

# Towards improved waste management services by local government – A waste governance perspective

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## Abstract

In terms of the South African Constitution (Act 108 of 1996), waste management service delivery is a local government function. The Constitution further gives every person the right to an environment that is not harmful to their health or well-being. Local government is therefore obliged to provide waste management services to realise this right of society in their area of jurisdiction. Failing waste management services is, however, a reality in South Africa in 2008. The magnitude of the problem is emphasized by newspaper headlines including: “SA’s *Rubbish Capital: Big stink continues as piles of garbage dumped in streets hit crisis levels*” (Pretoria News, 13 May 08); “*Next Crisis: Collapse of sewage system*” (Pretoria News, 20 March 08); “*Stinking state of SA’s Waters*” (Sunday Times, 23 March 08); “*Waste Companies dump death on our doorstep*” (Sunday Times, 2 December ’08).

Technology solutions to waste management problems only offer part of the solution to sustainable waste management services. Successful implementation of technology is strongly dependent on an enabling social, political and economic environment that is supportive of the given technology. In this context, the research undertaken by the Waste and Society research group of the CSIR has a fundamental role to play in terms of providing robust evidence-based data and information for policy and decision-making frameworks.

Waste management is currently afforded a low priority within all three spheres of government (Republic of South Africa, 2000) resulting in failing waste management services impacting negatively on human health and well-being. Social upliftment through economic growth on the other hand is afforded a high priority by government. South Africa’s Accelerated and Shared Growth Initiative (ASGISA) provides the political drive to halve unemployment and poverty by 2014, through a 4.5-

6% growth in the Gross Domestic Product (GDP). With indications of a strong correlation between a country’s GDP and waste generation (EPD, 1998), further economic growth in South Africa will inevitably lead to increased consumption of goods and services and consequently an increase in waste requiring collection, treatment and final disposal. This paper focuses on research undertaken at local government level identifying the governance challenges facing municipal waste management service delivery. Research findings towards supporting the creation of an enabling environment for sustainable waste management service delivery are presented.

## 1. Introduction

As at 1998, waste generation in South Africa amounted to approximately 533 million tonnes per annum (MT/a) of which the majority comprises mining waste (ca. 88 %) while domestic and trade waste represent 1.5% and sewage sludge 0.1% (DWAF, 1998). Municipal waste generation per capita is seen to differ noticeably across South African income groups, with low, middle and high income groups generating 0.41, 0.74 and 1.29 kg/cap/day respectively (Fiehn & Ball, 2005). For the middle class, generating in the order of 2.7 MT/a of domestic waste (DEAT, 2006) or about 0.7 kg per person per day, is comparable to that produced daily in developed countries such as the United Kingdom (Austin *et al.*, 2006). The generation of waste in South Africa is expected to increase, as a result of population and economic growth: two key drivers of waste generation (DEAT, 1999), at an expected rate of 2-3% (Fiehn & Ball, 2005). The six metropolitan municipalities of South Africa (City of Johannesburg, City of Tshwane, City of Cape Town, Nelson Mandela Municipality, Ekurhuleni Municipality and eThekweni Municipality) alone were estimated to dispose of 8.9 million tonnes of municipal solid waste during 2005 (Von Blottnitz *et al.*, 2006).

Waste management services, together with the way in which these services are rendered and maintained, lie at the heart of the pollution of water resources in many settlements (DWAF, 2001). It is reported that in the order of 30 000 people, mostly children, die each year in South Africa as a result of diarrhea and related diseases (DWAF, 2003). A major contributor of these diseases is untreated or polluted drinking water, but a significant portion is also related to pollution within densely populated, poorly serviced urban settlements. The General Household Survey of 2007 (Stats SA, 2007) revealed that 39% of households, or 50 % of the South African population (Fiehn & Ball, 2005), is not receiving a regular municipal waste collection service, with municipal waste collection having only improved by 2.7% between 1996 and 2001 (Fiehn & Ball, 2005). An estimated 8.3 % of households in South Africa still have no toilet facility or are using the bucket system (Stats SA, 2007).

While it is recognized that there are many well operated sanitary landfill sites in South Africa, in line with international best practice, of the 1280 known public and private landfill sites (general and hazardous) in the country, only 44% are duly authorised through permits (DEAT, 2006b) and of those permitted, compliance with permit conditions is seldom audited and often unknown (Godfrey & Oelofse, 2008). Of the non-permitted/unknown permit status landfill sites, in excess of 90% are thought to be municipal landfills. The biggest culprit of non-compliance in the landfilling of waste would therefore appear to be government itself (Godfrey, 2008). The picture for municipal wastewater treatment works is not better either. A 2006 survey revealed that in the order of 96 % of micro, small and medium wastewater treatment plants are not adequately operated and maintained (Snyman *et al.*, 2006).

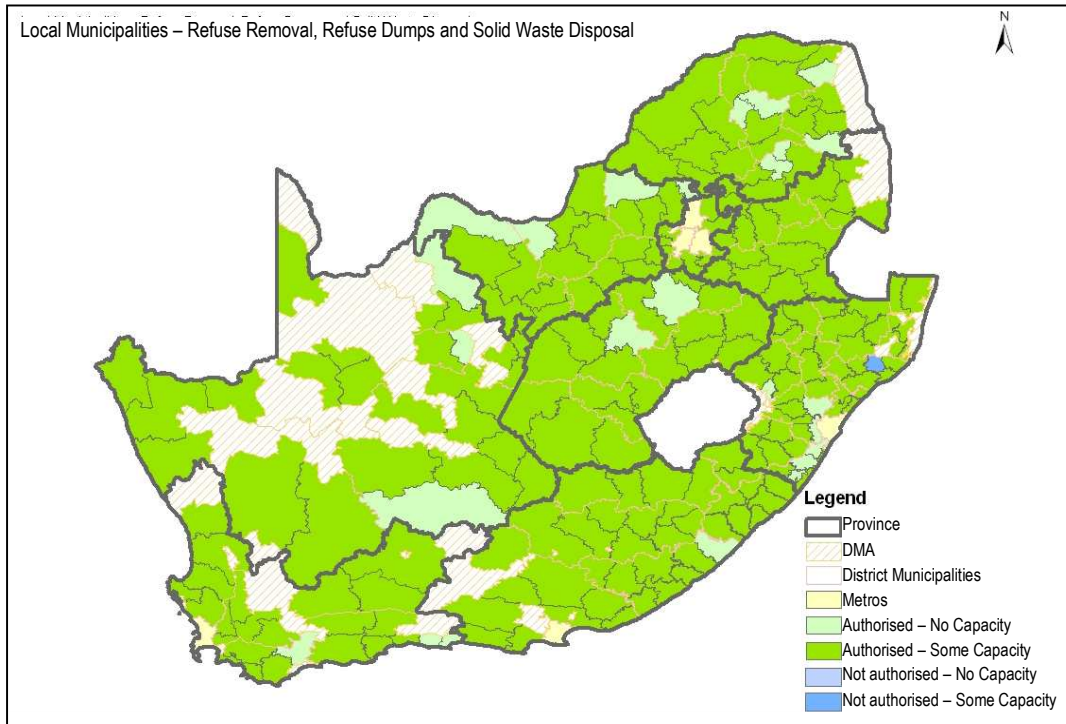
Municipalities are therefore faced with a number of challenges regarding the provision of complete and effective waste collection and sanitation services and the disposal of waste to legally compliant landfills. Current sludge disposal practices are also cause for concern as sludge stabilisation processes are reporting problems and inadequate disposal and use of sludge was found at 81% of the sewage plants surveyed (Snyman *et al.*, 2006).

The spatial distribution of current municipal waste management service delivery is illustrated in Figure 1. Municipalities with authorisation to deliver waste services, but without capacity to do so, can be assumed to provide unsustainable waste management services, if any. Similarly, municipalities without authorisation to deliver waste services and lacking the capacity to do so would in all likelihood not provide waste management services.

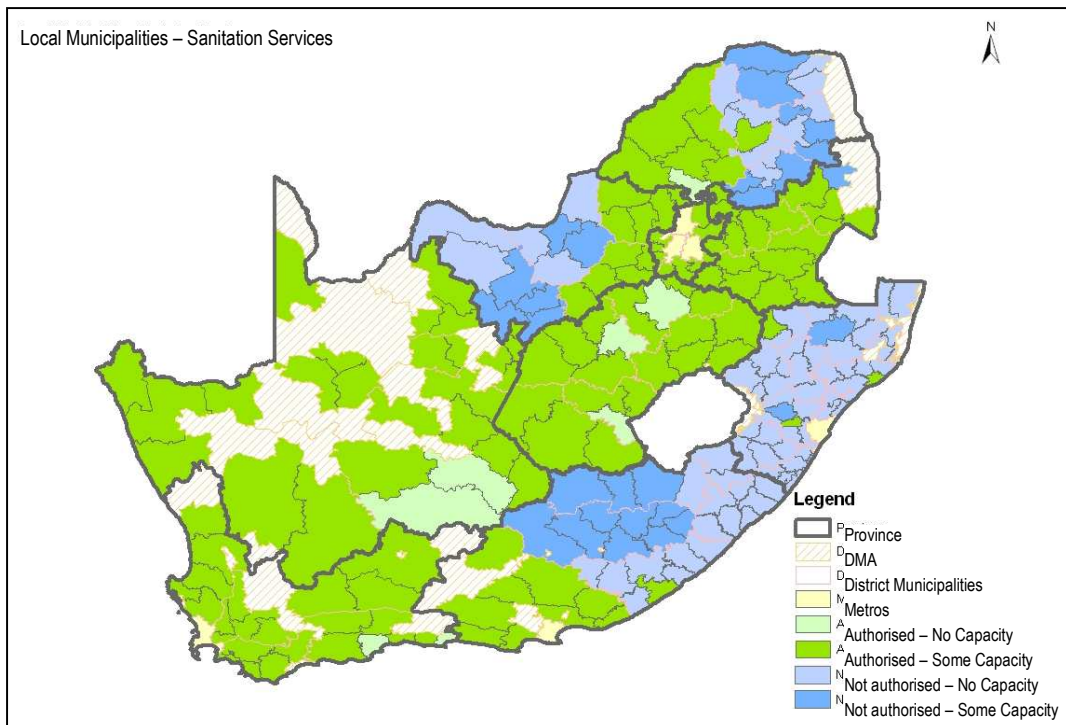
### 1.1. Local Government Responsibilities

The most significant change in local government since 1994 has been the amalgamation of local authorities (DWAF, 2003). However, the process of decentralization arguably transferred a number of new roles and responsibilities to local municipalities before they had the required financial and human capacity. The amalgamation of local authorities also placed an additional burden on already stressed human resources in local municipalities. Many local municipalities may have the supporting organizational structure to provide the additional services as required in terms of legislation, but often this structure is sparsely populated or populated with staff lacking the required background and experience to perform the function (Lorenz, 2003). High staff turnover faced by both the private and public sectors results in a loss of institutional memory, necessary for sustainable service delivery. While lost institutional memory can be supported through improved waste data collection and information and document management systems, these are often lacking within municipalities (Godfrey, 2008).

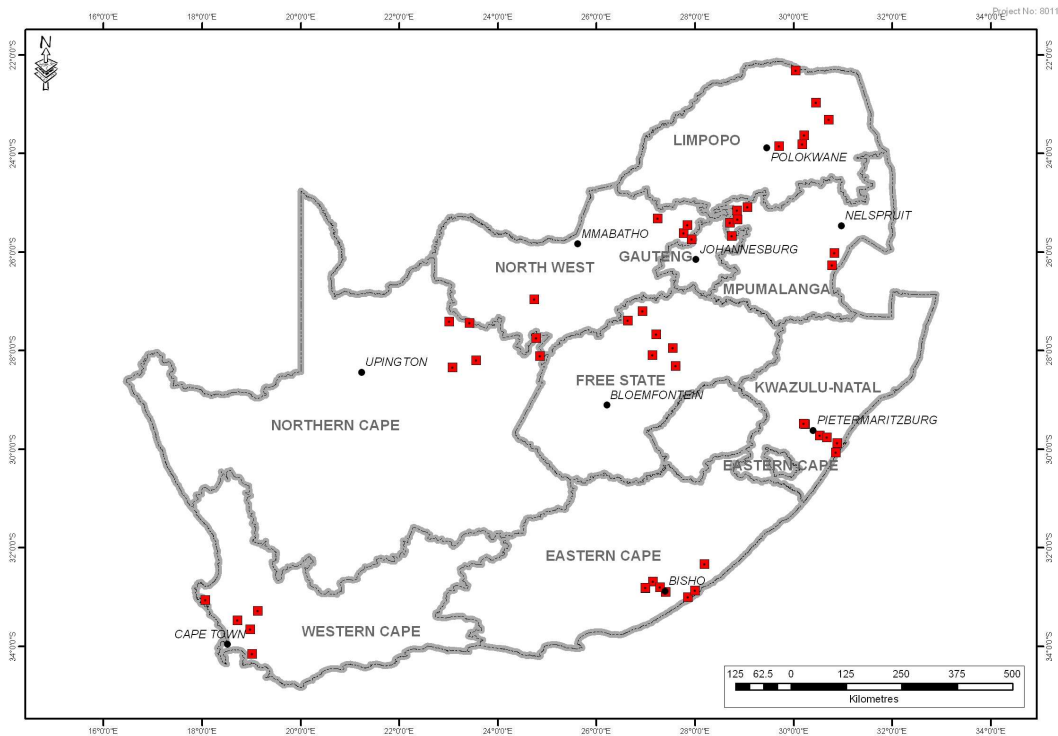
The ability of local government to recover the costs of waste and sanitation service delivery is becoming increasingly compromised, especially for local authorities with a smaller revenue base. Local government is not a “profit making” entity and as such the “polluter pays” principle often results in local ratepayers having to “pay” through rates and taxes. In addition, due to service backlogs and high poverty rates (57% average poverty rate for South Africa, HSRC, 2004) local authorities are expected to provide free basic services to communities with often little opportunity to recover these costs.



**Figure 1 Refuse removal, refuse dumps and solid waste disposal. (MDB, 2008).**



**Figure 2 Sanitation services by local municipalities (MDB, 2008)**



**Figure 3** Location of the wastewater treatment plants included in the national survey (Snyman *et al* 2006)

Any municipality with the executive authority for the provision of water services in terms of the Municipal Structures Act is a water services authority. The Strategic Framework for Water Services (DWAF, 2003) outlines water services authority responsibilities as ensuring access to water services; preparation of water services development plans to ensure effective, efficient, affordable, economical and sustainable access to services; regulating water services provision and water services providers within the area of jurisdiction; and provision of water services either by providing the services or by selecting, procuring and contracting with other service providers. The spatial distribution of sanitation services delivery is illustrated in Figure 2. Similar to waste management services, a lack of authorisation combined with a lack of capacity will manifest in poor to no sanitation services and poor operation and maintenance of sewage treatment plants, as is evident from the survey results by Snyman *et al*, (2006). The spatial distribution of the sewage

plants included in the national survey is illustrated in Figure 3.

## 1.2. Governance Challenges

South African legislation (Republic of South Africa, 1996) stipulates that waste removal and disposal as well as sanitation services are the mandate of municipalities; however, an increasing trend of poor service delivery in this regard is evident. The 2007/2008 municipal capacity assessments showed that of the 231 local municipalities, 11% had no capacity to perform their waste management functions and 37% had no capacity to perform their sanitation functions (Municipal Demarcation Board, 2008). The main reasons given included insufficient budget, too few staff, lack of appropriate equipment and poor access to service areas (Godfrey and Dambuza, 2006). This challenge is compounded by a lack of reliable waste data for the country, making it difficult to assess current levels of waste generation, waste disposal and associated service delivery (DEAT,

1999; Godfrey, 2004). Another aspect complicating waste service delivery is the fact that waste removal functions may have three or four departments performing aspects of the function such as technical or engineering services, environmental management, city police for enforcement and fleet management to name but a few (Municipal Demarcation Board, 2008).

Global population growth, shortages of funding, resources and scarcity of land are common factors that directly influence the level of waste management (Coetzee, 2006). There are, however, many local factors that contribute to the growing waste problem. One of the key challenges faced by local municipalities in South Africa is therefore the need to find the most effective and efficient way of delivering adequate waste and sanitation services to communities (Lorenz, 2003) within the local constraints. The obstacles that are preventing local

municipalities from providing sustainable waste and wastewater services are numerous, ranging from budget restrictions to illegal dumping, service backlogs, lack of effective by-laws and insufficient skills development (DEAT, 2007; Poswa, 2004).

## 2. Materials and method

Five local municipalities were selected as part of the research project. The objective of the research was to analyse the current obstacles to waste management service delivery at a municipal level.

The research project was undertaken during 2007. The five local municipalities sampled, all urban municipalities, differ in the number of households to be serviced, the available budget to support service delivery, and the percentage of the households being serviced (Table 1) from 83.2% to 15.2%.

Table 1: Local municipalities included in case study

Municipality	Population (2007) <sup>(1)</sup>	Households (2007) <sup>(1)</sup>	2006/07 Operational budget for refuse (R/annum) <sup>(2)</sup>	Operational budget per household (R/annum) <sup>(3)</sup>	% households with access to refuse collection (2007)	Operational budget per serviced household <sup>(1)</sup> (R/annum)
1	268 954	79 191	R30 238 000	R382	83.2%	R459
2	435 217	105 592	R29 735 495	R282	57.5%	R490
3	449 776	146 542	R27 887 535	R190	48.0%	R396
4	527 203	137 353	R30 294 830	R221	29.2%	R755
5	349 087	89 831	R12 151 263	R135	15.2%	R890

<sup>(1)</sup> Statistics South Africa (2007). Community Survey, 2007. Basic Results: Municipalities.

<sup>(2)</sup> Municipal Demarcation Board Capacity Assessments (2006/07); Municipal Budgets (2006/07)

<sup>(3)</sup> Assuming service delivery to all households

## 3. Results and discussion

The case study revealed four broad themes of challenges, or sub-systems, to effective waste management (collection and disposal), which were found to be common to all of the municipalities interviewed. These included:

- Financial management
- Equipment management
- Labour (staff) management
- Institutional behaviour (management and planning)

Slight nuances, or municipal-specific problems, are noticed between municipalities, e.g. one municipality experienced a number of underlying

waste issues around service delivery in tribal land, which was found not to be applicable to the other municipalities. Another municipality experienced the problem of increasing numbers of dead animals and the lack of personal protective equipment (PPE), not found in the other municipalities.

These four broad themes of obstacles to effective waste management are strongly aligned with the findings of a recent study by the South African Department of Environmental Affairs and Tourism (DEAT, 2007). However, further investigation into these obstacles, using a systems approach (Godfrey & Oelofse, 2008) revealed that these should not be seen as the obstacles, but rather the symptoms of a number of underlying and inter-

related root causes that need to be addressed. For example, while many municipalities identified the lack of budget for undertaking service delivery as a major obstacle (Municipal Capacity Assessments), the real underlying reasons included, amongst others:

- capping of municipal budgets (year-on-year growth) by National Treasury;
- ineffective cost recovery for disposal at landfills (many municipalities do not charge for disposal to landfill, due to lack of capacity or fear of increased illegal dumping);
- delays in finalizing municipal budgets (up to three months delays were reported);
- theft of infrastructure, e.g. fencing around landfill sites, power cables supplying electricity to sewage works, increasing opportunity costs; and
- reducing operational waste budgets by senior managers (without consulting those whose functions are impacted by the changes)

One could therefore conclude that a lack of funding is not the underlying problem, but the result of a number of inter-related sub-problems (listed above), increasing opportunity costs and manifesting in the ineffective utilisation of funds. The result is that the identified issues impact upon the efficient utilisation of resources within local government and ultimately the levels of service delivery. According to Churchman (1979) efficiency of operations is an overriding objective of systems. *"Any manager who is alert looks around his system and discerns where unreasonable wastes are occurring, if he's a good manager, he does his best to eliminate these wastes in order to reduce the total costs of operation of the system"* (Churchman, 1979:16).

It was also identified in the five case study municipalities that some of the identified problems were beyond the control of the local municipality, i.e. capping of municipal budgets; and therefore require intervention by provincial and national government. Local municipalities can however address some of the issues through local interventions aimed at:

- Awareness creation
- Capacity building
- Maintenance
- Holistic planning and
- Enforcement

### 3.1. Awareness Creation

Members of the public are often unaware of the lifecycle of waste and wastewater, and resultant pollution impacts of daily household activities such as putting out the bag or bin of waste, cooking, washing and water-borne toilet systems. There is also often an apparent lack of awareness of the inter-connectedness of municipal services among municipal planners. Housing and provision of potable water is afforded higher priority compared to sanitation and waste collection services. Every tap providing drinking water should however be viewed as a source of wastewater requiring collection and treatment. Communal taps is a case in point, where the water is used for washing purposes with no collection system to take care of the used wash water. This scenario is a major contributing source of stormwater pollution in dense settlements. Creating awareness within communities increases the ability of persons to act, act responsibly, and make informed choices with regards to waste and wastewater generation and disposal.

Benchmarking provides a useful tool for measuring and comparing service delivery between municipalities, thereby raising the local awareness of current and best practices with regards to waste and wastewater management.

### 3.2. Capacity Building

The research revealed a dire need for capacity building and training among municipal staff. Municipal services failure can often be attributed to staff with insufficient experience, lack of mentoring or the incorrect formal training and qualifications to perform the required job. For example, in municipalities visited, an environmental health practitioner was being utilized to operate a wastewater treatment facility, a position earmarked and required under regulation, for a civil engineer.

While it is not possible to always recruit staff with the ideal qualification and experience for a specific position in a municipality, the necessary systems should be put in place to ensure that the required capacity is provided and that staff members are trained for the position. Capacity building programmes should include aspects of training, mentoring and practical experience, e.g. apprenticeships programmes.

### 3.3. Maintenance

System, equipment and infrastructure failure in municipalities is often the symptom of poor maintenance. There are two common aspects to maintenance to ensure sustainability, namely:

- Routine maintenance and
- Repair maintenance

A schedule for routine equipment and infrastructure maintenance is required for any system to be sustainable. Regular maintenance also has the advantage in that it can inform budget planning by timeously identifying the need for replacement of capital equipment and infrastructure. Planned down-time of equipment for maintenance purposes provides for contingency plans to be put in place in order to continue to provide important services. Timeous repairs to, or replacement of broken parts further avoids unintended secondary damage and total failure of equipment and infrastructure, unnecessarily adding to expenditure within the municipality. Good maintenance has the additional advantage of limiting the pollution impacts resulting from municipal service delivery.

Short-term interventions on maintenance and operations improvements are both quicker and cheaper than refurbishment and installation of new infrastructure as proposed by some municipal waste managers. However, short-term interventions will not provide long-term solutions to poor and ineffective service delivery

### 3.4. Holistic Planning

Holistic planning is especially important in municipalities where one function is spread over more than one department. The one hand has to know what the other is doing in order to ensure efficient and sustainable service delivery. Planning without implementation of such plans, however, remains a theoretical exercise and will not improve current practices. It is therefore important that plans, such as the Integrated Waste Management Plans (IWMP) and Water Services Development Plans (WSDP) developed by or for municipalities, be implemented as a 'living' document, continuously utilised in the short-, medium- and long-term management of waste.

### 3.5. Enforcement

Despite some deficiencies, the mere enforcement of available legislation, including municipal by-laws, will improve the waste and sanitation situation at community level. Illegal dumping and littering is by default illegal and should be treated as such, with active involvement of local enforcement officers. Similarly, non-compliance of waste and wastewater facilities to permits and licences issued under legislation is an offence and offenders should be brought to task. The current high level of non-compliant municipal wastewater treatment facilities (Snyman *et al.*, 2006) is a case in point which may be viewed as leniency towards municipalities. In addition, the current situation has the potential to create dual standards in the management and operation of public and private facilities in South Africa.

Enforcement officers need to know what their responsibilities are under legislation and what actions can be taken under varying circumstances. Enforcement officers should therefore be equipped to know when to act, what process to follow and be able to understand why it is important to act. Successful prosecution is only guaranteed if the law enforcement officer acted according to prescribed protocols. For instance, illegal discharges to sewers needs to be proven in court by sufficient evidence. This may require that the perpetrator must be caught in the act and that "prosecution" samples must be taken in the presence of a police officer, following very specific protocols. Inefficient or non-service delivery by a municipality does not provide any reason for not enforcing the law. If a municipality does not provide a waste collection service, this does not give the public reprieve from prosecution when illegally dumping waste.

## 4. Conclusions

Municipalities are faced with a number of challenges regarding the provision of complete and effective waste collection and sanitation services and the disposal of waste to legally compliant landfill sites. All municipalities in South Africa are faced with similar challenges but there may be certain local nuances requiring local solutions and interventions. Certain challenges are beyond the control of the municipality, but good planning and

out-of-the-box thinking may provide solutions to those problems.

The Waste and Society Research Group therefore continues to research local solutions in municipalities that may be implemented or slightly altered for implementation in other municipalities. The governance environment within which local municipalities operate is under scrutiny and innovative ways to improve waste management and sanitation services within the current Constitutional setting are required.

## 5. Acknowledgements

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## 6. References

Austin, G., Gets, L.E., Liphoto, C., Nissing, C and von Blotnitz. (2006). Energy recovery from Municipal Solid Waste in South Africa. A pre-feasibility study for the Department of Science and Technology, pp 206.

Churchman, C.W. (1979). *The Systems Approach*. Revised and Updated. Dell Publishing: New York.

Coetzee, B. (2006) Bridging the gap between traditional vs integrated waste management – A South African Local Government perspective. In: *Proceedings of WasteCon 2006*. 5-8 September 2006. Somerset West, Cape Town.

Department of Environmental Affairs and Tourism (DEAT). (1999). State of the Environment, South Africa. Available from: <http://www.environment.gov.za/soer/nsoer/index.htm>. (Accessed 23 October 2006).

Department of Environmental Affairs and Tourism (DEAT). 2000. White Paper on Integrated Pollution and Waste Management for South Africa: A Policy on Pollution Prevention, Waste Minimization, Impact Management and Remediation

Department of Environmental Affairs and Tourism (DEAT). (2006). South Africa Environment Outlook: A report on the state of the environment Report. (Department of Environmental Affairs and Tourism, Pretoria). ISBN 0-621-36422-3.

Department of Environmental Affairs and Tourism (2006b). Implementation Plan for Transfer of the Waste Permitting Function. Department of Environmental Affairs and Tourism: Pretoria

Department of Environmental Affairs and Tourism (DEAT) (2007) Assessment of the status of waste service delivery and capacity at the local government level. August 2007, Draft 3. Department of Environmental Affairs and Tourism; Pretoria.

Department of Water Affairs and Forestry (DWAF) (2001) Managing the water quality effects of settlements: Legal considerations for managing pollution from settlements. (Department of Water Affairs and Forestry, Pretoria).

Department of Water Affairs and Forestry (DWAF) (2003) Managing failing waste services and their environmental Impacts: Towards cooperative governance. Produced by the Project to Manage the Water Quality Effects of Settlements

Environmental Protection Department. (1998). Waste data and statistics: Monitoring of solid waste in Hong Kong 1998. The government of the Hong Kong Special Administrative Region.

Fiehn, H and Ball, J. (2005). Background research paper: Waste. South Africa Environment Outlook. National State of the Environment Project. Department of Environmental Affairs and Tourism: Pretoria

Godfrey, L. (2004). Overview of existing South African Waste Information Systems. National Waste Management Strategy Implementation, South Africa. Department of Environment Affairs and Tourism: Pretoria

Godfrey, L. and Dambuza, T. (2006). Integrated Waste Management Plans – A useful management tool for Local Government or a bureaucratic burden? WasteCon 2006 Biennial International Waste Congress and Exhibition, Somerset West, Cape Town, South Africa, 5-8 September 2006



Godfrey, L and Oelofse, S. (2008). A Systems approach to waste governance – unpacking the challenges facing local government. Proceedings Waste 2008: Waste and Resource Management – a Shared Responsibility, Stratford-upon-Avon, Warwickshire, England, 16-17 September 2008.

Godfrey, L. (2008). Facilitating the improved management of waste in South Africa through a national waste information system. *Waste Management*, 28:1660–1671.

Human Sciences Research Council (HSRC) (2004). Fact Sheet; Poverty in South Africa. Available from <http://www.sarprn.org.za/documents/d0000990/> (Accessed on 22 August 2008)

Lorenz M. (2003) Activity Completion Report MCBF Activity 7.1.3 – Project for Building Service Delivery Capacity – Free State – DC16 – Xhariep Municipality p 65.

Municipal Demarcation Board (2008). National Report on Local Government Capacity: District and Local Municipalities. MDB Capacity Assessment Period 2007/2008. Available from: [http://www.demarcation.org.za/powers\\_functions2007/index\\_new.html](http://www.demarcation.org.za/powers_functions2007/index_new.html). (Accessed on 20 August 2008)

Poswa T.T. (2004) The importance of Gender in waste management planning: A challenge for solid waste managers. In: *Proceedings of the 8<sup>th</sup> World Congress on Environmental Health*, Durban, 22-27 February 2004. ISBN 0-9584663-7-8.

Republic of South Africa, 2000. White paper on integrated pollution and waste management for South Africa. A policy on pollution prevention, waste minimisation, impact management and remediation. Government Gazette Vol. 417, No.20978, 17 March 2000. General Notice 227 of 2000.

Snyman, H.G, van Niekerk, A.M and Rajasakran, N. (2006). Sustainable wastewater treatment – What has gone wrong and how do we get back on track. In: *Proceedings of WISA 2006*.

Statistics South Africa (Stats SA), (2007). General Household Survey 2007. Statistical release P0318. Available online at: [www.statssa.gov.za](http://www.statssa.gov.za)

Von Blottnitz, H., Austin, G, Nissing, C., Schmalbein, N, Iphoto, L, Ncwadi, N., Gets, A and Fedorsky, C. (2006). Burn, gasify, Pyrolyse or Ferment. Making sense of the many possibilities for energy from waste in South Africa. In: *Proceedings, WasteCon 2006. International Waste Management Biennial Congress and Exhibition*. Somerset West, 5-8 September 2006.