

# ARE DEVELOPING COUNTRIES READY FOR FIRST WORLD WASTE POLICY INSTRUMENTS?

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**SUMMARY:** The findings of on-going research conducted within South Africa on waste policy instruments shows that while typical command-and-control instruments lack effective monitoring and enforcement, alternative policy instruments such as economic or information based strategies, are either slow to find favour or fail soon after implementation. Developing countries, such as South Africa, face a number of challenges to the successful implementation of alternative, first world, waste policy instruments including institutional challenges (financial and human resources); insufficient political support; an unsupportive legal environment; lack of clarity regarding the role of government and the intention of policy, leading to a lack of ownership and to ineffective policy; and a lack of supporting data. However, these challenges do not imply that there is no place for such instruments in developing countries. Instead, what is needed in the implementation of waste policy instruments in developing countries is a stage-based, tailored approach, which takes cognisance of identified challenges in their design and implementation, thereby recognising the realities of developing country circumstances.

## 1. INTRODUCTION

A number of policy instruments exist for achieving waste and pollution control, including command-and-control instruments; economic or market-based instruments; voluntary agreements; and information-based strategies (Perman *et al.*, 2003; Sterner, 2003). Command-and-control instruments involve direct regulation and rely primarily on the application of regulatory instruments, such as standards, authorisations (licences/permits) and land-use controls. Environmental regulation is a relatively young approach to waste and pollution control, with most environmental legislation having been passed in the past 20-30 years in developed countries, and even more recently in developing countries (Goodstein, 2002). South Africa is no exception, with the majority of its environmental legislation having been passed in the last ten years.

While regulatory controls have historically been the predominant approach to controlling pollution in developed and developing countries, a shift in governance away from 'policing' to one of co-operation has seen the introduction in developed countries of a number of 'softer', alternative, policy instruments. This has been partly due to the failure of traditional command-and-control approaches (Sterner, 2003). In developing countries, regulatory controls remain the

principle means of waste and pollution control; however, failures in compliance and in the enforcement of waste legislation have generally resulted in deterioration in the management of waste (Sterner, 2003).

While South Africa shows a significant growth in environmental legislation between 1996 and 2007, there is also evidence of the emergence of alternative policy instruments. At least three on-going phases in the public administration of pollution and waste in South Africa can be identified (**Figure 1**). *Phase 1* (1996-2007), which began soon after the democratisation of South Africa in 1994, saw a rapid period of drafting, promulgation and amendment of environmental legislation. *Phase 2* (2002-2007), marked by the signing of the plastic Memorandum of Agreement (MoA) between government and the plastic industry, saw the introduction of alternative pollution and waste policy instruments in South Africa, such as the plastic bag levy (2003), MoAs, a draft policy paper on economic instruments for fiscal reform (2006), and the implementation of a national waste information system (2007). *Phase 3* (2005-2007) sees a period of increased enforcement action through the establishment of the Green Scorpions, a group of environmental management inspectors, and the transfer of the landfill permitting function from the Department of Water Affairs and Forestry (DWAF) to the Department of Environmental Affairs and Tourism (DEAT). Increased action is seen to be the result of a deterioration in the monitoring, compliance and enforcement of traditional regulatory instruments. According to Lukey *et al.*, (2004) and Seeliger *et al.* (2003) the South African government has been perceived to be unwilling and/or unable to enforce pollution and waste-related legislation

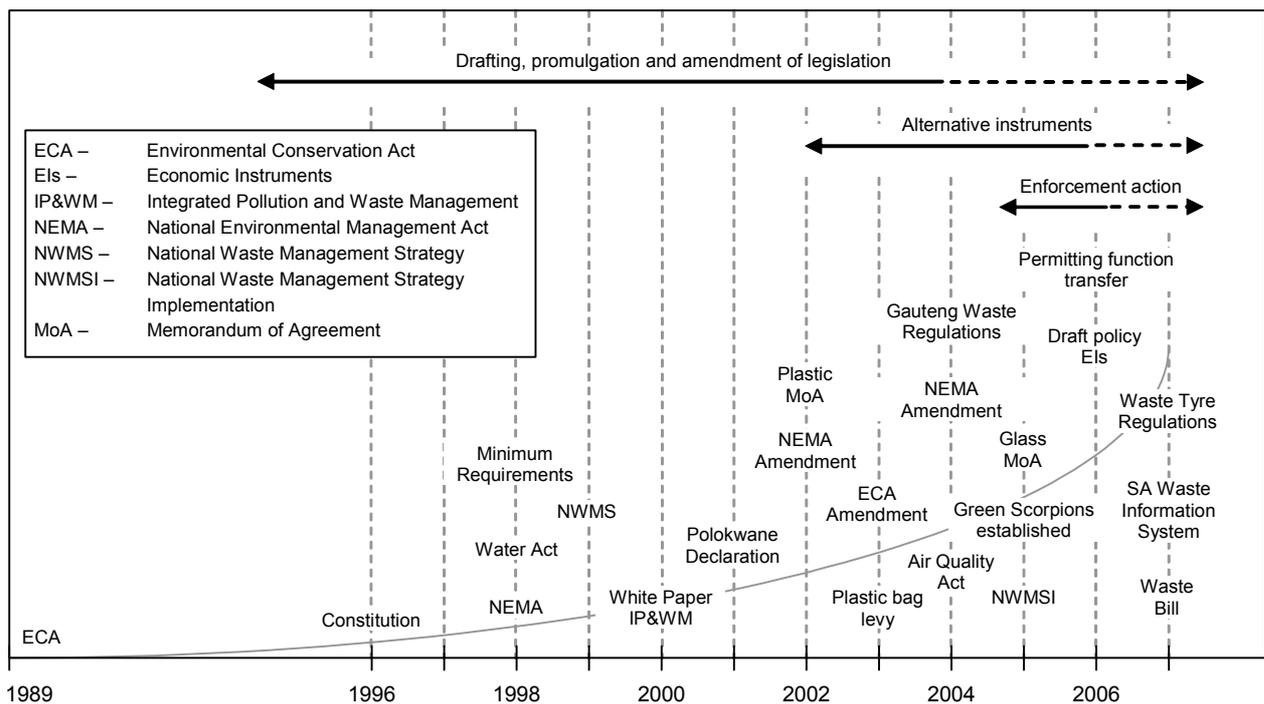


Figure 1. History of pollution and waste policy interventions in South Africa (1989-2007)

The introduction of alternative policy instruments in developing countries, is, however, often unsustainable in the short- to medium-term. In addition, the political and economic climate of developing countries is often inadequately placed to adopt such policy instruments, with the result that they often never get off the ground in terms of practical implementation. Instruments developed by first world countries are often adopted or applied within developing countries without consideration of the context. The failure of policy instruments is often ascribed to the lack of financial and human resources within developing country governments. According to Ball (2006:3,10), "*waste management in developing countries is characterised by a general lack of resources and reliable operating systems*". This results in "*unacceptable waste management practices and associated problems*". A review of capacity assessments of local municipalities in South Africa (Municipal Demarcation Board, 2005) indicated that 59.7% of municipalities could not fully perform their waste management functions as assigned to them under legislation, due principally to insufficient budgets, insufficient staff and insufficient equipment.

This paper aims to address the potential for, and sustainability of, two alternative policy instruments for solid waste management in developing countries: information-based strategies, focussing specifically on waste information systems and integrated waste management planning; and economic instruments. The paper focuses on the implementation and success of these policy instruments in South Africa, a country unique in that it contains elements of both developed and developing economies; but faced with often typical developing country institutional and resource challenges.

## 2. ADVANCES IN REGULATORY INSTRUMENTS

### 2.1 Overview

A number of policy instruments exist in the field of pollution and waste management (**Figure 2**), including:

- *Command-and-control instruments* (directive-based regulation) - direct regulation (discussed above)
- *Economic instruments* (economic incentive-based strategies) – defined as policy instruments which seek to ensure that the economic costs of environmental damage are internalised by those responsible for causing the damage through the market mechanism (polluter-pays principle) (Steel, 1999)
- *Voluntary agreements* (moral incentive-based strategies) - adopted by industry; have been used in many countries as an important complementary approach to pollution reduction, but seldom as a replacement for direct government control.
- *Information instruments* (information-based strategies) - information has emerged as a policy or regulatory instrument over the past two decades, capable of '*eliciting*' or '*inducing*' desired policy outcomes (Weiss, 2002; Antweiler & Harrison, 2003; Kolominskas & Sullivan, 2004).

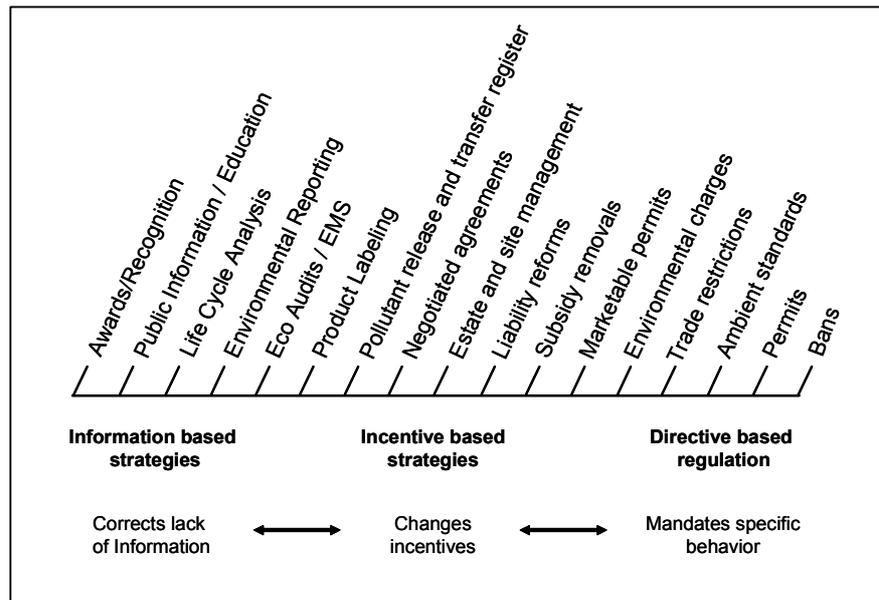


Figure 2. Range of instruments for environmental policy (from Bosman, 2005)

## 2.2 Economic instruments

In contrast with command-and-control approaches, which mandate specific behaviours, economic instruments (EIs) (such as taxes, subsidies, and marketable permits) aim to change behaviour indirectly by changing the prices (and hence incentives) that individuals and businesses face. For example, taxes per unit of waste collected or disposed of, create incentives to reduce waste generation or disposal; while payments per unit of waste recycled or reused create incentives to increase the amount of recycling or reuse. Advantages of economic over command-and-control instruments include cost-effectiveness and information-efficiency<sup>1</sup>, incentives for continual development of cleaner technologies and processes, and potential for revenue-generation (depending on the instrument) (Russell and Vaughan, 2003). They therefore seem ideally suited to overcoming the challenges facing environmental management in developing countries. For solid waste management specifically, a number of economic instruments have been used in developed countries (see Table 1):

Table 1 Types of economic instruments for solid waste management Source: Adapted from Pearce and Turner, 1994

Instrument	Example	Purpose
Virgin material tax	Aggregates Levy	Discourage use of virgin materials, encourage reuse
Product charges	Plastic bag tax	Decrease production, use and disposal of plastic bags
User charges	Household waste charge	Reduce waste at source, encourage recycling
Disposal charges	Landfill charges	Decrease amount of waste disposal
Deposit-refund scheme	Bottles, batteries	Encourage appropriate disposal/return for recycling (especially useful for hazardous waste products)
Recycling credits		Encourage recycling
Tax concessions/subsidies		Encourage recycling, reuse, etc

<sup>1</sup> the same level of pollution control can be achieved at lower cost and with lower informational requirements

However, the use of EIs for environmental management in developing countries has been limited (Russell and Vaughan, 2003). Many economists believe that developing countries are not ready for such instruments, due to a lack of financial and human resources, lack of institutional (and thus monitoring and enforcement) capacity, poorly developed markets and legal systems, lack of understanding of how markets operate, corruption, lack of transparency, and lack of adequate equipment and data (Bell and Russell, 2002; Russell and Vaughan, 2003).

Furthermore, where EIs have been applied, they have not been effective, because they have simply been imported from developed countries without consideration of developing country circumstances, and have been used primarily for raising much-needed revenue. They have thus failed to achieve environmental objectives, because price incentives (e.g. tax rates) were set at the wrong levels, and because of ineffective monitoring and enforcement (Bell and Russell, 2002; Russell and Vaughan, 2003). Only environmental funds for investment in pollution control technology (funded by earmarked environmental tax revenue) have achieved some success (Russell and Vaughan, 2003).

Recent developments in South Africa, including the publication of documents such as the National Waste Management Strategy (DEAT, 1999), a draft policy paper on the possible use of EIs for fiscal reform (National Treasury, 2006), and two documents on the possible use of EIs in waste recycling and health care waste management (DEAT, 2006a; 2006b), seem to suggest that the use of such instruments is being considered by government for solid waste management.

## **2.3 Information strategies**

### *2.3.1. Information systems*

Information can make people aware of the *consequences* of their behaviour and influence their *awareness and knowledge* regarding this behaviour (Weiss, 2002; Howes, 2001). Policy makers then rely on people to use these newly acquired skills to change their own behaviour, so as to achieve the intended policy outcome.

While information policy has been used internationally in many domains ranging from public health, energy conservation, and environmental management to family planning (Weiss, 2002), perhaps the most well known example of a successful information strategy is the toxic release inventory (TRI) implemented in the US in 1986 in response to the chemical accident at a Union Carbide plant in Bhopal, India (Terry & Yandle, 1997). Based on the principles of community-right-to-know, the TRI requires that certain listed industry types report on the quantity and types of pollutants released to air, water and soil; and transferred off-site for disposal, which are then made available to government and the public. The result of the TRI has been that companies have reduced their generation of waste and/or associated discharges as a result of social pressure and increased organisational awareness of wasteful processes (Howes, 2001; Weiss, 2002; Antweiler & Harrison, 2003; Kolominskas & Sullivan, 2004).

The White Paper on Integrated Pollution and Waste Management (IP&WM) (Republic of South Africa, 2000) outlined government's new thinking in relation to pollution and waste management. The policy (goal 6) identified the need to develop and maintain databases and information management systems, to monitor and collect information on pollution, chemical hazards, toxic releases, transportation of hazardous materials and waste generation. The intention being to support the implementation of pollution and waste reduction measures, effective integrated pollution and waste management, and the constitutional rights of all South Africans through access to information (Act 108 of 1996, Act 2 of 2000).

### *2.3.2 Organisational reports (Integrated Waste Management Planning)*

Organisational reports, as a policy instrument, are intended to generate specific information

within organisations and report this information to key stakeholders, such as government (Weiss, 2002). Through this process, organisational reports have the opportunity to influence both the organisation generating the information as well as the stakeholders receiving the information. Integrated waste management plans (IWMPs), required from all municipalities in South Africa is an example of such an organisational report. IWMPs are required to contain information on the current state of waste management within the municipality (waste types and quantities generated, costs, practices); current issues, gaps and needs; objectives and targets; and alternatives (Gauteng Provincial Government, 2002). The National Waste Management Strategy (NWMS) (DEAT, 1999) required that all municipalities complete integrated waste management plans (IWMPs) for their area of jurisdiction by 2003; and be implemented by 2006. Prior to this research, no single, up-to-date, database or inventory (whether public or private) of completed IWMPs in South Africa existed. As such, there is little information at a national government level regarding the status of completed IWMPs.

### **3. MATERIALS AND METHODS**

This paper presents the findings from three research projects being conducted by the CSIR in South Africa, namely the role of a national waste information system in influencing behaviour (complete), the status of waste management (including integrated waste management planning) in local government (on-going), and the viability of economic instruments for waste management in South Africa (on-going). A brief overview of each research project and the associated research methods are described below.

Data collection regarding waste information systems (WISs) in South Africa was conducted between 2004 and 2006 as part of the DEAT-Danida funded project on the development of a national WIS for South Africa.

Data collection on the status of waste management (including progress on IWMPs) in municipalities began in December 2004, with self-administered questionnaires being sent to the waste management departments of all 284 municipalities in South Africa. Although it is recognised that postal questionnaires provide a low response (Rea & Parker, 1992), often less than 20% or 30% (pers comm., R Koen, 2006), it was considered the only feasible option for assessing the needs of local government, due to the large geographical distribution of respondents and often limited access to electronic media. The intention of the questionnaire was to gather information on the current waste data and information practices in municipalities. The questionnaire posed a total of 31 (16 open and 15 closed) questions on current waste data and information practices in municipalities; the use and perceived value of waste data; the availability of IWMPs and supporting data (whether IWMPs had been completed, by whom and whether sufficient data was available to inform the planning process); the approach to current planning and decision-making; and the need for access to waste information. In an attempt to make the questionnaire 'user friendly' and easy to complete, thereby potentially maximising the return rate, factors such as questionnaire length, use of language, avoidance of leading questions, clarity of instructions, and layout and aesthetics were considered in the questionnaire design. To improve the response rate, follow up requests to the questionnaire were made in July 2005 and October 2005.

Exploratory research on economic instruments supporting waste management in South Africa was sparked by work done by the DEAT. In particular, two documents have been produced considering the use of EIs in the recycling and health care waste sectors (DEAT, 2006a; 2006b). However, these documents do not adequately assess whether or not such instruments are appropriate for the South African context; identify the constraints limiting the use of such instruments in a developing country such as South Africa; or possible solutions to ensure their

effective and appropriate design and implementation. There is therefore a need to review more carefully the potential EIs for waste management in South Africa; to understand the South African context with respect to EIs; and to identify the specific opportunities for and constraints to their implementation in South Africa.

## **4. RESULTS AND DISCUSSION**

### **4.1 Economic instruments**

Despite mention of EIs in several National Treasury and DEAT documents (see above), the emphasis appears to be on the use of economic instruments as mechanisms to secure funding for the implementation of waste management strategies, rather than as instruments for influencing waste-related behaviour (DEAT, 1999).

Two challenges to the successful implementation of EIs in developing countries are the trade-off between raising revenue and achieving environmental objectives; and the level of institutional capacity, which determines the effectiveness of legislation, monitoring and enforcement (Pearce and Turner, 1994). Firstly, effective environmental taxes erode their own tax base (by reducing pollution and waste). There is therefore a trade-off between their environmental effectiveness and their ability to raise revenue. EIs often fail in developing countries because they are seen as sources of much-needed government revenue, as opposed to incentives to change behaviour. While such revenues are often ring-fenced for reuse within pollution or waste management, ring-fencing has typically been discouraged by the South African Treasury, since it is seen to reduce the flexibility and transparency of fiscal policy (Steele, 1999), however. EIs should rather be seen as policy instruments driving behaviour, and any revenues generated should be subjected to the normal fiscal process (National Treasury, 2006).

Secondly, Bell and Russell (2002) and Russell and Vaughan (2003) argue that the required level of institutional capacity is currently lacking in most developing countries. For example, in South Africa, as in other developing countries, there is insufficient capacity for the monitoring and billing of waste services. EIs are unlikely to be effective in these circumstances. Many municipalities, for example, don't bill for the disposal of waste to landfill, due to a lack of resources, or fear of an increase in illegal dumping due to a lack of the necessary monitoring and enforcement capacity. Without proper gate control and quantification of the amount of waste entering landfills, and billing for disposal, effective landfill taxes cannot be implemented.

### **4.2 Information instruments**

#### *4.2.1 Waste information systems*

Of the ten known waste information systems in South Africa, seven systems are no longer operational, having succumbed to either total or sustainability failure (**Table 2**) (Godfrey, 2004). Information system failure is not unique to South Africa, or to developing countries; with developed countries showing up to a 50-85% partial or total failure rate of information systems (Heeks, 2002).

Table 2. Status of WIS in South Africa (as at 2007)

System	Status (2007)					Comment
	D	P	I	R	O	
<i>National systems:</i>						
SA Prototype WIS	✓	✓	-	-	-	Total failure <sup>(1)</sup>
SA WIS	✓	✓	(p)	-	(p)	Partially operational
<i>Provincial systems:</i>						
Gauteng IIMS	✓	✓	-	✓	-	Total failure
Gauteng HCWIS	✓	✓	-	✓	-	Total failure
Gauteng WIS	✓	✓	✓	-	(p)	Partial failure <sup>(2)</sup>
KwaZulu-Natal WasteMap	✓	✓	✓	-	-	Sustainability failure <sup>(3)</sup>
Mpumalanga PRR-PIS	-	-	-	-	-	Total failure
Western Cape PWIS	✓	(p)	-	-	(p)	Partially operational
<i>Municipal systems:</i>						
eThekweni (Durban) WIS	✓	✓	✓	-	✓	Operational
Johannesburg (SMLC) WIS	✓	✓	✓	-	-	Total failure

Where: D – system developed      P – system piloted      I – system implemented  
R – system replaced      O – system operational      (p) - partial

Developing countries do, however, show a comparatively higher failure rate than that experienced by developed countries, due to a lack of appropriate technical and human infrastructure, limited management capacity and commitment, high government staff turnover, an unsupportive public sector culture, post development withdrawal of donor funds, and adoption of often overly complex or unsuitable industrialised country information systems (Peterson, 1998; Heeks, 2002). According to Peterson (1998:38), “*Information systems fail or underperform more often than they succeed in the public sector in Africa*” primarily because “*they outstrip the capacity of government staff to manage. The management task is formidable.*”

Identified challenges to successfully implementing waste information systems in South Africa include political support, institutional challenges (financial and human resources), legal environment, clarity with respect to government roles and responsibilities, fear of ramifications, and lack of waste data.

#### 4.2.2 Organisational reports (Integrated Waste Management Planning)

Of the 284 local, district and metropolitan municipalities in South Africa, 99 municipalities responded to the postal questionnaire; a response rate of 34.9%. While such a response rate is considered good for a self administered postal questionnaire, it does pose questions as to the representivity of the results. Where possible, the results of the questionnaire were evaluated against available information on known IWMPs.

Although the NWMS (DEAT, 1999) required all municipalities to finalise their IWMPs by 2003, as at mid-2005, only 58.3% of municipalities who responded to the questionnaire had completed, or were in the process of completing, an IWMP. Of those municipalities that have

<sup>1</sup> Total failure occurs when a new system is either never implemented or is implemented but is immediately abandoned (Heeks, 2002).

<sup>2</sup> Partial failure occurs when major system goals are unattained or where there are significant undesirable outcomes (Heeks, 2002).

<sup>3</sup> Sustainability failure occurs when a system first succeeds but is then abandoned after a year or so (Heeks, 2002), e.g. while system continues to operate, the lack of a complete data set hinders application of the system.

completed IWMPs, many of these documents are in fact only Status Quo Analyses, a first step towards IWMPs.

In addition, 81.7% of the completed municipal IWMPs have been prepared by waste management consultants (Godfrey and Dambuza, 2006), which poses questions as to the likely internalisation of the findings of the IWMPs by municipalities and the resultant success of IWMP as policy instruments.

Identified challenges to successfully implementing IWMPs in municipalities included ownership of IWMPs, lack of supporting data, relevance of the IWMP, institutional challenges (financial and human resources), the legal environment, and public participation.

## **5. CONCLUSIONS**

The main challenges to the successful implementation of first world waste policy instruments in South Africa institutional challenges (financial and human resources); inadequate political support; an unsupportive legal environment; lack of clarity regarding the role of government and the intention of policy, leading to a lack of ownership and to ineffective policy; and a lack of the necessary supporting data. However, these challenges do not imply that there is no place for such instruments. For example, as a counter to institutional challenges, components of these instruments should be implemented as part of an integrated waste management system in progressively more institutionally-demanding stages, with the focus on gradually developing institutional capacity (Bell and Russell, 2002; Russell and Vaughan, 2003). What is needed in the field of solid waste management is a similarly stage-based, tailored approach to implementing first world policy instruments in developing countries. Institutional and other challenges in developing countries must be taken into account in the design and implementation of such instruments (Goodstein, 2002), but they should not be seen as a reason for these instruments not to be implemented at all. Rather, they should be implemented in a way that takes the realities of developing country circumstances into account.

Policy instruments to support the management of waste are also only likely to be successful if waste is identified as a priority by government and the private sector, which to date it has not (Republic of South Africa, 2000).

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