budget for the 2009/10 financial year, the Buffalo City and Nelson Mandela Metropolitan Municipalities, respectively, were able to spend only 72% and 81.5%. The level of spending on water service capital in excess of budget by the eThekwini Metropolitan Municipality compensated for the under spending by the balance of the sample metropolitan municipalities. The eThekwini Metropolitan Municipality spent 45% more than the original capital budget for water services. In order to achieve this result the municipality would have sacrificed surplus funds in the following two years. A municipality may overspend on the current year capital budget within the MTREF if funding is secured in outer two years of the MTREF and cash is available. In this case, the eThekwini Metropolitan Municipality used surplus cash to work ahead of the Aquaduct project schedule. This project will supply water to the northern part of the metropolitan area which includes the new airport.

5.7 MANAGEMENT OF OPERATING BUDGETS

A municipality performs the functions that are prescribed by The Constitution of South Africa (1996), Schedule 4B. The water service function is one of these functions. All functions performed by local government have an operating and capital budget. A municipality must financially ring-fence the various functions performed. Ring-fencing is required in order to enable the municipality to determine the operating income and expenses per service and to account for the assets and liabilities of the functions separately from each other. Once functions are accounted for in this manner, it increases the municipality's ability to accurately calculate a cost recovery tariff structure.

The water service of a municipality consists of raw water extraction, purification, potable water distribution, wastewater collection and wastewater purification.

A water service's operating costs consist of variable, fixed and transfer costs. The operating income consists of consumptive, availability charges, government grants and other income.

The total operating cost for the potable water and sanitation services for all of the 15 sample municipalities is shown in Table 5.14. The operating expenditure budget for the 2009/10 financial year was R8 140 million for the potable water service and R2 899 million for the sanitation service. The operating income budget for the potable water and sanitation services for the same period was R8 287 million for the potable water service and R3 019 million for the sanitation service.

Operating expenditure and income budgets for the 2009/10 financial year of the water service of the sample municipalities is shown in Tables 5.14 to 5.23. Operating budget information for the different categories of the sample municipalities is shown in Tables 5.15 to 5.17. Operating budget information for the different provinces in which the sample municipalities undertake the water service, is shown in Tables 5.18 to 5.23.

Table 5.14: Consolidated operating budget of 15 sample municipalities

2009/10 FINANCIAL YEAR	TOTAL		TOTAL						TOTAL
	Water Actual	Sanitation Actual	Water - Original Budgeted	Sanitation- Original Budgeted	% Potable water budget spent	% Sanitation budget spent	Water Actual as % Exp/Inc of Total Exp/Inc	Sanitation Actual as % Exp/Inc of Total Exp/Inc	Water + Sanitation Actual as % Exp/Inc of Total Exp/Inc
Operating Costs									
Variable Costs	**2,265,015,531**	**1,183,786,380**	**2,105,717,176**	**1,183,790,521**	**107.57**	**100.00**	**27.83**	**40.83**	**31.24**
Repairs and maintenance of infrastructure and other fixed assets	1,167,597,196	620,536,629	1,076,801,807	612,493,971	108.43	101.31	14.34	21.40	16.20
Administrative and service costs	474,139,026	309,159,572	423,414,493	280,243,905	111.98	110.32	5.82	10.66	7.10
Interdepartmental costs (Budget and Treasury, Corporate Service, legal costs, etc)	620,021,500	251,671,911	602,089,362	288,962,962	102.98	87.09	7.62	8.68	7.90
Contribution to the self insurance fund	1,302,514	1,576,219	1,795,667	1,575,105	72.54	100.07	0.02	0.05	0.03
Transfer to COID	1,955,295	842,049	1,615,847	514,578	121.01	163.64	0.02	0.03	0.03
	-	-	-	-					
Fixed Costs	**5,062,049,314**	**1,219,249,403**	**5,075,888,565**	**1,334,069,988**	**99.73**	**91.39**	**62.19**	**42.06**	**56.90**
Bulk Water costs	2,935,822,536	265,903,670	2,968,527,310	265,295,375	98.90	100.23	36.07	9.17	29.00
Contribution to the capital replacement reserve	163,862,749	75,387,399	71,190,777	25,072,790	230.17	300.67	2.01	2.60	2.17
Administrative overheads	843,147,890	486,061,425	942,855,827	554,826,466	89.42	87.61	10.36	16.77	12.04
Finance charge costs	350,586,779	80,490,972	414,859,121	145,714,610	84.51	55.24	4.31	2.78	3.90
Depreciation costs	768,629,359	311,405,937	678,455,530	343,160,747	113.29	90.75	9.44	10.74	9.78
	-	-	-	-					
Cost of transfers	**813,147,401**	**496,098,689**	**573,291,970**	**329,058,821**	**141.84**	**150.76**	**9.99**	**17.11**	**11.86**
ATTP cost of relief - varies according to consumption	55,751,068	61,998,833	46,982,960	62,062,680	118.66	99.90	0.68	2.14	1.07
Assets as a result of public contributions and donations	2,527,054	-	9,782,377	-	25.83		0.03	0.00	0.02
Contribution to GGR - Assets	146,570,576	257,845,988	31,296,297	159,074,905	468.33	162.09	1.80	8.89	3.66
Provision for non-payment of services by consumers	697,896,866	156,897,678	394,430,726	98,114,676	176.94	159.91	8.57	5.41	7.74
Cross-subsidisation (Rate and General or other service)	-89,598,163	19,356,190	90,799,610	9,806,560	-98.68	197.38	-1.10	0.67	-0.64
Planned result (surplus/loss/break even)	-	-	-	-					
TOTAL OPERATING EXPENDITURE [A]	**8,140,212,246**	**2,899,134,473**	**7,754,897,711**	**2,846,919,331**	**104.97**	**101.83**			
Proportion of Total Service	**74%**	**26%**	**73%**	**27%**					
Operating Income									
Consumptive Income	**5,913,900,987**	**1,823,308,742**	**6,192,904,627**	**1,964,412,313**	**95.49**	**92.82**	**71.36**	**60.39**	**81.50**
Availability Charges	450,266,972	75,695,523	463,680,773	56,607,087	97.11	133.72	5.43	2.51	5.54
Kouga Municipality	8,922,407	-	11,964,690	-	74.57		0.11	0.00	0.09
Metered when not categorised	166,039,313	49,765,192	164,292,100	49,859,125	101.06	99.81	2.00	1.65	2.27
Metered Charges Within - Commercial	1,571,069,842	222,685,846	1,613,224,990	273,694,123	97.39	81.36	18.96	7.38	18.89
Metered Charges Within - Industrial	42,669,358	31,898,127	38,472,380	32,784,730	110.91	97.30	0.51	1.06	0.79
Metered Charges Within - Residential	2,989,580,607	1,044,870,049	3,174,540,295	1,109,084,037	94.17	94.21	36.07	34.61	42.50
Metered Charges Outside Industry and Commerce	281,434,474	268,746,561	311,557,746	294,453,634	90.33	91.27	3.40	8.90	5.80
Metered Charges Outside - Residential	92,021,315	87,078,420	94,023,144	87,646,159	97.87	99.35	1.11	2.88	1.89
Other Consumers	311,005,441	42,569,023	320,293,229	60,283,418	97.10	70.61	3.75	1.41	3.72
Reclaimed Water	891,259	-	855,280	-	104.21		0.01	0.00	0.01
	-	-	-	-			0.00	0.00	0.00
Interest Earned - Outstanding Debtors	342,326,443	96,616,580	354,203,350	92,267,000	96.65	104.71	4.13	3.20	4.62
	-	-	-	-			0.00	0.00	0.00
Government Grants and Subsidies National Government -E-share ATTP	498,706,637	299,889,151	400,378,501	273,443,861	124.56	109.67	6.02	9.93	8.41
Government Grants and Subsidies National Government - GGR Revenue	273,328,832	247,401,581	161,166,019	250,937,146	169.59	98.59	3.30	8.19	5.49
Government Grants and Subsidies National Government - DWAF	46,499,968	151,000	34,091,168	2,693,000	136.40	5.61	0.56	0.01	0.49
	1,842	-	-	6,300			0.00	0.00	0.00
Rental of facilities and equipment	3,488,978	4,688,816	3,354,310	4,734,000	104.01	99.05	0.04	0.16	0.09
	-	-	-	-					
Other Income	**1,209,070,309**	**547,247,068**	**1,122,528,531**	**530,127,839**	**107.71**	**103.23**	**14.59**	**18.12**	**18.50**
Sundry Income	310,666,108	101,613,650	234,597,632	94,391,126	132.43	107.65	3.75	3.37	4.34
Public contribution & Donations Revenue	10,078,926	2,655,298	13,121,358	5,153,503	76.81	51.52	0.12	0.09	0.13
Internal charges Distribution Statements	751,022,772	135,390,168	765,417,746	150,201,134	98.12	90.14	9.06	4.48	9.34
Other Internal service Charges	71,420,133	37,869,560	51,125,432	24,848,002	139.70	152.40	0.86	1.25	1.15
Future Depreciation -CR & DPC	65,584,993	64,024,880	23,395,630	33,841,090	280.33	189.19	0.79	2.12	1.37
Contribution from the self insurance fund	243,142	354,369	-	-			0.00	0.01	0.01
Transfer from COID	54,235	52,766	-	-			0.00	0.00	0.00
GGR depreciation	-	-	34,870,733	44,633,570	-	-	0.00	0.00	0.00
Pail Service	-	17,466,611	-	18,217,360		95.88	0.00	0.58	0.18
Trade Effluent	-	187,819,766	-	158,842,054		118.24	0.00	6.22	1.98
	-	-	-	-					
TOTAL OPERATING INCOME [B]	**8,287,323,995**	**3,019,302,938**	**8,268,626,506**	**3,118,621,459**	**100.23**	**96.82**			
Profit/ (Loss)	147,111,749	120,168,465	513,728,795	271,702,129	28.64	44.23			

Table 5.15: Consolidated operating budget of 5 sample metropolitan municipalities

2009/10 FINANCIAL YEAR	TOTAL		TOTAL						TOTAL
	Water Actual	Sanitation Actual	Water - Original Budgeted	Sanitation- Original Budgeted	% Potable water budget spent	% Sanitation budget spent	Water Actual as % Exp/Inc of Total Exp/Inc	Sanitation Actual as % Exp/Inc of Total Exp/Inc	Water + Sanitation Actual as % Exp/Inc of Total Exp/Inc
Operating Costs									
Variable Costs	**1,976,051,857**	**1,026,238,676**	**1,802,674,312**	**1,015,520,684**	**109.62**	**101.06**	**27.58**	**41.02**	**31.06**
Repairs and maintenance of infrastructure and other fixed assets	1,043,255,113	556,320,513	966,019,177	551,897,116	108.00	100.80	14.56	22.24	16.55
Administrative and service costs	377,677,738	240,101,123	313,733,583	215,729,250	120.38	111.30	5.27	9.60	6.39
Interdepartmental costs (Budget and Treasury, Corporate Service, legal costs, etc)	551,941,197	227,438,772	519,590,038	245,844,635	106.23	92.51	7.70	9.09	8.06
Contribution to the self insurance fund	1,222,514	1,536,219	1,715,667	1,535,105	71.26	100.07	0.02	0.06	0.03
Transfer to COID	1,955,295	842,049	1,615,847	514,578	121.01	163.64	0.03	0.03	0.03
	-	-	-	-					
Fixed Costs	**4,440,555,711**	**1,002,372,918**	**4,444,494,299**	**1,076,914,786**	**99.91**	**93.08**	**61.97**	**40.07**	**56.30**
Bulk Water costs	2,637,837,548	265,870,140	2,675,740,386	265,246,000	98.58	100.24	36.81	10.63	30.04
Contribution to the capital replacement reserve	162,546,914	72,047,240	69,779,977	21,657,190	232.94	332.67	2.27	2.88	2.43
Administrative overheads	723,681,779	369,024,063	760,772,863	397,726,489	95.12	92.78	10.10	14.75	11.30
Finance charge costs	301,912,673	63,044,159	368,806,499	119,616,971	81.86	52.71	4.21	2.52	3.78
Depreciation costs	614,576,797	232,387,316	569,394,574	272,668,136	107.94	85.23	8.58	9.29	8.76
	-	-	-	-					
Cost of transfers	**749,359,790**	**472,907,543**	**503,280,057**	**306,512,340**	**148.90**	**154.29**	**10.46**	**18.90**	**12.64**
ATTP cost of relief - varies according to consumption	52,759,582	61,848,062	45,482,960	61,997,680	116.00	99.76	0.74	2.47	1.19
Assets as a result of public contributions and donations	2,527,054	-	9,782,377	-	25.83		0.04	0.00	0.03
Contribution to GGR - Assets	146,570,576	257,845,988	31,296,297	159,074,905	468.33	162.09	2.05	10.31	4.18
Provision for non-payment of services by consumers	637,678,217	133,857,303	325,918,813	75,633,195	195.66	176.98	8.90	5.35	7.98
Cross-subsidisation (Rate and General or other service)	-90,175,639	19,356,190	90,799,610	9,806,560	-99.31	197.38	-1.26	0.77	-0.73
Planned result (surplus/loss/break even)	-	-	-	-					
TOTAL OPERATING EXPENDITURE [A]	**7,165,967,357**	**2,501,519,138**	**6,750,448,668**	**2,398,947,811**	**106.16**	**104.28**			
Proportion of Total Service	**74%**	**26%**	**74%**	**26%**					
Operating Income									
Consumptive Income	**5,282,383,142**	**1,536,404,339**	**5,579,804,727**	**1,678,464,153**	**94.67**	**91.54**	**73.60**	**60.03**	**82.66**
Availability Charges	395,001,654	5,758,075	389,690,488	11,284,392	101.36	51.03	5.50	0.22	4.86
Kouga Municipality	8,922,407	-	11,964,690	-	74.57		0.12	0.00	0.11
Metered when not categorised	-	-	-	-			0.00	0.00	0.00
Metered Charges Within - Commercial	1,393,506,150	156,074,276	1,462,555,870	198,352,612	95.28	78.69	19.41	6.10	18.78
Metered Charges Within - Industrial	42,669,358	31,898,127	38,472,380	32,784,730	110.91	97.30	0.59	1.25	0.90
Metered Charges Within - Residential	2,914,313,705	983,812,928	3,101,754,481	1,049,282,726	93.96	93.76	40.60	38.44	47.26
Metered Charges Outside Industry and Commerce	281,434,474	268,746,561	311,557,746	294,453,634	90.33	91.27	3.92	10.50	6.67
Metered Charges Outside - Residential	92,021,315	87,078,420	94,023,144	87,646,159	97.87	99.35	1.28	3.40	2.17
Other Consumers	153,622,821	3,035,952	168,930,648	4,659,900	90.94	65.15	2.14	0.12	1.90
Reclaimed Water	891,259	-	855,280	-	104.21		0.01	0.00	0.01
	-	-	-	-			0.00	0.00	0.00
Interest Earned - Outstanding Debtors	327,727,908	95,198,807	352,653,350	91,117,000	92.93	104.48	4.57	3.72	5.13
	-	-	-	-			0.00	0.00	0.00
Government Grants and Subsidies National Government -E-share ATTP	366,200,373	252,090,627	355,170,704	247,523,030	103.11	101.85	5.10	9.85	7.50
Government Grants and Subsidies National Government - GGR Revenue	186,667,243	219,441,701	93,211,019	211,572,496	200.26	103.72	2.60	8.57	4.92
Government Grants and Subsidies National Government - DWAF	32,207,768	151,000	19,789,168	293,000	162.75	51.54	0.45	0.01	0.39
	1,842	-	-	6,300			0.00	0.00	0.00
Rental of facilities and equipment	3,488,978	4,686,671	3,354,310	4,732,000	104.01	99.04	0.05	0.18	0.10
	-	-	-	-					
Other Income	**978,810,917**	**451,471,507**	**944,727,822**	**444,340,236**	**103.61**	**101.60**	**13.64**	**17.64**	**17.34**
Sundry Income	106,592,880	35,914,172	81,051,967	34,710,132	131.51	103.47	1.49	1.40	1.73
Public contribution & Donations Revenue	10,078,926	-	13,121,358	-	76.81		0.14	0.00	0.12
Internal charges Distribution Statements	750,363,768	134,423,801	765,417,746	150,201,134	98.03	89.50	10.45	5.25	10.73
Other Internal service Charges	45,892,973	31,845,254	26,870,388	19,209,896	170.79	165.78	0.64	1.24	0.94
Future Depreciation -CR & DPC	65,584,993	64,024,880	23,395,630	33,841,090	280.33	189.19	0.91	2.50	1.57
Contribution from the self insurance fund	243,142	354,369	-	-			0.00	0.01	0.01
Transfer from COID	54,235	52,766	-	-			0.00	0.00	0.00
GGR depreciation	-	-	34,870,733	44,633,570	-	-	0.00	0.00	0.00
Pail Service	-	17,466,611	-	18,217,360		95.88	0.00	0.68	0.21
Trade Effluent	-	167,389,655	-	143,527,054		116.63	0.00	6.54	2.03
	-	-	-	-					
TOTAL OPERATING INCOME [B]	**7,177,488,171**	**2,559,444,652**	**7,348,711,100**	**2,678,048,215**	**97.67**	**95.57**			
Profit/ (Loss)	11,520,814	57,925,514	598,262,432	279,100,405	1.93	20.75			

Table 5.16: Consolidated operating budget of 9 sample local municipalities

2009/10 FINANCIAL YEAR	TOTAL		TOTAL						TOTAL
	Water Actual	Sanitation Actual	Water - Original Budgeted	Sanitation- Original Budgeted	% Potable water budget spent	% Sanitation budget spent	Water Actual as % Exp/Inc of Total Exp/Inc	Sanitation Actual as % Exp/Inc of Total Exp/Inc	Water + Sanitation Actual as % Exp/Inc of Total Exp/Inc
Operating Costs									
Variable Costs	**272,405,603**	**149,937,954**	**253,693,258**	**157,420,903**	**107.38**	**95.25**	**31.48**	**40.66**	**34.23**
Repairs and maintenance of infrastructure and other fixed assets	107,784,012	56,606,366	90,740,024	49,747,921	118.78	113.79	12.46	15.35	13.32
Administrative and service costs	96,461,288	69,058,449	96,317,910	64,514,655	100.15	107.04	11.15	18.73	13.41
Interdepartmental costs (Budget and Treasury, Corporate Service, legal costs, etc)	68,080,303	24,233,139	66,555,324	43,118,327	102.29	56.20	7.87	6.57	7.48
Contribution to the self insurance fund	80,000	40,000	80,000	40,000	100.00	100.00	0.01	0.01	0.01
Transfer to COID	-	-	-	-			0.00	0.00	0.00
	-	-	-	-					
Fixed Costs	**561,222,872**	**216,658,808**	**557,511,492**	**236,762,805**	**100.67**	**91.51**	**64.87**	**58.75**	**63.04**
Bulk Water costs	262,684,638	33,530	245,514,041	49,375	106.99	67.91	30.36	0.01	21.29
Contribution to the capital replacement reserve	1,315,835	3,340,159	1,410,800	3,415,600	93.27	97.79	0.15	0.91	0.38
Administrative overheads	119,466,111	117,037,362	182,082,964	157,099,977	65.61	74.50	13.81	31.74	19.17
Finance charge costs	48,674,106	17,446,813	46,052,622	26,097,639	105.69	66.85	5.63	4.73	5.36
Depreciation costs	129,082,183	78,800,944	82,451,065	50,100,214	156.56	157.29	14.92	21.37	16.85
	-	-	-	-					
Cost of transfers	**31,577,282**	**2,157,471**	**20,688,330**	**1,512,800**	**152.63**	**142.61**	**3.65**	**0.59**	**2.73**
ATTP cost of relief - varies according to consumption	2,991,486	150,771	1,500,000	65,000	199.43	231.96	0.35	0.04	0.25
Assets as a result of public contributions and donations	-	-	-	-			0.00	0.00	0.00
Contribution to GGR - Assets	-	-	-	-			0.00	0.00	0.00
Provision for non-payment of services by consumers	28,008,320	2,006,700	19,188,330	1,447,800	145.97	138.60	3.24	0.54	2.43
Cross-subsidisation (Rate and General or other service)	577,476	-	-	-			0.07	0.00	0.05
Planned result (surplus/loss/break even)	-	-	-	-					
TOTAL OPERATING EXPENDITURE [A]	**865,205,758**	**368,754,233**	**831,893,080**	**395,696,508**	**104.00**	**93.19**			
Proportion of Total Service	**70%**	**30%**	**68%**	**32%**					
Operating Income									
Consumptive Income	**579,521,246**	**253,886,521**	**566,615,981**	**256,244,396**	**102.28**	**99.08**	**57.58**	**60.16**	**71.94**
Availability Charges	51,533,501	41,882,018	52,182,466	38,307,271	98.76	109.33	5.12	9.92	8.06
Kouga Municipality	-	-	-	-			0.00	0.00	0.00
Metered when not categorised	166,039,313	49,765,192	164,292,100	49,859,125	101.06	99.81	16.50	11.79	18.63
Metered Charges Within - Commercial	177,563,693	66,611,570	150,669,120	75,341,511	117.85	88.41	17.64	15.78	21.08
Metered Charges Within - Industrial	-	-	-	-			0.00	0.00	0.00
Metered Charges Within - Residential	75,266,902	61,057,121	72,785,814	59,801,311	103.41	102.10	7.48	14.47	11.77
Metered Charges Outside Industry and Commerce	-	-	-	-			0.00	0.00	0.00
Metered Charges Outside - Residential	-	-	-	-			0.00	0.00	0.00
Other Consumers	109,117,837	34,570,620	126,686,481	32,935,178	86.13	104.97	10.84	8.19	12.40
Reclaimed Water	-	-	-	-			0.00	0.00	0.00
	-	-	-	-			0.00	0.00	0.00
Interest Earned - Outstanding Debtors	982,610	1,417,773	1,550,000	1,150,000	63.39	123.28	0.10	0.34	0.21
	-	-	-	-			0.00	0.00	0.00
Government Grants and Subsidies National Government -E-share ATTP	108,791,974	43,639,185	21,493,507	21,761,492	506.16	200.53	10.81	10.34	13.16
Government Grants and Subsidies National Government - GGR Revenue	86,661,589	27,959,880	67,955,000	39,364,650	127.53	71.03	8.61	6.63	9.89
Government Grants and Subsidies National Government - DWAF	550,000	-	1,900,000	2,400,000	28.95	-	0.05	0.00	0.05
	-	-	-	-			0.00	0.00	0.00
Rental of facilities and equipment	-	2,145	-	2,000		107.25	0.00	0.00	0.00
	-	-	-	-					
Other Income	**230,021,491**	**95,124,258**	**167,750,183**	**85,229,030**	**137.12**	**111.61**	**22.85**	**22.54**	**28.06**
Sundry Income	203,835,327	65,048,176	143,495,139	59,122,421	142.05	110.02	20.25	15.41	23.21
Public contribution & Donations Revenue	-	2,655,298	-	5,153,503		51.52	0.00	0.63	0.23
Internal charges Distribution Statements	659,004	966,367	-	-			0.07	0.23	0.14
Other Internal service Charges	25,527,160	6,024,307	24,255,044	5,638,106	105.24	106.85	2.54	1.43	2.72
Future Depreciation -CR & DPC	-	-	-	-			0.00	0.00	0.00
Contribution from the self insurance fund	-	-	-	-			0.00	0.00	0.00
Transfer from COID	-	-	-	-			0.00	0.00	0.00
GGR depreciation	-	-	-	-			0.00	0.00	0.00
Pail Service	-	-	-	-			0.00	0.00	0.00
Trade Effluent	-	20,430,111	-	15,315,000		133.40	0.00	4.84	1.76
	-	-	-	-					
TOTAL OPERATING INCOME [B]	**1,006,528,910**	**422,029,763**	**827,264,671**	**406,151,568**	**121.67**	**103.91**			
Profit/ (Loss)	141,323,153	53,275,530	-4,628,409	10,455,060	-3,053.39	509.57			

Table 5.17: Consolidated operating budget of 1 sample district municipality

2009/10 FINANCIAL YEAR	TOTAL		TOTAL						TOTAL
	Water Actual	Sanitation Actual	Water - Original Budgeted	Sanitation- Original Budgeted	% Potable water budget spent	% Sanitation budget spent	Water Actual as % Exp/Inc of Total Exp/Inc	Sanitation Actual as % Exp/Inc of Total Exp/Inc	Water + Sanitation Actual as % Exp/Inc of Total Exp/Inc
Operating Costs									
Variable Costs	**16,558,071**	**7,609,750**	**20,042,606**	**10,848,934**	**82.61**	**70.14**	**15.19**	**26.37**	**17.53**
Repairs and maintenance of infrastructure and other fixed assets	16,558,071	7,609,750	20,042,606	10,848,934	82.61	70.14	15.19	26.37	17.53
Administrative and service costs	-	-	-	-			0.00	0.00	0.00
Interdepartmental costs (Budget and Treasury, Corporate Service, legal costs, etc)	-	-	-	-			0.00	0.00	0.00
Contribution to the self insurance fund	-	-	-	-			0.00	0.00	0.00
Transfer to COID	-	-	-	-			0.00	0.00	0.00
Fixed Costs	**60,270,730**	**217,677**	**73,882,774**	**20,392,397**	**81.58**	**1.07**	**55.27**	**0.75**	**43.86**
Bulk Water costs	35,300,351	-	47,272,883	-	74.67		32.37	0.00	25.60
Contribution to the capital replacement reserve	-	-	-	-			0.00	0.00	0.00
Administrative overheads	-	-	-	-			0.00	0.00	0.00
Finance charge costs	-	-	-	-			0.00	0.00	0.00
Depreciation costs	24,970,379	217,677	26,609,891	20,392,397	93.84	1.07	22.90	0.75	18.27
Cost of transfers	**32,210,329**	**21,033,675**	**49,323,583**	**21,033,681**	**65.30**	**100.00**	**29.54**	**72.88**	**38.61**
ATTP cost of relief - varies according to consumption							0.00	0.00	0.00
Assets as a result of public contributions and donations							0.00	0.00	0.00
Contribution to GGR - Assets							0.00	0.00	0.00
Provision for non-payment of services by consumers	32,210,329	21,033,675	49,323,583	21,033,681	65.30	100.00	29.54	72.88	38.61
Cross-subsidisation (Rate and General or other service)							0.00	0.00	0.00
Planned result (surplus/loss/break even)									
TOTAL OPERATING EXPENDITURE [A]	**109,039,131**	**28,861,102**	**143,248,963**	**52,275,012**	**76.12**	**55.21**			
Proportion of Total Service	**79%**	**21%**	**73%**	**27%**					
Operating Income									
Consumptive Income	**51,996,598.79**	**33,017,881.84**	**46,483,919.00**	**29,703,764.00**	**111.86**	**111.16**	**50.33**	**87.28**	**98.96**
Availability Charges	3,731,816	28,055,430	21,807,819	7,015,424	17.11	399.91	3.61	74.16	37.00
Kouga Municipality							0.00	0.00	0.00
Metered when not categorised							0.00	0.00	0.00
Metered Charges Within - Commercial							0.00	0.00	0.00
Metered Charges Within - Industrial							0.00	0.00	0.00
Metered Charges Within - Residential							0.00	0.00	0.00
Metered Charges Outside Industry and Commerce							0.00	0.00	0.00
Metered Charges Outside - Residential							0.00	0.00	0.00
Other Consumers	48,264,782	4,962,452	24,676,100	22,688,340	195.59	21.87	46.72	13.12	61.96
Reclaimed Water							0.00	0.00	0.00
							0.00	0.00	0.00
Interest Earned - Outstanding Debtors	13,615,924	-	-	-			13.18	0.00	15.85
							0.00	0.00	0.00
Government Grants and Subsidies National Government -E-share ATTP	23,714,290	4,159,339	23,714,290	4,159,339	100.00	100.00	22.96	11.00	32.45
Government Grants and Subsidies National Government - GGR Revenue							0.00	0.00	0.00
Government Grants and Subsidies National Government - DWAF	13,742,200	-	12,402,000	-	110.81		13.30	0.00	16.00
							0.00	0.00	0.00
Rental of facilities and equipment	-	-	-	-			0.00	0.00	0.00
Other Income	**237,901**	**651,302**	**10,050,526**	**558,573**	**2.37**	**116.60**	**0.23**	**1.72**	**1.04**
Sundry Income	237,901	651,302	10,050,526	558,573	2.37	116.60	0.23	1.72	1.04
Public contribution & Donations Revenue							0.00	0.00	0.00
Internal charges Distribution Statements							0.00	0.00	0.00
Other Internal service Charges							0.00	0.00	0.00
Future Depreciation -CR & DPC							0.00	0.00	0.00
Contribution from the self insurance fund							0.00	0.00	0.00
Transfer from COID							0.00	0.00	0.00
GGR depreciation							0.00	0.00	0.00
Pail Service							0.00	0.00	0.00
Trade Effluent							0.00	0.00	0.00
TOTAL OPERATING INCOME [B]	**103,306,913.79**	**37,828,523.08**	**92,650,735.00**	**34,421,676.00**	**111.50**	**109.90**			
Profit/ (Loss)	-5,732,217	8,967,421	-50,598,228	-17,853,336	11.33	-50.23			

Table 5.18: Consolidated operating budget of sample Western Cape municipalities

2009/10 FINANCIAL YEAR	TOTAL		TOTAL						TOTAL
	Water Actual	Sanitation Actual	Water - Original Budgeted	Sanitation- Original Budgeted	% Potable water budget spent	% Sanitation budget spent	Water Actual as % Exp/Inc of Total Exp/Inc	Sanitation Actual as % Exp/Inc of Total Exp/Inc	Water + Sanitation Actual as % Exp/Inc of Total Exp/Inc
Operating Costs									
Variable Costs	**423,124,328**	**262,550,731**	**394,363,725**	**300,843,244**	**107.29**	**87.27**	**28.41**	**42.88**	**32.63**
Repairs and maintenance of infrastructure and other fixed assets	219,888,749	123,316,722	190,123,025	138,143,263	115.66	89.27	14.77	20.14	16.33
Administrative and service costs	4,850,691	14,648,228	-	-			0.33	2.39	0.93
Interdepartmental costs (Budget and Treasury, Corporate Service, legal costs, etc)	196,654,616	124,115,612	202,749,377	162,291,090	96.99	76.48	13.21	20.27	15.26
Contribution to the self insurance fund	41,713	28,109	-	20,703		135.77	0.00	0.00	0.00
Transfer to COID	1,688,559	442,060	1,491,323	388,188	113.23	113.88	0.11	0.07	0.10
	-	-	-	-					
Fixed Costs	**860,749,318**	**162,587,945**	**775,199,314**	**181,739,026**	**111.04**	**89.46**	**57.80**	**26.55**	**48.70**
Bulk Water costs	310,412,926	-	297,838,446	-	104.22		20.85	0.00	14.77
Contribution to the capital replacement reserve	115,631,094	14,974,700	23,826,497	7,945,560	485.30	188.47	7.77	2.45	6.22
Administrative overheads	101,922,937	34,950,701	141,518,292	71,255,646	72.02	49.05	6.84	5.71	6.51
Finance charge costs	135,476,672	13,239,027	152,291,202	17,018,568	88.96	77.79	9.10	2.16	7.08
Depreciation costs	197,305,689	99,423,517	159,724,877	85,519,252	123.53	116.26	13.25	16.24	14.12
	-	-	-	-					
Cost of transfers	**205,242,304**	**187,182,780**	**43,078,674**	**160,274,905**	**476.44**	**116.79**	**13.78**	**30.57**	**18.67**
ATTP cost of relief - varies according to consumption	-	-	-	-			0.00	0.00	0.00
Assets as a result of public contributions and donations	2,527,054	-	9,782,377	-	25.83		0.17	0.00	0.12
Contribution to GGR - Assets	33,346,531	141,189,159	31,296,297	159,074,905	106.55	88.76	2.24	23.06	8.31
Provision for non-payment of services by consumers	169,368,719	45,993,621	2,000,000	1,200,000	8,468.44	3,832.80	11.37	7.51	10.25
Cross-subsidisation (Rate and General or other service)	-	-	-	-			0.00	0.00	0.00
Planned result (surplus/loss/break even)	-	-	-	-					
TOTAL OPERATING EXPENDITURE [A]	**1,489,115,950**	**612,321,456**	**1,212,641,713**	**642,857,175**	**122.80**	**95.25**			
Proportion of Total Service	**71%**	**29%**	**65%**	**35%**					
Operating Income									
Consumptive Income	**1,657,089,104**	**906,058,406**	**1,663,560,312**	**942,347,127**	**99.61**	**96.15**	**82.80**	**77.12**	**94.49**
Availability Charges	16,695,923	15,764,651	16,437,947	19,758,381	101.57	79.79	0.83	1.34	1.20
Kouga Municipality	-	-	-	-			0.00	0.00	0.00
Metered when not categorised	69,876,858	26,196,274	65,865,000	26,572,700	106.09	98.58	3.49	2.23	3.54
Metered Charges Within - Commercial	91,710,693	42,332,570	76,621,120	51,222,511	119.69	82.64	4.58	3.60	4.94
Metered Charges Within - Industrial	-	-	-	-			0.00	0.00	0.00
Metered Charges Within - Residential	948,773,771	461,650,090	931,095,556	458,906,564	101.90	100.60	47.40	39.29	52.00
Metered Charges Outside Industry and Commerce	278,873,224	268,746,561	305,050,316	294,453,634	91.42	91.27	13.93	22.87	20.19
Metered Charges Outside - Residential	91,854,667	87,078,420	93,775,064	87,646,159	97.95	99.35	4.59	7.41	6.60
Other Consumers	159,303,968	4,289,840	174,715,309	3,787,178	91.18	113.27	7.96	0.37	6.03
Reclaimed Water	-	-	-	-			0.00	0.00	0.00
	-	-	-	-			0.00	0.00	0.00
Interest Earned - Outstanding Debtors	133,978,395	52,240,979	104,550,000	38,150,000	128.15	136.94	6.69	4.45	6.87
	-	-	-	-			0.00	0.00	0.00
Government Grants and Subsidies National Government -E-share ATTP	14,113,176	13,562,144	13,178,881	9,929,855	107.09	136.58	0.71	1.15	1.02
Government Grants and Subsidies National Government - GGR Revenue	89,225,789	160,626,316	64,033,299	177,646,327	139.34	90.42	4.46	13.67	9.21
Government Grants and Subsidies National Government - DWAF	-	-	-	-			0.00	0.00	0.00
	1,842	-	-	6,300			0.00	0.00	0.00
Rental of facilities and equipment	-	2,145	-	2,000		107.25	0.00	0.00	0.00
	-	-	-	-					
Other Income	**107,022,963**	**42,411,313**	**25,133,960**	**25,684,601**	**425.81**	**165.12**	**5.35**	**3.61**	**5.51**
Sundry Income	88,549,198	31,258,457	7,541,960	21,932,201	1,174.09	142.52	4.42	2.66	4.42
Public contribution & Donations Revenue	9,945,019	-	11,000,000	-	90.41		0.50	0.00	0.37
Internal charges Distribution Statements	659,004	966,367	-	-			0.03	0.08	0.06
Other Internal service Charges	7,869,742	4,155,092	6,592,000	3,752,400	119.38	110.73	0.39	0.35	0.44
Future Depreciation -CR & DPC	-	-	-	-			0.00	0.00	0.00
Contribution from the self insurance fund	-	-	-	-			0.00	0.00	0.00
Transfer from COID	-	-	-	-			0.00	0.00	0.00
GGR depreciation	-	-	-	-			0.00	0.00	0.00
Pail Service	-	-	-	-			0.00	0.00	0.00
Trade Effluent	-	6,031,397	-	-			0.00	0.51	0.22
	-	-	-	-					
TOTAL OPERATING INCOME [B]	**2,001,431,270**	**1,174,901,303**	**1,870,456,452**	**1,193,766,210**	**107.00**	**98.42**			
Profit/ (Loss)	512,315,319	562,579,847	657,814,739	550,909,035	77.88	102.12			

Table 5.19: Consolidated operating budget of sample Eastern Cape municipalities

2009/10 FINANCIAL YEAR	TOTAL		TOTAL						TOTAL
	Water Actual	Sanitation Actual	Water - Original Budgeted	Sanitation- Original Budgeted	% Potable water budget spent	% Sanitation budget spent	Water Actual as % Exp/Inc of Total Exp/Inc	Sanitation Actual as % Exp/Inc of Total Exp/Inc	Water + Sanitation Actual as % Exp/Inc of Total Exp/Inc
Operating Costs									
Variable Costs	**457,668,085**	**305,871,398**	**477,587,982**	**351,345,405**	**95.83**	**87.06**	**34.11**	**36.30**	**34.96**
Repairs and maintenance of infrastructure and other fixed assets	160,943,853	127,018,358	164,805,390	143,447,733	97.66	88.55	12.00	15.08	13.18
Administrative and service costs	132,491,596	132,536,397	140,264,318	155,442,713	94.46	85.26	9.88	15.73	12.13
Interdepartmental costs (Budget and Treasury, Corporate Service, legal costs, etc)	162,785,099	44,408,544	170,678,083	50,814,167	95.38	87.39	12.13	5.27	9.49
Contribution to the self insurance fund	1,180,801	1,508,110	1,715,667	1,514,402	68.82	99.58	0.09	0.18	0.12
Transfer to COID	266,736	399,989	124,524	126,390	214.20	316.47	0.02	0.05	0.03
	-	-	-	-					
Fixed Costs	**587,535,777**	**286,587,950**	**523,335,280**	**291,031,312**	**112.27**	**98.47**	**43.79**	**34.01**	**40.02**
Bulk Water costs	202,786,307	-	232,642,099	-	87.17		15.11	0.00	9.28
Contribution to the capital replacement reserve	46,915,820	57,072,540	45,953,480	13,711,630	102.09	416.23	3.50	6.77	4.76
Administrative overheads	126,828,048	121,811,891	141,517,677	138,357,252	89.62	88.04	9.45	14.46	11.38
Finance charge costs	11,627,847	13,682,844	11,408,628	18,886,883	101.92	72.45	0.87	1.62	1.16
Depreciation costs	199,377,755	94,020,675	91,813,396	120,075,547	217.16	78.30	14.86	11.16	13.43
	-	-	-	-					
Cost of transfers	**296,464,955**	**250,084,225**	**142,201,050**	**109,265,616**	**208.48**	**228.88**	**22.10**	**29.68**	**25.02**
ATTP cost of relief - varies according to consumption	55,751,068	61,998,833	46,982,960	62,062,680	118.66	99.90	4.16	7.36	5.39
Assets as a result of public contributions and donations	-	-	-	-			0.00	0.00	0.00
Contribution to GGR - Assets	113,224,045	116,656,829	-	-			8.44	13.85	10.52
Provision for non-payment of services by consumers	105,240,952	52,072,373	62,518,670	37,396,376	168.34	139.24	7.84	6.18	7.20
Cross-subsidisation (Rate and General or other service)	22,248,890	19,356,190	32,699,420	9,806,560	68.04	197.38	1.66	2.30	1.90
Planned result (surplus/loss/break even)	-	-	-	-					
TOTAL OPERATING EXPENDITURE [A]	**1,341,668,817**	**842,543,573**	**1,143,124,312**	**751,642,333**	**117.37**	**112.09**			
Proportion of Total Service	**61%**	**39%**	**60%**	**40%**					
Operating Income									
Consumptive Income	**697,022,644**	**430,799,226**	**654,436,810**	**436,121,321**	**106.51**	**98.78**	**54.84**	**56.57**	**75.70**
Availability Charges	85,394,492	50,743,813	103,851,596	27,648,706	82.23	183.53	6.72	6.66	9.14
Kouga Municipality	8,922,407	-	11,964,690	-	74.57		0.70	0.00	0.60
Metered when not categorised	-	-	-	-			0.00	0.00	0.00
Metered Charges Within - Commercial	62,135,317	53,294,389	55,088,180	50,330,590	112.79	105.89	4.89	7.00	7.75
Metered Charges Within - Industrial	42,669,358	31,898,127	38,472,380	32,784,730	110.91	97.30	3.36	4.19	5.00
Metered Charges Within - Residential	442,757,451	287,248,206	409,338,254	298,009,055	108.16	96.39	34.83	37.72	49.00
Metered Charges Outside Industry and Commerce	2,561,250	-	6,507,430	-	39.36		0.20	0.00	0.17
Metered Charges Outside - Residential	166,648	-	248,080	-	67.17		0.01	0.00	0.01
Other Consumers	51,524,463	7,614,690	28,110,920	27,348,240	183.29	27.84	4.05	1.00	3.97
Reclaimed Water	891,259	-	855,280	-	104.21		0.07	0.00	0.06
	-	-	-	-			0.00	0.00	0.00
Interest Earned - Outstanding Debtors	29,922,198	9,231,221	23,241,600	12,564,260	128.74	73.47	2.35	1.21	2.63
	-	-	-	-			0.00	0.00	0.00
Government Grants and Subsidies National Government -E-share ATTP	133,461,793	118,796,176	119,520,994	112,796,819	111.66	105.32	10.50	15.60	16.93
Government Grants and Subsidies National Government - GGR Revenue	156,703,219	58,815,385	48,405,134	33,926,169	323.73	173.36	12.33	7.72	14.46
Government Grants and Subsidies National Government - DWAF	35,441,672	-	32,108,623	-	110.38		2.79	0.00	2.38
	-	-	-	-			0.00	0.00	0.00
Rental of facilities and equipment	358,915	-	532,920	132,000	67.35	-	0.03	0.00	0.02
	-	-	-	-					
Other Income	**218,170,967**	**143,952,515**	**221,899,658**	**157,993,571**	**98.32**	**91.11**	**17.16**	**18.90**	**24.30**
Sundry Income	4,478,611	6,098,357	15,694,975	9,443,906	28.54	64.57	0.35	0.80	0.71
Public contribution & Donations Revenue	-	-	-	-			0.00	0.00	0.00
Internal charges Distribution Statements	133,284,565	13,346,511	140,696,370	19,377,501	94.73	68.88	10.49	1.75	9.84
Other Internal service Charges	14,525,421	15,389,886	7,241,950	10,997,130	200.57	139.94	1.14	2.02	2.01
Future Depreciation -CR & DPC	65,584,993	64,024,880	23,395,630	33,841,090	280.33	189.19	5.16	8.41	8.70
Contribution from the self insurance fund	243,142	354,369	-	-			0.02	0.05	0.04
Transfer from COID	54,235	52,766	-	-			0.00	0.01	0.01
GGR depreciation	-	-	34,870,733	44,633,570	-	-	0.00	0.00	0.00
Pail Service	-	17,466,611	-	18,217,360		95.88	0.00	2.29	1.17
Trade Effluent	-	27,219,136	-	21,483,014		126.70	0.00	3.57	1.83
	-	-	-	-					
TOTAL OPERATING INCOME [B]	**1,271,081,407**	**761,594,522**	**1,100,145,739**	**753,534,140**	**115.54**	**101.07**			
Profit/ (Loss)	-70,587,410	-80,949,051	-42,978,573	1,891,807	164.24	-4,278.93			

Table 5.20: Consolidated operating budget of sample Mpumalanga municipalities

2009/10 FINANCIAL YEAR	TOTAL		TOTAL						TOTAL
	Water Actual	Sanitation Actual	Water - Original Budgeted	Sanitation- Original Budgeted	% Potable water budget spent	% Sanitation budget spent	Water Actual as % Exp/Inc of Total Exp/Inc	Sanitation Actual as % Exp/Inc of Total Exp/Inc	Water + Sanitation Actual as % Exp/Inc of Total Exp/Inc
Operating Costs									
Variable Costs	**11,911,132**	**10,145,497**	**11,699,178**	**8,191,878**	**101.81**	**123.85**	**23.28**	**22.32**	**22.83**
Repairs and maintenance of infrastructure and other fixed assets	2,434,748	3,557,036	2,376,150	2,783,150	102.47	127.81	4.76	7.83	6.20
Administrative and service costs	-	-	-	-			0.00	0.00	0.00
Interdepartmental costs (Budget and Treasury, Corporate Service, legal costs, etc)	9,476,384	6,588,461	9,323,028	5,408,728	101.64	121.81	18.52	14.50	16.63
Contribution to the self insurance fund	-	-	-	-			0.00	0.00	0.00
Transfer to COID	-	-	-	-			0.00	0.00	0.00
	-	-	-	-					
Fixed Costs	**38,865,463**	**35,057,141**	**22,134,362**	**18,901,432**	**175.59**	**185.47**	**75.96**	**77.13**	**76.51**
Bulk Water costs	2,637,561	33,530	3,799,081	49,375	69.43	67.91	5.16	0.07	2.76
Contribution to the capital replacement reserve	1,315,835	340,159	1,410,800	415,600	93.27	81.85	2.57	0.75	1.71
Administrative overheads	14,388,621	16,089,059	14,045,300	16,458,943	102.44	97.75	28.12	35.40	31.55
Finance charge costs	799,461	706,325	1,252,471	860,545	63.83	82.08	1.56	1.55	1.56
Depreciation costs	19,723,985	17,888,068	1,626,710	1,116,969	1,212.51	1,601.48	38.55	39.36	38.93
	-	-	-	-					
Cost of transfers	**388,330**	**247,800**	**388,330**	**247,800**	**100.00**	**100.00**	**0.76**	**0.55**	**0.66**
ATTP cost of relief - varies according to consumption	-	-	-	-			0.00	0.00	0.00
Assets as a result of public contributions and donations	-	-	-	-			0.00	0.00	0.00
Contribution to GGR - Assets	-	-	-	-			0.00	0.00	0.00
Provision for non-payment of services by consumers	388,330	247,800	388,330	247,800	100.00	100.00	0.76	0.55	0.66
Cross-subsidisation (Rate and General or other service)	-	-	-	-			0.00	0.00	0.00
Planned result (surplus/loss/break even)	-	-	-	-					
TOTAL OPERATING EXPENDITURE [A]	**51,164,925**	**45,450,438**	**34,221,870**	**27,341,110**	**149.51**	**166.23**			
Proportion of Total Service	**53%**	**47%**	**56%**	**44%**					
Operating Income									
Consumptive Income	**35,182,368**	**23,568,918**	**35,104,900**	**23,286,425**	**100.22**	**101.21**	**88.56**	**70.94**	**93.98**
Availability Charges	-	-	-	-			0.00	0.00	0.00
Kouga Municipality	-	-	-	-			0.00	0.00	0.00
Metered when not categorised	35,182,368	23,568,918	35,104,900	23,286,425	100.22	101.21	88.56	70.94	93.98
Metered Charges Within - Commercial	-	-	-	-			0.00	0.00	0.00
Metered Charges Within - Industrial	-	-	-	-			0.00	0.00	0.00
Metered Charges Within - Residential	-	-	-	-			0.00	0.00	0.00
Metered Charges Outside Industry and Commerce	-	-	-	-			0.00	0.00	0.00
Metered Charges Outside - Residential	-	-	-	-			0.00	0.00	0.00
Other Consumers	-	-	-	-			0.00	0.00	0.00
Reclaimed Water	-	-	-	-			0.00	0.00	0.00
	-	-	-	-			0.00	0.00	0.00
Interest Earned - Outstanding Debtors	-	-	-	-			0.00	0.00	0.00
	-	-	-	-			0.00	0.00	0.00
Government Grants and Subsidies National Government -E-share ATTP	997,641	6,783,778	1,425,000	6,413,640	70.01	105.77	2.51	20.42	12.45
Government Grants and Subsidies National Government - GGR Revenue	716,892	1,937,013	19,100,000	10,300,000	3.75	18.81	1.80	5.83	4.25
Government Grants and Subsidies National Government - DWAF	-	-	-	-			0.00	0.00	0.00
	-	-	-	-			0.00	0.00	0.00
Rental of facilities and equipment	-	-	-	-			0.00	0.00	0.00
	-	-	-	-					
Other Income	**2,829,304**	**934,396**	**2,581,607**	**739,926**	**109.59**	**126.28**	**7.12**	**2.81**	**6.02**
Sundry Income	2,389,147	739,170	2,135,824	554,220	111.86	133.37	6.01	2.22	5.00
Public contribution & Donations Revenue	-	-	-	-			0.00	0.00	0.00
Internal charges Distribution Statements	-	-	-	-			0.00	0.00	0.00
Other Internal service Charges	440,157	195,226	445,783	185,706	98.74	105.13	1.11	0.59	1.02
Future Depreciation -CR & DPC	-	-	-	-			0.00	0.00	0.00
Contribution from the self insurance fund	-	-	-	-			0.00	0.00	0.00
Transfer from COID	-	-	-	-			0.00	0.00	0.00
GGR depreciation	-	-	-	-			0.00	0.00	0.00
Pail Service	-	-	-	-			0.00	0.00	0.00
Trade Effluent	-	-	-	-			0.00	0.00	0.00
	-	-	-	-					
TOTAL OPERATING INCOME [B]	**39,726,205**	**33,224,105**	**58,211,507**	**40,739,991**	**68.24**	**81.55**			
Profit/ (Loss)	-11,438,720	-12,226,332	23,989,637	13,398,881	-47.68	-91.25			

Table 5.21: Consolidated operating budget of sample Gauteng municipalities

2009/10 FINANCIAL YEAR	TOTAL		TOTAL						TOTAL
	Water Actual	Sanitation Actual	Water - Original Budgeted	Sanitation- Original Budgeted	% Potable water budget spent	% Sanitation budget spent	Water Actual as % Exp/Inc of Total Exp/Inc	Sanitation Actual as % Exp/Inc of Total Exp/Inc	Water + Sanitation Actual as % Exp/Inc of Total Exp/Inc
Operating Costs									
Variable Costs	**300,547,629**	**117,531,339**	**281,444,670**	**112,758,183**	**106.79**	**104.23**	**14.41**	**23.02**	**16.10**
Repairs and maintenance of infrastructure and other fixed assets	245,949,620	89,726,256	255,780,828	89,850,448	96.16	99.86	11.79	17.58	12.93
Administrative and service costs	33,037,084	22,529,785	6,820,628	17,383,328	484.37	129.61	1.58	4.41	2.14
Interdepartmental costs (Budget and Treasury, Corporate Service, legal costs, etc)	21,560,925	5,275,298	18,843,214	5,524,407	114.42	95.49	1.03	1.03	1.03
Contribution to the self insurance fund	-	-	-	-			0.00	0.00	0.00
Transfer to COID	-	-	-	-			0.00	0.00	0.00
	-	-	-	-					
Fixed Costs	**1,561,992,911**	**334,400,950**	**1,676,745,950**	**337,544,682**	**93.16**	**99.07**	**74.89**	**65.50**	**73.04**
Bulk Water costs	1,172,791,328	265,870,140	1,272,309,759	265,246,000	92.18	100.24	56.23	52.08	55.41
Contribution to the capital replacement reserve	-	-	-	-			0.00	0.00	0.00
Administrative overheads	173,439,451	60,129,924	179,865,044	64,246,097	96.43	93.59	8.32	11.78	9.00
Finance charge costs	4,361,327	1,630,673	4,569,909	3,584,003	95.44	45.50	0.21	0.32	0.23
Depreciation costs	211,400,805	6,770,213	220,001,238	4,468,582	96.09	151.51	10.14	1.33	8.40
	-	-	-	-					
Cost of transfers	**223,186,991**	**58,583,884**	**219,206,246**	**59,270,500**	**101.82**	**98.84**	**10.70**	**11.48**	**10.85**
ATTP cost of relief - varies according to consumption	-	-	-	-			0.00	0.00	0.00
Assets as a result of public contributions and donations	-	-	-	-			0.00	0.00	0.00
Contribution to GGR - Assets	-	-	-	-			0.00	0.00	0.00
Provision for non-payment of services by consumers	223,186,991	58,583,884	219,206,246	59,270,500	101.82	98.84	10.70	11.48	10.85
Cross-subsidisation (Rate and General or other service)	-	-	-	-			0.00	0.00	0.00
Planned result (surplus/loss/break even)	-	-	-	-					
TOTAL OPERATING EXPENDITURE [A]	**2,085,727,531**	**510,516,173**	**2,177,396,866**	**509,573,366**	**95.79**	**100.19**			
Proportion of Total Service	**80.34%**	**19.66%**	**81.04%**	**18.96%**					
Operating Income									
Consumptive Income	**1,465,300,379**	**382,669,699**	**1,806,896,235**	**484,287,440**	**81.09**	**79.02**	**81.22**	**66.15**	**84.77**
Availability Charges	7,125,163	9,187,059	7,300,000	9,200,000	97.60	99.86	0.39	1.59	0.75
Kouga Municipality	-	-	-	-			0.00	0.00	0.00
Metered when not categorised	60,980,087	-	63,322,200	-	96.30		3.38	0.00	2.80
Metered Charges Within - Commercial	495,685,282	102,779,887	595,398,600	148,022,022	83.25	69.44	27.48	17.77	27.45
Metered Charges Within - Industrial	-	-	-	-			0.00	0.00	0.00
Metered Charges Within - Residential	901,509,847	270,702,753	1,140,875,435	327,065,418	79.02	82.77	49.97	46.79	53.77
Metered Charges Outside Industry and Commerce	-	-	-	-			0.00	0.00	0.00
Metered Charges Outside - Residential	-	-	-	-			0.00	0.00	0.00
Other Consumers	-	-	-	-			0.00	0.00	0.00
Reclaimed Water	-	-	-	-			0.00	0.00	0.00
	-	-	-	-			0.00	0.00	0.00
Interest Earned - Outstanding Debtors	125,054,050	35,144,007	155,815,270	41,550,740	80.26	84.58	6.93	6.08	7.35
	-	-	-	-			0.00	0.00	0.00
Government Grants and Subsidies National Government -E-share ATTP	6,889,629	5,417,997	6,889,626	5,417,997	100.00	100.00	0.38	0.94	0.56
Government Grants and Subsidies National Government - GGR Revenue	23,830,354	6,221,717	29,627,586	6,664,650	80.43	93.35	1.32	1.08	1.38
Government Grants and Subsidies National Government - DWAF	-	-	582,545	-	-		0.00	0.00	0.00
	-	-	-	-			0.00	0.00	0.00
Rental of facilities and equipment	-	-	-	-			0.00	0.00	0.00
	-	-	-	-					
Other Income	**183,031,469**	**149,038,202**	**179,983,511**	**122,522,419**	**101.69**	**121.64**	**10.15**	**25.76**	**15.23**
Sundry Income	7,956,450	1,660,661	8,993,629	4,294,477	88.47	38.67	0.44	0.29	0.44
Public contribution & Donations Revenue	133,907	2,655,298	2,121,358	5,153,503	6.31	51.52	0.01	0.46	0.13
Internal charges Distribution Statements	143,573,560	38,165,124	149,240,086	40,874,673	96.20	93.37	7.96	6.60	8.34
Other Internal service Charges	31,367,552	18,129,356	19,628,438	9,912,766	159.81	182.89	1.74	3.13	2.27
Future Depreciation -CR & DPC	-	-	-	-			0.00	0.00	0.00
Contribution from the self insurance fund	-	-	-	-			0.00	0.00	0.00
Transfer from COID	-	-	-	-			0.00	0.00	0.00
GGR depreciation	-	-	-	-			0.00	0.00	0.00
Pail Service	-	-	-	-			0.00	0.00	0.00
Trade Effluent	-	88,427,763	-	62,287,000		141.97	0.00	15.29	4.06
	-	-	-	-					
TOTAL OPERATING INCOME [B]	**1,804,105,881**	**578,491,622**	**2,179,794,773**	**660,443,246**	**82.76**	**87.59**			
Profit/ (Loss)	-281,621,649	67,975,448	2,397,907	150,869,881	-11,744.48	45.06			

Table 5.22: Consolidated operating budget of sample KwaZulu-Natal municipalities

2009/10 FINANCIAL YEAR	TOTAL		TOTAL						TOTAL
	Water Actual	Sanitation Actual	Water - Original Budgeted	Sanitation- Original Budgeted	% Potable water budget spent	% Sanitation budget spent	Water Actual as % Exp/Inc of Total Exp/Inc	Sanitation Actual as % Exp/Inc of Total Exp/Inc	Water + Sanitation Actual as % Exp/Inc of Total Exp/Inc
Operating Costs									
Variable Costs	**1,004,909,016**	**480,214,164**	**851,891,887**	**400,373,113**	**117.96**	**119.94**	**34.71**	**58.12**	**39.91**
Repairs and maintenance of infrastructure and other fixed assets	488,822,146	269,485,006	421,644,941	228,030,679	115.93	118.18	16.88	32.62	20.38
Administrative and service costs	286,542,394	139,445,162	245,695,286	107,417,864	116.63	129.82	9.90	16.88	11.45
Interdepartmental costs (Budget and Treasury, Corporate Service, legal costs, etc)	229,544,476	71,283,996	184,551,660	64,924,570	124.38	109.80	7.93	8.63	8.08
Contribution to the self insurance fund	-	-	-	-			0.00	0.00	0.00
Transfer to COID	-	-	-	-			0.00	0.00	0.00
	-	-	-	-					
Fixed Costs	**1,816,630,118**	**345,969,544**	**1,860,155,986**	**441,236,270**	**97.66**	**78.41**	**62.74**	**41.88**	**58.11**
Bulk Water costs	1,115,072,066	-	1,043,937,925	-	106.81		38.51	0.00	29.96
Contribution to the capital replacement reserve	-	-	-	-			0.00	0.00	0.00
Administrative overheads	376,959,151	215,401,767	387,916,491	224,078,860	97.18	96.13	13.02	26.07	15.92
Finance charge costs	196,345,887	49,599,034	240,263,727	102,709,947	81.72	48.29	6.78	6.00	6.61
Depreciation costs	128,253,014	80,968,743	188,037,843	114,447,463	68.21	70.75	4.43	9.80	5.62
	-	-	-	-					
Cost of transfers	**73,864,821**	**-**	**154,417,670**	**-**	**47.83**		**2.55**	**0.00**	**1.98**
ATTP cost of relief - varies according to consumption	-	-	-	-			0.00	0.00	0.00
Assets as a result of public contributions and donations	-	-	-	-			0.00	0.00	0.00
Contribution to GGR - Assets	-	-	-	-			0.00	0.00	0.00
Provision for non-payment of services by consumers	185,711,874	-	96,317,480	-	192.81		6.41	0.00	4.99
Cross-subsidisation (Rate and General or other service)	-111,847,053	-	58,100,190	-	-192.51		-3.86	0.00	-3.01
Planned result (surplus/loss/break even)	-	-	-	-					
TOTAL OPERATING EXPENDITURE [A]	**2,895,403,955**	**826,183,708**	**2,866,465,543**	**841,609,383**	**101.01**	**98.17**			
Proportion of Total Service	**77.80%**	**22.20%**	**77.30%**	**22.70%**					
Operating Income									
Consumptive Income	**1,959,129,482**	**49,548,000**	**1,915,439,370**	**49,222,000**	**102.28**	**100.66**	**67.17**	**12.73**	**74.06**
Availability Charges	341,051,393	-	336,091,230	-	101.48		11.69	0.00	12.57
Kouga Municipality	-	-	-	-			0.00	0.00	0.00
Metered when not categorised	-	-	-	-			0.00	0.00	0.00
Metered Charges Within - Commercial	921,538,551	24,279,000	886,117,090	24,119,000	104.00	100.66	31.59	6.24	34.87
Metered Charges Within - Industrial	-	-	-	-			0.00	0.00	0.00
Metered Charges Within - Residential	696,539,538	25,269,000	693,231,050	25,103,000	100.48	100.66	23.88	6.49	26.61
Metered Charges Outside Industry and Commerce	-	-	-	-			0.00	0.00	0.00
Metered Charges Outside - Residential	-	-	-	-			0.00	0.00	0.00
Other Consumers	-	-	-	-			0.00	0.00	0.00
Reclaimed Water	-	-	-	-			0.00	0.00	0.00
	-	-	-	-			0.00	0.00	0.00
Interest Earned - Outstanding Debtors	53,371,800	373	70,596,480	2,000	75.60	18.65	1.83	0.00	1.97
	-	-	-	-			0.00	0.00	0.00
Government Grants and Subsidies National Government -E-share ATTP	343,244,398	155,329,056	259,364,000	138,885,550	132.34	111.84	11.77	39.91	18.38
Government Grants and Subsidies National Government - GGR Revenue	2,852,578	19,801,150	-	-			0.10	5.09	0.84
Government Grants and Subsidies National Government - DWAF	11,058,296	151,000	-	293,000		51.54	0.38	0.04	0.41
	-	-	-	-			0.00	0.00	0.00
Rental of facilities and equipment	3,130,063	4,686,671	2,821,390	4,600,000	110.94	101.88	0.11	1.20	0.29
	-	-	-	-					
Other Income	**544,004,004**	**159,684,308**	**545,845,913**	**174,050,049**	**99.66**	**91.75**	**18.65**	**41.03**	**25.94**
Sundry Income	70,498,361	15,562,852	70,364,623	15,021,049	100.19	103.61	2.42	4.00	3.17
Public contribution & Donations Revenue	-	-	-	-			0.00	0.00	0.00
Internal charges Distribution Statements	473,505,643	82,912,166	475,481,290	89,948,960	99.58	92.18	16.23	21.30	20.51
Other Internal service Charges	-	-	-	-			0.00	0.00	0.00
Future Depreciation -CR & DPC	-	-	-	-			0.00	0.00	0.00
Contribution from the self insurance fund	-	-	-	-			0.00	0.00	0.00
Transfer from COID	-	-	-	-			0.00	0.00	0.00
GGR depreciation	-	-	-	-			0.00	0.00	0.00
Pail Service	-	-	-	-			0.00	0.00	0.00
Trade Effluent	-	61,209,290	-	69,080,040		88.61	0.00	15.73	2.26
	-	-	-	-					
TOTAL OPERATING INCOME [B]	**2,916,790,621**	**389,200,558**	**2,794,067,153**	**367,052,599**	**104.39**	**106.03**			
Profit/ (Loss)	21,386,666	-436,983,150	-72,398,390	-474,556,784	-29.54	92.08			

Table 5.23: Consolidated operating budget of sample Northern Cape municipalities

2009/10 FINANCIAL YEAR	TOTAL		TOTAL						TOTAL
	Water Actual	Sanitation Actual	Water - Original Budgeted	Sanitation- Original Budgeted	% Potable water budget spent	% Sanitation budget spent	Water Actual as % Exp/Inc of Total Exp/Inc	Sanitation Actual as % Exp/Inc of Total Exp/Inc	Water + Sanitation Actual as % Exp/Inc of Total Exp/Inc
Operating Costs									
Variable Costs	**66,855,341**	**7,473,251**	**59,422,734**	**10,278,698**	**112.51**	**72.71**	**24.12**	**12.03**	**21.91**
Repairs and maintenance of infrastructure and other fixed assets	49,558,080	7,433,251	42,071,473	10,238,698	117.79	72.60	17.88	11.97	16.80
Administrative and service costs	17,217,261	-	17,271,261	-	99.69		6.21	0.00	5.08
Interdepartmental costs (Budget and Treasury, Corporate Service, legal costs, etc)	-	-	-	-			0.00	0.00	0.00
Contribution to the self insurance fund	80,000	40,000	80,000	40,000	100.00	100.00	0.03	0.06	0.04
Transfer to COID	-	-	-	-			0.00	0.00	0.00
	-	-	-	-					
Fixed Costs	**196,275,726**	**54,645,873**	**218,317,673**	**63,617,266**	**89.90**	**85.90**	**70.82**	**87.97**	**73.96**
Bulk Water costs	132,122,348	-	118,000,000	-	111.97		47.68	0.00	38.95
Contribution to the capital replacement reserve	-	3,000,000	-	3,000,000		100.00	0.00	4.83	0.88
Administrative overheads	49,609,682	37,678,083	77,993,023	40,429,668	63.61	93.19	17.90	60.65	25.73
Finance charge costs	1,975,585	1,633,069	5,073,184	2,654,664	38.94	61.52	0.71	2.63	1.06
Depreciation costs	12,568,111	12,334,721	17,251,466	17,532,934	72.85	70.35	4.54	19.86	7.34
	-	-	-	-					
Cost of transfers	**14,000,000**	-	**14,000,000**	-	**100.00**		**5.05**	**0.00**	**4.13**
ATTP cost of relief - varies according to consumption	-	-	-	-			0.00	0.00	0.00
Assets as a result of public contributions and donations	-	-	-	-			0.00	0.00	0.00
Contribution to GGR - Assets	-	-	-	-			0.00	0.00	0.00
Provision for non-payment of services by consumers	14,000,000	-	14,000,000	-	100.00		5.05	0.00	4.13
Cross-subsidisation (Rate and General or other service)	-	-	-	-			0.00	0.00	0.00
Planned result (surplus/loss/break even)	-	-	-	-					
TOTAL OPERATING EXPENDITURE [A]	**277,131,067**	**62,119,124**	**291,740,407**	**73,895,964**	**94.99**	**84.06**			
Proportion of Total Service	**82%**	**18%**	**80%**	**20%**					
Operating Income									
Consumptive Income	**100,177,010**	**30,664,493**	**117,467,000**	**29,148,000**	**85.28**	**105.20**	**39.41**	**37.45**	**38.93**
Availability Charges	-	-	-	-			0.00	0.00	0.00
Kouga Municipality	-	-	-	-			0.00	0.00	0.00
Metered when not categorised	-	-	-	-			0.00	0.00	0.00
Metered Charges Within - Commercial	-	-	-	-			0.00	0.00	0.00
Metered Charges Within - Industrial	-	-	-	-			0.00	0.00	0.00
Metered Charges Within - Residential	-	-	-	-			0.00	0.00	0.00
Metered Charges Outside Industry and Commerce	-	-	-	-			0.00	0.00	0.00
Metered Charges Outside - Residential	-	-	-	-			0.00	0.00	0.00
Other Consumers	100,177,010	30,664,493	117,467,000	29,148,000	85.28	105.20	39.41	37.45	38.93
Reclaimed Water	-	-	-	-			0.00	0.00	0.00
							0.00	0.00	0.00
Interest Earned - Outstanding Debtors	-	-	-	-			0.00	0.00	0.00
							0.00	0.00	0.00
Government Grants and Subsidies National Government -E-share ATTP	-	-	-	-			0.00	0.00	0.00
Government Grants and Subsidies National Government - GGR Revenue	-	-	-	22,400,000			0.00	0.00	0.00
Government Grants and Subsidies National Government - DWAF	-	-	1,400,000	2,400,000			0.00	0.00	0.00
	-	-	-	-			0.00	0.00	0.00
Rental of facilities and equipment	-	-	-	-			0.00	0.00	0.00
	-	-	-	-					
Other Income	**154,011,601**	**51,226,334**	**147,083,882**	**49,137,273**	**104.71**	**104.25**	**60.59**	**62.55**	**61.07**
Sundry Income	136,794,340	46,294,154	129,866,621	43,145,273	105.33	107.30	53.82	56.53	54.48
Public contribution & Donations Revenue	-	-	-	-			0.00	0.00	0.00
Internal charges Distribution Statements	-	-	-	-			0.00	0.00	0.00
Other Internal service Charges	17,217,261	-	17,217,261	-	100.00		6.77	0.00	5.12
Future Depreciation -CR & DPC	-	-	-	-			0.00	0.00	0.00
Contribution from the self insurance fund	-	-	-	-			0.00	0.00	0.00
Transfer from COID	-	-	-	-			0.00	0.00	0.00
GGR depreciation	-	-	-	-			0.00	0.00	0.00
Pail Service	-	-	-	-			0.00	0.00	0.00
Trade Effluent	-	4,932,180	-	5,992,000		82.31	0.00	6.02	1.47
	-	-	-	-					
TOTAL OPERATING INCOME [B]	**254,188,611**	**81,890,827**	**265,950,882**	**103,085,273**	**95.58**	**79.44**			
Profit/ (Loss)	-22,942,456	19,771,703	-25,789,525	29,189,309	88.96	67.74			

5.7.1 Operating results

For the sample of municipalities, the budgeted and actual operating results differed by R 518 million (Table 5.14). The sample of metropolitan municipalities reported an R 808 million difference between the planned and actual result (Table 5.15), and the sample local municipalities reported a difference of R 189 million (Table 5.16). The provincial perspective is shown in Tables 5.18 to 5.23.

The following factors explain the difference for the sample municipalities:

(a) The variable costs and the cost of transfers exceeded the budget resulting in the operating costs being higher than anticipated. The reason for exceeding the budget for the cost of transfers was higher grant contributions from national government that had to be spent, higher provisions for bad debt than anticipated due to lower levels of payment for services, and finally because of higher cross-subsidisation than anticipated to the rate and general and other municipal services.

(b) The higher than anticipated miscellaneous income for the sanitation service was not sufficient to offset the lower consumptive income for the sanitation service.

The mismanagement of the operating budget at the level of the operating result assessment is consistent for all of the sample municipalities.

5.7.2 Variable operating costs

Repairs and maintenance of infrastructure and other fixed assets, administrative and service costs, interdepartmental costs, contributions to the self-insurance funds and transfers to Compensation for Occupational Injury and Diseases (COID) fund are all variable operating costs (see Table 5.14).

The total variable costs budgeted for the potable water service of the sample municipalities was R2 106 million for the 2009/10 financial year and R1 184 million for the sanitation service for the same period. The actual costs for the water service were R2 265 million for the potable water service and R1 184 million for the sanitation service. Only the potable water service exceeded the planned variable cost materially by 7.57%.

The variable cost of the water service accounts for 31.24% of the total operating budget. Of the individual cost elements that make up the variable cost, the repairs and maintenance cost accounts for 16.20% for the sample of municipalities. The administrative and service cost accounts for 7.10% and the interdepartmental costs, 7.90% of the total operating budget of the sample municipalities.

The metropolitan municipalities budgeted R1 803 million for the potable water service variable costs and R 1 016 million for the sanitation service variable costs for the 2009/10 financial year (Table 5.15). The actual cost recorded for the variable cost of the two services respectively were R1 976 million andR1 026 million. The metropolitan municipalities exceeded the potable water service variable cost operating budget materially, 9.62% above budget.

The metropolitan municipality’s allocated 31.06% of their operating budgets to the water service variable costs. The budget for repairs and maintenance costs made up 16.55% of the total operating

costs of the water service, administrative and service costs 6.39% and interdepartmental costs 8.06%.

The 9 sample local municipalities provided for an accumulative variable cost budget of R253 693 million for the potable water service and R157 421 million for the sanitation service during the 2009/10 financial year (Table 5.15). The variable cost budget for the potable water service was exceeded by 7.38% and the sanitation service variable cost budget was under spent by 4.75%.

The sample local municipalities allocate 34.23% of the water service operating budget to variable costs, 13.32% to repairs and maintenance, 13.41% to administrative and service costs and 7.48% to interdepartmental costs.

A provincial perspective, Tables 5.18 to 5.23, shows that the majority of the provinces allocated 15% and higher to the cost of repairs and maintenance, however the Eastern Cape, Mpumalanga and Gauteng sample municipalities respectively only allocated 13.18%, 6.2% and 12.93% to the cost of repairs and maintenance.

5.7.3 Fixed operating costs

Bulk water costs, contributions to the CRR, administrative overheads, finance charges and depreciation are all elements of the fixed operating cost.

The fixed operating cost budget for the sample municipalities was R5 076 million for the potable water service and R1 334 million for the sanitation service in the 2009/10 year (Table 5.14). The actual fixed cost for the same period was R5 062 million for the potable water service and R1 219 million for the sanitation service. Although the sample municipalities forecasted the 2009/10 financial year fixed cost for the potable water service accurately, the fixed operating cost for the sanitation service was underspent by 8.61%.

The actual fixed operating costs for the 2009/10 financial year accounted for 56.90% of the total operating cost of the water service. Bulk water costs accounted for 29%, contribution to the capital replacement reserve 2.17%, administrative overheads 12.04%, finance charges 3.90% and depreciation costs 9.78% of the total operation cost of the water service.

The bulk water cost varies between municipalities, depending on the source of the raw water that is purchased in bulk before purification and, of course, whether the municipality has to purchase purified water.

A contribution to the CRR is an indication of the strength of the tariff structure and related income capacity to contribute towards the capital budget. The capital needs of water services of the sample municipalities made up 2.17% of total operating budget.

A finance cost is the interest component of an external loan that is in the process of being redeemed, previously raised to support infrastructure investment. The finance cost for the water service was 3.90% of the total operating cost of the sample municipalities. Grant funding and funding from

internal services is inadequate to support the water service capital needs, and municipalities have in the past approached the external loan market for funding to support the capital needs of the water service. Raising external loan finance for the water service is less easy than raising external loan finance for a service that does not generate income because the tariff structure can incorporate the financial service.

Accounting standards prescribe the useful life of an infrastructure asset. A municipality may assess the condition of the asset annually and adjust the useful life depending on the level of usage or asset consumption. If the infrastructure asset is under utilised, the useful life will be extended. If this is the case, the depreciation cost will decrease and have a positive influence on the tariff charged for the consumption of the service. The depreciation cost of the water service for the 2009/10 financial year was 9.78% of the total operating cost of the service for the full sample of municipalities.

The fixed costs of the water service for the sample metropolitan municipalities are shown in Table 5.15 and for the sample local municipalities in Table 5.16. The sample local municipalities fixed operating costs account for a 6% higher proportion of the operating budget compared with sample metropolitan municipalities. For the sample local municipalities the tariff income contribution to the capital budget was almost 2% less than that of the sample metropolitan municipalities. The indicator reveals that the tariff was saturated with operating costs and is not able to contribute towards the capital budget of the water service.

The lower proportions of bulk water costs and contributions to the capital programme (CRR) of the water service are offset by higher administrative costs, higher finance and higher depreciation costs. Local municipalities have the lowest per capita skilled staff in the water service. Their skilled staff service smaller portions of the population when compared to the higher per capita costs of the metropolitan municipalities. The depreciation costs of the sample local municipalities, as a proportion of the total operating cost, were 16.85%, compared to the 8.76% of the metropolitan municipalities.

The Amathole District Municipality's fixed cost proportion of the total operating cost was 43.86%, which was lower than the other two categories of municipality, Table 5.17. The bulk water costs were 25.60% of the total operating cost and the depreciation cost was 18.27% of the total operating cost. The district municipality did not contribute from the tariff income to the capital budget, had no external loans to support the water service capital budget and provided for 18.27% of the total operating cost for depreciation. The district municipality is managing aged infrastructure which is evident from the high level of depreciation and owns raw water sources, which is evident from the lower bulk water costs.

5.7.4 Costs of transfer

The costs of transfer category of operating costs for the water service includes the cost of indigent relief, assets as a result of public contributions, contributions to the capital budget from Government Grants Received (GGR), provision for the non-payment of services and the cross-subsidisation of other municipal services.

The budget for costs of transfer during the 2009/10 financial year was R573 million for the water service and R329 million for the sanitation service, 11.86% of total operating costs (Table 5.14). The actual costs of transfer for the same period were R813 million and R496 million, respectively. The actual costs of transfer therefore exceeded the budget by 41.84% and 50.76%, respectively.

The potable water service cost of indigent support resulted in the budget being exceeded by 18.66%.

The contributions from the National Government for capital projects of both the potable water and sanitation service were under estimated, resulting in the operating estimate being exceeded by 368.33% and 62.09%, respectively.

The budget for the provision for non-payment of services by consumers was overspent by both the potable water and sanitation service. The provision was overspent by 76.94% by the potable water service and 59.91% by the sanitation service.

The sanitation service cross-subsidised other municipal services during the period analysed. The contribution to other municipal services was overspent by 97.38%. A budget provision of R10 million was planned for and an actual cross-subsidisation cost of R19 million was incurred. The higher than planned cost was due to the needs of the other municipal services supported by the sanitation tariff structure and related income.

Cross-subsidisation for the potable water service was underspent for the financial year. A budget of R91 million was provided for. The actual result shows that the potable water service was cross-subsidised by other municipal functions by R90 million. The cross-subsidisation of the potable water service by other municipal services was influenced by the eThekwini Metropolitan Municipality. At this municipality, the potable water service planned to cross-subsidise other municipal functions, a budget of R58 million was provided for in this regard. The metropolitan municipality ended the financial year declaring that other municipal services had cross-subsidised the potable water service. A total cross-subsidisation of R112 million was recorded for the financial year. The analysis of the capital budget shows that the eThekwini Metropolitan Municipality spent ahead of the project plan on the Aquaduct providing potable water to the northern areas of the metropolitan municipality. In order to spend ahead of the project plan, surplus funds were used in anticipation of secured revenue streams in the outer years of the MTREF.
An analysis of the cost of transfers of the sample metropolitan municipalities (Table 5.15) does not show any material differences from the overall results of the sample municipalities.

The sample local municipalities exceeded the planned costs of the water service, primarily because of the underestimation of the cost of indigent support and the provision for bad debts. What is however, interesting is that the total costs of transfer compared to the total budget of the water services is 2.73% compared to the 11.86% of the consolidated result of sample municipalities. The local municipalities, in majority, did not cross-subsidise other municipal functions from the operating income or the tariff structure of the water service. In addition, the local municipalities did not reflect the expenditure on capital, financed from national grant funding, as an operating cost.

The sample district municipality provided for the costs of transfer. The element of the costs of transfer recorded by the district municipality is the provision for bad debts. The provision for bad debts was 38.61% of the total operating cost for water services. The district municipality has the lowest debt collection rate and has an increasing outstanding debt for water services (Table 5.12).

In all provinces budgets are exceeded by actual costs. The Mpumalanga, Gauteng, KwaZulu-Natal and Northern Cape Municipality's all record low levels of costs of transfer as a proportion of the total operating cost for the water service. A cost of transfer, as low as 0.66%, was recorded for the Mpumalanga Municipalities. The province's municipalities with the higher proportions of costs of transfer are the Eastern Cape and Western Cape Provinces. Eastern Cape municipalities record costs of transfer as high as 25.02% for the 2009/10 financial year.

5.7.5 Operating income

The operating income of the water service includes consumptive income, government grants and subsidies and other income. The latter element of operating income typically consists of interest on outstanding debt, rental of water service facilities, public contributions and donations, internal charges to municipal departments for services, insurance fund and COID payments received, depreciation on grant and donation funded infrastructure, pail services and trade effluent.

Accrued consumptive income represents 81.50% of the total operating income for the water service for the 2009/10 financial year (Table 5.14). A total of R6 193 million was budgeted for potable water service income and R1 964 million for the sanitation service. The actual consumptive income accrued for potable water and sanitation service respectively was R5 914 million and R1 823 million. The consumptive income accrued was 4.51% less than anticipated for the potable water service and 7.18% less than anticipated for the sanitation service. The accrued consumptive income for the water service was R420 million less than budgeted for.

5.8 SUPPORT SERVICE OPTIONS

5.8.1 Use made of external water service support organisations

Municipalities make use of consultants for project design, Private Public Partnerships (PPPs) and Water Boards to provide a water service. Local municipalities also have varying water service relationships with the district municipality in which the local municipality provides a water service. These are all examples of external water service support organisations.

The use made of external water service support organisations by 14 of the sample municipalities (of those that responded) is shown in Table 5.24.

Table 5.24: Use made of supporting external relationships to provide water services

DETAILS OF EXTERNAL SUPPORT	NMBM	Ethekwini	Ekurhuleni	Midvaal	Sol Plaatjie	Stellenbosch	Amathole	Polokwane	Steve Tshwete	Buffalo City	George	Kouga	Overstrand	CapeTown	TOTAL OVERALL	TOTAL METROS
Water Service Consultants (mostly project design)	√	√	√	√	√	√	√	√	√	√	√	√	√	√	14√	5√
Private Public Partnerships		√						√	√					√	4√	2√
Water Boards				√	√		√	√		√		√			6√	1√
District Municipality								√	√			√			3√	Nil

Water service consultants for water service project design work were used by 14 of the sample municipalities. Water service PPPs existed at 4 of the sample municipalities, Polokwane and Steve Tshwete Local Municipalities and the Cape Town and eThekwini Metropolitan Municipalities. Water Boards provided a service in 6 of the sample municipalities. The Buffalo City Metropolitan Municipality was the only metropolitan municipality that had an external working relationship with a Water Board. The Amathole District Municipality, which performed its functions outside of the Buffalo City Metropolitan Municipality, had an external relationship with the same Water Board providing services to the Buffalo City Metropolitan Municipality. The other local municipalities that had an external relationship with a Water Board were Midvaal, Sol Plaatjie, Polokwane and Kouga Local Municipalities.

The local municipalities that had external water service support relationships with a district municipality were the Polokwane, Steve Tshwete and Kouga Local Municipalities. The metropolitan municipalities did not have an external relationship with a district municipality for the provision of water services as a district municipality did not function within the jurisdiction of a metropolitan municipality.

5.8.2 Water service provider/authority involvement in the financial management of the water service

Financial management of the water service includes budget determination, tariff setting, meter reading, checking of billing data inputs (variance reporting), billing, cash collection and credit control. Municipalities utilise external water service financial management relationships differently.

The water service provider/authorities that were involved in the financial management of the water service for 13 sample municipalities (those that responded) are shown in Table 5.25.

Full use of external relations during budget determination was made by 4 local municipalities and the district municipality. The Cape Town Metropolitan Municipality and the Sol Plaatjie Local Municipality indicated a partial involvement of external relations in the determination of the budget. The balance of the sample municipalities indicated that there was no external water service support relations involved in the determination of the budget. The metropolitan municipalities predominately did not use external support relations during the determination of the budget.

Table 5.25: External relations and the extent to which the water service provider/authority is involved in the financial management of the water service

DETAIL	NMBM	Ethekwini	Ekurhuleni	Midvaal	Sol Plaatjie	Amathole	Steve Tshwete	Buffalo City	George	uMhlatuze	Kouga	Overstrand	CapeTown	TOTAL OVERALL	TOTAL METROS
Budget determination															
Fully involved						√	√		√		√	√		5√	Nil
Partially involved					√								√	2√	1√
Not involved	√	√	√	√				√		√				6√	3√
Tariff setting															
Fully involved							√		√		√	√		4√	Nil
Partially involved						√								1√	Nil
Not involved	√	√	√	√	√			√		√				7√	3√
Meter reading															
Fully involved	√			√			√		√		√	√		6√	1√
Partially involved														Nil	Nil
Not involved		√	√		√	√		√		√				6√	2√
Checking of billing data inputs (variance reporting)															
Fully involved							√		√		√	√		4√	Nil
Partially involved														Nil	Nil
Not involved	√	√	√	√	√	√		√		√				8√	3√
Billing															
Fully involved							√		√		√	√		4√	Nil
Partially involved														Nil	Nil
Not involved	√	√	√	√	√	√		√		√				8√	3√
Cash collection															
Fully involved							√		√		√	√		4√	Nil
Partially involved														Nil	Nil
Not involved	√	√	√	√	√	√		√		√				8√	3√
Credit control															
Fully involved							√		√		√	√		4√	Nil
Partially involved														Nil	Nil
Not involved	√	√	√	√	√	√		√		√				8√	3√

Local municipalities that fully involve water service support external relations in budget determination also involved external support relations in tariff setting. The Amathole District Municipality only partially involved external support relations in tariff determination, while the municipality fully involved external support relations in budget determination. The majority of the sample municipalities did not involve external support relations in tariff setting. Metropolitan municipalities did not involve external support relations in tariff determination.

Meter reading presented more of an opportunity for the involvement of external support relations in financial management. The Nelson Mandela Bay Metropolitan Municipality with 5 local municipalities fully involved external support relations in meter reading. There was no involvement of external support firms in meter reading.

The Steve Tshwete, George, Kouga and Overstrand Local Municipalities involved external support relations during the checking of billing data inputs, for example, the analysis of variance reports. There was no involvement of external firms in the checking of billing data inputs. The balance of the sample municipalities did not involve external firms in the checking of the billing data inputs.

It was only the Steve Tshwete, George, Kouga and Overstrand Local Municipalities that provide for the involvement of external firms in billing, cash collection and credit control. The remaining sample municipalities did not involve external firms in the rendering of financial management.

5.9 THE ACCURACY OF FINANCIAL COST ESTIMATION

5.9.1 Ring-fencing

The complete ring-fencing of a municipal service is reliant on the service presenting a balance sheet and statement of performance, separate from the balance of the services offered by the municipality. By ring-fencing a service the municipality is able to determine if the full cost of providing the service is being recovered from the consumers of the service, and thus if the service is sustainable over the short, medium to long-term. The ring-fenced framework for the water service is an essential element of ensuring the sustainability of the water service. Ring-fencing provides a foundation for the accuracy of the costing methodology used.

The intention of ring-fencing is to ensure that a service provider knows all its fixed and variable costs and is able to apply cost covering pricing (Pape and McDonald, 2002:18).

Ring-fencing is also required in order to comply with the Water Services Act (Act 108, 1997), when performing the functions of a water service provider. A water service authority must manage and account for those functions separately.

Whether a sample municipality ring-fenced the water service is shown in Table 5.26. Ring-fencing was fully implemented by 2 municipalities, eThekwini Metropolitan Municipality and the Kouga Local Municipality. The balance of the sample metropolitan, local and district municipalities did not implement the principle of water service ring-fencing.

Table 5.26: Ring-fencing of the water service

DETAILS	NMBM	Ethekwini	Ekurhuleni	Midvaal	Sol Plaatjie	Stellenbosch	Amathole	Polokwane	Steve Tshwete	Buffalo City	George	uMhlatuze	Kouga	Overstrand	CapeTown	TOTAL OVERALL	TOTAL METROS
Ringfenced?:																	
Yes		√											√			2√	2√
No	√		√	√	√	√	√	√	√	√	√	√		√	√	13√	4√
If NO! cost and revenue determination easy?																	
Yes	√		√		√	√	√	√		√	√	√		√	√	11√	4√
No				√	√				√							3√	Nil

The Midvaal, Sol Plaatjie and Steve Tshwete Local Municipalities agreed that without the ring-fencing of the water service that it was not possible to accurately determine water service costs and revenue needs. The balance of the sample group, that did not implement the principle of ring-fencing, believed that, even if the water service is not ring-fenced, it would still possible to determine the accurate costs of the water service and the income required to sustain the water service.

5.9.2 Internal costing methodology

An internal costing methodology is vital to ensure complete ring-fencing of a service. Without a recognised costing methodology and the implementation thereof, it is impossible to determine the accurate costs of a service, especially the indirect cost of support services, and therefore also to

determine the income that must be generated for providing the service. The costing methodology provides a base to ensure that the accurate cost of a support service is allocated to the user service (in this case the water service).

Activity Based Costing (ABC) and the Percentage of Total Cost of Support Services are the most common costing methodologies used in local government. ABC focuses attention on the cost drivers of the support services. The Percentage of Total Cost of Support Services methodology of costing was used by 6 of the sample municipalities, 4 sample municipalities utilised the ABC methodology and 1 municipality utilised a hybrid of both ABC and Percentage of Total Cost of Support Services costing methodology (Table 5.27).

Table 5.27: Internal costing methodology

METHOD OF INTERNAL COSTING	NMBM	Ethekwini	Sol Plaatjie	Stellenbosch	Polokwane	Steve Tshwete	Buffalo City	uMhlatuze	Kouga	Overstrand	CapeTown	TOTAL OVERALL	TOTAL METROS
Percentage of total cost of the support service	√	√	√	√	√					√		6√	2√
ABC costing framework							√	√	√		√	4√	2√
Other													
Mixture of ABC & internal cosing methods						√						1√	Nil

ABC, the more accurate of the two costing methodology, is utilised the least by the sample municipalities.

5.9.3 The cost of bulk services

Municipalities source either bulk raw water or bulk treated water. Bulk raw water is sourced from either municipal owned supply dams or purchased from DWA. Treated potable water is typically sourced from a Water Board. Raw water from DWA and treated water from a Water Board are purchased at a cost of production by a municipality.

The cost of bulk water services for the 14 municipalities is shown in Table 5.28.

Table 5.28: Source and pricing of bulk water services

DETAIL	NMBM	Ethekwini	Ekurhuleni	Midvaal	Sol Plaatjie	Stellenbosch	Anathole	Polokwane	Steve Tshwete	Buffalo City	George	Kouga	Overstrand	Cape Town	TOTALS
Proportion of water self supplied (%)	**20%**	**0.00%**				**75%**	**74%**	**100%**	**100%**	**36%**	**100%**	**40%**	**100%**	**39%**	**49%**
Price per m^3 (in Rands)	0.0385					0.6600		1.78		1.89			6.19	3.02	
Method price/cost established															
Percentage of total cost of the support service						√									1√
Own source. Cost = pumping cost									√						1√
Sum of costs divided by volume supplied								√		√	√		√	√	5√
Was this treated as a FC or VC?															
FC	√					√				√	√		√	√	6√
VC							√	√	√						3√
Proportion of water supplied by DWA (%)	**70%**	**0%**		**10%**	**100%**	**25%**	**0%**	**0%**				**50%**		**61%**	**23%**
Price per m^3 (in Rands)	0.6679			1.892		0.3190								0.4301	
Method price/cost established															
Purchase price						√									1√
Was this treated as a FC or VC?															
FC	√			√		√								√	4√
VC	√				√										2√
Proportions of water supplied by a Water Board (%)	**10%**	**100%**	**100%**	**90%**			**26%**			**64%**		**10%**			**29%**
Price per m^3 (in Rands)		3.2535	3.5372	3.343						4.64					
Method price/cost established															
Umgeni Water		√													1√
Consultation process			√												1√
Tariff cost per supply scheme										√					1√
Was this treated as a FC or VC?															
FC	√		√	√			√								4√
VC	√	√								√					3√
Control Total for water supplied	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%

On average for the 14 sample municipalities, 49% of bulk water was self-supplied, 23% was supplied by DWA and 29% was supplied by Water Boards. The Nelson Mandela Metropolitan Municipality self-supplied bulk water and in addition, received further sources from DWA and a Water Board. Other sample municipalities were either entirely self-supplied or received all bulk water required from DWA or a Water Board. George, Steve Tshwete, Overstrand and Polokwane Local Municipalities were totally self-supplied. The Sol Plaatjie Local Municipality sourced its full bulk supply from DWA and the eThekwini and Ekurhuleni Metropolitan Municipalities were supplied by a Water Board and had no bulk water supply from either DWA or own sources.

The cost of bulk water supply varies between source and within the same source. When a municipality extracts raw water from a self-supplied source it must determine the price per m^3. The Nelson Mandela, Stellenbosch, Polokwane, Buffalo City, Overstrand and Cape Town Municipalities had varying dependencies on self-supplied bulk raw water. The price of self-supplied bulk raw water for the Nelson Mandela Metropolitan Municipality was R0.0385/m^3. This municipality self-supplied 20% of its bulk raw water. The price per m^3 of self-supplied bulk raw water for the Overstrand Local Municipality was R6.19/m^3. The Overstrand Local Municipality was totally dependent on self-supply. The Cape Town Metropolitan Municipality was 39% reliant on own sources and the cost price of this water was R3.02/m^3.
There are various methods for calculating a price for self-supplied bulk water. The common pricing methodology used by the sample municipalities is percentage of total cost of the support service. The sum of cost divided by the volume supplied methodology of determining price was used by five of the sample municipalities.

The DWA supplied 24% of the raw water required by the sample municipalities: ranging from 100% for the Sol Plaatjie Local Municipality to 50% for the Kouga Local Municipality and even smaller percentages to others.

The average price of bulk raw water supplied to municipalities by DWA varies between municipalities (Table 5.28). The Stellenbosch Local Municipality was charged R0.3190/m^3 while the Midvaal Local Municipality was charged R1.892/m^3. The water tariffs from DWA recover operating and maintenance costs, depreciation and replacement of assets. These elements were charged for separately by DWA. An average pricing was supplied for the purpose of this study.

Water Boards supplied approximately 31% of the total water supply required by the sample municipalities. A Water Board may supply purified and/or raw water. The price they charged varies by the type of supply and between municipalities. In some instances Water Boards provided as little as 10% of the total supply required by a municipality (Table 5.28), while in other cases they provided 100% of the treated water required, e.g. to the eThekwini and Ekurhuleni Metropolitan Municipalities. The price charged to the eThekwini Metropolitan Municipality was R3.2535/m^3, whilst the Ekurhuleni Metropolitan Municipality was charged R3.5372/m^3. The highest price charged by a Water Board was to the Buffalo City Metropolitan Municipality. This municipality acquired 64% of its water from the Water Board and was charged R4.64/m^3.

The sample municipalities varied in the manner in which the cost of supply was reflected financially (Table 5.28). Of the sample municipalities, six viewed the cost of self-supply as a fixed cost and three viewed it as a variable cost.

The DWA cost of raw water supply was treated as a fixed cost by four of the sample municipalities and treated as a variable cost by two of the sample municipalities. A Water Board supply was viewed by four sample municipalities as a fixed cost and as a variable cost by three sample municipalities.

Table 5.14 reveals that the majority of the sample municipalities view the supply of raw or purified bulk water as a fixed cost.

5.9.4 Fixed costs versus variable costs

When developing a tariff structure for the cost recovery of a service being consumed, the division of costs into fixed and variable is an important element because the former should ideally be recovered by means of an availability charge, while the latter by means of a volume consumed charge. The problem with this is that municipalities are inconsistent in the classification of water service costs as either a fixed cost or variable costs.

The way municipalities proportion water service costs, either fixed or variable is shown in Table 5.29.

Table 5.29: Fixed and variable cost analysis

DETAILS	NMBM	Ethekwini	Ekurhuleni	Midvaal	Sol Plaatjie	Stellenbosch	Amathole	Polokwane	Steve Tshwete	George	uMhlatuze	Kouga	Overstrand	CapeTown	AVERAGE TOTALS
Cost breakdown of water service:															
Proportion fixed cost (%)	30%	60%	90%	50%	28%	64%	26%	17%	45%	50%	56%	70%	60%	70%	51%
Proportion variable cost (%)	70%	40%	10%	50%	72%	36%	74%	83%	55%	50%	44%	30%	40%	30%	49%
Proportion control for fixed vs variable cost	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**
Cost breakdown major service cost category:															
Proportion bulk water supply (%)	68%	42%	45%	20%	40%		14%	54%	34%	50%	20%	40%	20%	20%	36%
Proportion treatment and reticulation of potable water (%)	18%	11%	44%	20%	14%		60%	28%	66%	10%	17%	30%	35%	15%	28%
Proportion receipt, treatment and disposal of waste water (%)	14%	11%	10%	30%	34%		22%	14%		25%	35%	25%	35%	65%	25%
Proportion administration of service including collection of revenue (%)		37%	1%	30%	12%		4%	3%		15%	28%	5%	10%		11%
Proportion control for major service cost category	**100%**	**100%**	**100%**	**100%**	**100%**	**0%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

Of the municipalities 51% classify the costs incurred as fixed cost and 49% as variable costs.

The classification of costs varies from municipality to municipality. The Nelson Mandela Metropolitan Municipality classified 30% of the operating costs as fixed and the remaining costs as variable. This split in costs was similar to that of the Sol Plaatjie Local Municipality and the Amathole District Municipality. The Cape Town Metropolitan Municipality classified 70% of the operating costs as fixed and the remaining costs as variable. The eThekwini and Ekurhuleni Metropolitan Municipalities classified 90% of the total operating costs as fixed and 10% as variable.

The consolidated financial template (Table 5.14) showed that 31.24% of the operating costs for the 2009/10 financial year were variable costs, 56.90% were fixed costs and that 11.86% were cost of transfers. The ratio differs due to the inclusion of the cost of transfer in Table 5.14.

A water service provided by a municipality typically consists of bulk water supply, treatment and reticulation of potable water, receipt, treatment and disposal of waste water, and the administration of the service including the collection of revenue.

The sample municipalities allocated operating costs to each of these elements of the water service (see Table 5.29).

On average, 36% of the operating budget was spent on bulk water supply, 28% on the treatment and reticulation of potable water, 25% on receipt, treatment and disposal of waste water and 11% on the administration of the service, including the collection of revenue.

Although the Nelson Mandela and Cape Town Metropolitan Municipalities' and the Steve Tshwete Local Municipality did provide a 100% split of operating costs, the municipalities did not apportion costs to the 4 water service elements listed above. The Stellenbosch Local Municipality provided no split of costs.

Municipalities that did provide apportioned costs for the 4 elements differed significantly in the cost apportionment. Although the average cost apportionment to bulk water supply was 36%, the George

Local Municipality apportioned 50% of its operating costs to bulk water supplied. The George Local Municipality supplies 100% of its own raw water, indicating that this raw water source is costly to treat. The Polokwane Local Municipality apportioned 54% of the operating costs to the bulk water supply element of the water service. The Polokwane Local Municipality entirely self-supplied its bulk water. Sample municipalities that had low levels of costs apportioned to this element were Amathole District Municipality and the Midvaal, uMhlatuze and Overstrand Local Municipalities. The Amathole District Municipality sourced its bulk water from municipal owned sources and a Water Board. The Midvaal Local Municipality sourced its bulk water from DWA and a Water Board and the Overstrand Local Municipality made use of municipal owned sources.

The average cost allocation to the treatment and reticulation of potable water was 28% (Table 5.29), however the Amathole District Municipality allocated 60% of its total operating cost to this element of the water service, and the Ekurhuleni Metropolitan Municipality 44%.

Of the operating costs an average of 25% for the water service was allocated to the receipt, treatment and disposal of waste water (Table 5.29). The Midvaal, Sol Plaatjie, uMhlatuze and Overstrand Local Municipalities' allocated higher proportions, while eThekwini and Ekurhuleni Metropolitan Municipalities and the Polokwane Local Municipality allocated lower proportions.

The eThekwini Metropolitan Municipality and the Midvaal and uMhlatuze Local Municipalities respectively, apportioned 37%, 30%, and 28% to the cost of administration of the water service, including the collection of revenue. An average apportioned cost of the sample municipalities for this element of water service provision was 11%, however the Ekurhuleni Metropolitan Municipality only apportioned 1% of its water service provision operating costs to this cost element.

5.9.5 Adequacy of depreciation provision

5.9.5.1 Asset valuation methods and the municipal asset register details

The accounting standards applicable to municipalities allow for a choice of asset valuation. Assets are either valued at replacement cost or historical cost. The choice of asset valuation has an impact on the value of depreciation allowed for, and hence the annual cost elements of operating a service. The replacement method results in a higher depreciation cost. As a result, the accumulated depreciation is higher than those municipalities using only the historical method of asset valuation. The reason for a higher cost is because the replacement value is almost always higher than the historical value of infrastructure assets. Apart from the asset valuation choice, the cost of depreciation will be influenced by asset extent, age and state. A municipality must provide for an annual conditional assessment of all infrastructure assets.

The asset valuation methods used and the details included in the municipal asset register of the sample municipalities are shown in Table 5.30.

The replacement method of asset valuation was used by 10 of the municipalities sampled, while 8 used the historical method of asset valuation. The Nelson Mandela and Ekurhuleni Metropolitan Municipalities and the Steve Tshwete Local Municipality provided for both methods of asset

valuation. The 5 sample metropolitan municipalities all used the replacement method of asset valuation and 2 of the metropolitan municipalities used both methods.

The funding source of the capital programmes of a municipality also influences the depreciation cost to be recovered by the tariff structure supporting the water service.

Table 5.30: Asset valuation methods and the municipal asset register details

DETAILS	NMBM	Ethekwini	Ekurhuleni	Midvaal	Sol Plaatjie	Stellenbosch	Amathole	Polokwane	Steve Tshwete	Buffalo City	George	uMhlatuze	Kouga	Overstrand	Cape Town	TOTAL OVERALL	TOTAL METROS
Asset valuation method:																	
Replacement	√	√	√			√	√		√	√	√			√	√	10√	5√
Historical	√		√	√	√			√	√			√	√			8√	2√
Water service infrastructure details are recorded in the asset register?																	
Extent?																	
Yes	√	√	√	√	√	√	√		√	√	√	√		√	√	13√	5√
No								√								1√	Nil
Age?																	
Yes	√	√	√	√	√	√	√		√	√	√	√	√	√	√	14√	5√
No								√								1	Nil
Value?																	
Yes	√	√	√	√	√	√	√	√	√	√	√	√	√	√	√	15√	5√
No																Nil	Nil
State of municipal infrastructure?																	
Yes	√		√	√		√	√	√	√	√	√	√		√	√	12√	4√
No		√			√								√			3√	1√

Asset registers are required to be completed and include details on extent of infrastructure assets, age, value and state of municipal infrastructure. Details of the completeness of the asset registers are included in Table 5.30.

The extent of infrastructure assets was included in the asset register of 13 of the sample municipalities. The Polokwane Local Municipality did not list infrastructure in the asset register and the Kouga Local Municipality did not provide information in this regard. All 15 sample municipalities listed the value of the infrastructure in their asset registers and 12 described the state of the municipal infrastructure in the asset registers. The eThekwini Metropolitan Municipality and the Sol Plaatjie and Kouga Local Municipalities did not provide for the state of the infrastructure assets in the asset register. Although the eThekwini Metropolitan Municipality performs an annual conditional assessment of the infrastructure assets, it did not include this detail in the asset register.

5.9.5.2 Depreciation methodology

Two different depreciation methodologies are applied by municipalities – the straight line and asset consumption method. The straight line method calculates annual depreciation by dividing the value of the asset by the legislated or envisaged life span. The asset consumption method calculates annual depreciation based on the usage of an asset. An asset that is used heavily will depreciate faster than an asset that is not being utilised. The asset consumption method will consider the capacity of the asset and past and future consumption of the asset. The asset consumption method is an accurate method of infrastructure asset depreciation.

The straight line method of asset depreciation was used by 13 of the sample municipalities, as indicated in Table 5.31. In Table 5.30 it is shown that 12 of the sample municipalities retain data on

the state of the infrastructure assets in their asset registers. This would imply that the municipalities undertook a conditional assessment of the infrastructure assets.

Table 5.31: Depreciation methodology applied

DETAILS	NMBM	Ethekwini	Ekurhuleni	Midvaal	Sol Plaatje	Stellenbosch	Amathole	Polokwane	Steve Tshwete	Buffalo City	George	uMhlatuze	Kouga	Overstrand	CapeTown	TOTAL
Depreciation method used:																
Straight line method	√	√		√	√	√	√	√	√	√	√	√		√	√	13√
Asset consumption																Nil
Other																Nil

The data in Table 5.14 above showed that sample municipalities under provided for depreciation when determining the operating cost budget. For the 2009/10 financial year R678 million was budgeted for the depreciation of potable water infrastructure asset depreciation and R343 million for sanitation infrastructure asset depreciation. The cost of depreciation for the potable water infrastructure assets for the 2009/10 financial year was R769 million, R90 million higher than budget.

5.9.5.3 Accumulated depreciation

If there is inadequate maintenance (renewal or rehabilitation), the DRC of infrastructure assets will drop. Boshoff and Childs (2009) reported that the CRC ratio for water and sanitation infrastructure was 52%.

The accumulated depreciation and the current and depreciated replacement costs of the water service related infrastructure assets of 12 sample municipalities is shown in Table 5.32.

Table 5.32: Analysis of accumulated depreciation

DETAILS	NMBM	Ethekwini	Ekurhuleni	Sol Plaatje	Stellenbosch	Amathole	Polokwane	Steve Tshwete	George	uMhlatuze	Overstrand	CapeTown	Average
	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000	R'000
Accumulated depreciation	414 997	1 500 600	479 174	2 440	140 908	420 368	34 397	860 719	158 707	2 816 511	866 296	2 026 126	**810 103**
Current Replacement cost **(CRC)**	32 000 000	31 500 000	6 200 000	690 000	364 434	1 527 101	263 328	1 756 139	1 524 716	4 035 440	1 212 444	27 100 000	**9 014 467**
Depreciated Replacement Cost **(DRC)**	31 585 003	29 999 400	5 720 826	687 560	223 526	1 106 734	228 932	895 421	1 366 009	1 218 929	346 149	25 073 874	**8 204 364**
DRC/CRC	99%	95%	92%	100%	61%	72%	87%	51%	90%	30%	29%	93%	**75%**

The accumulated depreciation recorded for the 2009/10 financial year was R810 million, while the current replacement cost for the water service related infrastructure assets was R9 billion. The depreciated replacement cost of the same infrastructure was R8 204 million. The DRC/CRC ratio for the consolidated sample of municipalities was 75%, above the 65% identified as critical by Burns (2002). Sample municipalities with low DRC/CRC ratios are the Stellenbosch, Steve Tshwete, uMhlatuze and Overstrand Local Municipalities. The latter local municipality has a DRC/CRC ratio as low as 29%.

The sample metropolitan municipalities reported an average 93.8% DRC/CRC ratio; a surprising finding given the high value of backlog water service infrastructure maintenance and rehabilitation reported by the respective municipalities (Table 5.2).

5.9.6 Scarcity cost consciousness

A water scarcity conscious municipality would provide for the next major potable water supply scheme in the IDP, WSDP, WMP and the budget. A scarcity cost of water is a reflection of the future cost of water.

Sample municipalities that have a firm understanding of the cost per m^3 to finance the next major potable water supply scheme are shown in Table 5.33.

Table 5.33: Estimated cost per m^3 of water for the next major potable water supply scheme

DETAILS	Ethekwini	Ekurhuleni	Sol Plaatjie	Amathole	Polokwane	Steve Tshwete	George	Overstrand	Cape Town
R	Rands	Rands	Rands	Rands	Rands	Rands	Rands	Rands	Rands
Estimated cost per cubic meter of water (per m^3)	0.42	2.984	15.67	7.00	20.00	5.50		9.50	7.0-15.00
New dam (estimated cost per m^3)							1.50		
Re-use (estimated cost per m^3)							2.70		

A cost of R20/m^3 of water to fund the next major potable water supply scheme was provided by the Polokwane Local Municipality. The Sol Plaatjie Local Municipality estimated this same cost at R15.67/m^3 of water and the Cape Town Metropolitan Municipality estimates this cost at R7-R15/m^3 of water. A lower cost per m^3 of water was provided by the eThekwini Metropolitan Municipality. This municipality estimated the cost of the next major potable water supply scheme to be R0.42/m^3 of water. The George Local Municipality presented two cost structures measuring the costs/m^3 of water. To provide for a new dam would cost R1.50/m^3 of water and to provide for a recycling plant would cost R2.70/m^3 of water.

5.9.7 Environmental cost consciousness

A water service has an impact on the environment and the environmental cost should be built into the tariff structure used to recover the cost of the service.

Sample municipalities were requested to indicate if an estimate had been made of the total environmental cost of waste water service provision. If the sample municipalities had in fact provided for an estimate of the total environmental cost, it was requested that the municipalities indicate the year of the estimate and the value of the estimate.

The environment cost of the waste water service provided was not estimated by the sample municipalities, Table 5.34.

Table 5.34: Environmental cost of the waste water function

DETAILS	NMBM	Ethekwini	Ekurhuleni	Midvaal	Sol Plaatjie	Stellenbosch	Anathole	Polokwane	Steve Tshwete	Buffalo City	George	uMhlatuze	Kouga	Overstrand	CapeTown	TOTAL
Environmental costs estimated?																
Yes																
No	√	√	√	√	√	√	√	√	√		√	√	√	√	√	**14**√
If yes, what value and in what year?																
Value																
Year																

5.10 CONCLUSIONS

Across the sample of municipalities it was found that the per capita cost to address the cost of the sanitation backlog infrastructure maintenance and rehabilitation was increasing. Metropolitan municipalities have access to greater levels of capital funding and have appeared to concentrate more on addressing the water service backlog than the sanitation service backlog. The per capita cost of backlogs is the highest in non-metro municipalities.
The recording of potable water service interruptions by municipalities is a necessity when prioritising capital expenditure, however many do not do it. Sample municipalities with high backlogs in water service infrastructure maintenance and rehabilitation have recorded no water interruptions, which is unlikely.

Not recording the days of failed sanitation by the sample municipalities is an indication that municipalities are in fact failing to monitor sanitation services. This argument is strengthened by the high value of sanitation service backlog infrastructure maintenance and rehabilitation recorded (Table 5.2). Data on days of failed sanitation services is necessary in order to prioritise the capital expenditure of a municipality.

There did not appear to be a negative correlation between the blue drop quality status or green drop status and the value of backlog infrastructure maintenance and rehabilitation, however reasons for not achieving the blue drop status and green drop status include infrastructure, operating processes employed and lack of skills to manage a sustainable potable water system. The bigger problem with meeting service standards was with waste water management, where only 5 of the municipalities reporting achieving the green drop status.
Capital expenditure/value of building plans fell over the 2006-2010 period – suggesting capital expenditure was lagging behind demand and not accommodating growth.

Operational readiness of the water service infrastructure is identified as a risk by several municipalities, mostly not a high risk. Not identifying the priority rating of the risk could explain why less than required capital is provided by municipalities to contribute to mitigating the water service risk. Three municipalities do not maintain risk registers.

Water meter audits are undertaken by municipalities, however there are often long periods between these audits. When water meter audits are not undertaken frequently by a municipality, there is a risk that water consumption utilised to determine cost recovery tariffs is inaccurate. It will also

contribute to higher non-revenue water being recorded, possibly resulting in under cost recovery of the service. The monitoring effort is less than legally required.

Across the sample of municipalities it was found that high numbers of the population were being served by skilled staff. This would decrease if the high number of vacant posts were to be filled by the municipalities. There was a 34% vacancy rate in the sample municipalities water services which is of concern.

Municipalities are committing effort to planning water services, but a further assessment is required to determine if municipalities are in fact implementing projects and efficiency plans in accordance with the plans, and if the plans are realistic considering resource availability.

Reducing non-revenue water is necessary to reduce the burden it places on paying customers. High non-revenue water has been recorded by the sample municipalities. Non-revenue water recorded was 33%.

Across the sample municipalities it was found that significant transfer costs are embodied in the tariff calculations. The provision for transfer costs may be inadequate as the net debt owed by consumers for the water service is increasing, however, this would decrease if municipalities implemented strategies to collect outstanding debt. Of the debt accrued, 91% was collected.

There are various funding sources used by municipalities to fund capital programmes. A large portion of the funding package for the municipality's capital programme was funded from external loans – transferring the cost recovery impact to future paying consumers.

The allocation of 15% of the total capital budget for water services is low, considering the backlogs in infrastructure. There was a significant gap between the per capita investment in water infrastructure (maintenance, rehabilitation and service coverage) and the per capita investment required (backlog). Smaller municipalities tend to spend more of the water service capital budget on new bulk infrastructure as opposed to maintenance and rehabilitation of existing infrastructure. This tendency will challenge the sustainability of the service and might in part explain the high number of service interruptions in the potable water service and days without a sanitation service. Metropolitan municipalities spend higher proportions of their capital budgets.

The sample metropolitan municipalities have the lowest operating cost impact on capital funding to support rehabilitation of infrastructure assets and new capital for networks.
Municipalities underspend on the capital budgets provided for water services, metropolitan municipalities less so. National Government Conditional Grants that are underspent are returned to the National Government.

The water service operating result budgeted for differs significantly from the actual result – possibly due bad planning and budgeting by unskilled staff. Variable costs were however well planned for. Repairs and maintenance allocations from the operating budget appear to be low in proportion to the total cost of the water service, which might explain the increase in backlog maintenance at the municipalities. The fixed operating cost of the water service was found to be the highest cost proportion of the total operating budget. The finance cost (linked to the value of external loans) of

the sample municipalities was low, allowing for leverage to raise external loan funding to support the water service, and contribute to addressing the backlog in water service infrastructure asset maintenance and rehabilitation and service coverage. The cost of depreciation was high for sample local and district municipalities, a good indication of aging infrastructure. The cost for those consumers that cannot afford to pay for the water service was underestimated, and it was deduced that many consumers that could afford to pay for the water service are not doing so. The significantly higher anticipated contributions to the bad debt provision was evidence of this. The water service revenue was also found to be used for the cross-subsidising of other municipal services. Consumptive income for water services was found to be overestimated.

Municipalities made limited use of external support options during the rendering of the water service.

Ring-fencing of the water service is necessary to align water service liabilities with assets, determine the equity of the water service, determine costs and developing cost reflective tariffs that will raise sufficient income to sustain the water service. However, the majority of municipalities did not implement the principle of ring-fencing the water service. Longer-term horizon planning requires the development of financial models that allow for the analysis of various planned scenarios. Financial models can only produce accurate results once the full asset base is accounted for and the associated liabilities are recognised. In addition, municipalities were found to know a little about consumption trends and the nature of demand by the users of the water service.

Municipalities used various internal costing principles to determine the cost of the water service.

Bulk water was either self-supplied or supplied by DWA and/or a Water Board to municipalities. The cost of bulk water supply varied between source and within the same source. Municipalities were uncertain if the cost of a bulk supply of water should be treated as a fixed or a variable cost. Without the consistent classification of the operating costs, the calculation of cost recovering tariffs will be guesswork.

The asset registers across the municipalities were found to be complete, so there was no reason why a municipality should not apply the asset consumption method of depreciation instead of the straight line method of asset depreciation. Municipalities were already measuring and recording the conditionality of infrastructure assets. The depreciation cost used to determine the tariff structure for a particular year was deduced to be under provided, resulting in the full cost of depreciation not being recovered by the water service tariff. Municipalities were not using depreciation adequately to manage asset replacement. This might, however, explain why municipalities still allocated large portions of external grant funding to infrastructure asset maintenance and rehabilitation (Table 5.12). It may also explain the growth in backlog infrastructure asset maintenance and rehabilitation being experienced.

Providing for the next major potable water supply scheme was material in terms of the estimated cost per m^3. These costs were not included in tariff structures being applied by the sample municipalities for the period focused on in the study. A finite amount of water is available, and major challenges will be experienced if a municipality does not plan for the next major potable water supply scheme and secure the funding required.

Across the municipalities the environmental cost of the waste water function was not estimated and was not included in the tariff structure. A municipality is often not insured for this risk. If an environmental cost does arise it might mean that a municipality's sustainability will be challenged (not only the sustainability of the water service).

CHAPTER 6

CONCLUSIONS AND RECOMMENDATIONS

6.1 CONCLUSIONS

South African municipalities face enormous challenges to sustain water service delivery in order to fulfill the desire of government to extend high quality services from a relatively small portion of the population to the whole. Evidence of failures in delivery are mounting, including a lack of political will at local government levels, low budget priority, insufficient capital, lack of capacity and skill and flawed tariff and accounting structures.

These challenges take place within an institutional setting, defined by the Constitution of South Africa Act (Act 108, 1996) and a number of supporting Acts. The Constitution identifies municipalities as the key role players in the delivery of water services – potable water and waste water management. This water service delivery and planning is regulated by the Local Government Municipal Systems Act (2000), which requires, inter alia, that municipalities formulate a Water Service Development Plan, and implement a tariff structure that recovers costs and takes other social objectives into account. The standards of water service provided are regulated by the Water Services Act (1997) and the latter identifies the National Department of Water Affairs as the lead setting and monitoring agent in this connection. Ring-fencing of water accounts is an implicit requirement of the Water Services Act (1997).

The pursuit of the objective of increasing welfare under a cost recovery constraint, through the use of the IBT, inevitably leads to a mismatch problem in tariffs set and demand satisfied. The strongest case for the IBT is to be built when the cost recovery is abandoned as a constraint and instead adopted as an objective, for example, in the form of minimising the shortfall in cost recovery, subject to the tariff structure not distorting price signals (at least not any more than linear tariffs would). In terms of this objective, the IBT structure has considerable merit. The reason why it has considerable merit is that in many instances the national government has inadvertently set up a mismatch between service supplied and willingness to pay, making it unlikely that cost recovery can be realised other than through distorting production and consumption in the economy. The IBT is the most feasible tariff structure for minimising the inevitable revenue shortfall.
The IBT cost recovery "objective" model is not the one currently favoured by South Africa's Department of Water Affairs. They favour a model of promoting social welfare within constraints. Their model has as its objective maximizing the number of consumers included in the service and is subject to the triple constraints of: meeting defined quality standards for all aspects of the service, full cost recovery and satisfaction of politically driven aspirations for service. It is a model that inevitably leads to a mismatch problem, political demand for subsidies and to failures (compromises) in satisfying the constraints.

An important, but neglected (in Africa), type of efficiency/equity analysis of water service provision in South Africa is that of the efficiency in mix of water service output. It has the aim of getting the right product mix. An analysis of efficiency in the mix of water service output is one that aims to match demand to the service produced. It is inefficient to produce a mix of outputs that the

recipients cannot afford. A possible way forward to address water tariff efficiency/equity challenges is through giving this mix more attention (Chapter 3) in future.

The findings of the survey administered to shed light on municipal experiences in water service provision are summarised in Table 6.1.

Table 6.1: Summary of survey findings related to the main aims of the study

	Aim of Study	Absolute threat to serivice sustainability	Concern	Not a Concern
a)	Is there a backlog in the service coverage and infrastructure rehabilitation and maintenance?	Backlog in infrastructure rehabilitation and maintenance		Backlog in water service coverage
b)	Is the water service a sub-standard service?		Yes	
c)	Is the provision of water services prioritised by water service authorities?		Competes with other services. Not prioritised as a high risk.	
d)	Is there a monitoring effort by the water service authorities?		Limited	
e)	Are there adequate skills to provide a sustainable water service?		No	
f)	Do water service authorities adequately plan for the sustainability of the service?			Yes (WSDP)
g)	Is adequate capital allocated to the sustainability of the water service?	No (increasing backlogs reported)		
h)	Are water service costs correctly classified to allow for the determination of cost recovery tariffs?		Inconsistent	
i)	Are water service budgets compiled using renowned budget forecasting methodologies and accurate trends in water consumption?		Many variances between forecast and actual costs and income were reported	
j)	Is the water service ring-fenced and are proven costing methodologies used?	Water service is not ring-fenced		Inconsistent use of costing methodologies
k)	Are asset replacement costs and depreciation accurately determined?	No		
l)	Is there under recovery of financial costs because of inadequate provisions for depreciation and maintenance of infrastructure?	Yes		
m)	Does existing pricing policy incorporate the full financial costs of managing water?	No		
n)	Are economic costs taken into account in the pricing of water services?		No	

Sustainability in water service provision in South Africa may be at risk because of backlogs in water service infrastructure rehabilitation and maintenance, the water service not being ring-fenced, inaccurate determination of asset replacement costs and depreciation, under recovery of financial costs and inadequate pricing (tariff setting) policy (Table 6.1). This conclusion is inferred from an in-depth analysis of water services data and information elicited from a sample of 14 municipalities out of a total of 278.

Water service authorities do however plan for the sustainability of the water services and have implemented various costing methodologies. Both contribute positively to the sustainability of the water services.

6.2 RECOMMENDATIONS

(a) The Department of Water Affairs (DWA) accept that South Africa faces a mounting challenge to water service delivery under the current institutional arrangements, and that these may need urgent review if serious adverse economic consequences are to be averted.

(b) There is an urgent need to clarify economically what municipalities are trying to achieve through the tariff setting arrangements linked to water service delivery. To avert serious distorting effects, there needs to be more attention paid to demand, and this in turn, requires that municipalities put more effort into generating knowledge about this demand.

(c) The IBT can play a potentially very important positive role, but not within the current DWA framework for tariff setting. The DWA need to change the model to one of minimising cost recovery shortfall, subject to the constraint of attaining a given level of social welfare and satisfying economic demand (as opposed to political demand).

(d) Regulations by the DWA should consider benchmarks for water service provision at the local government level and review national department's monitoring and oversight over water service provision.

(e) The DWA and Water Boards must be transparent when determining tariffs to be charged to municipalities for either raw or potable water. This could include a standard set of tariffs linked to clear criteria or conditions.

(f) Municipalities must record water services interruptions diligently in order to raise the risk profile of the water service.

(g) Municipalities must prioritise achieving the blue drop quality status and green drop status. Such priority must be reinforced in the service delivery mandate of municipalities.

(h) Municipalities must ring-fence the water service in their accounts and apply financial modelling in order to determine tariffs that recover costs. Such modelling and forecasting must be supported by a sound costing methodology and be linked to the WSDP and WMP.

(i) Municipalities must implement strategies that reduce the excess burden of transfer costs by setting in place strategies and processes to recover debt from consumers that can afford to pay, and by reducing cross-subsidisation of other municipal services from the water service.

(j) Municipalities must explore enterprise asset management models that provide for the full life cycle of an infrastructure asset. Such a life cycle starts with the asset to be acquired and ends with the disposal of the asset. The asset management models are able to record and predict the repairs and maintenance needs of the infrastructure used to support the water

service and must be used to motivate for further repairs and maintenance allocations in the operating budget and rehabilitation allocations in the capital budget. The enterprise asset management model must be built on the foundation of an accurate asset register linked to WSDP and WMP.

(k) Municipalities need to ensure that strategies are developed to spend both the operating and capital budget allocated. These may include the employment of project management skills or more efficient supply chain management policies and/or supply chain management capacity.

(l) Municipalities must develop tariff structures that will recover the full cost of the water service.

The consideration of the study recommendations as well as the detailed study analysis and review of a sample of South African municipalities will actively assist to address the growing water service delivery problem. This will in turn support the growth and development of South Africa its people and economy.

REFERENCES

Babbie, E. and Mouton, J. 2001. *The practice of social research. South African Edition*. Cape Town: Oxford University Press.

Banerjee, S., Foster, V., Ying, Y., Skilling, H. and Wodon, Q. 2010. *Cost Recovery, Equity, and Efficiency in Water Tariffs: Evidence from African Utilities*. [Online] Available: http://www-wds.worldbank.org/external/default/WDSContentServer/IW3P/IB/2010/07/28/000158349_20100728131236/Rendered/PDF/WPS5384.pdf. [Accessed 14 December 2011].

Boshoff, L and Childs, R. 2009. *A basis for estimating infrastructure renewal requirements in the South African Municipal Space. In Guidelines for Infrastructure Asset management in Local Government – 2006-2009.* Pretoria: DPLG.

Boshoff, L. 2009a. *Municipal Infrastructure Asset Care in South Africa: A reality check.* Unpublished Paper.

Boshoff, L. 2009b. *Status and future of municipal asset maintenance in South Africa*. DBSA.

Burns, P. 2002. *Infrastructure Depreciation: An alternative approach to straight line*. Strategic Asset Management, Issue 84.

Coady, D. and Dreze, J. 2002. *Commodity Taxation and Social Welfare: The Generalized Ramsey Rule*. International Tax and Public Finance May; 9, no. 3, pp. 295-316.

COGTA. 2009a – *see* South Africa. Department of Co-operative Governance and Traditional Affairs. 2009a. *MIG Policy Review – Draft Discussion Document.*

Collis, J. & Hussey, R. 2003. *Business research: a practical guide for undergraduate and post graduate students.* 2nd Ed. UK: Palgrave Macmillan.

Creswell, J.W. 2009. *Research Design: Qualitative, Quantitative and Mixed Methods Approaches*. 3rd ed. United Kingdom: Sage Publications Ltd.

Dockel, J.A. 1973. *The influence of the price of Water on Certain Water Demand Categories.* Agrekon, Volume 12, no. 3, pp. 17-22.

Donaldson, D. 2010. in Gross, T. 2010. *Ramsey Taxation and (the Absence of) Taxation Competition*. [Online] Available: http://www.econ.ucsb.edu/about_us/events/seminar_papers/gross.pdf. [Accessed 16 December 2011].

DWAF and WRC. 1995 – *see* South Africa. Department of Water Affairs and Forestry and the Water Research Commission. 1995. *Procedures to assess effluent discharge impacts*.

DWAF. 2002 – *see* South Africa. Department of Water Affairs and Forestry. 2002. *Guidelines for Compulsory National Standards and, Norms and Standards for Water Services Tariffs.*

DWAF. 2005a – *see* South Africa. Department of Water Affairs and Forestry. 2005a. *Water Services Infrastructure Asset Management Strategy Study.*

DWAF. 2005b – *see* South Africa. Department of Water Affairs and Forestry. 2005b. *Estimate of required municipal infrastructure investment required to address backlogs in access to basic services.*

DWAF. 2005c – *see* South Africa. Department of Water Affairs and Forestry. 2005c. *Terms of reference for Water Service Infrastructure Asset Management strategy.*

Field, B. 2001. *Natural Resource Economics: An Introduction.* New York: McGraw-Hill Companies Inc.

Fourie, J. 2007. *A Note on Infrastructure Quality in South Africa*. Stellenbosch University. [Online] Available: http://www.econ.sun.ac/wpapers/2007/wp032007/wp-03-2007.pdf. [Accessed 20 December 2011].

Gibson, S, stevlyn@ibi.co.za, 2011. Masters research. [E-mail] Message to K Jacoby (kjacoby@mandelametro.gov.za). Sent 3 March 2011. [Accessed 3 March 2011].

Gibson, S. 2004. *The Forgotten Municipalities.* Paper presented at Institute of Municipal Engineering of Southern Africa (IMESA) conference, Mossel Bay, October 2004.

Hosking, S.G. and Hosking P.A. 2009. *The determination and recovery of environmental costs of water services provided by the Nelson Mandela Bay Municipality*. Environmental and Resource Conference. Cape Town.

Hosking, S.G. 2010. *Investigating the mechanism and processes used in setting water services tariffs*. WRC Project K5/1871/3. Pretoria: Water Research Commission.

Hosking, S.G. 2011a. *Providing water services at tariff levels that cover cost and that are sensitive to demand*. WRC Project K3/2087. Pretoria: Water Research Commission.

Hosking, S.G. 2011b. *Private sector participation in municipal water service provision – a reassessment*. Paper presented at the 12th Annual BEN-Africa Conference, 31 October – 2 November, Zanzibar, Tanzania.

Jacoby, K. 2010. *An assessment of South African municipal tariff setting, based on three Eastern Cape examples*. Unpublished honours treatise, Nelson Mandela Metropolitan University, Port Elizabeth.

Lambrechts, IJ. 2006. *Replacement depreciation and price regulation*. Journal of Energy in Southern Africa.

Lawless, A. 2007. Numbers & needs in local government. SAICE, Midrand, South Africa.

MSA. 2000 – *see* South Africa. 2000. *The Local Government Municipal Systems Act 32 of 2000.*

Mueller, J. 2006. *Overblown: How Politicians and the Terrorism Industry Inflate National Security Threats, and Why We Believe Them*. New York: Free Press.

National Treasury. 2008 – *see* South Africa. National Treasury. 2008. *Local Government Budgets and Expenditure Review 2003/04-2009/10.*

National Treasury. 2011a – *see* South Africa. National Treasury. 2011a. *National Treasury local government database*.

National Treasury. 2011b – *see* South Africa. National Treasury. 2011b. *Municipal Budget Circular for the 2011/12 MTREF*.

Nelson Mandela Bay Municipality. 2010. *Annual Report for 2009/2010*, Port Elizabeth: Government Printer.

Nelson Mandela Bay Municipality. 2010. *Integrated Development Plan for 2009/2010.* Port Elizabeth: Government Printer.

Nelson Mandela Bay Municipality. 2010. *Operating and Capital Budgets for 2009/2010.* Port Elizabeth: Government Printer.

Nelson Mandela Bay Municipality. 2010. *Water Service Development Plan for 2009/2010.* Port Elizabeth: Government Printer.

NMBM IDP. 2010 – *see* Nelson Mandela Bay Municipality. 2010. *Integrated Development Plan for 2009/2010.*

NMBM WSDP. 2010 – *see* Nelson Mandela Bay Municipality. 2010. *Water Service Development Plan for 2009/2010.*

Olivier, A. 2006. *Water Tariff Increase in Manus: An Evaluation of the Impact on Households*. Working Paper DT/2006/10. DIAL: Paris.

Pape, J and McDonald, DA. 2002. *Cost Recovery and the Crisis of Service Delivery in South Africa.* Human Sciences Research Council Publishers. Cape Town.

Philippe, M. 2009. *Public-Private Partnerships for Urban Water Utilities, a review of experience in developing countries*. [Online] Available: http://www. ppiaf.org/sites/ppiaf.org/files/FINAL-PPPsforUrbanWaterUtilities-PhMarin.pdf. [Accessed 20 December 2011].

Power, PB. n.d. *Depreciated Replacement Cost Valuation Handbook*. For the valuation of the electrical network assets of the Electrical Distribution Industry in South Africa.

Ramsey, F.P., 1927. *A Contribution to the Theory of Taxation*. The Economic Journal, 37/145, 47-61 [Online] Available: http://www.jstor.org/stable/2222721 [Accessed 20 December 2011].

SABS. 2001 – *see* South African Bureau of Standards, 2001. *Specification for Drinking Water. Compulsory National Standards for Quality of Potable Water (SABS 241-2001)*

SAICE. 2006 – *see* South African Institute of Civil Engineering, 2006. *The SAICE Infrastructure Report Card for South Africa.*

Salim, R. 2006. *Measuring productive efficiency incorporating firms' hetrogenety: An empirical Analysis*. Journal of Economic Development, Volume 31, no. 1.

Segal, N. 2009. *Does South Africa face a water crisis? A report to Business Leadership South Africa*. [Online]. Available: http://www.infrastructuredialogues.co.za/wp-content/uploads/Does-South-Africa-face-a-water-crisis.pdf. [Accessed 20 December 2011].

South Africa. 1996. *The Constitution of the Republic of South Africa Act 108 of 1996.* Pretoria: Government Printer.

South Africa. 1997. *The Intergovernmental Fiscal Relations Act 97 of 1997.* Pretoria: Government Printer.

South Africa. 1997. *The Water Services Amendment Act 108 of 1997.* Pretoria: Government Printer.

South Africa. 1998. *The Local Government Municipal Structures Act 117 of 1998.* Pretoria: Government Printer.

South Africa. 2000. *The Local Government Municipal Systems Act 32 of 2000.* Pretoria: Government Printer.

South Africa. 2001. *Statistics South Africa Census 2001:* Government Printer.

South Africa. 2003. *The Local Government Municipal Systems Act 44 of 2003.* Pretoria: Government Printer.

South Africa. 2003. *The Municipal Finance Management Act 56 of 2003.* Pretoria: Government Printer.

South Africa. 2005. *The Intergovernmental Relations Framework Act 13 of 2005.* Pretoria: Government Printer.

South Africa. Department of Co-operative Governance and Traditional Affairs. 2009a. *Municipal Infrastructure Grant Policy Review – Draft Discussion Document.* Pretoria: Government Printer.

South Africa. Department of Water Affairs and Forestry and the Water Research Commission. 1995. *Procedures to assess effluent discharge impacts*. Water Research Commission WRC Report No TT 64/94. Document written by CSIR Environmental Services.

South Africa. Department of Water Affairs and Forestry. 2002. *Guidelines for Compulsory National Standards and, Norms and Standards for Water Services Tariffs.* Pretoria: Government Printer.

South Africa. Department of Water Affairs and Forestry. 2004. *National Water Strategy, 1st Edition.* Pretoria: Government Printer.

South Africa. Department of Water Affairs and Forestry. 2005a. *Water Services Infrastructure Asset Management Strategy Study.* Pretoria: Government Printer.

South Africa. Department of Water Affairs and Forestry. 2005b. *Estimate of required municipal infrastructure investment required to address backlogs in access* to *basic services*. Pretoria: Government Printer.

South Africa. Department of Water Affairs and Forestry. 2005c. *Terms of reference for Water Service Infrastructure Asset Management strategy*. Pretoria: Government Printer.

South Africa. Department of Water Affairs. 2009a. *Blue Drop Report 2009*. Pretoria: Government Printer.

South Africa. Department of Water Affairs. 2009b. *Green Drop Report 2009*. Pretoria: Government Printer.

South Africa. Department of Water Affairs. 2010. *Strategic Plan 2010/11-2013/14*. [Online] Available: http://www.dwaf.gov.za/documents.Other/Strategic%2520Plan/StrategicPlan2010-2013.pdf. [Accessed 15 December 2011].

South Africa. Minister of Water Affairs and Forestry. 1998. *National Water Act.* Pretoria: Government Printer.

South Africa. National Treasury. 2008. *Local Government Budgets and Expenditure Review 2003/04-2009/10.* Pretoria: Government Printer

South Africa. National Treasury. 2011a. *National Treasury local government database*. [Online]. Available: http://www.treasury.gov.za.htm. [Accessed on 20 March 2011].

South Africa. National Treasury. 2011b. *Municipal Budget Circular for the 2011/12 MTREF*. MFMA Circular No.55. Pretoria: Government Printer.

South African Bureau of Standards . 2001. *Specification for Drinking Water. Compulsory National Standards for Quality of Potable Water (SABS 241-2001).* Pretoria: Government Printer.

South African Government Information. 2011. *Categories of Municipalities*. [Online] Available: http://www.info.gov.za/aboutgovt/locgovt/categories.htm. [Accessed 20 December 2011].

South African Institution of Civil Engineering, 2006. *The SAICE Infrastructure Report Card for South Africa.*

South African Local Government Association. n.d. *Financial Best Practice Manual-Tariffs Illustrative Policy*. [Online]. Available: http://www.imfo.co.za/bestpracticemanual.htm. [Accessed 20 March 2011].

Strauss, A. & Corbin, J. 1990. *Basics of Qualitative Research Techniques and Procedures for Developing Grounded Theory.* 2nd Edition. London: Sage Publications.

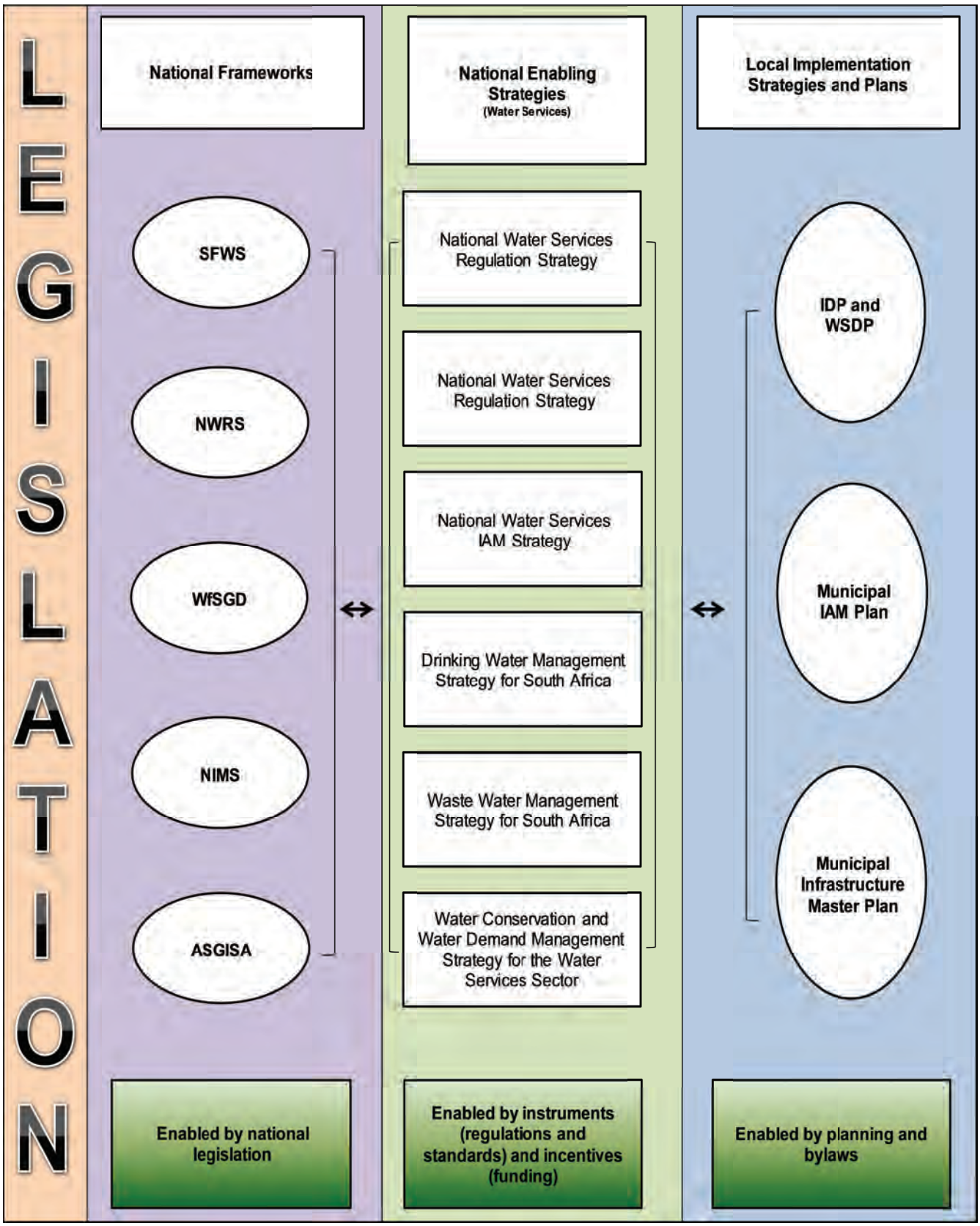
Veck, G.A. and Bill, M.R. 2000. *Estimation of Demand for Water by Means of Contingent Valuation.* WRC Report No 790/100. Pretoria: Water Research Commission.

Wall, K. 2005. *Water and Waste-water Treatment Works in South Africa: A Study of the Compliance and regulatory Gap.* Paper presented at conference "Poverty reduction through better regulation", Johannesburg. February 2005.

Whittington, D., J. Boland, and V. Foster. 2002. *Understanding the Basics: Water Tariffs and Subsidies in South Asia*. Water and Sanitation Program, World Bank, Washington, DC.

ANNEXURES

ANNEXURE A- Overview: Integration of Frameworks, Strategies and Plans for Water Services in South Africa


LEGISLATION
National Frameworks
National Enabling Strategies
(Water Services)
Local Implementation Strategies and Plans
SFWS
NWRS
WfSGD
NIMS
ASGISA
National Water Services Regulation Strategy
National Water Services Regulation Strategy
National Water Services IAM Strategy
Drinking Water Management Strategy for South Africa
Waste Water Management Strategy for South Africa
Water Conservation and Water Demand Management Strategy for the Water Services Sector
IDP and WSDP
Municipal IAM Plan
Municipal Infrastructure Master Plan
Enabled by national legislation
Enabled by instruments (regulations and standards) and incentives (funding)
Enabled by planning and bylaws

ANNEXURE B – Covering letter to Municipalities on Water Service and Water Tariffs

PO Box 6203
WALMER
PORT ELIZABETH
6065

TO WHOM IT MAY CONCERN

PROVIDING WATER SERVICES AT TARIFF LEVELS THAT COVER COST AND THAT ARE SENSITIVE TO DEMAND

The Nelson Mandela Metropolitan University (NMMU) is currently undertaking a study on behalf of the Water Research Commission of South Africa, under project code KSA 3.

A component of the study deals with under cost recovery of water services tariffs at selected municipalities in the year 2009/10, a focal point of this questionnaire.

This component of the study covers three objectives:

A. Identifying the extent of, consequences from and causes of sub-standard water service provision. This purpose will be pursued by the application of regression analysis to responses made to the questionnaire;
B. Generating information by which to estimate the extent of under-financial-cost-of-service calculation. This purpose will be pursued by suitable descriptive analyses of the responses made to the questionnaire; and
C. Reach a view on the merit of introducing benchmarking.

You are hereby requested to participate in the study by completing the attached questionnaire and financial template. It will be greatly appreciated if you will allow us some of your time to complete the questionnaire and template.

The questionnaire and template is being administered on behalf of Prof SG Hosking, Department of Economics, Nelson Mandela Metropolitan University. He can be contacted at 041-504 2205 or through e-mail address, Stephen.hosking@nmmu.ac.za or at Nelson Mandela Metropolitan University, PO Box 77000, Port Elizabeth, 6310.

The answers supplied will be treated as confidential, but will inform public policy on water service provision and tariff setting.

IMPORTANT NOTES FOR RESPONDENTS COMPLETING THE QUESTIONNAIRE:

- Other than when stated differently, all financial and other data must be extracted from the 2009/10 financial year.
- Throughout this document “water services” refers to water supply and sanitation services.
- Reference to a “water service authority” should be read to include a municipality that is a water service provider/authority.

Thanking you in advance of participating in the study.

KEVIN JACOBY
Nelson Mandela Metropolitan University
St. no. 209031721
Cell no. 082 468 3000
Fax no. 0415061444
kjacoby@mandelametro.gov.za

Survey facilitated by Mr Kevin Gillmer
Cell no. 082 825 3812
Fax no. 0415061444
kgillmer@mandelametro.gov.za

ANNEXURE C – Water Service and Tariff Survey

SURVEY

INSTRUCTIONS: PLEASE FILL IN THE REQUESTED INFORMATION IN THE SPACE PROVIDED (LINE OR BOX) OR TICK (MAKE A CROSS) IN THE APPROPRIATE BOX. THANK YOU.

1) What was the value of the **backlogs** in water services maintenance/rehabilitation and service/coverage for the following years? (A backlog in maintenance/rehabilitation would refer to the value of maintenance or rehabilitation that could not take place due to a lack of financial or other resources. A backlog in service/coverage would refer to the value of infrastructure that is required to provide those households with a water/sanitation service that do not have access to water services).

Water	**07/08**	**08/09**	**09/10**
	R	**R**	**R**
Maintenance/rehabilitation backlog			
Service/coverage backlog			

Sanitation/Sewerage	**07/08**	**08/09**	**09/10**
	R	**R**	**R**
Maintenance/rehabilitation backlog			
Service/coverage backlog			

2) How many **potable water service interruptions** were recorded/experienced in 2009/10 (number of households without water for longer than a day)? ☐

3) During how many **days** do records show household sanitation services failed during the financial year 2009/10? ☐

4) Had the water authority achieved the DWA **blue drop** quality in 2009/10?

Yes	No

5) Had the water authority achieved the DWA **green drop** quality of sewage service status in 2009/10?

Yes	No

6) What is the total Rand value of the building plans approved by the municipality for the 2007/8, 2008/9 and 2009/10 financial years?

2007/08	**2008/09**	**2009/10**
R	R	R

7) Is the operational readiness of the water service infrastructure identified as part of the risk portfolio of the water service authority?

Yes	No

If so, what is its priority rating?

8) How many years ago was a water meter audit last conducted?

Years

9) How many engineers, technologists, technicians and artisans positions were directly funded, employed and vacant in the water sanitation departments of the municipality in 2009/10?

	Funded	**Employed**	**Vacant**
Engineers			
Technologists			
Technicians			
Artisans			
Total			

10) Does the water service authority (municipality) have a formalised WSDP?

Yes	No

11) Does the water service authority (municipality) have a master plan for water and sanitation that includes cost estimates?

Yes	No

12) Please complete the table below showing the amount of water served and number of customers during 2009/10

Type of water service provided	Number of households	Amount of water (m^3)
Free water (non-revenue). Includes bursts, reservoir overflows and leakages		
Revenue (charged for) water*		
Total water served (outflow from purification works)		

**This number may include those provided with free basic water in some cases.*

13) Total property tax raised for the 2009/10 financial year?

R

14) What was the breakdown of <u>within</u> the municipality of transfer payments for water service for the year 2009/10?

Nature of transfer	R
Bad debts	
Net cross-subsidy of costs from other budgets (negative (-) if some of the water budget is used elsewhere)	
Shortfall in ATTP allocation to water service for free basic water	
Other non-tariff water provided, excluded in the above categories	

15) What percentage of all money owed for all services is collected by the municipality for the following years (the municipality's debt collection percentage)?

07/08	08/09	09/10
%	%	%

16) What is the actual outstanding debt for water services during the following years?

	07/08	08/09	09/10
	R	R	R
Water			
Sanitation/Sewerage			

%

17) What key sources (and percentages) of infrastructure (Capex only) funding is used by your municipality to fund water services:

- Internal Sources
- Municipal Infrastructure Grant
- Direct Department of Water Affairs grants
- Loan funding
- Donor funding
- Other _____

18) What is the municipality's total capital budget for 2009/10? **R**

19) What is the municipality's total water services capital budget for 2009/10? **R**

20) What percentage of the total water services capital budget was spent? **%**

21) What percentage of the total water services capital budget was allocated to?

	External grant funding %	**Other sources %**
Rehabilitation of water services infrastructure?		
New capital: networks?		
New capital: sanitation facilities		
New capital: bulk water supply and bulk sewage?		
Total	**100%**	**100%**

22) Does the municipality make use of any of the following external relationships to provide water services?

➢ Water Service Consultants (mostly project design)	
➢ Private Public Partnership	
➢ Water Boards	
➢ District Municipality	
➢ Other (specify)_____	

23) In the case of an external relationship used to provide water services, to what extent is the water services authority / water services provider involved in the financial management of the service?

o Budget determination

Fully involved	Partially involved	Not involved

o Tariff setting

Fully involved	Partially involved	Not involved

o Meter reading

Fully involved	Partially involved	Not involved

o Checking of billing data inputs (variance reporting)

Fully involved	Partially involved	Not involved

o Billing

Fully involved	Partially involved	Not involved

o Cash collection

Fully involved	Partially involved	Not involved

- Credit control

Fully involved	Partially involved	Not involved

24a) Is the water service completely ring-fenced (separate balance sheet and statement of performance)?

Yes	No

24b) If water services are not ring-fenced, can it be easily determined what the full cost of this service is and what the revenue is?

Yes	No

25) What internal costing methodology is used by the municipality?

- Percentage of total cost of the support service
- ABC costing framework
- Other

(specify)_____

26) How is the cost of bulk water established? (see table below)

Supplier	%	Price per m^3	Method price/cost established	Was this treated as a fixed (FC) or variable cost (VC)?
Self supplied				
DWA				
Water Board				

27) Estimate the breakdown % of costs of water service provision into fixed and variable:

	%
Fixed cost	
Variable cost	

28) Estimate the breakdown % of costs between the various types of water service provided:

Type of service	%
Bulk water supply	

Treatment and reticulation of potable water	
Receipt, treatment and disposal of waste water	
Administration of service including collection of revenue	

29) What asset valuation method is used?

- Replacement
- Historical

30) Which of the following details relating to water infrastructure are recorded in the Municipal Asset Register?

	Yes	**No**
Extent		
Age		
Value		
State of municipal infrastructure		

31) What depreciation methodology is applied?

- Straight line method
- Asset consumption
- Other (specify)_____

32) What was the value of accumulated depreciation for water services assets as at 30 June 2010?

R

33) What was the Current Replacement Cost (CRC) of water services assets as at 30 June 2010?

R

34) What was the Depreciated Replacement Cost (DRC) of the water services infrastructure assets (Current Replacement Cost less accumulated depreciation) as at 30 June 2010?

R

35) What is the estimated cost per m^3 of water of the next major potable water supply scheme for the municipality?

R/m3

36a) Has an estimate been made of the total environmental cost of waste water service provided?

Yes	No

b) If yes, what value and in what year?

R	Year

37) Who are the water services supplied to?

	Type of user	Number of users. (1)	% of the total users supplied
1	Non-Revenue		
2	Residential		
3	Non-Residential		
4	Other Municipalities		
5	Other not specified here		
	Total (100%)		100%

(1) Number of indicated users supplied by this organization.

38) What are the pricing block tariffs for residential users (and also water sales per block, if determinable – last two columns)?

	Price Block	Potable Water Pricing (R/kl)	Waste Water Management Pricing (R/kl)	Water Sales per annum (R Mill)	Water Distributed per annum (Kilo Ltrs)
	Availability Charge				
1	Block 1				
2	Block 2				
3	Block3				
4	Block4				
5	Block5				
6	Block6				
7	Other Blocks				
	Single (flat) tariff				
	Average Cost Price of water sold				
				Total	

39) What are the pricing block tariffs for <u>non-residential</u> (business) users (and also water sales per block, <u>if determinable</u> – last two columns)?

	Price Block	Potable Water Pricing (R/kl)	Waste Water Management Pricing (R/kl)	Water Sales per annum (R Mill)	Water Distributed per annum (Kilo Ltrs)
	Availability Charge				
1	Block 1				
2	Block 2				
3	Block3				
4	Block4				
5	Block5				
6	Block6				
7	Other Blocks				
	Single (flat) tariff				
	Average Cost Price of water sold				
				Total	

40) Do the extra costs of providing water services to specific customers increase, decrease or stay constant as more of the service is provided? (Circle the correct answer)

Increase	Decrease	Remain Constant

41) How is the supply of bulk potable water obtained?

	Supply Organisation	**% of Total Bulk Water Supply (1)**	**Duration of Contract (2)**
1	**Self-Supplied**		
2	**DWA**		
3	**Water Board**		
4	**Other**		

(1) What percentage does this organisation constitute of your total source of water supplied?
(2) What was the initial duration period of the current contract?

42) If more potable bulk water is required, how is it obtained?

_____

_____

_____

_____

43) What process is followed in the setting of the tariffs for the potable bulk water?

_____

_____

_____

44) Is the quality of the bulk water supplied a factor taken into consideration in setting the tariff?

Yes	No

45 a) Did your organization/municipality submit responses to changes proposed for pricing to be applied/charged by the bulk supplier of water to your organization/municipality?

Yes	No

b) If "Yes", what was the nature of the response and was it submitted to the DWA, the regional Water Board, or an alternate supplier?

_____

_____

_____

_____

45) Did your response have any effect on the price set?

Yes	No

47) How often is a review made of the way municipal water services are provided, as required by Section 77, Municipal Systems Act, No. 32 of 2000?

_____

_____

_____

Name:_____

Organisation/Municipality:_____

Date:_____

ooOOOOOoo

APPENDIX D: CAPACITY BUILDING REPORT

Table D.1: Capacity building through Project K5/2087

Student name	Employment	Degree (year submitted/ awarded)	Title of dissertation
Kevin Jacoby	Student, Nelson Mandela Metropolitan University, Port Elizabeth	Masters (submitted December 2012)	The growing South African Municipal Water Service Delivery Problem