

Evaluation of the implementation of water and sanitation  
policies in a low-cost housing settlement of Ambleton and  
Ambleton Extension in Pietermaritzburg, Msunduzi  
Municipality

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## **Abstract**

The post apartheid government has been engaged in the process of delivering formal housing, water, and sanitation services to the poor. Because of huge backlogs in the provision of these basic services, the government has focused on meeting quantitative targets. The government has made significant strides to reduce the level of backlogs in basic service the delivery. However, there were challenges that confronted government in its endeavours to expedite delivery of services. The main challenge relates to the fragmentation in the funding mechanism for housing and the physical infrastructure, particularly water and sanitation infrastructure. Concerns have been raised about the ability of the local sphere of government to provide suitable land and quality physical infrastructure which were a prerequisite for sustainable settlements.

The aim of the study was to evaluate the implementation of water and sanitation policies in a low-cost housing (LCH) settlement of Ambleton and Ambleton Extension in Pietermaritzburg. In line with the set objectives, the study attempted to find out if the implementation of water and sanitation policies in the area was consistent with the national policies and to establish whether or not people that lived in the area felt the quality of services has improved their lives.

A qualitative methodology was used to collect data. In this regard three methods of collecting data were used, namely, semi-structured questionnaire, interviews and observation. The findings of the study showed that there were challenges with water and sanitation services. Some of the challenges relate to the inconsistent and fragmented nature of the funding mechanism that is inherent in basic service delivery policies. Residents of Ambleton and Ambleton Extension were generally unhappy about the quality of water and sanitation services.

The study recommends that the government should revise its funding mechanism to strengthen the ability of municipalities to provide quality services.

## Preface

The research described in this mini-dissertation was conducted at the Centre for Environment, Agriculture and Development in the University of KwaZulu-Natal, Pietermaritzburg, South Africa. The work was carried out under the supervision of Professor Robert Fincham and co-supervised by Miss Mary Lawhon of the Centre for Environment, Agriculture and Development, Pietermaritzburg.

I hereby declare that this research document and the contents contained in it are entirely my work and do not form part of the award of any degree of this or any other University. Wherever use is made of others' work, it is duly acknowledged in the text.

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## **List of Abbreviations**

<b>ASGISA</b>	<b>Accelerated and Shared Growth Initiative of South Africa</b>
<b>CSIR</b>	<b>Centre for Scientific and Industrial Research</b>
<b>DEAT</b>	<b>Department of Environmental Affairs and Tourism</b>
<b>DFA</b>	<b>Development Facilitation Act</b>
<b>DoH</b>	<b>Department of Housing</b>
<b>DWAF</b>	<b>Department of Water Affairs and Forestry</b>
<b>FBW</b>	<b>Free Basic Water</b>
<b>GEAR</b>	<b>Growth, Employment and Redistribution Strategy</b>
<b>IDRC</b>	<b>International Development Research Centre</b>
<b>KZNPA</b>	<b>KwaZulu-Natal Provincial Administration</b>
<b>LCH</b>	<b>Low-cost Housing</b>
<b>MIIF</b>	<b>Municipal Infrastructure Investment Framework</b>
<b>NEMA</b>	<b>National Environmental Management Act</b>
<b>NSTT</b>	<b>National Sanitation Task Team</b>
<b>RDP</b>	<b>Reconstruction and Development Programme</b>
<b>WHO</b>	<b>World Health Organisation</b>

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# Chapter One

## Background and Context

### 1. Introduction

In 1994 South Africa emerged from a long history of colonial and apartheid regimes that were characterised by minority domination. Through a variety of legislation such as the 1913 Land Act, the black majority were stripped much of their land which had sustained their livelihoods and resettled in infertile reserves which together constituted 13% of the country's territory (Browett 1982; Walker 2005; Lahiff 2007). This rendered many blacks vulnerable to exploitation as cheap labour during the mining and industrial boom of the early 20<sup>th</sup> century (Pretorius and du Toit-de Villiers 2002).

The apartheid government introduced racial segregation policy which was designed to control the influx of Africans into white neighbourhoods and to systemically control (Bonner 1995). The apartheid system ensured that Africans could enter white areas only to offer their labour and were expected to return to the reserves once they were no longer productive (Dimitrou 1990; Maylam 1990). Those who were allowed permanent residency in urban areas were housed away from white areas in overcrowded single sex hostels and township houses with minimal basic services (Christopher 1990; Mabin 1992). Access to land and basic services was race based, with black people receiving inferior or no services at all (Smith 2004; Smith and Green 2005).

When racial inequality and segregation was abandoned as an official policy in 1991, people were allowed to move freely integrate across the racial divide. This period presented prospects of better life the black who had endured extreme poverty and underdevelopment which were partly an outcome of segregation policies (Cheru 2001; Ngwane *et al.* 2002). Those who had been confined to Bantustans could freely move to seek jobs, housing, and other amenities associated with urban areas (Crankshaw 1993). The influx of people to urban areas was accompanied by the explosion of shack dwellings (Goodlad 1996;

Pottie 2003), which lacked adequate water and sanitation facilities (Centre for Scientific and Industrial Research (CSIR) 1999).

The emergence of democracy in 1994 brought about optimism that basic service delivery backlogs were going to be eradicated (Bruggemans 2004). The government adopted Reconstruction and Development Programme (RDP) as a policy framework to address historical inequalities (Weeks 1999). As envisaged in the RDP, the government embarked on a massive build-programme (Aldrich and Sandhu 1995) to expedite basic service provision (Binns and Nel 2002; Visser 2004). However the government soon realised that it would not be able to eradicate the backlogs that existed as the RDP model was unsustainable without a strong economic base (Campbell 2001). Hence, in 1996 the government introduced 'Growth, Employment, and Redistribution' (GEAR) strategy (Bruggemans 2004) as macro-policy framework to ensure fiscal discipline and sustained economic growth (Cheru 2001; Bond 2000). The government maintained that while fiscal discipline remained the prominent objective of the GEAR, it had retained the broad social objectives of the RDP (Weeks 1999).

Between 1994 and 1995, the housing backlog in urban South Africa was approximately over 1.5 million units. Respectively, there were approximately 15 and 20 million people who did not have access to potable water and sanitation services (Campbell 2001; Pottie 2003). Clearly, the government was faced with a significant challenge to redress this legacy of apartheid (Pillay and Naud'e 2006). Notwithstanding the challenges, government remained firm in its determination to improve access to housing, water, and sanitation services (Smith and Hanson 2003).

As at March 2007, the government had built over 2.3 million housing units (as illustrated in Table 1). However, in the same period the backlog had increased to an estimated 2.4 million units, owing to increased urbanisation (Department of Housing (DoH) 2007). The number of households who were beneficiaries of

housing programme was equivalent to the number of housing units built. The housing delivery statistics of the DoH (Table 1) shows the number of units completed or in the process of completion not the number of people occupying the completed units.

**Table 1: Housing Delivery Statistics as at March 2007 (DoH 2007)**

<b>Province</b>	<b>Houses Completed or Being Completed</b>
Eastern Cape	288 231
Free State	161 250
Gauteng	592 457
KwaZulu-Natal	390 090
Limpopo	217 513
Mpumalanga	169 962
Northern Cape	49 145
North West	228 361
Western Cape	258 896
<b>Total Number of Houses Completed</b>	<b>2 355 913</b>

Recent statistics suggests that the number of people having access to water and sanitation services has increased significantly. As at April 2008, backlog in access to potable water supply was estimated to be 5.7 million people as illustrated in Table 2 below.

**Table 2: Population without Access to Potable Water (DWA 2008 a)**

<b>Province</b>	<b>Total Water Backlog* April 1994</b>	<b>Total Water Backlog April 2001</b>	<b>Total Water Backlog April 2006</b>	<b>Total Water Backlog April 2008</b>	<b>%Backlog April 2008</b>
Eastern Cape	3,689,468	3,117,596	1,578,996	1,097,727	19.00
Free State	624,811	404,905	207,379	39,266	1.00
Gauteng	1,235,463	898,189	683,026	352,815	6.00
KwaZulu-Natal	3,863,572	4,047,872	2,584,186	2,128,791	37.00
Limpopo	2,405,632	2,172,269	1,484,660	1,081,218	19.00
Mpumalanga	1,221,170	1,016,630	731,832	474,398	8.00
Northern Cape	1,030,826	909,779	612,867	381,395	7.00
North West	392,729	170,811	117,221	78,755	1.00
Western Cape	1,426,578	364,519	217,666	125,497	2.00
<b>National</b>	<b>15,890,249</b>	<b>13,102,570</b>	<b>8,217,833</b>	<b>5,759,862</b>	<b>100.00</b>

Table 3 shows the total estimated number of households with access to sanitation below the RDP service levels. An estimated 3 million people did not have access to proper sanitation at RDP level.

**Table 3: Sanitation Backlog below RDP Households (HH) Level (DWAFF 2008b)**

Province	Sanitation Below RDP HH - April 1994	Sanitation Below RDP HH - Oct 2001	Sanitation Below RDP HH - April 2007	Sanitation Below RDP HH - April 2008	% Backlog
Eastern Cape	1,001,470	899,644	578,884	514,804	16.00
Free State	399,778	348,437	266,256	265,516	8.00
Gauteng	612,137	511,621	427,051	425,597	13.00
KwaZulu-Natal	939,917	1,063,612	672,683	604,158	18.00
Limpopo	800,405	840,314	711,734	665,749	20.00
Mpumalanga	421,754	434,304	369,484	359,598	11.00
North West	377,533	422,984	343,521	324,441	10.00
Northern Cape	143,119	85,567	61,458	58,984	2.00
Western Cape	388,739	153,226	94,720	92,665	3.00
<b>National</b>	<b>5,084,852</b>	<b>4,759,709</b>	<b>3,525,791</b>	<b>3,311,512</b>	<b>100.00</b>

Inadequate water and sanitation infrastructure was prevalent in low-income areas, where water services were usually available through a public standpipe or yard connection outside the home, but not close to sanitation facilities. This had implications for personal hygiene, which in turn could lead to food contamination (River Health Programme 2005). The provision of physical infrastructure, in particular potable water and sanitation services led to improvement in the health of urban dwellers. Therefore the significance of physical infrastructure as a prerequisite to good housing and healthy living conditions could not be overemphasised (Choguill 1999).

Municipalities were the sphere of government that was primarily responsible for the provision of basic services, such as water and sanitation. However, there were areas of overlapping competencies and these could be rationalized through the intergovernmental framework (Wittenberg 2003). Municipalities also played a

key role in facilitating development of housing settlements through releasing and/or identifying suitable land and beneficiaries. The macro-policy principles of GEAR placed upon government the need to exercise fiscal discipline which made it difficult for local government to expedite service delivery (Smith and Hanson 2003). The contradictions that were inherent in GEAR made it difficult for government to buy suitably located land in urban areas. Thus many LCH developments were situated on the peripheries of urban areas, some not suitable for human settlement because of awkward topography, which also rendered the provision of water and sanitation difficult (River Health Programme 2005). Also at the core of GEAR was the principle of cost recovery which required consumers to pay the full costs of services rendered. While cost recovery mechanism was a necessary tool for sustainable development, it placed a huge burden on the poor and unemployed citizens (Human Science Research Council (HSRC) 2002).

In their effort to maintain financial sustainability, municipalities often resorted to cut off or disrupt water supply to consumers who defaulted. Many poor households put up with restricted supply of water as they could not settle their debt. The introduction of free basic services policies such free basic water (FBW) policy somewhat lessened the impact on poor households (Peters and Oldfield 2005). Therefore the emphasis on fiscal discipline embedded in GEAR made it difficult for municipalities to adequately implement basic services policies.

## **1.1 Problem Statement**

Given the massive backlogs in housing, the government's focus was to build houses on a massive scale. Despite the government's resolve, there were formidable challenges that hampered the desired progress. The lack of reasonably priced and suitably located land on which to build houses presented a challenge to government in general. Municipalities in particular were coerced into providing water and sanitation infrastructure (Moeti and Khalo 2008). This happened at a time when many municipalities had a limited revenue base having been recently reconfigured to cater for areas that had not been previously serviced and whose populace had been generally poor (Smith and Green 2005). Many struggling municipalities were unable to fulfil what has been dubbed in some quarters as "unfunded mandates" (Maruvan 2002; Moeti and Khalo 2008). Hence, a number of LCH settlements were located on unsuitable land such as on floodplains, dolomite, and shale where infrastructure could not be readily made available (Adebayo and Adebayo 2000).

The Constitutional imperative that required municipalities to provide the supporting infrastructure was burdensome on poor municipalities. The pressure to deliver as many housing units as possible and this against the backdrop of scarce and costly land thus impacted negatively on the quality of supporting infrastructure. Notwithstanding the fact that people received formal and improved dwelling units as well as secure tenure, they were not satisfied about the quality of potable water supply and sanitation infrastructure.

The purpose of this study was therefore to evaluate the implementation of water and sanitation policies in a LCH settlement of Ambleton and Ambleton extension located in the Msunduzi Municipality (Referred to as France by locals).

## **1.2 Research Question**

What was the extent, suitability, and appropriateness of water supply and sanitation services in Ambleton and Ambleton Extension, Msunduzi Municipality?

## **1.3 Aim and Objectives of the Study**

**Aim of the study was to:** Evaluate the implementation of water and sanitation policies in the Low-cost Housing of Ambleton and Ambleton Extension in the Msunduzi Municipality to understand the extent to which they facilitate sustainable human settlement.

### **Objectives of the study were to:**

1. Evaluate whether or not the quantity of potable water in the study area met the criteria set by national and local government policy standards;
2. Assess whether or not the water and sanitation technology was appropriate in relation to site specific conditions;
3. Determine the level of community satisfaction with water and sanitation provision;
4. Verify whether or not the community's expectations were in line with water and sanitation policy provisions; and
5. Reflect on the possible key challenges faced by the municipality and service providers in implementing the respective policies.

## **1.4 Structure of Dissertation**

The study consisted of four main parts, that is, background and context; literature review; results and discussion; and conclusions and recommendations. In Chapter One the background and context, problem statement, key research question, and the aim and objectives of the study are set out. In Chapter Two, there is a literature review which outlines the history of basic service provision in South Africa. The broad literature search constitutes literature on housing policies and the insight into water and sanitation policy provisions as a criterion to evaluate implementation of these policies at a local government level.

Chapter Three contains the context and methodology of the study. In Chapter Four there is an outline of the findings and discussion of the study through field visits and interaction of the researcher with community representatives, local government representatives, and contract service providers (developers) as key informants. The research field visit entailed getting from different stakeholders in the study area different perspectives on the provision of water and sanitation services. The field visit was successfully conducted and the prospective stakeholders were helpful and willingly participated. As such, the report gives a balanced version of views from service providers as well as practical experiences have emerged from implementation of policy in South Africa. In Chapter Five the conclusions point to the areas of shortfalls while recommendations outline areas of potential improvement.

## **Chapter Two**

### **Literature Review**

#### **2. Introduction**

South Africa emerged from apartheid era with great inequality in terms of access to basic services. The apartheid also gave rise to current imbalances in the population distribution which produced racially segregated communities. It was also largely responsible for the early development of spontaneous urban settlements that were characterised by disproportionate access to basic services (Adebayo and Adebayo 2000) such as formal housing, potable water, and sanitation services.

The democratic government committed to redressing the past inequalities and to expedite basic service provision through the RDP (African National Congress 1994; Midgley 2001). The RDP as the primary policy framework macro-policy was introduced to effect change and create a just society where everyone was guaranteed right to basic services (Adelzadeh 1996; Mackay 1999). The basic tenets of the RDP tenet were further given legitimacy in the Constitution of the Republic of South Africa (Act 108 of 1996) which guaranteed equal distribution and access to services (Mackay *et al.* 2003).

In 1996, GEAR was introduced as an alternative to the RDP. The objectives of distributional equity there were captured in the RDP were retained in GEAR (Visser 2004). The key success factors of the GEAR were its focus on economic growth, the cost recovery measures to service provision and the use of private capital to stimulate investment in the public sector (Khosa 2000). GEAR fulfilled the dual commitment of fiscal discipline and basic service delivery (Smith and Green 2005). While the objectives envisaged in the RDP were chiefly the function of the national and provincial government, the GEAR shifted some responsibilities to local government (Visser 2004; Weeks 1999).

Although GEAR put the country on a sustained economic growth trajectory, the economy failed to generate the required levels of employment to reduce poverty. The beneficiaries of service delivery were therefore unable to pay for services rendered to them (Visser 2004). In turn the municipalities failed to enforce stringent cost recovery measures and therefore could not collect adequate revenue which was necessary to maintain existing services and extend service provision to other needy citizens (Visser 2004). As such there was widespread criticism levelled at GEAR. Some experts in LCH development even suggested GEAR as the economic policy in was the root of the failures to build sustainable habitats in urban areas (Goebel 2007). Local government could not always afford to buy and re-allocate sufficient and suitable land for housing development. Hence the existing housing developments perpetuated planning and organisation doctrine that existed under apartheid, where rows of identical houses were built on the periphery of urban centres (Huchzermeyer 2001; Goebel 2007).

Various measures, legislative and otherwise were introduced by government since 1994 to enable local government to address conflicting land requirements. For example, the Development Facilitation Act (DFA), Act 67 of 1995, was aimed at helping municipalities expedite and streamline land development initiatives in participatory manner (The Housing Act 1997; Binns and Nel 2002). Further, land that was held by provincial governments was released to municipalities for allocation to residents of informal settlements to guarantee them security of tenure and facilitate in-situ upgrade (CASE) 1998). Further, legislation was introduced to give effect to local government mandate, namely, the Municipal Structures Act 117 of 1998 (as amended) and the Municipal Systems Act 32 of 2000 (Nealer and Raga 2008).

This legislation made provision for municipalities to develop Integrated Development Plans (IDPs) to inform development priorities and to assess land requirements (Barichievy *et al.* 2005; Bekker and Leilde' 2003; Raga and Taylor 2005). Further, the government's Municipal Infrastructure Investment Framework

(MIF) was introduced to help augment municipal finances for infrastructure projects (Department of Constitutional Development 1997).

Over the years, the government has regularly reviewed and refined its policies to respond appropriately to service delivery needs (Funke *et al.* 2007). At a macro-policy level, the Accelerated and Shared Growth Initiative of South Africa (ASGISA) was adopted to address the inadequacies of GEAR. ASGISA was introduced in 2005 with the aim to stimulate employment linked economic growth. Although the jury is still out on ASGISA, early indications were that it was not succeeding in its objectives of bridging the inequality gap between the rich and the poor (Baty 2009).

Despite the contradictions that may be inherent between the RDP, GEAR, and ASGISA, they were introduced to provide a macro-policy framework for equitable access to basic services. To give legal force to these policies, number of dedicated policies and legislation were developed to govern specific aspects of different basic services. In this chapter, the focus is on the policies governing housing, water, and sanitation services. The preceding sections in this chapter draw on the evolution of these policies, their implications, and the implementation of current policies to redress past imbalances.

## **2.1 Housing Policy Evolution**

The turn of the 20<sup>th</sup> century coincided with a demand for labour to sustain the economic boom caused mainly by the recently discovered large reserves of precious metals. The Native Land Act of 1913 made provision for a white minority government to evict black people from their land and to force them to seek work in mines and white farms as cheap labour (Browett 1982). However, large-scale migration of black people from rural areas drew criticism from the white minority which demanded that government introduce influx control measures to keep white settlements separate from black areas. Accordingly, the Native (Urban

Areas) Act of 1923 declared cities as preserved for whites only (Mandy 1984). While white people were beneficiaries of state housing subsidies, blacks were systematically excluded from this benefit. Most black urban dwellers were accommodated in grossly overcrowded townships distant from urban centres and deprived of adequate basic services. Some black rural dwellers were allowed in urban centres only to work for white people and had to leave upon finishing such services (Goodlad 1996).

The advent of apartheid policies in 1948 resulted in the introduction of the Group Areas Act of 1950 that further entrenched the policy of separate development. The policy set about to confine black people to the fringes of urban areas (Bonner 1995). Townships and the so-called Bantustan homelands (also referred to as reserves) were designated as being areas where black people could exercise freedom. These areas were intended to provide political rights to black people, but they did not offer real economic and social rights. With this situation, black people constantly commuted to white urban areas to seek a better life (Goodlad 1996).

The influx control measures imposed by the state were not effective at preventing black people from settling in urban areas and so the demand for housing in townships remained high. While the government accepted that there was a need to devise housing schemes to cater for an ever expanding black urban population, it failed to invest enough capital in black areas. The housing crisis led to spontaneous emergence of informal squatter settlements in townships and the outskirts of towns and cities around the country (Seekings 2000; Hardoy *et al.* 2004.).

The failure of the apartheid government to appropriately address the housing crisis and social difficulties in general led to revolt against the state. Widespread unrest across the country induced the business community to intervene and play a role in improving the quality of life in urban areas. Sustained pressure from

civic organisations led to the abolishment of influx control measures in the mid-1980s. The subsequent influx of black people into urban areas exacerbated the housing crisis as government failed to make reasonable investment in this sector. Private sector intervention led to the establishment of the Urban Foundation in 1976 which initiated reforms in urban and social policy. The Urban Foundation strategy redefined the housing policy and facilitated funding to advance home ownership for black people (Lalloo 1999). Despite increased commitment in the form of housing subsidies, the funding structure did not favour the majority of poor people. Against this backdrop, informal settlements became the predominant way of securing shelter for the poor (Boaden 1990).

### **2.1.1 The Current Housing Policy**

In the 1990s, the housing crisis in South Africa reached its worst point, and a significant number of South Africans lived in dire conditions (Goebel 2007). When the first democratic government was elected, the previously disadvantaged were optimistic that the situation would change for the better. In order to reduce the housing backlog, government acknowledged that it needed to deliver housing on a large scale (Mackay 1999). At the same time, there was a need to overcome the inherent apartheid system of separate development and promote integrated development in which people would have equal access to socio-economic amenities (Mackay 1999; Lemanski 2004).

Shortly after the first democratic elections, a new housing policy framework was agreed upon after intense negotiations. The housing policy framework that emerged from the negotiation was contained in the RDP (Goodlad 1996). The RDP served as a broad approach aimed at addressing access to housing and other socio-economic amenities need (African National Congress 1994; Pottie 2003). The government promised to build a minimum of one million LCH annually in order to meet the housing demands. The government acknowledged that this was an ambitious figure, especially during the transition period (Department of

Housing (DoH) 1995) and also given shortage of affordable and well located land on which to develop build housed (Goodlad 1996; Huchzermeyer 2001).

## **2.2 Historical Background to Water Policy in South Africa**

The Department of Water Affairs (DWA), previously the Department of Water Affairs and Forestry (DWAF) was the competent authority in terms of water resource management. Prior to 1994, the policy approach and functions of the DWAF were constrained to water resource management. The core functions of DWAF were to administer the Water Act, manage larger catchments, administer government water control areas, manage water quality, and supply bulk untreated water to water supply utilities (Funke *et al.* 2007). The Water Act of 1956 had as its main focus the development of water resources. In this regard, dams, pump stations, and pipelines were built to store floodwater for use in periods of drought and to redistribute and supply to mainly white areas (MacKay 2003). The apartheid policies excluded the majority of black people from these benefits. Therefore, the black people, many whom, lived in the most arid parts of the country and depended on subsistence farming, could not adequately sustain their livelihoods (Abrams 1996).

The primary use of water in the country had been dedicated to irrigation of agricultural land and mining sector (Bond *et al.* 1994). Water rights were mainly dependent on land ownership, in which those who 'owned land over which water flowed had a right to share of that water' (Funke *et al.* 2007). This meant that, there was great inequality in the access to water, especially for the majority of black people who were never allowed reasonable land ownership (MacKay 2003). Therefore, when the democratic system was introduced, the historic focus of water management was changed, and new legal instruments were put in place. The approach to management of water resources and allocation emphasised that equitable access to water must take precedence (Abrams 1996).

### **2.2.1 The Current National Water Policy**

The skewed distribution of basic services inherent in the apartheid government presented the democratic government with the daunting task of redressing past inequalities. Legislative review and reform enabled the government to streamline water provision in order to ensure equitable access (Smith and Hanson 2003). Historically, the provision of water had been the duty of central government. With the establishment of local government in 1996, the responsibility to provide water was devolved to this sphere of government (Smith and Green 2005). This happened at the time when local government was undergoing re-demarcation to include previously disadvantaged areas. Most local governments had a limited tax base and therefore could not properly fulfil their mandate (McDonald 2002). In addition, municipalities did not sufficient budget for maintenance purposes and large volumes of water and money were wasted through undetected leaks as damaged infrastructure remained unattended for extended periods (Moeti and Khalo 2008). Therefore municipalities often do not have maintenance budget and. The problem was compounded by when user communities do not report damaged infrastructure to authorities. In the long run, municipalities incur huge costs when deteriorated infrastructure has to be completely overhauled (Wall 2000).

Water loss was more prevalent in areas that get water through communal standpipes. Standpipes were often shared by between 10 and 20 users whilst individual or shared in-yard water supply was shared between one or two households. Water consumption at standpipes tended to be high, especially because water was commonly available free of charge. In such instances, very little consideration was given to consumption patterns, often because users have no sense of ownership and responsibility (Wood *et al.* 2001).

Due to lack of defined ownership, communal standpipes were highly prone to damage and frequent water leaks. Habitually, in such conditions, there was also very little consideration given to wastewater disposal, especially in non-sewered

areas. As such wastewater tended to collect around standpipes and formed contaminated streams along roads or natural drainage (van Vuuren 2007). Communities living under these conditions tended to be unwilling to pay. It was said that willingness to pay increased with the quality of service received (University of Cape Town Greywater Research Team 2005).

In formal settlement, including LCH settlements, communities often had greater responsibility for tap protection and there were reasonable consumption patterns. Consumption levels tended to be generally reasonable in individual or bulk metered households because consumption level could be monitored through meter readings. In such instances, excessive consumption levels could be curtailed and users were more likely to report leakages when detected (Wood *et al.* 2001).

Proper sanitation systems were important as access to water to facilitate appropriate wastewater disposal (van Vuuren 2007). This was particularly important to avoid water contamination (DWAF 1997). The cost of treating contaminated raw water directly impacted on cost of treated water and this which had a negative bearing on the poor who could not afford exorbitant service (South African Institute of Race Relations (SAIRR) 1998). Poor households were compelled to pay for services from paltry incomes or they could face service cut-offs (McDonald 2002; Smith and Green 2005).

Government acknowledged that access to services was of little consequence if households were unable to pay for the cost of using them. Unwavering in its commitment, government developed a Free Basic Water (FBW) policy as a strategy to alleviate the affordability problem faced by the poor. The FBW policy comprised a so called 'life-line' of 6kl of water per household per month (DWAF 2001; Peters and Oldfield 2005). The free basic water principle was premised on a consumption rate of 25l per capita per day, within 200 m of the households which translates to 6kl per household per month.

Municipalities exercised discretion in how the FBW policy was implemented (Lagardien and Cousins 2004; Smith and Green 2005). First, municipalities may choose to provide free basic water to all consumers regardless of their economic status. Second, the FBW policy may be targeted at the poorest households, where the municipality may subsidise a portion of a household's water bill. The municipality were allowed to use restrictive devices to limit water use to its preferred amount of water per month (Hall *et al.* 2006). Municipalities were encouraged to adopt and implement a tariff policy on the levying of fees for municipal services. For example, the Solid Waste Tariff Setting Guidelines for Local Authorities was aimed at ensuring that municipal waste tariffs were consistent with the provisions of the Act and any other applicable legislation to avoid unfair discrimination (DEAT 2002). The national government was tasked with developing national guidelines to ensure consistency in the formula that municipalities follow to determine the appropriate tariffs for different services (Wood *et al.* 2001).

The recommended minimum household water requirement in terms of the Water Services Act, Act 108 of 1997 was 25l per capita per day, within 200 m of the households which translates to 6kl per household per month (Ward *et al.* 2000; Peters and Oldfield 2005). Such water allocation was considered to be sufficient to meet health and basic needs (MacKay and Ashton 2004; Hall *et al.* 2006). In this regard, if the household consumption exceeded the perceived basic requirement (6kl), they were subjected to rising block tariff which was steep for poor households (Ralo *et al.* 2000).

### **2.3 Historical Background to Sanitation Policy in South Africa**

The fragmented nature of institutional structures during the apartheid era contributed to the lack of cohesive strategies, guidelines, or support structures to guide the provision of sanitation services. Urban and rural areas designated for black people were characterised by very limited or no sanitation services

provision. In some cases, available services were often in a bad state of disrepair (DWAF 2002). As a result, the majority of black people were deprived of basic sanitation services. Lack of political legitimacy and will often meant that mainland administration did not make resources available to “homelands”, where they were mostly needed (Funke *et al.* 2007).

Where resources were made available, the primary focus was on building toilets, sewer systems, and maintenance while health and hygiene education were given little consideration (DWAF 2002 a). The most prevalent sanitation facilities were on-site systems, namely the bucket system found mainly in urban townships and rudimentary pit toilets found mainly in rural areas. Sanitation services were very poorly designed and operated. This poses pollution problems for the environment in general, and threatens groundwater supplies and compromises health and dignity of human beings (The Water Wheel 2007).

### **2.3.1 The Current National Sanitation Policy**

The new political dispensation ushered in a reorientation of the national policy on sanitation based on an integrated approach. There was an understanding that improved quality of life can be realised through an integrated approach putting emphasis on other important sanitation aspects such as good hygiene practices (Obi *et al.* 2006). Hence, the formation of a National Sanitation Task Team (NSTT) in 1995 was specifically for the purpose of facilitating an integrated inter-departmental approach. The representatives from the Departments of Water Affairs and Forestry; Health Education; Environmental Affairs and Tourism; Housing; Public Works; Local Government; as well as the Mvula Trust were brought together to prepare coherent institutional and statutory frameworks to address the demand for sanitation (DWAF 2002 b).

Sanitation provision meant much more than just building toilets because access to sanitation confers a right to human dignity. Sanitation infrastructure also plays

a pivotal role in safe disposal of a range of household waste, including human excreta and ordinary wastewater. Policy emphasis was directed towards ensuring provision of adequate and proper sanitation facilities (Barnhardt Dunstan and Associates 1998). Therefore, there was a need to realign sanitation programmes in such a way that funding requirements were factored into the housing development programme in order to provide an appropriate and comprehensive package. A free basic sanitation policy that was consistent with the FBW policy was necessary to ensure integrated that sanitation tariffs were integrated with of the water supply (DWAF 2002 b).

Most municipalities favoured full waterborne sanitation systems over on-site systems because people will generally aspire to having full waterborne sanitary systems (Department of Provincial and Local Government 2005). Many were often reluctant to provide an on-site sanitation system because of the perception that such a system was inferior. Where municipalities have financial constraints in providing a full waterborne system, there was a tendency to implement 'temporary' communal toilets (Gadd and Holden 2002).

Communal on-site sanitation systems tended to generate disgruntlement arising from certain factors such as odours that attract flies to breed around the system. A wide range of mostly basic sanitation facilities were prevalent in informal settlements. These ranged from pit latrines, bucket toilets, VIPs, aqua-privies, digesters, and compost systems, and in some areas, low-flush and full-flush septic tanks, and communal ablution blocks that have been provided (University of Cape Town Greywater Research Team 2005). Such systems were usually shared by up to 40 users per facility. High user ratio may subject the system to misuse and where maintenance was inadequate, the facilities often overflowed. Consequently, users abandoned these facilities, opting even to use open areas or bush. Where municipalities did provide regular service, for example, emptying buckets, some households disposed of human waste in nearby streams and bushes, which poses serious environmental and health threats (Alcock 1999).

Whilst current urban sanitation policies were generally in favour of full waterborne sanitation systems, the cost implications often deterred investments in it. Government needed to invest billions of rands to provide such a system and maintenance requirements were a financial burden to poor households and municipalities alike. Nonetheless, in any formally planned settlement, including LCH, the provision of low-flush and full waterborne sanitation remains the favoured approach across the country (Palmer Development Group and University of Cape Town 1993). Waterborne sewerage were however more susceptible to misuse thus required regular repairs, especially where people used newspaper instead of toilet paper. Newspapers and other foreign objects clogged the sewer system (Barnhardt Dunstan and Associates 1998). This was most prevalent in most low-cost housing developments, particularly where the infrastructure was of lower quality. The common practice of allowing backyard shack development put excessive demand on available facilities (Palmer Development Group 1994).

The problem was further exacerbated by the fact that some sanitation and water infrastructure of low-cost housing had been connected to already overworked infrastructure of adjacent townships. This increased the incidences of sewer blockage, burst and spillage leading to environmental pollution (Barnhardt Dunstan and Associates 1998). The household size also had an impact on the sustainability of the system. Where there were extended families there was extra load on water and sanitary services. Inadequate maintenance of existing sanitation facilities contributed greatly to sewer problems which exacerbated the problems (Venter *et al.* 2004). Lack of proper planning regarding prior to installing sanitation facilities compounded the problems around sanitation system (Bond 1999). Geological and topographical conditions should be suitable for the preferred system to function optimally. Lastly, the sanitation system should be upgradeable to suit the needs of beneficiaries should they so wish (National Sanitation Task Team (NSTT) 1996).

Against the backdrop of current challenges encountered in the provision of sanitation services, the government has set an optimistic target to eradicate lack of sanitation services by 2010. With the current estimate of 3 million households without access to proper sanitation services, it is thought to be an insurmountable task to eradicate this backlog by the year 2010 (DWAF 2008 b).

## **2.4 Creating Sustainable Settlements**

Human settlements provide a space where development takes place. It was important that the location of a housing development was carefully chosen and planned. The location of LCH settlements had an influence on the standards of living in these settlements. LCH settlements that were mostly not situated in convenient locations, close to areas of economic opportunities due to scarcity and cost of land has in inner cities (Adebayo and Adebayo 2000). LCH developments were therefore often located on unsuitable and unstable land on the outskirts of the city where extension of adequate bulk infrastructural base was difficult to put, resulting in dire implications for the urban environment and sustainable development to put (Sisulu 2005).

The concept of sustainable development emerged from the 1992 Earth Summit held in Rio de Janeiro and was included in its Local Agenda 21 initiative. Local Agenda 21 was one of the most significant innovations designed to address urban environmental problems, and Chapter 7 of Local Agenda 21 emphatically articulates the need for sustainable human settlement (Habitat Agenda 1996). It entailed a plan detailing development strategies for achieving sustainable development. Local Agenda 21 affirmed that sustainable development can be achieved through understanding the synergies between access to basic services, healthy living, and the physical environment (Department of Environmental Affairs and Tourism (DEAT) 2000; Hardoy *et al.* 2004).

Following the Rio Summit, the United Nations held the Second Conference on Human Settlement (Habitat II) which was aimed at addressing the issue sustainable human settlement. It was from this conference that the concept of Habitat Agenda emanated (Habitat Agenda 1996). It described sustainable human settlement as one that offers adequate shelter, basic services, and access to employment within a safe environment. The objectives of Habitat Agenda II were enshrined in the Constitution and all legislative documents of South Africa (Huchzermeyer 2001; Gwebu 2003).

While South Africa committed itself to respecting the principles of sustainable development, but the country has failed to apply these principles LCH developments. Huge housing backlogs led to mass production of LCH settlements that often lack adequate physical infrastructure, which renders some settlements inhabitable (Goebel 2007).

## **2.5 Integrating Housing, Water, and Sanitation Services**

Generally, water supply and sanitary services cannot be separated from the provision of housing. Therefore, housing backlogs should be addressed through a holistic approach that encompasses access to potable water and sanitation infrastructure (Palmer Development Group and University of Cape Town 1993). Therefore, the provision of an adequate infrastructural base was a prerequisite to the achievement of sustainable human settlements (Choguill 1996). If potable water and sanitation needs were not met, it was likely that the integrity of the natural environment cannot be maintained (Stiftung 2002).

Local governments were confronted by institutional problems which hindered implementation of potable water and sanitation programmes in the same way as housing programmes. Implementation of these programmes at municipal level, mostly, remained a responsibility of various departments within one municipality which created coordination problems and limited the speed of delivery. Water

and sanitation were located at technical or engineering departments, while housing was handled by housing departments. This fragmented nature of services provision emanated from the lack of sound institutional frameworks in local government. The challenge, therefore, for local governments was to ensure integrated services delivery to contribute to sustainability of low-cost housing developments (Wood *et al.* 2001).

Integration of housing and physical infrastructure for sustainable settlement was important.

## **2.6 Water and Sanitation Services in the Msunduzi Municipality**

The Msunduzi Municipality has made a significant effort to provide water and sanitation services to low-cost housing settlements. Notwithstanding its efforts, the pace of delivery to outlying areas remained a challenge, owing partly to difficult terrain (Moffet 2003). The character of the terrain that the municipality was confronted with often compelled it to seek alternative water supply and sanitation technology to the conventional and favoured waterborne system. Alternative technologies were not found favour with many beneficiaries due to ensuing complications attributable to the terrain not being suitable for the applicable technology. Disgruntled beneficiaries wanted an overhaul of the existing infrastructure. At the time the municipality was under pressure to expedite access to basic services to its growing population (The Witness 2007 a).

After local government elections in the year 2000, the previously independent town councils of Ashburton, Claridge, Bishopstowe, the rural managerial district of Vulindlela, and the Pietermaritzburg were amalgamated to form the Msunduzi Municipality (Msunduzi Municipality 2002). As the city, Pietermaritzburg where the seat of Msunduzi Municipality was serviced a relatively small and mostly affluent urban population covering an area of about 150 km<sup>2</sup> (Moffet 2003) and

had a population of 176 590. In contrast the boundaries of the Msunduzi Municipality reached 649 km<sup>2</sup> in extent and with the population of 523 470 (Msunduzi Municipality 2002). In addition, favourable political conditions and promising economic prospects made the municipality an attractive destination for other distant rural migrants. Consequently, the size of the population has grown threefold and has resulted in a significant increase in the total areas under Msunduzi jurisdiction (Goebel 2007).

While the population of Msunduzi Municipality increased quite significantly, its revenue base marginally increased. Rural settlements and poorer urban settlements in the greater Edendale area contributed little to the Municipal revenue. The Municipality found itself in the predicament where it had a large number of people who required basic services but were unable to pay for services rendered. Payment levels were low which made the costs of providing and maintaining services expensive. Whereas the Municipality was able to fulfil its basic service mandate through Council's budgetary provisions/grants from the national treasury, operational and maintenance costs were a burden.

### **2.6.1 Water Services**

The Water Services Act of 1997 states that government has a responsibility to provide 6kl of potable water per household per month within 200m of each household (Smith and Green 2005). Accordingly, the Msunduzi Municipality undertook to provide all those connected to its reticulation system with bulk potable water. The Municipality was committed to provide water supply infrastructure to all its citizens and to ensure that qualifying households benefit from the FBW policy (Smith and Green 2005). While the Municipality would preferred to service all households with a full-pressure system, due to financial constraints it resolved to employ alternative low-pressure systems, at least as a short-to-medium-term solution.

The residents that received the low-pressure system often complained that it had problems as it was susceptible to frequent leakages. With vast volumes of water were lost due to leakages. The Witness (2007 b) estimated that an approximately R45 million in revenue was lost due to water leaks in 2006. In recent studies, it has been indicated that well over 70% of leakage incidents were reported to the Msunduzi Municipality (Smith and Green 2005).

### **2.6.2 Sanitation Services**

Financial constraints that confronted the Msunduzi Municipality impacted on the pace with which it was able to extend sanitation services to previously neglected areas, including LCH settlements. The limited revenue base effectively excluded the option of a full waterborne sanitation system in other LCH (Built Environmental Support Group 2007). The Municipality has, at least in the short-term, opted to develop alternative sanitation infrastructure, namely the VIP and septic tanks. In the long run the Municipality hoped to extend waterborne sewerage systems to areas that were currently serviced by alternative systems. However, this exercise may prove expensive and unsustainable in a low-income context with its limited rate base because the municipality may not be able to recover its investment capital and may not afford operational and maintenance costs (Moffett 2003).

### **2.7 Potential Environmental and Health Implications**

While a significant number of people were provided with houses and secure tenure, some settlements experienced a lack the supporting physical infrastructure. An adequate level of infrastructure was essential to maintain the balance between the environment and quality of life. Inadequate access to water and sanitation impacted negatively on the quality of the natural environment, negatively affecting the health of human beings (Nwonwu 2007). On-site

sanitation systems, in particular, when not developed properly, failed to meet environmental standards (Choguill 1996).

Seepage of untreated or partially treated sewage from on-site sanitation systems into nearby rivers was a problem, especially during rainy seasons. Polluted surface runoff served as an efficient transport mechanism for pathogenic microorganisms, nutrients, organic substances, and other pollutants (Umgeni Water 1998). Increased nutrient load in surface water depletes oxygen that supports aquatic life, thus impacting on oxygen dependent species. High levels of suspended solids may reduce light penetration in the water, impacts photosynthetic process of plants and lead to paralysis of the entire ecosystem (DEAT 1996).

Further, polluted water bodies could serve to transmit pathogenic viruses and bacteria, because such water resources tended to harbour a variety of disease causing microbes (DWAF 1996). Therefore, there were far-reaching consequences for human health due to the lack of adequate water and sanitation infrastructure. According to the World Health Organisation (WHO) (1997), poor water quality was one of the leading causes of human illness and mortality in the world. Diarrhoeal disease remained the single leading cause of infant morbidity and mortality in developing countries, claiming more than 2 million lives every year worldwide (ANON 2000; Anand 2006). Conservative estimates by the World Health Organisation (WHO) (1997 and 2008) put the diarrhoeal related deaths at approximately four to six million a year worldwide.

## 2.8 Conceptual Framework

Figure 1 below is a schematic representation of the conceptual framework of this study. In section 2.9.1., the conceptual framework is explained.

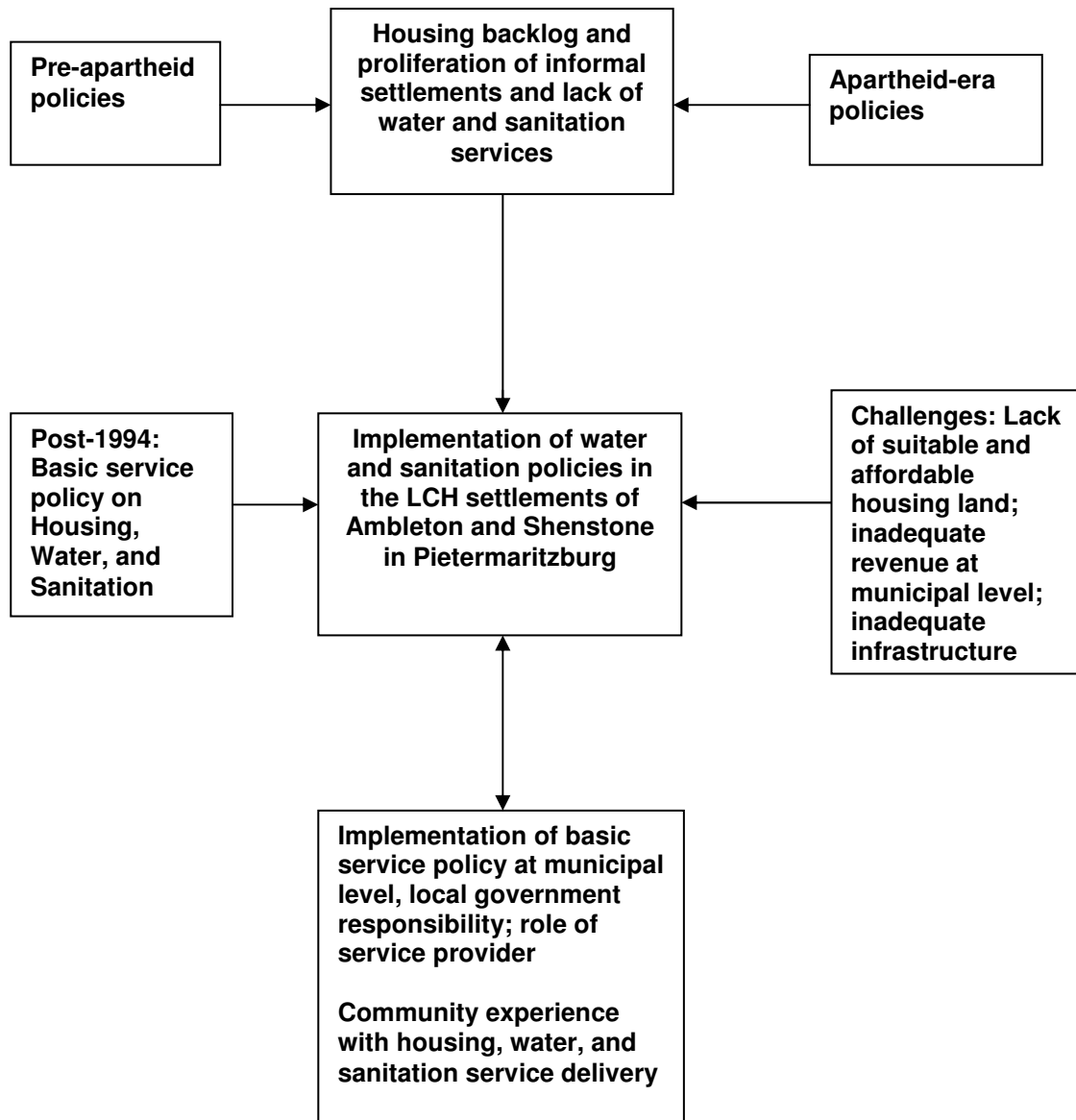


Figure 1: The conceptual framework for the study.

### **2.8.1 Explaining the Conceptual Framework**

The conceptual framework builds on the theoretical background of the literature on the historical background concerning housing issues and associated problems. The literature review gives an idea of how the past government system has given rise to the current housing crisis and imbalance in population distribution. The figure indicates that the past government system was responsible for the early development of spontaneous settlements around cities and towns that have come to characterise South Africa.

Further, the figure indicates attempts by the current government to eradicate housing backlogs through the development of LCH settlements. The figure shows that the government's efforts were hindered by the challenge of a lack of suitable and affordable land to build LCH on a wide scale. The government's focus on quantity and the lack of adequate revenue base at local government have hindered government's effort to deliver proper supporting infrastructure such as water and sanitation services. Because local government through service providers, has been mainly coerced in providing physical infrastructure despite insufficient revenue, the resulting products have often been of low quality and do not create sustainable and liveable settlements.

### **2.9 Summary**

This chapter indicates that the current crisis of and progress in access to housing, water supply, and sanitation services cannot be considered in isolation. While the current situation was linked to a historical context, it was also important to understand that future solutions should be based on lessons of the present and/or trends of the past. Therefore, one should not reflect on the current state of provision of housing, water, and sanitation services without understanding the past and its impact on current and future urban development.

In 1994, the newly elected government was confronted with a huge backlog in basic service delivery. The government recognised the need to expedite provision of basic services as a matter of priority. However, the government first had to review apartheid institutional and statutory frameworks in order to streamline basic service delivery. The legislation that emerged provided a framework that was premised on the Constitution, with the roles of national, provincial, and local government spheres in service provision clearly defined. As the principal role, the national and provincial government focused on eradicating the backlog in LCH, water supply, and sanitation services (Pottie 2003). In this regard, local government coordinates and serves as a vehicle for the implementation of national and provincial government policies and programmes. Local government was tasked with the provision of basic services such as water and sanitation (Bond *et al.* 1994).

Further, while the LCH initiative is a nationally and provincially driven and funded programme and in which local government actively participates in facilitating the availability of suitable land. In addition, local government was primarily responsible of ensuring provision of supporting infrastructure for water supply and sanitation. Although it was the constitutional responsibility of municipalities to provide water and sanitation services, municipalities required substantial financial resources and human resources. Thus, infrastructure programmes, planned with the intent of improving access to basic services imposed unintended financial burden in the future for some municipalities. In addition to infrastructure programmes, some municipalities were overwhelmed by the FBW policy.

Municipalities with limited revenue generating capacity were confronted by constraints in fulfilling their constitutional mandates. Delegation of functions to local government was not often accompanied by proportional resources and municipalities were often compelled to provide cheap and low quality infrastructure at the expense of sustainability (Maruvan 2002; Smith and Hanson 2003).

## **Chapter Three**

### **Context and Methodology**

#### **3. Introduction**

Historically, the provision of services was complex process that involved different levels of government. For example, under the apartheid government, the responsibility to provide housing was located in eleven ministries, namely, one in the central government, one in each of the four provincial governments, and one in each of the six Bantustans (Palmer Development Group and University of Cape Town 1993). As the post apartheid government prepared to expedite the provision of service delivery, this fragmented institutional arrangement was streamlined. Further the government adopted an institutional model that strengthened the role of local government as the primary vehicle to facilitate the provision of basic services such as potable water, sanitation. The local government had a direct fiscal responsibility for the provision of these services (Pottie 2003). Most municipalities assumed this responsibility at a time when many of them had an eroded revenue base, owing, mainly to the fact that the newly demarcated municipalities also catered for new areas without major improvement in their tax base (Wood *et al.* 2001).

Further, the introduction of GEAR did not make it easy for the local government to expedite service delivery. At the heart of GEAR was a strong drive to ensure fiscal discipline and to impose cost recovery measures to services rendered by municipalities (Visser 2004; Smith and Green 2005). These institutional inadequacies of macro-policy framework and inconsistent funding model inherent in the housing, water, and sanitation policies placed a formidable challenge to municipalities to expedite service delivery. The situation was exacerbated by dearth of skilled personnel in the local government sector. Hence the aim of the study was to explore the implementation of water and sanitation policies in a LCH settlement.

The context and setting of the study are outlined in the following sections.

### **3.1 Context and Significance of the Study**

The study was part of the International Development Research Centre (IDRC) funded research on “Urban Health and Ecosystems” which was a collaborative initiative between the University of KwaZulu-Natal (UKZN-PMB-RSA) and the Queens University of Canada in partnership with the local Msunduzi Municipality and other relevant stakeholders, such as local NGOs and Umgeni Water. The research project was the first initiative involving tertiary institutions and the local authority since the signing of Memorandum of Understanding by UKZN, the Msunduzi Municipality, and the Pietermaritzburg Chamber of Business. The research project was intended to explore the relationship between urban ecosystems and human health. Therefore, this study was part of the wide vision to encourage tertiary institutions to play a much more prominent and dynamic role in providing an appropriate research component to monitor and evaluate development. It was thus recognised that capacity building to strengthen the ability of urban developers was urgently required in order to improve general living conditions in human settlements.

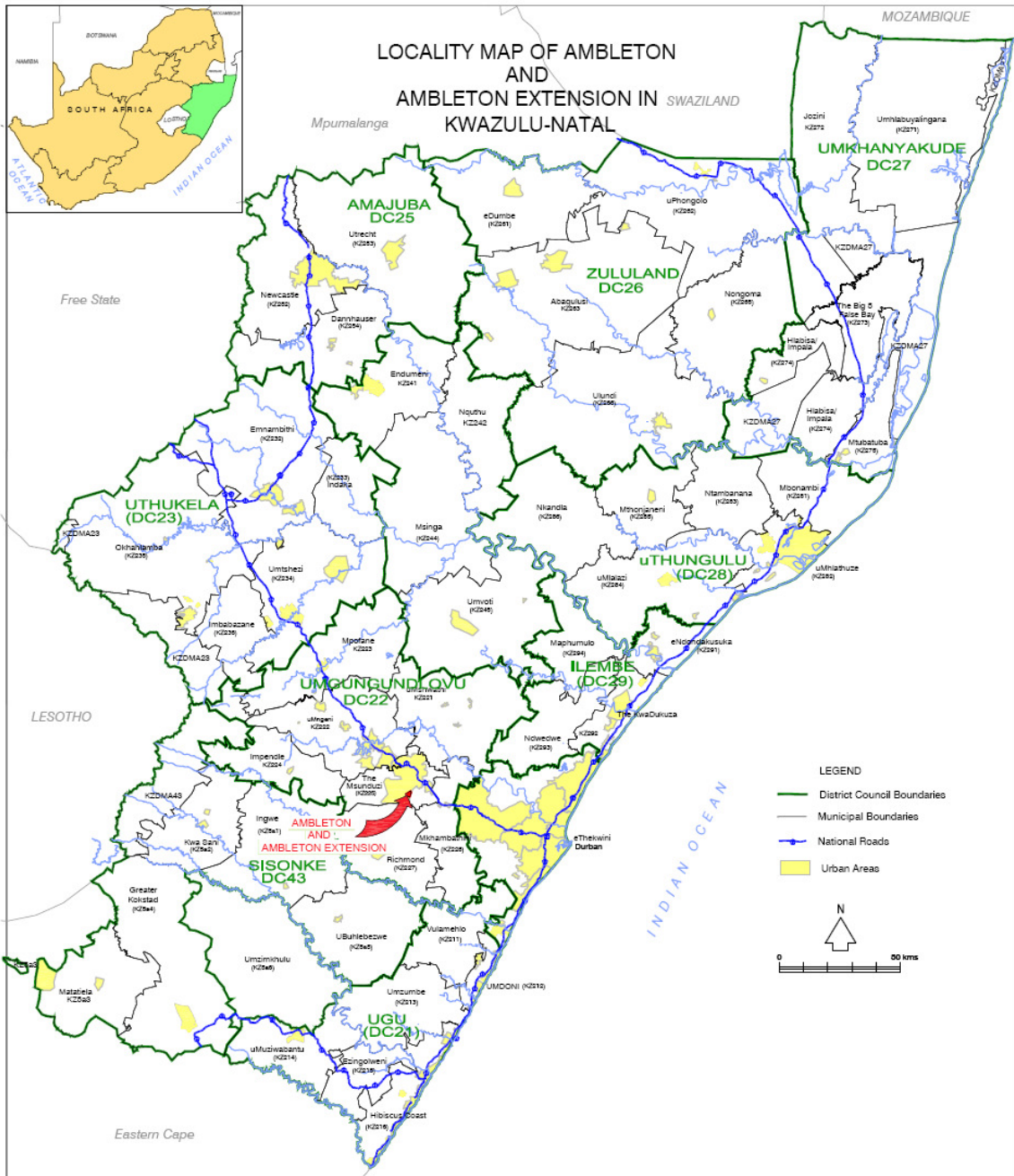
#### **3.1.1 Selection of the Study Area**

This study was based on the low-cost settlement of Ambleton and Ambleton Extension. The selection of Ambleton and Ambleton Extension as the study area was based mainly on the fact that the area formed part of the settlements that had been earmarked for the “Urban Health and Ecosystems” research project. Therefore, this study was intended to contribute towards the objectives of this major research project.

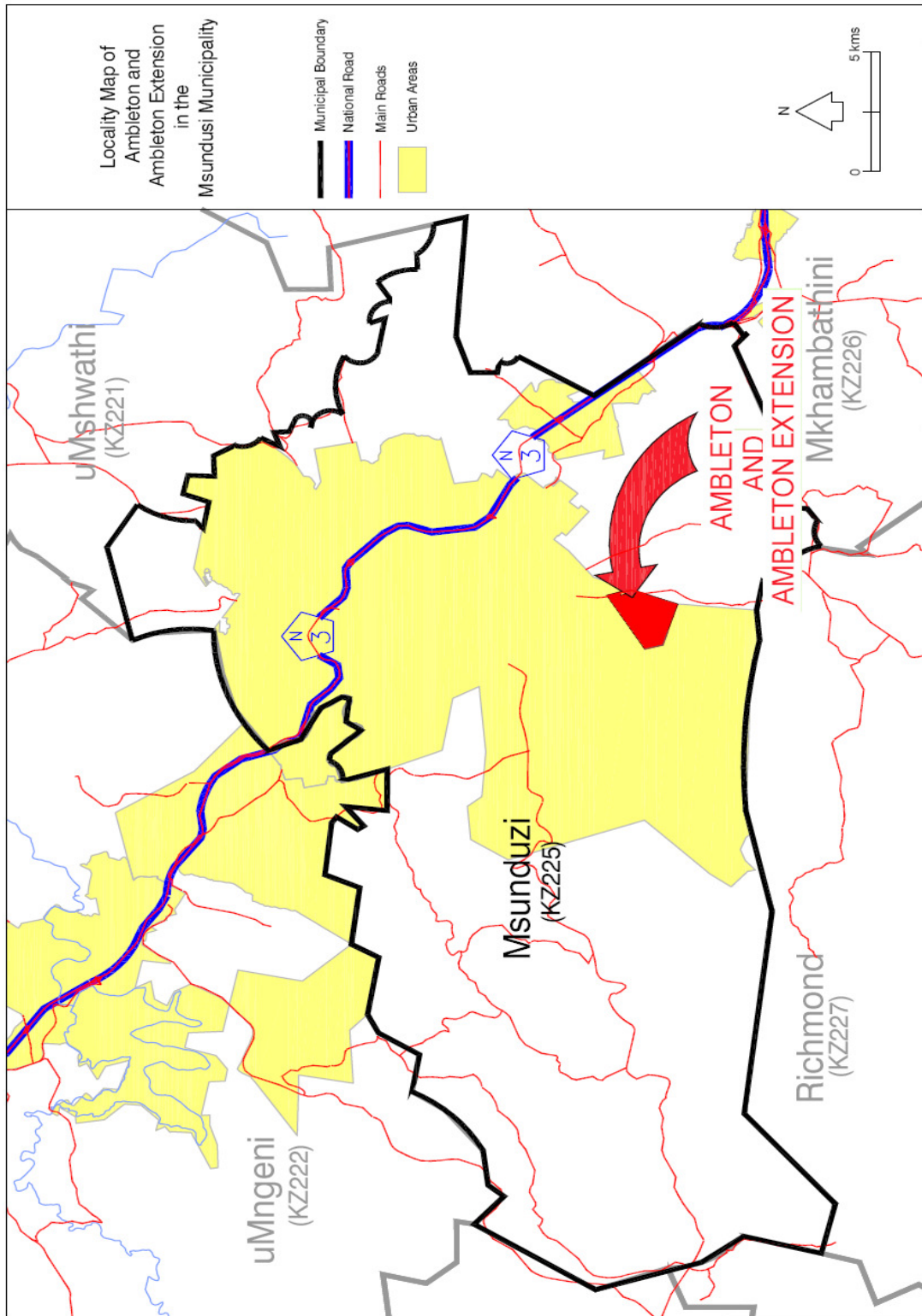
#### **3.1.2 Description of the Study Area**

The study area is situated on the farms of Ambleton and Ambleton Extension. It is located within the municipal area of the Msunduzi Municipality, in which the city of Pietermaritzburg is also the capital of KwaZulu-Natal, South Africa (Figures 2 a and b). Low-cost housing settlements constitute the main land use in the area.

The area was earmarked for low-cost housing development around the mid-1990s. The Msunduzi Municipality (the then Pietermaritzburg-Msunduzi Transitional Local Council (TLC)) had planned to develop around 4000 housing units. This included 547 residential sites that were already in existence which were built by the previous administration, the KwaZulu-Natal Provincial Administration (KZNPA). The existing development was referred to as Phase 1 Development (Bergman Inge'rop (Pty) Ltd 2001).



**Figure 2a: The Location of Ambleton and Ambleton Extension in KwaZulu-Natal Province, South Africa.**



**Figure 2b: The Location of Ambleton and Ambleton Extension in the Msunduzi Municipality.**

### **3.1.3 Landscape**

The study area consisted of two areas, namely, the upper area which is close to Richmond Road and next to the Slangspruit development and a lower area, near Imbali Township. The topography is such that the two areas are bisected by a defined valley line. The lower area is on a north-east facing slope while the upper area is on a west facing slope. The upper area also consists of two convex slopes which are dissected by a well-defined valley line. The slopes differ from 1:20 on hilltops and valley bottoms to 1:6 on the sides of valleys, and the areas close to the valley lines have slopes greater than 1:3 (Bergman Inge'rop (Pty) Ltd 2001).

The geotechnical survey undertaken showed that the geology of the area is mainly underlain at shallow depth by shale with frequent dolerite intrusions (Bergman Inge'rop (Pty) Ltd 2001). The shale underlies mainly the steeper higher lying parts of the area. The lower lying area has significant soil depths. The geotechnical survey also revealed some steeper areas on the site outside the present development as being unsuitable for development. This was mainly attributed to the presence of unfavourable dip angles of the underlying shale substrata. According to the survey, there were considerable areas that were unsuitable for housing development. Therefore, it was advised that the investigation be taken into account in the conceptual plan of the entire Ambleton development. It was highlighted that the steepness of the slopes and thin soil cover will render the area unsuitable for agricultural activities (Bergman Inge'rop (Pty) Ltd 2001).

### **3.1.4 Water and Sanitation Services**

The existing water and sanitation services in the Ambleton and Ambleton Extension were not common for all the Phases in the development. With regard to water, Phase 1 initially had water supply in a form of a neighbourhood standpipe with a meter which was shared by 20 households. However, was

upgraded to yard taps. The sanitary facility was a VIP with a block structure built over a concrete slab.

Phase 2 has yard taps which were mostly mounted on the walls of houses. There were two types of sanitary facilities that existed in this Phase. One part of the phase had an improved VIP system which was all concrete. The other part had the HS low-flush toilet system which was manufactured and supplied by The Hungerford-Schroeder Organisation and was named after R.J. Hungerford-Schroeder, the Managing Director of this organisation. Two types of the HS system currently exist in Phase 2, the Mark 4 version and the improved Mark 5 version. There were slight variations in the system, perhaps insignificant. The HS system was an on-site disposal system which incorporated a liquefying system for solids that allows for rapid disposal of effluent into the upper earth soil levels where the organic solids were degraded by means of microbial activity.

Currently, a full waterborne and bulk sewer system for the area was not feasible because of financial and landscape constraints. However, this system will be constructed in future when funds become available, and the existing system was built on the understanding that it would be a temporary measure which will be improved once funds become available and when the level of affordability by the community improves. Therefore, the economic status of the community and the municipality dictated that the viable system for the area was an on-site sanitation system.

According to the Msunduzi Municipality, the majority of those lived in LCH settlements like Ambleton and Ambleton Extension experience economic hardship and, therefore, found it difficult to pay for services. In 2004, the municipality introduced an indigent policy to help relieve a certain category of poor households of the burden of paying for basic services such as water (The Msunduzi Municipality 2004). Indigent households qualified either automatically or on application to be considered for the benefits of the indigent policy.

Automatic eligibility qualified a household allotment of free basic services per month. A qualifying household in this category should not have property valued at more than R30 000. This category of household was entitled to 6kl per month (The Msunduzi Municipality 2004).

## **3.2 Methods**

Data collection methods that were used in the study are described in this section. The literature review presents the background and context of the research topic. Other data collection methods were used to collect qualitative data in the field.

### **3.2.1 Literature Review**

Current and recent literature was made use of in order to establish a basic understanding of issues relating to the effect of urbanisation, historical background of housing, lack of basic service and consequent environmental and health problems in an urbanising world.

### **3.2.2 Field Survey**

The study set out to evaluate the implementation of water supply and sanitation services in a LCH housing settlement. The study was conducted between September and November 2005 using qualitative research methods. Semi-structured interviews were administered to a variety of key respondents from within and outside the municipality. The **sample** of the study included the municipal officials; the consultant on the Ambleton and Ambleton Extension project; the subcontractor who developed one of the sanitation types in use in the area; and the Ward Committee of the area. The participants in the study were selected to get a balanced sense of the issues and to strengthen the validity of the study.

A focus group discussion was held with three key official housing and engineering departments. Individual interviews were conducted with senior staff responsible for housing delivery and for water and sanitation infrastructure portfolios. A member of the Council Executive Committee responsible for infrastructure was also interviewed. Interviews were also conducted with service providers (developer of sanitation technology and project consultant) in order to enhance the information gathered. The project consultant charged with supplying building material and sub-contracting to business suppliers (developer of sanitation technology) and housing contractors were interviewed.

Further, a focus group discussion was held with eight community representatives serving on the Ward Committee of Ambleton and Ambleton Extension. The choice to interview the Ward Committee was influenced by time considerations and the understanding that the quality of data obtained would still be enhanced. The Ward Committee was a link between the community in the study area and the ward councillor who then represented the community in the local Council. Therefore, the Ward Committee was well placed to better gauge the feelings of the community. Similarly, the Ward Committee as a statutory body within the municipal system, and was assumed to be privy to policy imperatives that inform municipal decisions on service delivery issues. It follows, therefore, that the Ward Committee would advance in a moderate way the demands of community based on what the Municipality can reasonably afford.

Interview questionnaires were drawn up (see Appendix A) to elicit a variety of perspectives from respondents on the implementation of water supply and sanitation policies. Results from a focus group discussion with key respondents, especially the Ward Committee, were treated discreetly and with confidentiality. Given the time constraints of the study, the sample frame was limited to relevant municipal officials and ward committee members. Absolutely ethical conduct was maintained during the course of study. The researcher explained the background as well as the significance of the study and that respondents' information would

be treated with confidentiality should they wish so. Only with the consent of the participant did the researcher move to questions.

In addition, research data was collected through observation and informal, random, and impromptu interaction with households during field visits. The researcher engaged with ten randomly selected households affected by water and sanitation problems in Ambleton and Ambleton Extension. Interaction with the affected households was supplemented by the pictures the researcher took during field observation in the study area. This offered the author an opportunity to gain a firsthand account of the sentiments of the community. Affected households were thus given a chance to confirm or reject respondents' perspectives. The researcher further looked at reporting by local print media as evidence of water and sanitation problems in Ambleton and Ambleton extension. The newspaper coverage may thus validate that indeed there were problems with water and sanitation in the area.

### **3.2.3 Reliability and Validity of Data**

The reliability and validity of this study was looked at from the context that the study had time limitations. Notwithstanding this, the researcher sought to produce research data that is trustworthy. Hence, the findings of the research ought to be considered reliable and valid. The researcher dedicated reasonable time in the field interviewing key informants. Importantly, the researcher undertook to ensure that the key informants were relevant to the study. The key informants were experienced and knowledgeable on service delivery. The researcher backed up information from interviews with field observation and random interaction with households to add further credibility to the findings.

### **3.3 Summary**

A collaborative initiative between the Msunduzi Municipality and the UKZN partnering with Queens University of Canada facilitated the inception of the “Urban Health and Ecosystems” project with related research topics. One such topic, the subject of this study, was the evaluation of the implementation of water and sanitation policies in a LCH settlement, namely, Ambleton and Ambleton Extension. The study area was characterised by an undulating landscape with shale rocks present at shallow depths. Water provision was reticulated to yard taps with capable households having extended the service to in-house taps. Households have either VIP or HS sanitation systems depending on the landscape of the area. Financial and landscape constraints did not allow for the provision of preferred full waterborne sanitation system.

The literature review was used to gather historical background to the basic service provision of the country and the legislative imperatives of the new dispensation in the provision of water and sanitation infrastructure. A qualitative research approach was followed wherein research data was gathered through focus group discussions to elicit a variety of perspectives on the objectives of the research topic. Informal interaction with the directly affected community presented an opportunity to get an account of firsthand experiences of the people concerned.

## **Chapter Four**

### **Results and Discussion**

#### **4. Introduction**

The study sought to evaluate the implementation of water and sanitation policies in the LCH settlement of Ambleton and Ambleton Extension. In this chapter, the implementation of water and sanitation policy was analysed based on perspectives of various respondents. The study was conducted using a dual approach; firstly, through group and individual interviews administered to officials of the Msunduzi Municipality, Ambleton and Ambleton Extension ward committee, and service providers (Appendix 1). Secondly, the feedback was derived from direct field observation and random interaction with research subjects at a household level.

In this regard, the interview questionnaires were designed in such a way that the feedback from the respondents gives effect to the objectives of the study. The objectives of the study were to: (1) Evaluate whether or not the quantity of potable water in the study area meets the criteria set by national and local government policy standards; (2) Assess whether or not the water and sanitation technology was appropriate in relation to site specific conditions; (3) Determine the level of community satisfaction with water and sanitation provision; (4) Verify whether or not the community's expectations were in line with water and sanitation policy provisions, and (5) Reflect on the possible key challenges faced by the town planners and service providers in implementing the respective policies.

To give impetus to the objectives of the study, the assessment of water and sanitation policy implementation was based on criteria that attempted to find answers to following issues: (1) Quantity of potable water supplied and distance of water supply facility from households (cartage) in Ambleton and Ambleton Extension; (2) Type of water supply and sanitation technology in relation to landscape of the area and technical challenges that ensued; (3) Community

satisfaction with and expectations of water and sanitation services; and (4) key challenges faced by planners and service providers in implementing water and sanitation policies challenges.

The results are presented as follows:

- 4.1 Evaluation of whether or not the quantity of potable water, cartage, and sanitation services meets the provisions of national government policy
- 4.2 Assessment of whether or not water supply and sanitation technology was appropriate to site specific conditions
- 4.3 Evaluation of the level of community satisfaction and expectations in relation to accepted daily water and sanitation requirements of households and whether or not the community's expectations were justified in terms of policy provision
- 4.4 Reflection of the possible key challenges faced the possible key challenges faced by the Msunduzi Municipality and service providers in implementing water and sanitation policies

Table 4 gives an abridged overview of how the results are presented in this dissertation.

**Table 4: Summarised Presentation of Results**

<b>Heading</b>	<b>Issue</b>	<b>Result</b>
Evaluation of whether or not the quantity of potable water, cartage, and sanitation services met the provisions of national government policy	Quantity of potable water supplied to households and distance travelled to a water collection point (cartage)	Respond to objective (1)
Evaluation of whether or not water supply and sanitation technology was appropriate to site specific conditions	Type of water supply and sanitation technology in relation to landscape, the technical challenges that ensued	Respond to objective (2)
Evaluation of the level of community satisfaction and expectations in relation to accepted daily water and sanitation requirements of households and whether or not the community's expectations were justified in terms of policy provisions	Community satisfaction with and expectations of water and sanitation services	Respond to objectives (3) and (4)
Reflection of the possible key challenges faced the possible key challenges that were faced by the Msunduzi Municipality and service providers in implementing water and sanitation policies	Key challenges faced by the town planners and service providers in implementing the respective policies	Respond to objective (5)

The feedback from the interview discussions with key respondents and field observation is given in the results as outlined in sections 4.1, 4.2, 4.3, and 4.4 below. The perspectives expressed by interviewed respondents are summarised in the corresponding tables, tables 5, 6, 7, and 8.

#### 4.1 Evaluation of whether or not the quantity of potable water, cartage, and sanitation services met the provisions of national government policies

**Table 5: Summary of Key Respondents' Perspectives on the Implementation of Water and Sanitation Policy**

Issue	Comments			
	Ward Committee	Municipality	Service Providers	Observation and Interaction with Households
Potable water quantity & cartage	The municipality adheres to national policy in this regard. Households receive 6kl of water free per month. All households have yard taps some have upgraded to in-house taps.	Provides 6kl of water per month as guided by national policy. As per minimum requirement in terms of cartage, the municipality provides water to every household yard.	Although the brief did not include water reticulation, one service provider believes the municipality has adhered to national policy.	Households that interacted with the researcher confirmed that the municipality provides water but not sure about the daily allocation but the 200l low- pressure tanks do not provide adequate water per day.
Sanitation service	Households have on-site sanitation system (VIP and low-flush).	National sanitation policy stipulates VIP and low-flush system as minimum requirements. The municipality adhered to this.	The sanitation supplier concurred that HS low-flush sanitation system adheres to policy.	The researcher confirmed that households either have VIP or low-flush systems. Not all ten households visited have functioning toilets. But problems vary from household to household.

In this section of the findings, the focus was on how implementation of water and sanitation policy was viewed by different sectors interviewed for the study. The researcher sought to evaluate national policy implementation based on the quantity of potable water and distance (cartage) of water taps from the households versus policy requirements. Similarly, the study aimed to confirm whether or not the sanitation infrastructure adheres to basic sanitation requirements as envisaged in the policy. In an effort to corroborate the perspectives of key respondents and assess firsthand the accounts of directly affected households, the researcher interacted with some households in Ambleton and Ambleton Extension.

The results summarised in Table 5 show that all key respondents unanimously agreed that indeed Msunduzi Municipality adhered to national policy on water and sanitation services in Ambleton and Ambleton Extension. Field observation confirmed perspectives by respondents: the researcher saw 200l tanks mounted on rooftops and above toilet seats in-house. All the households that the researcher interacted with confirmed receiving potable water within households' yards. Further, households that interacted with the researcher confirmed having either VIP or HS sanitation systems. However, some of these households reported that they have neither VIP nor HS system. They argued that the service providers never completed the infrastructure and the households were left with open pits.

In the Ambleton and Ambleton Extension LCH, the Msunduzi Municipality implemented the free basic water allocation as prescribed in the FBW policy. Responding to the question of whether or not the municipality had a clear comprehension of policies guiding basic service delivery, the participants argued that all municipal decisions were informed by very good understanding of national, provincial, and municipal policies. One participant pointed out that this was the case in the Ambleton and Ambleton Extension development. It was reported that concerning water quantity, the Msunduzi Municipality provides free

6kl of potable water per month to households in the area (Zungu *personal comm.* 2005). This was in line with the FBW policy which states that the households should be provided with 6kl free water per month as a minimum requirement (Ward *et al.* 2000; Peters and Oldfield 2005). The Ward Committee (*personal comm.* 2005) confirmed that the Municipality had put systems in place to ensure households in Ambleton and Ambleton Extension would get the minimum level of water supply as envisaged in the FBW policy. The Municipality installed 200l low-pressure water tanks (Figures 3 a and b) that were either mounted on top of roofs or in the area directly above the toilet seat (personal observation 2005).

Nonetheless, the Ward Committee argued that the Msunduzi Municipality needed to be flexible in its implementation of the FBW policy. It was reported that reticulating water through 200l low-pressure tanks was a rigid approach to water supply. This water restriction approach subjected households to interrupted and unreliable water supply. In addition, 6kl of water per month was not enough to sustain large households (Ward Committee *personal comm.* 2005).

For its part, the Msunduzi Municipality reiterated that it adhered to the minimum requirements of the FBW policy. But it conceded that 6kl may indeed be inadequate to meet the needs of larger households given that the 6kl allotment of free water was calculated on an eight-member family (Water and Sanitation Team *personal comm.* 2005). Responding to the question of whether or not water supply was adequate for the households in Ambleton and Ambleton Extension, the Ward Committee (*personal comm.* 2005) argued that indications were that larger households consumed more than the 6kl of water per month. When probed further, the Ward Committee advanced as evidence of this the fact that some households resorted to tampering with water restriction devices to obtain more water. Indigent households that consumed in excess of 6kl were encouraged to approach the municipality and arrange for free basic water to be increased appropriately. Otherwise those that consumed in excess of 6kl were

exposed to large water bills because water in excess of 12kl per month was subjected to a block tariff (Water and Sanitation Team *personal comm.* 2005).

In line with the policy requirement for cartage, the Msunduzi Municipality bought bulk potable water from a reputable service provider, Umgeni Water, and reticulated it to yard taps. Although the brief of service providers did not include reticulation of water, the Project Consultant (*personal comm.* 2005), was impressed that the municipality had gone beyond the minimum policy requirements for water reticulation. As a minimum standard, the Water Supply and Sanitation Policy required that local government provides water within 200m of each household and it should be adequately available on a regular daily basis (Ward *et al.* 2000).

Potable water in Ambleton and Ambleton Extension was provided through yard or on-site low-pressure taps. This infrastructure could easily be upgraded to in-house connections. A few households had already upgraded this system to in-house taps (Ward Committee *personal comm.* 2005; Zungu *personal comm.* 2005; personal observation 2005). While study was not intended to quantify the total number of households already having in-house taps in the area and the number could not be ascertained, seven out ten households visited by the researcher had in-house taps, while the other three had taps in their yards, signifying that a large proportion of households could have in-house taps (personal observation 2005). The households that were not been connected to yard taps were serviced with standpipes which were generally shared by a few households. The standpipes were within acceptable distance from homes and were, within the maximum 200m distance prescribed in the national policy (Ward Committee 2005 *personal comm.*).



**Figure 3 a: Low-pressure water tank mounted on top of the roof.**  
*(Photograph by: Siyabonga Zondi)*



**Figure 3 b: Indoor low-pressure tank mounted above the toilet seat.**  
*(Photograph by: Siyabonga Zondi)*

Households in Ambleton and Ambleton Extension were provided with two types of on-site facilities, both of which met the basic requirements of the national sanitation policy. Some households were provided with VIP structures (Figure 4) built of concrete and erected over concrete slabs that were placed directly above pits that have to be drained once full. Other households were provided with the HS low-flush system (Figure 5) (Ward Committee 2005 *personal comm.*; Water and Sanitation Team *personal comm.* 2005; *personal observation* 2005). The HS low-flush toilet incorporates a liquefying system for solids that allowed for rapid disposal of effluent into the upper earth soil levels where the organic solids were degraded by means of microbial activity (Sanitation Supplier *personal comm.* 2005). Of the ten households visited by the researcher five had the VIP sanitation system. Of the other five households, four had the HS low-flush sanitation system, while one was left without any toilet, seemingly because the yard around that household was beset with shale rock (Figure 6), which makes it difficult to dig either for septic tanks or VIP toilets.



**Figure 4: VIP sanitation system made of concrete slab.**

*(Photograph by: Siyabonga Zondi)*



**Figure 5: The HS low-flush sanitation system.**

*(Photograph by: Siyabonga Zondi)*

## 4.2 Assessment of whether or not water supply and sanitation technology was appropriate to the site specific conditions

**Table 6: Summary of Key Respondents' Perspectives on Type of Technology used for Water and Sanitation Infrastructure**

Issue	Comments			
	Ward Committee	Municipality	Service Providers	Observation and Interaction with Households
Type of water supply and sanitation technology in relation to site specific conditions	Water was reticulated to low-pressure tanks. Water trickles and interruptions were common probably owing to undulating nature of the area. Prevailing shale conditions render both HS and VIP unsuitable for the area. HS soak-away requires sufficient top soil for optimum microbial activity. VIP pits were shallow due to shale rock and thus fill frequently	Undulating nature of the area renders the low-pressure water system problematic at times. Equally, full-pressure water system would have been unaffordable and difficult in such conditions. Concedes that VIP pits were shallow and fill up quickly. But waterborne system would have been equally compromised and cost astronomical given the nature of landscape. Geotechnical survey would have informed whether HS would be suitable or not, given its requirements	Business supplier of HS system insisted HS system works perfectly if soil conditions necessary for microbial activity were adequate	There were households where more than one pit for septic tanks had been dug. And there was evidence that in these instances shale rocks were found at very shallow depths (Figure 6). Shale rocks make it difficult to dig for either HS or VIP system. As such other households were left and told to dig pits and service providers would return to install soak-away system. In this regard, the implications were far-reaching as narrated by one household the researcher visited, where occupants relieved themselves either in the wild or at neighbours if they were available

The study as summarised in Table 6 indicated that the water supply in the study area was serviced by a low-pressure piped water system, through yard taps mainly. Responding to the question of whether the infrastructure was planned to be a permanent or temporary service to the area, the Project Consultant (*personal comm.* 2005) indicated that the Municipality always preferred a full-pressure water system. According to the Project Consultant, a full-pressure water system for the area was not a feasible option, owing to capital and operating costs requirements. The Municipality had envisaged that in future this option may be looked into, when funds become available as its preferred water reticulation system. The Project Consultant asserted that the Municipality would be the first to concede that despite full-pressure system being an attractive option, it was less feasible than a low-pressure system.

On the question of whether the Municipality has a standard water and sanitation technology, the participants from the Msunduzi Municipality indicated that its approach in this regard was informed by the landscape of the area to be serviced. Therefore, Ambleton and Ambleton Extension was not an exception, and the landscape would have been a key determinant of the type of infrastructure provided. Considering that the area was characterised by shale rocks, installing a bulk full-pressure system would not have been a prudent option considering the costs associated with this type of infrastructure. In addition, the beneficiaries, being in general low-income earners, would suffer the consequences of high tariffs as the Municipality would have to recover its initial capital investment. Further, the shale rocks that characterise the landscape of the area proved problematic even with the low-cost on-site technology and this was evidenced by the difficulty that was encountered when digging pits (Water and Sanitation Team *personal comm.* 2005).

While initially position the Msunduzi Municipality had been in favour of a full-pressure water system, it has since revised that idea. When responding to the question of whether or not it had any intentions of improving the current

infrastructure, the Municipality mentioned that, despite its problems the low-pressure system, it was and still was the best option available. Furthermore, the low-pressure system allows indigent households to get potable water at affordable costs to both the Municipality and these households (Water and Sanitation Team *personal comm.* 2005). Some studies vindicate the revised policy of the Municipality in this regard. Recent studies suggest that the low-pressure yard tank system was more acceptable given that it also lends itself to the implementation of a FBW policy. The system may provide a sustainable and affordable long-term approach to water supply (Maruvan 2002).

The low-pressure tank served as a control device to regulate the amount of water that was consumed by households. Thus, the municipality ensured that household supply could be limited to the predetermined daily or monthly volume of free basic water but within the minimum threshold provided for in the Water Services Act, Act 108 of 1997. This way, the Municipality was able to measure and monitor household consumption (Water and Sanitation Team *personal comm.* 2005). While this system found favour with the Msunduzi Municipality, there was need to it in a sensibly and considered manner to cater for larger households that, because of their, could not necessarily keep within their 6kl monthly allocation. Water restrictions that were imposed by the low-pressure system caused discontent amongst the affected households (Ward Committee *personal comm.* 2005).

People suffer the daily inconvenience of a trickling flow of water and intermittent interruptions. Many households complain of regular and persistent interruption in water supply, allegedly owing to the low-pressure water system (Ward Committee *personal comm.* 2005). In fact, even some within the Municipal administration acknowledged the extent of problems associated with water interruptions. Responding to the question about the significance of the nature of the landscape of the area to be serviced, the Municipality acknowledged the need for the landscape to be conducive to the technology of the infrastructure to

be employed in the area. The municipality conceded that the undulating nature of Ambleton and Ambleton Extension land did not render the area suitable for proper infrastructure (Water and Sanitation Team *personal comm.* 2005).

On the question of whether or not the Municipality had any role in securing the land on which Ambleton and Ambleton Extension was built, it was mentioned that the Municipality was central in identifying this land. On whether or not this was suitable land for the purpose, the Municipality conceded that some of the problems experienced in the area had to do with the unsuitability of that land for human settlement. Notwithstanding landscape problems, the municipality alleged that most of the government's efforts were compromised by shoddy workmanship on the part of some service providers (Water and Sanitation Team *personal comm.* 2005).

Protests about the level of water supply were widely covered in the local print media. Reports showed that the municipality abdicated its responsibilities when it failed to call to account unscrupulous service providers where contractual obligations contravened. Media reports by The Witness (2007 a) revealed that some residents claimed that they were not connected to the water supply at all, despite having occupied their houses for years. On the other hand, those who were connected to the water supply complained that taps to control water flow either were not provided or simply broke frequently. In this regard, many residents claimed that they were forced to bend water pipes when water was not being used and avoid unnecessary loss of water. The Municipality was already incurring huge losses in revenue because due to unaccounted water that was lost in this manner (The Witness 2007 b).

For sanitation provision, the Ward Committee (*personal comm.* 2005) argued that both the HS and VIP as sanitation systems were not suitable for an area like Ambleton and Ambleton Extension because of the landscape. For this reason, the Ward Committee argued that both sanitation systems do not adequately cater

for the needs of community as environmental constraints made it difficult to build appropriately designed sanitation infrastructure. The design of sanitation infrastructure was compromised due to the undulating and rocky nature of the area. The findings of the geotechnical survey indicated that the area was characterised mainly by shale rock found at shallow depth (Figure 6) with inadequate topsoil cover to facilitate biological activity, a requirement of the HS system. In addition, the water table being potentially close to the septic tanks, the VIP pits were shallow.



**Figure 6: Shale rock found at shallow depths, immediately below a thin layer of top soil. (Photograph by: Siyabonga Zondi)**

There were widespread problems with both the HS and VIP sanitation systems, clearly indicating the problematic state of sanitation infrastructure in the area. Despite the HS and VIP sanitation systems being within the provision of policy, people continuously experience problems with both (Ward Committee *personal comm.* 2005). Hungerford-Schroeder (*personal comm.* 2005) insisted that the HS was better than the VIP system because it offered a cheaper alternative as it only

requires digging of a top soil layer. Responding to the question of whether or not there was a need to upgrade the current infrastructure, the sanitation supplier argued that if there were problems with the HS system, that should be blamed on contractors who failed to install the system properly. People were equally frustrated by the HS and VIP infrastructure. In fact, the frustration has reached the point where some of the observed households have had to completely alter the HS system and dig new septic tanks. Septic tanks made by households posed serious threats to human health and the natural environment as pits were dug haphazardly without due consideration to proper design in terms of size and other necessary specifications (personal observation 2005).

Furthermore, some of these pits were lying open and abandoned without having been connected to the soak-way system (as illustrated in Figure 6). According to According to the Witness (2007 b), this was despite some households being told to dig pits in their yards so that septic tanks could be connected to the toilets. Hungerford-Schroeder (*personal comm.* 2005) reiterated that the HS system was constrained only by the nature of the landscape, which could explain why certain pits were abandoned. However this should not be condoned as other alternatives that could be to remedy the situation. It was also possible that an alternative sanitation system could perform better than the HS system which was constrained by the prevailing. Even households that had toilets connected to the septic tanks still experience problems, owing mainly to the incompatibility of the soak-away system with the soil conditions in the area. The HS sanitation system requires that a soak-away should have a depth of about 400 mm in order to allow for optimal microbial breakdown of human excreta.

Responding to the question of whether or not different parts of Ambleton and Ambleton Extension have different infrastructure, the Water and Sanitation Team agreed. This was informed by the nature of the land to be developed, the Municipality argued. Neither the VIP nor HS system was completely suitable for the land on which Ambleton and Ambleton Extension. The presence of shale

compelled the Municipality to dig shallow pits because as the rock was found to be close to surface. As a result, residents allege that the VIP toilets fill up frequently. The Municipality often failed to respond when requested to drain toilets that were full. In this regard, some affected households reluctantly opted to use nearby open spaces rather than use overflowing toilets (Ward Committee *personal comm.* 2005). On the question of whether or not the Municipality was responsible for the maintenance of the infrastructure, Zungu (*personal comm.* 2005) conceded that the municipality does have a clear policy on whose responsibility it was to drain VIPs that were full. It was mentioned that, even if the municipality intervened, it could not manage the demand as did not budget for frequent drainage. So, the responsibility was left to individual households, despite the fact that some cannot afford to pay for these services (Zungu *personal comm.* 2005).

### 4.3 Evaluation of the level of community satisfaction with the quality of water and sanitation services and the assessment of whether or not the community's expectations were justified in terms of policy provisions

**Table 7: Summary of Key Respondents' Perspectives on Community Satisfaction**

Issue	Comments			
	Ward Committee	Municipality	Service Providers	Observation and Interaction with Households
Community satisfaction and expectation about water and sanitation services	<p>The Ward Committee said community was not consulted by the municipality. It argues that the municipality was not in touch with their problems and therefore was not sympathetic.</p> <p>Though satisfied with housing, the community was not satisfied with the quality of water and sanitation services. As such, the necessary components that make a house a liveable home were not there if water supply and toilets were not satisfactory and conducive for use by the disabled and elderly</p>	<p>Conceded some responsibility for technical limitations of sanitation system. In terms of the HS system it believed some households were guilty of introducing foreign objects, which affected its technical ability</p>	<p>Despite obvious technical limitations, business supplier of the HS system insisted that households must bear some of the blame for introducing foreign objects that clog the system</p>	<p>People were more content with housing structure unlike water and sanitation system that does not adequately address people's needs. Many households felt their health was already compromised by inadequate air circulation due to clogged toilets. Many resorted to using buckets to relieve themselves which were often disposed of in nearby open spaces</p>

Responding to the question of how satisfied the community was with the level of water and sanitation, the Ward Committee indicated that there was a high level of discontent in this regard. The Ward Committee mentioned that it also bore the brunt of anger from the community and would be accused of not conveying their grievances to the Msunduzi Municipality. In turn, the Ward Committee alleged that the level at which the local municipality engaged beneficiaries on issues of water and sanitation was not satisfactory. Many Ward Committee members did admit that this affected the level at which they could engage with the municipality. In addition, the majority of Ward Committee members conceded that their knowledge of the water and sanitation policy was limited. Hence, they could not properly execute their responsibilities as the interface between the community and the municipality. Nonetheless, the Ward Committee was adamant that it performed its responsibilities with absolute dedication under difficult circumstances. It argued that it endeavoured to apprise the Municipality about challenges and concerns of the people of Ambleton and Ambleton Extension.

However, the Ward Committee admitted that the disgruntlement from the community was not entirely without merit and that their expectations of the municipality were realistic. Regrettably, the community had lost confidence that its interests could be properly served by those who represent it. Responding to the question of whether or not community participation on the design and implementation of services would have helped, the ward Committee agreed. The view of the Ward Committee was that consultation with prospective residents would have allowed them to be acquainted with the demands of the housing project. This way the beneficiaries could participate in the design and overall implementation of services in their area.

On the question of whether or not the input from the community would be reflected in the decisions of the Municipality, the Ward Committee was sceptical. It cautioned that the municipality seemed to pay lip-service to public consultation

given the committee's experience. It was mentioned that the municipality had not negotiated in good faith and reported problems encountered by the community had not been given favourable attention. It was the considered view of the ward committee that the views of the prospective community on the design and implementation of the project would have gone unheeded.

Answering the question of whether or not the existing infrastructure should be upgraded, it was mentioned that such ideas would be embraced. When asked about the ability of the populace of Ambleton and Ambleton Extension to pay for better infrastructure, the Ward Committee believes many households may not be able to afford to pay. The terrible conditions and seriousness of the problems regarding water supply and sanitation services has compelled people to demand better; the cost was secondary. The Ward Committee argued that the demands of the people were fair, but they also admit that there was a lot to be grateful for. Many residents feel gratified by government's endeavours to provide housing but feel equally deprived of access to adequate potable water and sanitation services (Ward Committee *personal comm.* 2005). The Witness (2007 a) confirmed that people do appreciate that government has given them houses and other basic amenities. People complain to a lesser degree about the nature of houses they occupy but were generally not satisfied about the poor potable water supply and sanitation services which they feel constitutes the most basic of their needs.

Community dissatisfaction with water supply was attributed mainly to the quantity of water available per day per household. The Ward Committee mentioned that households were also not happy that the service providers opted to install water taps behind houses in positions that were far removed from front doors (Figure 7). Further, the Ward Committee argued that there were few households with in-house tap connections in Ambleton and Ambleton Extension. It was mentioned that people were, therefore, unlikely to develop hygienic habits when taps were far removed from the toilets.



**Figure 7: Water supply tap connected behind one of the houses, far removed from the front door. (Photograph by: Siyabonga Zondi)**

The Ambleton and Ambleton Extension area was also subjected to interruptions of water supply which the community has attributed to the low-pressure system. When asked about functioning and maintenance of municipal services, the Ward Committee reported that it believed that these services were not functioning well and the municipality did not always ensure their maintenance. It was reported, though, that not all households experiences were the same, and some were

satisfied with the minimum service rendered. However, there were households that were badly affected by water and sanitation problems.

The Ward Committee (*personal comm.* 2005) reported that the low-pressure system restricts the flow of water from the taps and often gets interrupted by concurrent use by neighbouring households. Thus, people have become very frustrated, and some feel compelled to tamper with water restriction devices when attempting to secure a sufficient and uninterrupted water supply. The water meter devices being enclosed in plastic compartments were somewhat susceptible to vandalism and can be easily tampered with (Figure 8). The Ward Committee charged that there have been complaints that, when one household tampers with the water meter in any way, the water pressure of the neighbouring household was adversely affected. Consequently, there have been reports that this has created tension amongst affected households.



**Figure 8: Water reticulation network that was shared by more than one household. Water meters were susceptible to vandalism and tampering which may affect water supply. (Photograph by: Siyabonga Zondi)**

While the magnitude of water problems was recognised, these problems were not prevalent throughout the settlement. The Ward Committee argued that parts of the settlement enjoy a fairly reliable water supply. It was mentioned that smaller households were getting a reliable supply of water, but larger households seemed to be the most affected by water problems. Many affected households view stringent water restrictions to have been unnecessarily imposed by the municipality (Community Ward Committee *personal comm.* 2005).

With regard to sanitation services, the main source of frustration for the community was that the on-site sanitation systems that have been built do not comply with the right to dignified sanitation services. Responding to the question on whether or not it was necessary to improve the existing infrastructure in Ambleton and Ambleton Extension, the Ward Committee answered that many households would welcome improvements. It was reported that people were not happy with the situation right from the beginning but had remained calm because it had been impressed upon them that the VIPs and HS sanitation systems would be temporary until there was sufficient budget to fund a more conventional system.

With regard to VIP system, households complained that the toilets filled up more quickly because pits were dug too shallow and thus required regular emptying. Also, affected households had to find their own means of disposing sewerage because the municipality was often reluctant to deploy specialised tankers on frequent basis. In some areas, the problem was exacerbated by awkward siting of VIP toilet facilities which rendered them poorly accessible to the tankers. As a result, when left too long, VIP toilets eventually overflowed which posed serious health risks. Hence, people were often compelled to seek alternative places in which to relieve themselves. It was reported that affected households felt cheated as their circumstances had not improved regarding sanitation. Although grateful about having secured housing and land ownership, they felt dejected at the fact their sanitation problems were likely to remain because the VIP system

could not be easily upgraded to a waterborne system (Ward Committee *personal comm.* 2005).

Equally, some households have been frustrated by the HS system. Responding to the question about whether the type and level of service was what the community expected when they located to Ambleton and Ambleton Extension, the Ward Committee indicated that the community expected better. Further, it was reported that the affected households were justified in their expectation as they had hoped much better service than they had had in the previous settlements. Many households were disgruntled at the fact that the HS system has failed to work as specified. In many households, the installation of the infrastructure was abandoned without completion and connection to running water.

Where running water was available, the soak-away systems were not properly designed or the local soil conditions were not suitable or optimal for microbial activity. When the municipality was asked whether or not it had any intention of improving the plight of the affected people, it indicated that it has ongoing maintenance plans, but households also have a responsibility to properly safeguard services installed. The Water and Sanitation Team (*personal comm.* 2005) believes that, beyond the technical limitations of the sanitation services, households were partly to blame for the problems they complain about. The team alleges that evidence suggests that some households introduce unsuitable objects or materials to the low-flush system.

Unsuitable materials, such as newspapers, tend to clog the system. Further, the retention capacity and bacteriological activity of septic tanks may be severely reduced. When the system is clogged, it fails to facilitate effluent infiltration to the soak-away area (Hungerford-Schroeder *personal comm.* 2005). In this regard, households confronted with such a situation protested that poorly functioning toilet facilities result in inadequate air circulation resulting in unbearable stench

from toilets which poses a serious health hazard. The Witness (2007 b) has widely covered stories of households in Ambleton and Ambleton Extension who find themselves in such predicaments. It was reported that people abandon using in-house HS toilets and relieve themselves in buckets with sewerage disposed in a nearby open land.

Responding to the question about whether or not the sanitation system was suitable for the disabled, elderly, and children, the Ward Committee was emphatic in its response. It mentioned that both the VIP and HS sanitation facilities do not cater for the disabled, elderly, and to some extent even children. The size of the HS toilet buildings were particularly small, measuring two by one metres, which renders them unsuitable for disabled persons, especially those in wheel chairs. It was reported that affected households had complained that disabled people can use toilet facilities only through the assistance of family members and this was problematic because people to assist may not always be around. The position of some VIP facilities in elevated parts of the yard relative to the housing structure (Figure 9) rendered these facilities poorly accessible to the elderly, disabled, and children (Ward Committee *personal comm.* 2005). In turn such facilities reinforced the perception that the disabled, elderly, and children remained marginal members of society whose needs were not adequately catered for in development initiatives.

The Ward Committee argued that issue of poorly accessible toilet facilities was a classic indicator that water and sanitation service provision in Ambleton and Ambleton Extension was not fully responsive to the needs of beneficiaries. This advances the view that development initiatives should involve intended beneficiaries in both the planning and implementation phases of the project. In fact, the Municipality acknowledged the frustrations of the community and promised that in future similar mistakes would not be repeated. It conceded that, ideally, the approach should have been to have community participation in all stages. However, community involvement in projects does not always occur

because it takes time and may require extra funding (Water and Sanitation Team *personal comm.* 2005).



**Figure 9: Poorly accessible toilet facility, particularly to disabled people. This toilet was also located very close to the public road, which may pose safety problems, especially at night. (Photograph by: Siyabonga Zondi)**

#### 4.4 Reflection on the possible key challenges faced by the Msunduzi Municipality and service providers in implementing water and sanitation policies

**Table 8: Summary of Key Respondents' Perspectives on Challenges Faced by the Ward Committee, Municipality, and Service Providers**

Issue	Comments			
	Ward Committee	Municipality	Service Providers	Observation and Interaction with Households
Challenges faced by the Ward Committee, Municipality, and Service providers in implementing water and sanitation services.	The Ward Committee argued that they were poorly consulted by the Municipality. Hence, some of the problems could have been addressed in the early stages of the project if the municipality had consulted the community as the beneficiary of the development.	The municipality indicated that housing development was a concurrent competency between national and provincial departments of housing. It argues that its role is constrained because it was limited to facilitating land acquisition, and identifying beneficiaries. Land acquisition has proved difficult owing to lack of suitably located land; the problem that was exacerbated by price of good land. Because housing delivery is located at a provincial level, municipalities cannot effectively participate in processes of procuring, managing and/or supervise service providers. Planners and environmental impact assessors as well as building contractors were directly contracted to the provincial housing department and were as such lawfully accountable to this authority and not to the municipality.	DEZZO Housing indicated that its role was to provide building material to the project. Whereas the Hungerford-Schroeder Organisation specialises in low-cost sanitation technology. Both charge that they had no role in planning and environmental due diligence for the project.	The researcher observed that the area by shale rock, in some areas worse than in others. It was apparent that some of the problems experienced with sanitation could be attributed to land conditions.

The Ward Committee indicated that people it represents were never made aware about the challenges that the Msunduzi Municipality and service providers encountered in implementing water and sanitation infrastructure. The affected households indicated that the municipality should have told beneficiaries about the magnitude of the problems that could emerge. The municipality acknowledged the extent of the problems and conceded that the matter could have been better handled (Ward Committee *personal comm.* 2005). However, housing being a concurrent competence of national and provincial government, the role of the municipality was constrained. Its role was limited to identifying suitable land and beneficiaries. Successful acquisition of suitable land was determined by price and how much the provincial government is prepared to pay. Therefore, the municipality may identify suitable land but it may be beyond the price schedule of the province (Zungu *personal comm.* 2005).

Even when the results of geotechnical investigation showed that the area was characterised by shale at shallow depths, the decision to proceed with the housing development was never reviewed. The financial constraints clearly outweighed geotechnical considerations. The municipality claims it would have been difficult to argue on aspects of the due diligence study, because responsible service providers take orders from provincial government to whom they contracted. The municipality decided to proceed with the project on the basis that innovative means would be employed to help negotiate obstacles encountered during the implementation phase. The other option would have been to seek an alternative location, a process that would have been both costly and protracted, thus delaying the delivery of much needed housing development in the municipality (Ward Committee *personal comm.* 2005).

The municipality conceded that the problems that were emerging in Ambleton and Ambleton Extension could have been better anticipated had there been better planning and due consideration given to the geotechnical investigations. The geotechnical investigations indicated that the area was characterised by

shale, which could make the laying of water and sanitation infrastructure difficult. Clearly, problems that have to do with unsuitable landscape could not be addressed at an operational stage. For example, the presence of shale renders the area unsuitable for both the HS and VIP sanitation facilities. The soil conditions were particularly problematic to the functioning of the HS system because the infiltration capacity of effluents may be inhibited. In fact, the results of the study indicated that the use of the HS system was not practical in certain parts of Ambleton and Ambleton Extension, particularly in areas where shale is encountered at shallow depths. The prevailing underlying shale does not offer suitable soil conditions necessary for an effective soak-away system or sufficiently deep VIP pits (Hungerford-Schroeder *personal comm.* 2005).

Given such unsuitable land conditions in Ambleton and Ambleton Extension, it was not clear how a sanitation system such as the HS system, which has specific requirements regarding soil conditions, was ever considered for use in the area. It was not clear how conclusive the percolation tests were to ascertain whether or not the subsoil conditions in the vicinity of a selected position in an area allowed for the disposal of effluent through a soak-away, as illustrated in Table 8, first column. The soak-away system generally comprises three elements, namely, the septic tank (Figure 10) to retain and allow for separation and bacteriological breakdown of its faecal contents; the storage and infiltration area of the soak-away to facilitate effluent infiltration and evapotranspiration in a designated area, preferably a vegetated one (Scott Taylor Consulting 2007).



**Figure 10: Infiltration area of soak-away system to facilitate effluent infiltration. The soak-away leads to a septic tank covered by a concrete slab.**

*(Photograph by: Siyabonga Zondi)*

Subsoil that allows effluent to percolate to 25mm of the soil depth within 30 minutes (second column of Table 9) offers favourable conditions for construction of a soak-way system. The more permeable the subsoil was, the less time is required for effluent to percolate and consequently the infiltration area can facilitate more effluent per square metre (third column) as illustrated in Table 8.

**Table 9: Percolation tests for an on-site soak-away system** (Scott Taylor Consulting 2007)

Position of the area tested in relation to the yard	Percolation rate (time for a 25mm drop in test effluent level, in minutes)	Rate of application of effluent to subsoil infiltration areas (litres per m <sup>2</sup> of soak-away wall area per day)

Further, the septic tanks should be sized accordingly, considering the size of the household in order to accommodate the extreme scenario. For example a soak-away system should be designed to accommodate the minimum of an 8-member household. Sewage flows from a dwelling can be estimated, taking into consideration the amount of effluent that a soak-away system can accommodate as illustrated in Table 9.

**Table 10: Requirements for an on-site soak-away disposal system** (Scott Taylor Consulting 2007)

Number of members in household	Anticipated daily effluent flow (litres)	Approximate length soak-away area (m)	Approximate evapotranspiration area (m <sup>2</sup> )

The HS system incorporates an element for liquefying solids or a biological digester (Figure 11). The biological digester allows for rapid disposal of effluent into the septic tank (Figure 10) where the organic solids are degraded by means of microbial activity.



**Figure 11: Element of the HS low-flush toilet system that allows for the separation of and bacteriological breakdown of faecal matter.**

*(Photograph by: Siyabonga Zondi)*

The manufacturer argued that the HS system requires suitable conditions to function well and conceded that the type of soils in Ambleton and Ambleton Extension were not ideal. However, the manufacturer disputed claims that seek to blame all the problems on the technology. Some of the problems could be attributed to damage caused by the use of newspapers instead of toilet paper, according to the manufacturer.

#### **4.5 Discussion**

Regarding water quantity, cartage, and the type of sanitation service, the Msunduzi Municipality adheres to policy provisions. The residents of Ambleton and Ambleton Extension receive 200l of water per day per household which was equal to 6kl per month. This amount of water corresponds to the 6kl prescribed in the FBW policy as the amount that households can be given free of charge. Accordingly, households in Ambleton and Ambleton Extension receive a free 200l daily supply of water which was reticulated to 200l low-pressure tanks. In terms of FBW policy, the 6kl monthly household quota is the minimum amount required to perform basic requirements of a household. However, this research indicated that one of the primary concerns raised by households was that this quota was not adequate, especially for larger households.

Early discussions about FBW had indicated that the amount of 25l of water per day per person was at the lower end of the continuum of the amount envisaged in the RDP. The relevant clause in the RDP had recommended an amount of 50l to 60l of water per person per day as being the adequate amount of water needed to meet all the basic human needs (African National Congress 1994). Further, some studies demonstrate that 25l per person per day water allocation may be sufficient only for direct consumption, preparation of food, and hygiene, but may not be enough for a complete, healthy, and productive life. In fact, the research conducted in similar settlements elsewhere in the municipality illustrates that many low-income households in the Msunduzi Municipality far exceed their monthly 6kl allotment of free basic water. As the research indicates, households that exceed the free allotment were exposed to the applicable steep block tariffs (Smith and Green 2005).

This research shows that some households were not served adequately by the monthly 6kl of water. It was evident from the assertion of the Ward Committee that many households consume in excess of their allocated 6kl free water per month. The alleged occurrence of water leaks due to faulty infrastructure

suggests that the reported consumption rate of households may not be a true reflection. However, given that there was a large amount of water that goes unaccounted for, it was difficult to quantify how much of water those households were billed for was actually a true reflection of the amount they used rather than the water lost due to leaks.

In a low-income context, the cost of basic services such as water generally constitutes a significant proportion of household income, and expenditure on other essential needs was often compromised. Many households would rather default on their monthly household bills than compromise other essential needs. In return, the Msunduzi Municipality like many municipalities around the country installed water restriction devices in the form of low-pressure tanks to restrict consumption in households at Ambleton and Ambleton Extension to within 6kl free water per household per month to avoid incurring costs due to defaulting households. The Municipality insisted that the restriction devices were necessary to avoid the risk of going bankrupt due to defaulters who fail to pay for water when they use more than their 6kl free water monthly allotment.

Whilst low-pressure yard tanks could potentially be a valuable tool for self-monitoring household consumption patterns, research indicates that 6kl monthly water allotment was not sufficient for large households. Large households, in particular, were often deprived of an adequate water supply to the extent that many resort to tampering with water restriction devices in an effort to secure sufficient water supply. In this regard, a number of affected indigent households do not get the benefits of the FBW policy. If, as the primary targets of this policy, poor households were not reaping the full benefits then the policy is not the “lifeline” as was intended. Some households even complained that the low-pressure system was inconvenient when doing household chores as it restricts the flow of water (Ward Committee *personal comm.* 2005).

On the other hand, literature suggests that low-pressure yard tanks were relatively far more acceptable, sustainable, and lend themselves suitable to implementation of the FBW policy. It was further argued that the low-pressure system was less prone to vandalism and unauthorised connections (Maruvan 2002). This assertion may be true in an ideal situation but as the study indicated, the water reticulation network in Ambleton and Ambleton Extension was exposed to vandalism that was attributed to frustration that people feel. The Ward Committee (*personal comm.* 2005) mentioned that generally the community felt that the existing level of water supply was not adequate to sustain their needs. Accordingly, there was great contempt for and dissatisfaction with the level of water supply, as most residents feel that low-pressure yard tanks subject them to conditions very similar to the ones in informal settlements and rural settlements.

Furthermore, the Ward Committee (*personal comm.* 2005) indicated that it frequently received complaints complaining about regular breakdown of existing infrastructure. Adding to this frustration was the apparent lack of swift response from the Municipality to attend to reported incidences of tap leaks or bursts. In this regard, water flowing in the streets was a familiar sight in the area. As this could go on for days, if not weeks, before being attended to, the Municipality was incurring undue cost from unaccounted water. The Msunduzi Municipality conceded that the level of maintenance was not satisfactory but attributes this largely to resource constraints (Ward Committee *personal comm.* 2005).

It was clear from the results that, given the current predicament, people of Ambleton and Ambleton Extension would embrace the idea of upgrading the infrastructure into bulk services. This was despite the Ward Committee conceding that the economic conditions of many households indicate that they may not be able to afford to pay for better infrastructure. The terrible conditions and seriousness of the problems with the existing services make the bulk water and waterborne sanitation services an attractive alternative. However, although the Msunduzi Municipality prefers bulk water and sanitation infrastructure, it lacks

the necessary financial muscle to accede to the wishes of the people of Ambleton and Ambleton Extension.

Despite a strong political will to provide better basic services, the Msunduzi Municipality has a small revenue base with which to provide the preferred services. Thus a compromise was needed, especially because the provision of water and sanitation services was solely the responsibility of local government. Funding is problematic, though. The national government funds the capital cost associated with housing and physical infrastructure (through MIG or equitable share). The 2004 estimates put the housing subsidy at around R31 000 having been increased from R25 800 (KwaZulu-Natal Housing 2005). On the other hand, the bulk of basic water and sanitation infrastructure projects, including operational and maintenance needs, were funded by the local government.

If the Msunduzi Municipality was to remain financially viable while investing in infrastructural needs, it needs to have a wide tax base. Equally, the municipality must improve its rates collection processes to maximize the income from its existing base. However, given the generally low-income of many households in the municipality, particularly in a LCH settlement such as Ambleton and Ambleton Extension, even prudent rates collection strategies often fail. The cross-subsidisation of low-income neighbourhoods by high-income neighbourhoods does not provide substantial revenue base. In addition, the equitable share from national Treasury was not sufficient to cater for ongoing operational and maintenance requirements. When the municipality was unable to collect rates, infrastructure projects that may have started well often falter; the settlement of Ambleton and Ambleton Extension was no exception (Water and Sanitation Team *personal comm.* 2005).

Further, the municipalities have been encouraged to be prudent with expenditure to avoid bankruptcy. The emergence of GEAR and the emphasis it puts on fiscal discipline to a large degree deters investment in conventional expensive

technology. The use of low-cost infrastructure reflects the attempts by the Msunduzi Municipality to reduce the cost of infrastructure investments in areas where it was unlikely to recover its investments. Ambleton and Ambleton Extension development represented an example of the conservative approach by the municipality to curtail infrastructure spending. Largardien and Cousins (2004) suggest that this narrow financial approach often overlooks the long-term benefits of supplying appropriate water and sanitation technology.

It was thus important to move beyond the question of financial constraints and take into account other factors. The choice of technology should be based on a holistic consideration of all relevant factors. A range of considerations, including the topography of the area, should determine the type and quality of infrastructure technology to be used. Therefore, while a low-pressure water system and an on-site sanitation system in Ambleton and Ambleton Extension offered a cheap alternative to full-pressure and waterborne sewer system, the landscape of the area was not conducive to the systems chosen. Choguill (1996) argues that an on-site sanitation system may offer affordable technology, but it often fails to meet environmental and hygienic standards because it was likely to pollute groundwater and may be associated with ill health, if not used properly.

The presence of shale renders the Ambleton and Ambleton Extension unsuitable for the HS and VIP sanitation facilities. The soil conditions were particularly problematic for the functioning of the HS system because the infiltration capacity of effluents may be inhibited. Problems were prevalent particularly in areas where shale was encountered at shallow depths. The presence of shale does not offer suitable soil necessary for an effective soak-away system and sufficiently deep VIP pits (Hungerford-Schroeder *personal comm.* 2005).

The manufacturer of the HS system reiterated that the system should work well if the prerequisites such as suitable soil conditions were in place. Further, the infrastructure should be installed properly, adhering to manufacturer's

specifications. Some of the problems could, therefore, be attributed to the failure of contractors to adhere to the manufacturer's specifications (Hungerford-Schroeder *personal comm.* 2005). In-house water connection was important, especially where the HS sanitation system was installed. This was particularly important because where an HS system was installed developers are most likely to put the in-house drainage system separate from the toilet. A separate drainage system inside the house was important to accommodate disposal of greywater which, would otherwise be thrown down toilets. The HS system was sensitive to greywater, especially if that water contains greasy fluids (Hungerford-Schroeder *personal comm.* 2005). Vorster (*personal comm.* 2005) reiterated that the HS and VIPs present acceptable technology options and affirmed that these options would perform well under favourable conditions. Therefore, many problems were attributed directly to incompatible soil conditions.

While it was acknowledged that the bulk of the problems with the HS system have to do with inappropriateness of the system for the area and shoddy workmanship, beneficiaries must take the blame for some of the problems. One of the identified problems was the use of newspaper as a sanitary wipe instead of toilet paper. This practice clogs the biological digester which adversely impacts on its functioning. When the biological digester was not optimally functioning, it fails to facilitate effluent discharge into the soak-away system. In this regard, the smell of the faecal matter was not properly channelled out but rather comes back into the house thus subjecting people to a stench from the toilet (Hungerford-Schroeder *personal comm.* 2005).

Nonetheless, the manufacturer remains certain that, despite existing problems, the HS system offers the better option for Ambleton and Ambleton Extension rather than the VIP. The HS system costs around R950.00, whereas the VIP costs approximately R2000.00. In addition, the HS system has an added benefit in that it was designed so that it adjoined the housing structure and was accessed from inside, whereas the VIP was a separate structure. Further, the HS

sanitation system was upgradeable. The VIP system, on the other hand, was not upgradeable. Also, it was the transition from on-site to municipal bulk systems which may prove difficult to achieve. In reality, there were many on-site sanitation systems that have been installed as temporary intervention, only to have them become permanent (Vorster *personal comm.* 2005).

Now that the status quo seems likely to remain permanent, residents of Ambleton and Ambleton Extension were distressed and disgruntled that they have to endure what was perceived as being inferior toilet facilities that were in a poor state. Households were exposed to non-functioning toilet facilities, due to either breakdown of or incomplete infrastructure where the service providers left open pits only. Many household have been compelled to improvise, for example, people take it upon themselves to build septic tanks in cases where work was left incomplete by the contractors (Ward Committee *personal comm.* 2005). Despite these efforts, affected people cannot turn open pits into proper toilets because they lack necessary apparatus to build a complete sanitation facility. Affected people were often forced to use alternatives such as plastic packets which they dispose of in open field. This has heightened fears of an outbreak of disease as a result of lack of adequate on-site toilets. Further, pits that have been left open and unattended pose a hazard, especially to children (The Witness 2007).

The problems were well-known and the municipality concedes that people were justified in demanding better services. But the municipality does not have the finances to overhaul the infrastructure. Initially, the existing sanitation system had been provided as a temporary infrastructure (Naicker *personal comm.* 2005). Ideally, the municipality would have opted for bulk services for Ambleton and Ambleton Extension but could not afford the amount of capital required. With the unfavourable landscape of Ambleton and Ambleton Extension, upgrading the existing services to bulk infrastructure would be an excessively costly exercise (Naicker *personal comm.* 2005).

Given its current financial position and the associated costs of providing infrastructure, the municipality could now not even contemplate providing bulk infrastructure to Ambleton and Ambleton Extension. Since a bulk waterborne sanitation system was costly to operate, the municipality was unlikely to fully recover its capital investment (Stanton 2004). In fact, Choguill (1999) observed that, when a government authority tasked with the provision of physical infrastructure was unlikely to be recovered the capital the investments were hardly ever made. Consequently, such bulk infrastructure may be given low priority and the expenditure was often postponed. Obviously, the municipality cannot postpone the provision of basic services; hence it had to seek alternative and affordable technologies rather than conventional services (Water and Sanitation Team *personal comm.* 2005).

Extending bulk waterborne system to Ambleton and Ambleton Extension requires an investment in a new, alternative municipal system or improvement of the existing system. The existing bulk sewer line was in the adjacent Imbali/Slangspruit area and cannot accommodate additional loads as it is already running at full capacity. Therefore, a conventional water supply and sanitation system may have been disregarded because the cost of a completely new system or an improvement to the existing system would have been exorbitant (Vorster *personal comm.* 2005). The manufacturer of the HS sanitation system advised against replacing the on-site system, arguing that it offers a viable, cost-effective, and sustainable solution for sanitation in South Africa, considering that the country has scarce water resources (Hungerford-Schroeder *personal comm.* 2005).

#### **4.6 Summary**

The Msunduzi Municipality has made significant strides in the provision of basic services in Ambleton and Ambleton Extension. There were problematic areas, particularly with respect to the potable water supply and sanitation infrastructure. For its part the Municipality has undertaken to provide adequate potable water and to ensure that respective beneficiaries have access to appropriate sanitation services. In this regard, the area was reticulated with running water and the provision was made for sanitation services. The provision for the minimum level of potable water supply and sanitation services was consistent with the provision of the national policy which recommended 25l of water per day per person. Water supply was through a low-pressure water reticulation system and sanitation facilities were provided through the HS (low-flush/septic tank) and VIP systems.

The findings of the study indicated there was frustration with the water and sanitation services. Water supply was through low-pressure 200l tanks that were mounted on roofs. The low-pressure system allows for a minimum flow of water while the size (200l) of water tanks was determined by the daily allowance that makes up the 6kl allocation of free basic water per household per month. While the low-pressure system allowed for minimum flow of water, the FBW policy allowed households to get 6kl of free water per month regardless of household size. Some households had many members and were not adequately catered for by the 6kl monthly allotment of water. Given that block tariffs were applied when water consumption of a household exceeded the free 6kl monthly allocation, larger and poor households were compelled use less than not to exceed they required so as not to exceed the limit, lest exorbitant tariff could not afford. A household that exceeds its 6kl free allotment may not see the benefits of the FBW policy because the block tariffs that once the 6kl allotment was exceeded get steeper as consumption increases. In this regard, benefits that may have been accrued from the FBW policy may be cancelled by charges incurred from the application of block tariffs.

Smith and Green (2005) argue that for large households to benefit from the FBW policy, the tariff structure should be sensitive to the poor such that water consumption in excess of 6kl does not become burdensome to the poor. Water consumption over the free 6kl allocation should be reasonably subsidised through adjusted grant allocations from national government in order to keep its cost affordable to the destitute. This was particularly important because households that depend on free basic water provision may not be able to pay for additional amount on water bills.

Given the account by the Ward Committee (2005), people were very disgruntled by the HS and VIP sanitation systems. According to the Ward Committee (2005), affected people feel so strongly about the sanitation that, if they had their way, they would advocate for a complete overhaul of the existing system and preferably have it replaced by a full waterborne system. Those arguing for the existing sanitation system argue that in principle the on-site sanitation system offers an affordable alternative to the conventional waterborne system. However, even the proponents of the on-site system concede that the presence of shale in Ambleton and Ambleton do Extension does not offer optimal conditions for on-site sanitation systems. As the ubiquitous shale rocks rendered the area suitable for only shallow pits, VIP toilets filled up frequently. With sufficient investment, the areas that were serviced by the HS system could easily be converted into a full waterborne system because the system, although it was a low-pressure system, is nonetheless a flush system. On the other hand, areas serviced by the VIP system may need further investment to install flush equipment. While the municipality would ideally prefer a full waterborne sanitation system for Ambleton and Ambleton Extension, the general cost factor was a deterrent and, given the difficult landscape that characterised the area, the exercise would be excessively expensive.

## **Chapter Five**

### **Conclusions and Recommendations**

#### **5.1 Conclusions**

In 1994, South Africa emerged from a long history of racial segregation and minority domination by successive colonial and apartheid regimes. Since black people had been deprived equal access to basic services, the main goal of the democratic government was to redress the inequality. It put in place policies and programmes aimed at ensuring that there was universal access to basic services. The political will demonstrated by government has indeed been translated into action. Today millions of previously disadvantaged South Africans have formal houses, water and sanitation. However, the progressive nature of and the vision entrenched in the policies and legislative frameworks alone does not guarantee absolute access to these basic services.

Policy implementation has been the fundamental challenge of this government. Inadequacies that were inherent in basic service policies and lack of adequate resources, especially at local government negatively affect the pace of delivery and quality services. This was evident in Ambleton and Ambleton Extension where households were not satisfied by the quality of services they received. The findings showed that while the Msunduzi Municipality has made remarkable strides in delivering basic services, its efforts were plagued with problems.

With regard to potable water supply, the Municipality provided households with adequate water in terms of applicable water policies, including the FBW policy provisions. Households received reticulated water within their yards which exceeded the minimum legislative requirements in terms of cartage. However households complained of indiscriminate implementation of low-pressure system and restriction devices to limit water use to 6kl monthly allotment regardless of household size. In the absence of restriction devices many households exceeded the 6kl allotment of free basic water which eroded the benefits of the FBW policy as water consumption above this threshold was subjected block tariffs.

The Msunduzi Municipality understood the plight and the economic circumstances of the affected households in the area. Qualifying indigent households that had water requirements exceeding the normal 6kl were encouraged to make necessary arrangements with the Municipality According to the Ward Committee (*personal comm. 2005*). However, households that did not approach the municipality were exposed to steeper bills due to a block tariff (Water and Sanitation Team *personal comm. 2005*).

The major criticism with regard to sanitation infrastructure relates to its functioning. The affected households complained that the system was either not functioning at all or it was not functioning optimally. All the participants conceded that there were indeed problems with the water and sanitation services which were attributed to the kind of technology. The technology types used in Ambleton and Ambleton Extension which were chosen mainly for financial reasons were not suitable for the condition of the area. In some cases where the choice of water supply and sanitation service technology was appropriate, the failure of a system was attributed to lack of developers to adhere to product specifications. In this regard, the water and sanitation services did not work properly because they had not been properly installed.

The problems experienced in the area were widespread and the community representative bore the brunt of anger from the community. They were often accused of not properly presenting grievances of the community to the Municipality. The Ward Committee admitted that the grievances of community were legitimate and that their expectations of the Municipality were warranted. The situation was exacerbated by the reluctance of the Municipality to directly engage the community. Regrettably, the community had lost confidence that the Municipality had its best interests in its conduct.

The municipality faced a number of challenges in the implementation of water and sanitation policies Ambleton and Ambleton Extension. Some of the

challenges related to the varying competencies in terms of basic service provision between national, provincial and local government. Housing was a concurrent competence of national and provincial government. The role of the municipality was limited to identifying suitable land and beneficiaries for houses. The ultimate authority in terms of land purchase was with the provincial government and price was the main deciding factor on where the settlement was located. Housing projects received funding from better resourced national government. A large proportion of the national government's funding was largely dedicated towards the construction of housing units, while the responsibility for water and sanitation provision was mainly left to local governments. While municipalities do receive equitable share from the national government to finance infrastructure projects, it was often not adequate to fund infrastructure projects at a scale equivalent to the number of housing units.

Even when the results of geotechnical investigation showed that the area was characterised by shale at shallow depths, the decision to proceed with the housing development in the areas could not be reviewed. Clearly the financial constraints outweighed geotechnical considerations. Because of the inherent limitations in the housing policy, the Municipality could not dictate terms to the service providers that were answerable to the provincial government. Although it was evident that technology was not suitable to site specific conditions, the Municipality could not afford the alternative technology options because of lack of sufficient financial resources. In the end residents suffered the consequences these decisions.

## **5.2 Recommendations**

Water supply and sanitation services in Ambleton and Ambleton Extension complied with the standards for basic services of the respective policies. Notwithstanding this, water and sanitation infrastructure in the area were beset with the problems. Residents felt that the services did not meet their requirements and were dissatisfied, in particular the low-pressure system, which they believed imposed the unreasonable restriction on amount of water. What the Msunduzi Municipality needed to in this regard was to exercise some discretion in this regard. Some flexibility could be introduced to increase the 6kl free water threshold was increased to accommodate the needs of larger indigent households.

Problems that were inherently linked to the landscape require serious review of the system. The majority of problems with the system related directly the nature of the landscape, the municipality may not be able to rectify such problems based on appropriately designed systems. However Municipality was warranted to intervene and overhaul major infrastructure problems. Some of the problems could be attributed lack of proper maintenance. The Municipalities must dedicate appropriate maintenance resources on an ongoing basis. In a short term, financial assistance could be requested from the government to expedite rectification of existing problems.

There were households where sanitation facilities were never installed at all because infrastructure could not be laid, mainly due to shale rock. Other options should have been explored but these households were deprived of the most basic rights. Service providers that abandoned their responsibilities should be called to account. Further, developers should have ensured that infrastructure was properly built and appropriate and that beneficiaries were familiarised about the correct use of the infrastructure.

The Municipality also has the responsibility to engage the beneficiaries about proper use of their services to minimise some of the problems. This should be accompanied by Health and hygiene awareness and education should be vigorously promoted because poorly functioning sanitation infrastructure may lead to outbreaks of disease. A comprehensive assessment of potential health risks faced by the people of Ambleton and Ambleton Extension as a result of poorly functioning sanitation services required. In addition potential environmental threats should also be established.

It was important that water supply and sanitation programmes improve the level of service provided in the community. To realise this imperative, there was a need for increased initial investment in water and sanitation infrastructure. The national government should revise the funding model and extend its scope to include physical infrastructure (water and sanitation) projects with the long-term operation and maintenance to be left to local government to fund.

In future, the choice of a feasible water and sanitation technology should be made based on:

- Assessment of what financial assistance could be expected from national government;
- Projected income that could be generated from local rates; and
- Assessment of what the target community can afford.

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## **Appendix A**

### **1. Questionnaires**

#### **CENTRE FOR ENVIRONMENT, AGRICULTURE AND DEVELOPMENT (CEAD), UNIVERSITY OF KWAZULU-NATAL**

**10 November 2005**

#### **Evaluation of the implementation of water and sanitation policies in a low-cost housing settlement of Ambleton and Ambleton Extension in Pietermaritzburg, Msunduzi Municipality**

**Introduction:** Good morning/afternoon. My name is Siyabonga Zondi, I am from the University of KwaZulu-Natal and I am here as part of my research. I would like to ask you some questions about your area with respect to service provision. The questions will help me formulate a picture about the level of service provision in your area. Information gathered here will be used towards my academic work. Such information may be used by the Msunduzi Municipality and other interested groups for the purpose of future decision making by the Council. However I do not promise that the study will bring any immediate direct benefit to the community. Your participation in the study is voluntary and as such I cannot provide compensation for your participation. Should you be uncomfortable with any of the questions, you may choose not to give an answer and may also end our conversation any point in time. Your name and/or occupation will not be used in this report should you choose to remain anonymous. This study will also be or has been conducted on other key respondents, namely relevant ward committee members representing the community, HS developer, consultants and council officials.

Do you have any question regarding my visit? Yes/No

Are you comfortable to participate in this study? Yes/No

The study aims to evaluate the implementation national of water and sanitation policies in your areas. Challenges that might have been faced by the municipal town planners and constructors during the process of housing delivery will be considered. Therefore the interviews will be administered for the purpose of getting perspectives of the community, developers of the sanitation, project consultant and local government in order to ascertain constraints that exist from the inception of the project as well as the current scenario. The interview questions will be as follows:

## A. Community Perspective

### 1. Type of municipal service

#### (a) Water supply system:

In house tap	Yard tap	Communal standpipe
Yes/No	Yes/No	Yes/No

#### (b) Sanitation infrastructure:

Indoor	Outdoor	Communal
Yes/No	Yes/No	Yes/No

#### (c) Type of sanitary facility:

Full waterborne	VIP latrine	aqua privy	Septic tank	Bucket	Other
Yes/No	Yes/No	Yes/No	Yes/No	Yes/No	Yes/No

(d) Is the sanitation system suitable for disabled, old aged and children? Yes/No

(e) Do you feel the sanitation and water supply are adequate to cater for the needs of household? Yes/No, if No what problems do you experience?

### 2. Does the community feel the water and sanitation system has improved their lives?

1. Strongly agree	2. Agree	3. Not Sure	4. Disagree	5. Strongly disagree
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Please explain your answer.

### 3. How satisfied is the community with the level of water and sanitation provided?

1. Very satisfied	2. Satisfied	3. Not Sure	4. Dissatisfied	5. Very dissatisfied
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Please explain your answer.

### 4. Did the community expect the type and level of service they now have?

1. Strongly agree	2. Agree	3. Not Sure	4. Disagree	5. Strongly disagree
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Please explain your answer.

5. Does the community think the municipal services are well functioning and maintained?

1. Strongly agree	2. Agree	3. Not Sure	4. Disagree	5. Strongly disagree
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Please explain your answer.

6. According to your understanding, is the current water and sanitary infrastructure a temporal or permanent?

7. Do you think improvements on the existing infrastructure are necessary and will such endeavours be welcomed?

1. Strongly agree	2. Agree	3. Not Sure	4. Disagree	5. Strongly disagree
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Please explain your answer.

8. Would the community be willing pay for an upgraded infrastructure?

1. Strongly agree	2. Agree	3. Not Sure	4. Disagree	5. Strongly disagree
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Please explain your answer.

9. Is there any socio-political pressure on the council to upgrade the current water and sanitation infrastructure?

1. Strongly agree	2. Agree	3. Not Sure	4. Disagree	5. Strongly disagree
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Please explain your answer.

10. Do you think a participatory approach to design and implementation of service delivery would have avoided some the problems that are currently experienced with regard to sanitary infrastructure?

1. Strongly agree	2. Agree	3. Not Sure	4. Disagree	5. Strongly disagree
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Please explain your answer.

11. Do you feel the view and input of the community would have mattered in this matter?

1. Strongly agree	2. Agree	3. Not Sure	4. Disagree	5. Strongly disagree
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Please explain your answer.

## B. Service Provider's Perspective

1. Please explain your role in Ambleton and Ambleton Extension area.

2. How would you rate your understanding of national, provincial and municipal policies guiding housing and basic services delivery?

1. Very good	2. Good	3. Not Sure	4. Poor	5. Very poor
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3. How would you rate the following aspect of development? Choosing an appropriate location:

1. Very important	2. Important	3. Not Sure	4. Unimportant	5. Very unimportant
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Please explain your answer.

4. Did you have any role in the choosing the location of Ambleton and Ambleton Extension LCH? Yes/No

5. Do you feel the site of Ambleton and Ambleton Extension development was the most suitable location for that kind of development?

6. Was a geotechnical survey conducted to ascertain soil conditions for this development? Yes/No, if yes was the survey conclusive?

1. Strongly agree	2. Agree	3. Not Sure	4. Disagree	5. Strongly disagree
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Please explain your answer.

7. Did you have any constraints in carrying out your duties during Ambleton and Ambleton Extension housing development as far as the provision of basic services is concerned? Yes/No, please explain your answer.

8. Please rate your service with regard to the following statement: Is your company socially responsible?

1. Strongly agree	2. Agree	3. Not Sure	4. Disagree	5. Strongly disagree
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Please explain your answer.

9. Please rate the following statement: Would you consider your service to be user friendly?

1. Strongly agree	2. Agree	3. Not Sure	4. Disagree	5. Strongly disagree
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Please explain your answer.

10. Did you foresee some of the problems that exist with the infrastructure?  
Yes/No

11. If the answer to the above question is yes, did you at any point intervene to give advice in this regard? Yes/No

12. If the answer to question above is No, do you think your advice would have mattered?

1. Strongly agree	2. Agree	3. Not Sure	4. Disagree	5. Strongly disagree
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Please explain your answer.

13. Do you think there were any shortcomings in the planning process for this project and what were those shortcomings?

1. Strongly agree	2. Agree	3. Not Sure	4. Disagree	5. Strongly disagree
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Please explain your answer.

14. Did you have any input on the planning, design of the project or were you merely responsible implementation process? Yes/No, please explain your role in this regard.

### C. Local Government's Perspective

1. How would you rate your understanding of national, provincial and municipal policies guiding housing and basic services delivery?

1. Very good	2. Good	3. Not Sure	4. Poor	5. Very poor
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2. How would you rate the following aspect of development? Choosing an appropriate location:

1. Very important	2. Important	3. Not Sure	4. Unimportant	5. Very unimportant
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Please explain your answer.

3. Did you have any role in the choosing the location of Ambleton and Ambleton Extension LCH? Yes/No

4. Do you feel the site of Ambleton and Ambleton Extension development was the most suitable location for this kind of development?

1. Strongly agree	2. Agree	3. Not Sure	4. Disagree	5. Strongly disagree
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Please explain your answer.

5. Were there any alternative locations for this kind of development? Yes/No

6. Did you have any constraints in carrying out your duties during Ambleton and Ambleton Extension housing development as far as the provision of basic services is concerned? Yes/No, please explain your answer.

7. What constraints did the municipality encounter in developing Ambleton and Ambleton Extension?

8. Does the municipality have a standard water and sanitation technology for all LCH? Yes/No, if yes are alternatives sought in case the landscape is not conducive for the chosen technology, especially with regard to sanitation.

9. Was a geotechnical survey conducted to ascertain soil conditions for this development? Yes/No, if yes was the survey conclusive?

10. Were the findings of the survey appropriately applied in all phases of this development?

11. Do different phases of this development have different water and sanitation infrastructure? Yes/No, if yes was a geotechnical survey a determinant, particularly with respect to sanitation.

12. Is Msunduzi Municipality responsible for maintenance of water and sanitation infrastructure in the area? Yes/No, if yes what constraints are there that hinder Council in fulfilling its responsibilities?

13. Does the Council have any intentions of improving the current water and sanitation infrastructure in the future? Yes/No, if yes what problems do you foresee in this regard?

14. Are there any socio-ecological implications that are envisaged due to inadequate water supply and sanitation services? Yes/No