



Selection, Design and Implementation of Economic Instruments in the Solid Waste Management Sector in Kenya

The Case of Plastic Bags

Foreword



This thoughtful and comprehensive report on the problems and possible solutions to Kenya's and particularly Nairobi's waste problems was recently launched to keen public and media interest during UNEP's 23rd Session of the Governing Council held in Nairobi in February 2005. The study looks at the rising mountain of solid waste generated in Kenya's capital and, using UNEP guidelines, investigates the use of economic instruments for solid waste management. Economic instruments are increasingly being recognized as a viable solution to many environmental problems. They can provide the incentive to change behaviour and generate income to support more environmentally friendly ways of dealing with pollution.

After a broad overview of the problem of solid waste management in general, the report focuses on a specific problem of critical concern to the population of Nairobi – the scourge of plastic shopping bags that litter the city – and develops an integrated environmental policy package to address the problem. The findings and conclusions of the report point to the need to adopt a range of strategies when designing environmental policy that include a harmonious balance of economic instruments, command and control measures and voluntary initiatives. Accordingly, a seven point strategy is recommended, to be introduced over a two to three year period and implemented by a new body to be known as the Plastics Levy Management Committee (PLMC).

The policy proposals start with a total ban on flimsy plastic bags less than 30 microns thick and the application of a levy or tax on the thicker ones. The levy would then be earmarked to support a range of other measures such as public awareness campaigns, recycling schemes and the development of environmentally friendly alternative bags such as cotton or sisal. A pilot implementation plan has been outlined in the report and I understand from the Kenyan Government that there is real political will to now take these proposals forward. Addressing the problem of plastic bags in Nairobi can be the start, the test bed to what I hope will be wide ranging and creative action to cut pollution and stimulate new, modern businesses and jobs in Nairobi and elsewhere.

A handwritten signature in black ink, which appears to read 'Klaus Töpfer'. The signature is written in a cursive style with a long horizontal stroke at the end.

Klaus Töpfer
Executive Director
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The inspiration and energy for the project came from the then Permanent Secretary of the Ministry of Environment and Natural Resources in the Republic of Kenya, Ambassador Francis Muthaura (currently Head of the Public Service and Secretary to the Cabinet), and Hussein Abaza from the Economics and Trade Branch (ETB) of UNEP.

Naftali Ndugire at the National Environmental Management Authority (NEMA) was the project leader. Team members included Bernard K'Omudho, Francis Kihumba, Joyce C. Onyango, Michael Okoth and Julia Magambo. The National Steering Committee established to guide the project included representatives from the Ministry of Industry, Trade and Tourism; Ministry of Finance and Planning; Ministry of Environment and Natural Resources; Nairobi City Council; National Chamber of Commerce and Industry; University of Nairobi; The World Conservation Union (IUCN); and other co-opted stakeholders. Moses Ikiara and Clive Mutunga from the Kenya Institute for Public Policy Research and Analysis (KIPPRA) reworked the final report and developed the case study on the selection and design of economic instruments for plastics waste management. We would also like to acknowledge the industry participants who participated in the stakeholder workshops and provided information through interviews and other forums.

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United Nations Environment Programme

The United Nations Environment Programme (UNEP) is the overall coordinating environmental organization of the United Nations system. Its mission is to provide leadership and encourage partnerships in caring for the environment by inspiring, informing and enabling nations and people to improve their quality of life without compromising that of future generations. In accordance with its mandate, UNEP works to observe, monitor and assess the state of the global environment, improve the scientific understanding of how environmental change occurs, and in turn, how such change can be managed by action-oriented national policies and international agreements. UNEP's capacity building work thus centers on helping countries strengthen environmental management in diverse areas that include freshwater and land resource management, the conservation and sustainable use of biodiversity, marine and coastal ecosystem management, and cleaner industrial production and eco-efficiency, among many others.

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In the field of environmental economics, ETB aims to promote the internalization of environmental costs and enhance the use of economic instruments to contribute to sustainable development and poverty reduction, including in the specific context of Multilateral Environmental Agreements. The UNEP Working Group on Economic Instruments, serves as an advisory body to UNEP-ETB's work programme on economics and has been instrumental in the preparation of UNEP publications on economic instruments.

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Executive summary

The generation of solid waste has become an increasing environmental and public health problem everywhere in the world, but particularly in developing countries. The fast expansion of urban, agricultural and industrial activities spurred by rapid population growth has produced vast amounts of solid and liquid wastes that pollute the environment and destroy resources. The management of solid waste is often weak due to lack of appropriate planning, inadequate governance, poor technology, weak enforcement of existing legislation and the absence of economic and fiscal incentives to promote environmentally sound development. The Government of Kenya has currently prioritised solid waste management as a pressing issue and recognizes the value and importance of integrating environmental and development objectives into the decision-making process. The importance of this subsector has been identified in various policy and legislative documents.

The use of appropriate economic instruments (EIs) can help to achieve sustainable development by providing the means of internalising environmental degradation and resource depletion costs into the production and consumption process. Economic instruments can work harmoniously with traditional regulatory mechanisms as well as help to provide the necessary funds for supporting sound environmental management initiatives such as recycling and waste disposal facilities.

Objectives and structure of the report

This report examines and discusses the use of economic instruments for environmental management in Kenya and, using UNEP guidelines (UNEP, 2004), develops an environmental policy package to address a specific solid waste management problem. The broad objective of the report is to equip policymakers, planners and other stakeholders with the techniques and methodologies required to develop and apply appropriate economic instruments for solid waste management. Central to this project was the establishment of an effective multi-stakeholder process involving public sector institutions, the private sector, universities, and civil society, among others, in order to ensure broad consensus and support for implementation of the final package of policy proposals.

The report is structured as follows. Following a general introduction to the problem, the use of economic instruments for solid waste management is discussed and some case studies are provided for illustration, followed by a discussion of lessons learned from other country experiences. The report then presents a detailed overview of the status of solid waste management in Kenya, and the waste generated by plastic shopping bags was selected for development of a policy proposal. The plastic shopping bag problem in Nairobi was chosen on account of its importance, high political and public attention, and availability of international experience to learn from. International experience has shown that there is great opportunity for Nairobi to reduce the use of plastic shopping bags and therefore all forms of nuisance associated with their use. In addition, the enactment of the Environmental Management and Coordination Act (EMCA) in 1999 and the creation of the National Environment Management Authority (NEMA) to oversee its implementation provide a strong institutional base for the use of economic instruments for this purpose.

The assistant environment minister and 2004 Nobel Peace Prize winner, Wangari Maathai, has also urged an urgent search for a solution to the problem. Furthermore, these environmental benefits can be achieved together with the country's leading development goals of reducing poverty and creating employment.

The process of selecting, designing and implementing economic instruments for this project is explained in some detail using a four-phase strategy developed by UNEP. An integrated economic instrument-based environmental policy package to address the selected problem is developed using these guidelines. Finally a pilot implementation project is proposed, along with a concrete plan of implementation and follow-up activities.

Report findings

In Nairobi, like in many developing country cities, the solid waste sector is largely characterized by low coverage of solid waste management services, pollution from uncontrolled dumping of waste, inefficient public services, chaotic or unregulated private sector participation, and lack of key solid waste management infrastructure (such as transfer facilities, sanitary waste disposal facilities, and systems for waste separation). In addition, the sector lacks policy and a strong reuse and recovery industry. Not surprisingly therefore, only about 25 per cent of the estimated 1,500 tons of solid waste generated daily gets collected in Nairobi, the capital city of Kenya of about 3 million people. Furthermore the city is surrounded by four fast growing satellite towns that do not have waste disposal facilities.

The percentage of solid waste that is recovered by the municipality is only about 8 per cent of the recyclables and 5 per cent of the compostables, while private sector participation is un-regulated, with private companies operating in open competition with each other purely on a 'willing-buyer-willing-seller' basis. It is now estimated that there are at least 60 private companies engaged in solid waste collection services in the city (JICA, 1998). Furthermore, while the Nairobi City Council (NCC) and private refuse companies are collecting around three quarters of the waste from high-income homes, formal collection services for waste produced in slums and unplanned settlements are virtually non-existent. Up to 60 per cent of Nairobi's residents live in these low income areas. There is also widespread indiscriminate dumping in illegal dump sites, the only official dumpsite at Dandora is full and the city council has no waste transfer facilities. Other problems include poor technology and lack of analytical data.

The use of economic instruments for solid waste management in Kenya is not well established although some instruments are used to a limited extent. In addition, although the private sector has been participating in the service of waste collection, transportation and disposal without any policy or legal/regulatory provisions, the Environmental Management and Co-ordination Act of 1999 and policy development efforts by the Nairobi City Council promise to make privatization a leading economic instrument for the management of solid wastes in the country.

Status of plastic bags

The Kenyan so-called 'flexibles' industry is lucrative and is growing at an estimated rate of 8 to 10 per cent per year. This growth is driven not only by local demand but also demand from the regional market, although recently, due to policy uncertainty, investment in the industry has dropped. According to industry estimates, about 4000 tons of flexibles are produced monthly in the country, with an estimated 2000 tons going into the waste stream. About half of the flexibles produced in the country are less than 15 microns in thickness. For instance, the plastic bread bags are between 6 and 7 microns. It is these thin plastic bags that are most prone to inadvertent littering. The level of recycling and reuse of post-consumption flexibles is very low, with only four firms in the country involved in the activity. Recycling

has not been widely practiced as a result of various factors. With the exception of some paper bags, there are not many alternatives to plastic shopping bags in the country. Shopping bags made from natural products are available but are hardly used because of the easy and free availability of plastic shopping bags in market outlets and the low price at which the plastic bags are sold in outdoor markets. Report findings have indicated that at least two million plastic bags are now being handed out every month at supermarkets and kiosks in Nairobi alone.

Recommendations

The report proposes an environmental policy package comprising seven instruments to manage plastic bag waste, to be introduced gradually over a two to three year period:

1. A ban on plastic shopping bags that are less than 30 microns in thickness
2. Consumer awareness and anti-littering campaign
3. Promotion of voluntary schemes such as a national code of practice for retailers
4. A plastic bag levy collected from suppliers
5. Support for development of environmentally-friendly alternative bags
6. Support for development of an effective plastic bags recycling system
7. Support for development of a managed disposal system to cater for the plastic bags that will enter the waste stream irrespective of the measures taken.

The key economic instrument proposed in the package is the plastic bag levy, from which the funds raised would be earmarked to support development of environmentally-friendly alternative bags, an effective plastic bags recycling system and a well-managed disposal system. Positive effects are expected to be seen in job creation in alternative environmentally friendly industries (cotton or sisal) and in recycling and waste disposal activities.

Countries that have used the levy have registered huge reductions in the production and use of plastic shopping bags, and have raised revenue for other environmental purposes. A comparative analysis of the two options of either collecting the levy directly from shoppers at the retail outlets or from the suppliers for Nairobi indicates that it is more cost-effective to collect the levy from suppliers. There are a few suppliers to collect the levy from and the Kenya Revenue Authority (KRA) has the capacity to do so at a modest collection fee.

A pilot project to implement the policy package and an institutional structure and other modalities to manage the project is proposed. The key institutional structure for managing the pilot project would be a Plastics Levy Management Committee (PLMC), legally constituted and chaired by the National Environmental Management Authority (NEMA). The function of the PLMC would be to ensure that the plastics levy is collected and the resulting revenue allocated to the earmarked activities. In addition, the PLMC will be responsible for data collection, general monitoring and evaluation of the pilot project and running public awareness and anti-littering campaigns.

Lessons learned from implementation of the pilot project could be used to design and implement similar environmental policy packages for other priority solid waste problems in Kenya and other developing countries.

List of acronyms

CAC	command and control instrument
CBA	cost-benefit analysis
CBO	community based organization
EI	economic instrument
EMCA	Environmental Management and Coordination Act
ETB	UNEP's Economics and Trade Branch
ETU	Economics and Trade Unit
GOK	Government of Kenya
IDB	International Development Bank
IUCN	The World Conservation Union
JICA	Japan International Cooperation Agency
KRA	Kenya Revenue Authority
LA	Local Authority
NCC	Nairobi City Council
NEAP	National Environment Action Plan
NEMA	National Environment Management Authority
NES	National Environment Secretariat
NGO	non-governmental organization
SWM	Solid Waste Management
OECD	Organization for Economic Co-operation and Development
UNCHS (HABITAT)	United Nations Centre for Human Settlement
UNCTAD	United Nations Conference on Trade and Development
UNEP	United Nations Environment Programme
UNFPA	United Nations Population Fund

1. Introduction

1.1 Overview of solid waste management in developing countries

Solid waste management is becoming a major public health and environmental concern in urban areas of many developing countries. The situation in Africa, particularly in the capital cities is severe. The public sector in many countries is unable to deliver services effectively, regulation of the private sector is limited and illegal dumping of domestic and industrial waste is a common practice. In general, solid waste management is given a very low priority in these countries. As a result, very limited funds are provided to the solid waste management sector by the governments, and the levels of services required for protection of public health and the environment are not attained. The problem is acute at the local government level where the local taxation system is inadequately developed and, therefore, the financial basis for public services, including solid waste management, is weak.

Improper solid waste management leads to substantial negative environmental impacts (for example, pollution of air, soil and water, and generation of greenhouse gases from landfills), and health and safety problems (such as diseases spread by insects and rodents attracted by garbage heaps, and diseases associated with different forms of pollution). Municipal (or local) authorities charged with responsibility of providing municipal solid waste management services (together with other municipal services) have found it increasingly difficult to play this role. The difficulty has been aggravated by lack of effective legislation, inadequate funds and services, and inability of municipal authorities to provide the services cost-efficiently. Changing lifestyles such as use of canned soft drinks, mobile phones, and disposable diapers (movement towards a “consumer society” in general), moreover, will pose special waste management challenges, as waste management systems in developing countries are incapable of frequent adjustment to match these lifestyle changes.

Cities in both developed and developing countries generally do not spend more than 0.5 per cent of their per capita gross national product (GNP) on urban waste services, which covers only about one-third of overall cost (World Bank, 1999). The responsibility over solid waste collection and disposal is thus well beyond the capacity of municipal governments. More than 80 per cent of the total waste management costs in low-income countries are collection costs (World Bank, 1999). In Latin America the cost of waste collection is about 46 per cent of the total municipal solid waste management cost. Cost recovery in SWM service is difficult because, even though there is some willingness to pay for waste collection service, there is little such willingness for waste disposal. Traditionally, therefore, municipal authorities have financed the services through general revenues or attempted to charge for the service through inefficient property tax. Owing to the existence of willingness to pay, however, private provision of waste collection has potential. In addition, limited economies of scale and ease of entry and exit in waste collection imply that competition can keep the price of the private service competitive.

The upshot is that an increasing proportion of urban dwellers in developing countries, particularly the urban poor, will lack access to municipal solid waste management services and, consequently, suffer from pollution-related environmental and health problems. Fortunately, there are ways of dealing with or, at

least, minimizing this problem. One of the ways, which is the subject of this paper, is the use of well-designed economic instruments to create the requisite incentives.

While laws and regulations, what is generally termed as ‘command and control’ instruments (CACs), are the most prevalent mode of solid waste management, interest in the use of economic instruments (EIs) is growing. Whereas CACs prescribe the standards to be complied with on what, how, when, where and how much to produce, consume, emit and clean up, EIs are much more flexible and non-prescriptive over actions required. This allows economic agents to dynamically innovate ways of cost-effectively complying with the minimum standards specified. In other words, economic agents chose the level of pollution on the basis of their marginal cost/marginal benefit equation, by trading with the level of pollution above or below the minimum.

The CAC approach is designed in such a way that the motivation for agents to comply comes from fear of fines and penalties. For this disincentive to work, however, vigilance and enforcement capacity must be adequate. Most developing countries lack such capacity and, generally, tend to have the following problems with their CAC approaches: inadequate detail in law, lack of inspection staff, lack of transport, inadequate empowerment of inspectors to ticket offenders, political intervention to quash tickets, disinterest by the courts for these minor offences and lack of courts for them, inadequate police coverage to enable arrests and follow-up through the court system, and insignificant and therefore non-detering fines and penalties (IDB, 2003).

Where there are such performance monitoring and enforcement capacity weaknesses, economic instruments offer a viable alternative (IDB, 2003). The 1992 Rio Declaration on Environment and Development endorsed the use of EIs for the achievement of sustainable development (Principle 16). In solid waste management, EIs promise to improve the delivery of services and thus lessen the solid waste problem. The main strength of EIs as policy instruments is the potency of incentives or disincentives in making polluters go beyond what is required by laws and regulations.

Clearly, therefore, the success of EIs is dependent on successfully implementing regulatory controls. For EIs to work effectively, the regulatory standards need to be clear and the compliance enforcement capacity adequate. In a given country, the harmonious balance between CACs and EIs depends on local conditions and preferences. In many developing countries, for example, where inspection and enforcement resources are limited, political interference may lead to inequitable compliance requirements. Even for modest standards of performance in such countries, therefore, EIs need to be designed accordingly.

1.2 Background to the report

This project on the *Selection, Design and Implementation of Economic Instruments in the Solid Waste Management Sector* was first conceived in March 2000 in response to UNEP’s call for project proposals from governments on two thematic areas: Trade liberalization and the environment; and Selection, design and implementation of economic instruments. This Country Report is the key product of the project. The aim of the report is to equip policymakers, planners and other stakeholders with the techniques and methodologies required to select, design and implement appropriate economic instruments in solid waste management. This is important because the appropriate EIs in a given country are determined by its socio-economic-political conditions.

The specific objectives of the report are to:

1. Build and strengthen human and institutional capacity in the assessment, design and implementation of economic instruments for solid waste management

2. Form linkages with other international efforts on the development and application of economic instruments (including links with UNEP, OECD, and countries with the relevant experience)
3. Institute a multi-stakeholder process involving public sector institutions, the private sector, universities, and the civil society, among others, to identify and implement economic instruments for waste management
4. Design an economic instruments-based policy package to manage a selected solid waste problem
5. Implement a proposed pilot project.

The magnitude and nuisance of the solid waste management problem in Nairobi motivated this project's choice. Like many developing country cities, Nairobi's solid waste sector, which could be taken to generally represent the country's situation, is largely characterized by low coverage of solid waste management services, pollution from uncontrolled dumping of waste, inefficient public services, chaotic or unregulated private sector participation, and lack of key solid waste management infrastructure. In Nairobi, the capital city of Kenya of about 3 million people, only about 25 per cent of the estimated 1,500 tons of solid waste generated daily gets collected. Yet, until the mid 1970s the Nairobi City Council (NCC) singly collected over 90 per cent of the waste.

After significant deterioration in the services provided by the NCC, private companies and community-based organizations started providing waste collection services in the mid 1980s. There are now many actors involved in the service, operating in open competition and without any guidance, control, or partnership from or with the NCC. Even the small private companies and informal actors, who are the only providers of service to the urban poor, are harassed instead of being encouraged and facilitated. The consequence of all this has been a chaotic solid waste management sector.

The Government has now prioritised solid waste management highly over other environmental issues. The importance of this subsector has been identified in various policy and legislative documents in the last few years, including the National Environment Action Plan (NEAP) 1994, Policy Paper on Industrialization to the Year 2020 (1996), Sessional Paper No.6 of 1999 on Environment and Development, and Environmental Management and Coordination Act (1999). The importance of having a strategy on solid waste management was also given due attention in the Government's Financial Bills of 1994/95 and 1998/99. The Minister for Environment echoed this during his opening remarks at the National Stakeholders Workshop held on 15 February 2001, as part of this project. In cities like Mombasa, hotels are reportedly cancelling planned city tours for tourists because of heaps of uncollected and unsightly solid wastes in the city streets.¹

At the local level too, solid waste management has attracted a lot of attention. Many municipalities have instituted specific departments just to manage waste that is generated within their jurisdictions. The Nairobi City Council has established the Department of Environment whose main function is to manage solid waste generated within the city boundaries. This department draws a lot of the City budget when compared with the other nine departments of the council. For example, during the 1998/99 financial year, the Department of Environment consumed about 19.2 per cent of the council's total expenditures.

1.3 Project approach

The approach used in the project is broadly that of integrating international and local experiences through observations, views, suggestions and advice. The project was launched in July 2000 after a consultative process involving the then Kenya's National Environment Secretariat, which was the predecessor of the

¹ Reported in the Daily Nation, 13 December 2004.

current National Environment Management Authority (NEMA). A National Steering Committee (NSC) for the project was established, whose membership included:

- Ministry of Industry, Trade and Tourism
- Ministry of Finance and Planning
- Ministry of Environment and Natural Resources
- Nairobi City Council
- National Chamber of Commerce and Industry
- University of Nairobi
- The World Conservation Union (IUCN)
- Other co-opted stakeholders.

In addition, a country team was constituted in a transparent matter and it formulated a project inception report in readiness for the First National Stakeholders' meeting held on 28 November 2000 at the Kenya School of Monetary Studies and attended by 28 participants. The main objective of the meeting was to introduce the entire project to the main stakeholders in Kenya outlining its objectives, justification, implementation strategy, inputs and expected outputs. This was followed by a National Stakeholders' Workshop held on 15 February 2001 at the Kenyatta International Conference Centre, Nairobi. The workshop, which was attended by top policymakers in government, private sector representatives, national agencies and civil society organizations, had four main objectives:

1. institute a multi-stakeholder process to identify and implement economic instruments in the solid waste management sector
2. stimulate decision makers to take a proactive role in formulating country and sector specific economic instruments to help achieve sustainable development
3. strengthen human and institutional capacity in the assessment, selection, design and implementation of economic instruments in the solid waste management sector in Kenya, and
4. specify modalities for implementation.

As a way of enhancing capacity in the use of economic instruments, the project team leader participated in the Expert Working Group Meetings on Economic Instruments in Berlin and Geneva, organized by UNEP's Economics and Trade Branch (ETB, Geneva). Presentations and focused discussions took place in both meetings, along with exchanges of national experiences on the use of economic instruments in achieving environmental policy objectives.

Data collection

The methods used in the project to collect data included:

- Desk review of national and international publications and records
- Discussions on economic instruments at international meetings, symposia, seminars and workshops
- Group discussions in national workshops, round-table panels and peer review meetings
- Use of structured questionnaires and informal interviews to collect data from the industry
- Input from consultants at different stages of the project.

2. Use of economic instruments for solid waste management

As indicated in the introduction, when it comes to designing environmental policy, it is not simply a question of choosing either economic instruments (EIs) or command and control strategies (CACs) but adopting harmonious balance of both. This chapter takes the discussion further by systematically building the rationale for EIs and indicating the extent by which they have been applied in solid waste management.

2.1 Benefits of economic instruments

Generally, economic instruments introduce more flexibility, efficiency and cost-effectiveness into solid waste management measures. Furthermore, they can stimulate development of pollution control technology and expertise in the private sector; provide government with a source of revenue to support waste management programmes; and eliminate a government's requirements for larger amounts of detailed information needed to determine the feasible and appropriate level of control for each plant or product.

Specifically, in solid waste management, EIs can be used as a tool to:

- reduce the amount of waste generated
- reduce the proportion of hazardous waste in the waste generated
- segregate hazardous waste for special handling and disposal
- encourage recovery, reuse and recycling of wastes
- support cost-effective solid waste collection, transport, treatment and disposal systems
- minimize adverse environmental impacts related to solid waste collection, transport, treatment and disposal systems, and
- generate revenues to cover costs. (IDB, 2003)

Command and control strategy involves direct regulation along with monitoring and enforcement systems. It generally requires the government to formulate the waste standards, to specify schedules for meeting the standards, permitting and enforcement procedures for facilities, liability assignment, and penalties for non-compliance. The major advantage of the command and control approach is that the regulator has a reasonable degree of predictability about how much pollution levels will be reduced.

The definition of economic instruments varies in the literature. However, there appears to be some general consensus in the definition of an economic instrument as *a policy, tool or action which has the purpose of affecting the behaviour of economic agents by changing their financial incentives in order to improve the cost-effectiveness of environmental and natural resource management.*

Economic instruments have various uses in the environmental and natural resource management arena, and according to UNEP (2004), EIs have at least six benefits over CACs. Economic instruments:

1. Provide flexibility in the overall cost of reducing emissions

EIs ensure that the overall economy wide cost of meeting specific emission targets are reduced by allowing the market to determine how much pollution each specific firm can reduce. In this way they encourage firms whose emission reduction is less costly to abate more rather than forcing every firm to meet a specific emissions level.

2. Act as incentives for the use of innovative abatement technologies

Since firms can trade in emissions, and because emission reductions have financial value, firms have a continued incentive to invest in abatement technology innovation since extra reductions can be sold to others.

3. Allocate environmental and natural resources to parties who value them most

Properly structured EIs ensure fair allocation of environmental and natural resources and encourage their sustainable utilization while at the same time raising revenues for the government in the form of resource rents.

4. Guarantee self-enforcement by aligning public and private interests

EIs create decentralized and self-enforcement systems for environmental policies by creating an incentive for agents with vested interests to ensure the proper use of environmental and natural resources. Thus the burden of control is taken away from the state.

5. Increase transparency in resource use and allocation

Application of EIs in environmental and natural resource management is appealing in the sense of their openness as the costs and rights associated with many EIs are more visible through trading levels, prices, ownership patterns and fee receipts. This makes it easy to evaluate investment trade-offs and discourages practices such as lobbying for special privileges or exceptions.

6. Help in cost-recovery of publicly provided services

In the provision of publicly owned or delivered resources such as drinking water or oil, market pricing is applied in many markets. In others, their prices are set at levels that recover the full cost of providing them. The revenues can then not only be used to finance continued provision of these services but also in activities that encourage increased conservation.

Economic instruments are also discussed in terms of their ‘functional objectives’. According to UNEP (2004), EIs have four major functional objectives:

1. Establish, clarify or improve property rights

Property rights based EIs provide an incentive for owners of resources to invest in them and extract/harvest them sustainably. In other words, clear property rights add security and flexibility to the management of environmental and natural resources as they discourage “the tragedy of the commons” tendencies. It is worth noting that property rights need not be individualized, since even communal property rights can in some cases provide more secure tenure.

2. Ensure that resource users pay a fair price for what they consume

Environmental fees are charged to help clarify price signals and encourage efficient use of environmental and natural resources. Most of these fees first address the issue of recovering the cost of providing goods and services from the beneficiaries, as the most efficient solutions in an economic sense occur when fees are set to recover both the direct costs of goods and services plus the environmental costs associated with producing and using a particular product/service. However, political realities often eclipse this outcome.

3. Subsidize cleaner alternatives

Some EIs can be applied to change production or consumption behaviour to one that is more environmentally superior. Well-targeted and focused interventions, mostly in the form of subsidies, may be able to accelerate the development of these preferred alternatives.

4. Generate revenue

A number of EIs, for example permits, levies and taxes have immediate revenue generating implications to the government. This revenue can be potentially earmarked to help enforce, improve, and expand environmental and natural resource management.

2.2 Taxonomy of economic instruments for solid waste management

In order to ease the choice of economic instruments for specific solid waste management targets, a properly laid out menu is also important. Although the literature reveals a general agreement on key subcategories of economic instruments, there are still notable differences. We adopt the taxonomy of IDB (2003), which groups EIs into three main categories: revenue raising, revenue providing and non-revenue instruments.

Revenue raising instruments

These include the various kinds of user charges (levies or taxes) for the provision of collection, transportation and final disposal services. These are directed at “internalizing” the externalities associated with the production, transportation and disposal of wastes. The revenue raised from such charges may then be earmarked for solving the specific problem for which the charge was levied. There are many examples of charges and taxes that fall under the category of revenue raising economic instruments (see Box 1).

Box 1: Revenue raising instruments

- pollution charges, based on pollutant loading;
- waste generation charges, based on waste quantities and degree of waste hazard;
- waste user charges, based on collection and disposal services received;
- waste tipping charges, to unload at transfer or disposal facilities;
- product charges or fees to handle disposal of problem products, such as batteries, tyres and refrigerators;
- disposal taxes, added to disposal charges to influence disposal choices;
- pollution taxes, added to user charges to influence choices for pollution reduction;
- eco-taxes, added to non-renewable energy production or fuels to influence energy demand and fuel choices;
- presumptive taxes, based on presumed levels of pollution; and
- renewable resource taxes, on virgin materials to influence demand for their use and motivate recycling of secondary materials.

Under this category are also subsidies and subsidy removal schemes which are meant to compensate for the cost of solid waste collection, transportation and disposal. In as much as subsidies find vast applications, they are especially desirable in situations where polluters cannot be easily identified. On the other hand, subsidy removal is aimed at discouraging production and consumption behaviour that is harmful to the environment.

Revenue providing instruments

These include subsidies of different kinds that seek to directly reward desired behaviour (waste reduction, improved management, or recycling) rather than penalize the behaviour to be discouraged. Subsidies can be direct payments, reductions in taxes or other charges, preferential access to credit, or in-kind transfers like the provision of land or other resources. These instruments tend to reduce revenues available to the authorities. Examples of revenue providing economic instruments used in solid waste management are presented in Box 2 below.

Box 2: Revenue providing instruments

- tax credits and tax relief, allowances on property taxes, customs duties, or sales taxes to motivate investment in waste management improvements;
- charge reduction, based on proof of recycling or reuse in reducing wastes requiring collection or disposal;
- tax rebates, for pollution savings or energy efficiencies;
- environmental improvement funds, established to support pollution reduction, resource protection, energy efficiency;
- research grants, to stimulate technology development;
- carbon sequestration funds, to encourage purchase of lands that rejuvenate air quality, sometimes as a trade-off by polluters;
- host community compensation, incentives given by host communities to accommodate waste transfer or disposal facilities;
- development rights, long-term leases of land and development rights provided to private companies building waste treatment and disposal facilities, or to those finding remedy to and reclaiming old disposal sites.

Non-revenue instruments

These instruments, which include deposit-refund programmes, combine the incentive effects of charges (when a good is purchased and the deposit is made) and subsidies (when the good is returned or otherwise handled properly and the deposit is refunded) for the management of solid waste. Other incentive-creating policies can include property rights based instruments as well as legal-/information based instruments. Under this sub-category are found liability laws and performance bonds (which increase the financial cost of irresponsible waste handling or disposal); performance disclosure (in which information about the performance of a waste producer or handler affects its financial condition by affecting public standing); and general public education (to alter the demand for environmentally- improved waste management).

Creation or facilitation of markets is a measure relevant to all parts of the product and waste cycle. Policies to promote more competitive markets in waste management services, instead of the usual direct public administration of waste management, can alter the incentives for participation in the provision of the services; the incentives of the public to rely upon the services, and the fiscal condition of public authorities. Experience with tendering long-term contracts to private service providers illustrates this type of economic instrument. Specific examples of non-revenue economic instruments used in solid waste management are provided in Box 3.

2.3 Use of economic instruments for solid waste management in Kenya

Solid waste management in Kenya has largely relied on command and control strategies, an approach that has proved to be inefficient as evidenced by the mountains of uncollected or illegally dumped solid waste. The use of economic instruments for solid waste management is not well established although some

Box 3: Non-revenue economic instruments

- Product life cycle assessment, which predicts overall environmental burden of products and can be used in certification programmes;
- Deposit-refund, deposit paid and refund given upon product return for reuse;
- Take-back systems, where manufacturers take back used products or packaging; Procurement preferences, evaluation criteria adding points for products with recycled content or reduced resource demand;
- Eco-labelling, which notes product's recyclable content and whether product is recyclable;
- Recycled content requirements, laws and procurement specifications noting the precise recycled content required;
- Product stewardship, which encourages product designs that reduce pollution, include the full cost of solid waste recycling and disposal, reduce wastes and encourage recycling;
- Disclosure requirement, in which waste generators are required to disclose their pollution;
- Manifest systems, precise cradle-to-grave tracking of hazardous wastes;
- Blacklists of polluters, published lists enable consumers to consider whether to buy from polluting companies;
- Liability insurance, liability assurances by contractors and private operators;
- Bonds and sureties, guarantees for performance by contractors and private operators;
- Performance-based management contracting where oversight contractors commit to overall service improvements; and
- Clean City competitions which reward neighbourhoods and cities that have improved cleanliness.

instruments are used to a limited extent. These include user charges; financial instruments – subsidies and licences; fiscal instruments – imports duty waiver; deposit-refund systems; property rights; institutional reforms and regulations. In addition, although the private sector has been participating in the service of waste collection, transportation and disposal without any policy or legal/regulatory provisions, the Environmental Management and Co-ordination Act of 1999 (EMCA, 1999) and policy development efforts by the Nairobi City Council (NCC) promise to make privatization a leading economic instrument for the management of solid wastes in the country. Part V Section 57, sub-section I of EMCA (1999) provides for “taxes and other fiscal incentives, disincentives or fees to induce or promote the proper management of the environment and natural resources or the prevention or abatement of environmental degradation”. This is elaborated in subsection 2 that states that, “without prejudice to the generality of sub-section (1) the taxes and fiscal incentives, disincentives or fees may include:

- a) Customs and excise waiver in respect of imported capital goods, which prevent or substantially reduce environmental degradation caused by an undertaking.
- b) Tax rebates to industries or other establishments that invest in plants, equipment and machinery for pollution control, re-cycling of wastes, water harvesting and conservation, prevention of floods and for using other energy resources as substitutes for hydrocarbons;
- c) Tax disincentives to deter bad environment behaviour that leads to depletion of environmental resources or that cause pollution;
- d) User fees to ensure that those who use environmental resources pay proper value for the utilization of such resources.”

EMCA (1999) has, however, not been fully operationalized and some of these economic instruments have not been applied. Notably, though, the National Environmental Management Authority (NEMA) is spearheading efforts to operationalize the application of economic instruments.

In the remainder of this section, economic instruments that have been used in the management of solid wastes in the country are briefly reviewed, where possible highlighting the experience.

Revenue raising instruments

User charges

This is a commonly used instrument, which requires the waste generator to pay for the collection, transportation and disposal of the waste. It is a system used by both the City Council and private waste collectors. Table 1 illustrates some of the tariffs charged by Nairobi City Council for refuse collection. Two issues are worth noting from the table. First, the charges are not based on weight or volume of waste. Second, the levels of rates of tariffs enforced are way below the approved ones. All households that pay for water services also pay Kshs 40 a month for dustbin hire (waste storage facility and also its collection), whether or not they actually get the bin or the service.

Table 1: NCC SWM Tariffs, October 1997

Charges	Volume	Approved Tariff	Enforced Tariff	Typical use
Dustbin	70 litres			
Hire		Kshs 40/month	Kshs 20/month	
Refuse removal		Kshs 420/month	Kshs 15/month	
Standard Container	1 M ³			Commercial centre, small industries
Hire		Kshs 1,680/month	Kshs 200/month	
Refuse removal		Kshs 2,240/month	Kshs 200/month	
Bulk Container	9-11 M ³			Factories, markets, hospitals
Hire (max 4 load)		Kshs 5,600/month	Kshs 600/month	
Excess load		Kshs 2,800/load	Kshs 500/month	
Tipping charges				
Pickup		Kshs 140/load	Kshs 30/load	
Lorry		Kshs 280/load	Kshs 30/load	

Source: JICA (1998).

The private waste collectors charge a fee ranging between Kshs 200-600 per month per household, to collect the waste twice a week. The firms provide polythene bags free of charge to the households to store the waste. The private waste collectors who serve the commercial/industrial sector provide a bulk container at a fee of Kshs 2000 per big container per collection, and Kshs 250 per 200 litre drum and 70-litre polythene bag per collection respectively.

The main advantage of the user charge is that collection of revenue is relatively easy and cost effective for the council since the collection charges are tucked in the water bills. For the private waste collectors, the collection is made easy by the willingness to pay by the consumers, (households, commercial and industrial enterprises).

There are many disadvantages too, however, with the way the user charge is currently designed. These include:

- Being a standard charge, it does not target the amount and pollution content of waste generated.
- It does not encourage recycling because it has no provision for segregation of waste at source.
- Private sector waste collectors encourage the principle of exclusion because they target only those who are willing and have the ability to pay. They therefore target high and medium income estates. Even in these areas, there are still some people who cannot pay, which reduces the system's effectiveness.

- There is also double payment for those served by the private sector waste collectors because the City Council has not adjusted the water billing system.
- Lack of adequate enforcement capacity has led to the situation where waste generators and private waste collecting companies dump waste in illegal dumps.
- Cost-revenue estimates by JICA (1998) show that, for both the Nairobi City Council and private waste collectors, operational costs are much higher than the benefits (excluding social and environmental benefits). In other words, the economic instruments used (such as fees for dustbins, tipping fees, and license fees) do not meet the principle of full-cost pricing and charging for environmental degradation in the management of wastes.

Revenue providing instruments

Licences and import waiver

These instruments are not widely applied in the management of solid waste in the country. However, two types of these instruments, licenses and import duty waiver, are used. The private sector waste collectors register and pay a fee for a license, Kshs 10,000 annually, to enable them to operate their business in Nairobi. Duties for importation of pollution abatement machinery (which includes waste collection tippers, and treatment, recycling, and waste minimization machinery) were waived in the Finance Act of 1994/95. Some of the private SWM firms do not seem to be aware of this waiver, however.

Non-revenue instruments

Deposit-refund system

A deposit refund system has been applied in the beverages industry. Consumers pay deposits for reusable glass bottles, which are refunded upon return of the bottles. This deposit ranges between Kshs.10 and 25 for soft drink and beer bottles, respectively. The deposit refund system has been popular not only in Nairobi but also through out Kenya because of its ease of administration, which involves collaboration with wholesalers, retailers and consumers.

Privatization

The private sector has entered the solid waste management sector largely in response to demand for improved services. With the exception of instances where the NCC has contracted a private company to offer waste collection, transportation and disposal in Nairobi's Central Business District, private participation occurs in an unregulated, unstructured, and informal manner. As an economic instrument, therefore, it is more accurate to conclude that privatization has only been minimally used in solid waste management.

2.4 Some case studies from around the world

Other experiences in SWM using various policy instruments can be obtained from ISWA and UNEP (2002).² Lessons from these and other Latin American case studies are discussed in the following section.

² The document can be downloaded from http://www.uneptie.org/outreach/wssd/docs/sectors/final/waste_management.pdf.

Box 4: Human and solid waste management in Urban Africa: A case study of Accra, Gaborone and Harare

A variety of user charges are being (or have been used) in three cities; Accra, Gaborone and Harare. These charges include monthly solid waste charges, pay-as-you dump fees or a collection charge as part of a monthly service fee (for low income groups in Gaborone) or annual municipal rates (for house owners in Gaborone and Harare). For commercial waste, public containers are used and collected at a charge. With respect to human waste, the economic instruments that have been used include a connection fee for sewage systems and a monthly charge (Accra).

These instruments are being used in conjunction with some associated instruments: (i) Legislative ordinances and a ban on pit latrines (CAC), (ii) Institutional reforms, and (iii) Subsidies. In Accra the management of public toilets was successfully decentralized to the local level. In Accra and Gaborone, solid waste was partly privatized. The results were positive, and the collection became cheaper. The first stage of human waste collection from pan latrines, that is bringing it to collection depots, from where waste management department collected containers at US\$15/container, was privatized in Accra. Most charges are only meant to cover operational costs and as such capital costs are implicitly subsidized through cross-subsidization from high to low-income groups and government subsidies.

The implementation of some economic instruments was discontinued as they failed to work as expected. These include the collection fees for solid waste and the pay-as-you dump charge in Accra. Three design problems arose. First, it proved difficult to identify which collection system would be most suited for the particular socio-economic condition(s). For example, the people may consider sewerage systems too expensive and connections to the system may only increase if they are made compulsory (as in Accra). The risk of free riding is high. The second problem was how to cover both capital and operational costs since most schemes suffer from maintenance problems and the necessary recurrent expenditures are not properly planned or can no longer be afforded. A third problem was how to link the level of charges to the amount of waste generated. As they stand, charges are not likely to reduce the amount of waste but primarily contribute to the financing of the schemes. These problems appear to revolve around maintenance, participation and revenue collection. The administrative costs of modest fees are very high, and authorities may find it difficult to implement an efficient revenue collection system. If given a choice, households may opt not to link up with the sewerage system, necessitating an intervention by legal institutions.

Source: Arntzen and Fidzani, 2000

Box 5: Economic instruments for solid waste management in Latin America

In Latin America, some economic instruments are widely and significantly used, while for others only some isolated experiences are known.

User charge

A frequently used instrument is user charges for the collection, transferal and disposal of solid wastes. At least in countries like Bolivia, Brazil, Chile, Colombia, Ecuador, Jamaica, Mexico and Venezuela there is experience with this instrument. For residential wastes, however, it is usual for these charges to be fixed and payable periodically, unrelated to the volume, weight or type of waste being disposed of. In this case, the economic instrument is being directed exclusively to the achievement of cost recovery and not towards the reduction of generated wastes. For example, in the urban municipalities of Greater Santiago, where this instrument has been used for many years and is considered a success, recovery is about 55 per cent of service cost. The essential problem is that it is not possible to exclude from service those who do not pay, which makes it impossible to recover the total cost. The use of charges through territorial taxes has the inconvenience that collection costs are high, as they usually involve the use of legal mechanisms and, therefore, have a high non-payment rate.

A simple and cheap method for increasing recovery is to add this charge to the bill of some other utility. In Colombia, this unified utility bill is the usual practice in many cities, and it has recently also been used in Guayaquil, Ecuador, and La Paz, Bolivia, where it is applied as a surcharge on the electricity bill. This policy allows a higher level of recovery, and some degree of progressiveness (higher income families consume more electricity and therefore pay more for solid waste services), even though it generates a distortion in the electricity market, without increasing efficiency in the solid waste market.

It seems that there are no experiences in Latin America of residential user charges based on volume, weight or type of waste. Even though the necessary technologies exist, the general understanding is that the controls needed for an effective application of this type of charge, and to avoid fraud or abuse, substantially exceed the institutional capacity of local governments. However, it is possible to highlight the cases of Chile, Colombia and the city of Rio de Janeiro where non-residential user charges are directly related to the weight of the wastes being collected. In Santiago, Chile, for example, these users freely agree on the service conditions with the many existing private collection companies. Under this concept, users internalize at least the private costs of providing the service in their marginal consumption and production decisions, achieving a more efficient social solution.

It is important to note that user charges should ideally distinguish among the costs related to providing the service in each and every one of the stages involved, i.e., collection, transport, transfer, and final disposal. In this manner, a final user might opt, for example, to employ his own means to transport his wastes to a final disposal site, which would charge a fee related to that stage of the service. Differentiated charges by stage exist in countries such as Ecuador, Colombia, Venezuela and Chile.

Deposit-refund system

Another instrument extensively used in the region is the deposit and refund system for recyclable wastes. In countries such as Barbados, Brazil, Bolivia, Chile, Colombia, Ecuador, Jamaica, Mexico and Venezuela these systems exist for products like paper and cardboard, glass bottles, aluminum cans and tyres. Under this system a consumer, when buying an affected good, pays an amount that is reimbursed when the consumer returns the recyclable waste. An interesting characteristic of this activity is that in most countries it is voluntary, based on the interest that many producers have in reusing the recyclable materials. Mexico is the only known exception to this rule, as used car batteries must be returned to acquire new ones. Recycling process and markets for plastic soft drink bottles (made of recyclable material) is thriving in Brazil where over 30 per cent of these bottles are recycled.

Privatization and other institutional reforms

Some municipalities have taken interesting initiatives to organize this process. In many cases in Brazil and Chile, they have organized and "formalized" waste collectors, so that they contribute in a better way to the collection and separation of recyclables, mitigating the social problem associated with these collectors.

Involvement of the private sector in the service of collection, transferal and disposal of wastes is widespread in Latin America. The rationale for this involvement has been the low level of observed coverage, the high inefficiency of municipal operators, the lack of financial resources and the extensive occurrence of illegal dumping.

To date, private operators under direct contract service 40 per cent to 50 per cent of cities in Latin America. Studies indicate that there have been important cost reductions (50 per cent in 5 cities studied) due to larger labour and vehicle productivity. Contract duration is about 5 to 8 years, with periodic re-bidding so that there is competition for the market. Lessons learned from this privatization process include: there is need to develop an overall framework for private sector participation; there have been some justified increases in costs; cost recovery continues to be a problem; municipal labour issues need to be resolved before privatization; municipal institutions for contract regulation need to be strengthened; and improvement of contract characteristics is needed (well defined standards, payment against results and regular monitoring).

Source: IDB, 2003

Box 6: Deposit-refund system in Korea

Korea uses an extensive waste disposal deposit-refund system which covers food, beverages, liquor bottles and containers, batteries, tyres, lubricating oil, electric home appliances (and any other item that generates toxic waste), bulky or heavy commodities that require treatment, non-degradable materials and harmful household commodities that should not be mixed with the general waste stream. The manufacturer is required to deposit a certain amount for each unit sold, refundable upon collection and treatment.

Source: Panayotou, 1998

Lessons learned from case studies

From several Latin American case studies, IDB (2003) has identified a number of key factors for the successful implementation of economic instruments in the solid waste management sector. These provide important lessons for the development of an appropriate policy package to address plastic shopping bag waste in Nairobi, the task of Chapter 5. First, a policy on the development and use of economic instruments and empowerment of government staff to seek opportunities for implementing new economic instruments are critical. National policy guidelines on cost recovery measures, moreover, reduce political risk for local officials. Second, building on what already exists (through review and improvement) should be the priority.

Third, learning by doing is the way forward since many instruments will not be perfectly designed. "An imperfectly designed instrument does not, in general, create any long-term problems. Where the instrument is flawed, it is likely that public reaction, as well as the reaction of industry, will soon let government know that the instrument needs to be amended. And so, imperfection is certainly more tolerable in the process of implementation than no action" (IDB, 2003: 29).

Fourth, there is need to establish a national commission to study and implement economic instruments. The commission should include diverse professionals including economists, engineers, lawyers, and

environmental scientists (from ministries responsible for environment, land, finance, and others, and from the private sector) and should apply multi-disciplinary approaches to carry out the economic analysis and environmental assessment of each economic instrument option before choice is made. The commission will, in addition, provide a focal point for development and technical assistance.

Fifth, in principle, user charges can encourage waste minimization and proper waste management throughout the product and waste cycle. However, the charges should be directly related to the volume, weight and type of waste, and that they need to be collectable. Inclusion of these charges in other public service bills has significantly improved collection.

Sixth, the use of taxes at the disposal stage to internalize the air, water and soil pollution effects of disposal has great potential but this requires that the municipalities have sufficient financial strength (which can be improved via better management of user charges) and stringent control of illegal dumping.

Seventh, revenue providing economic instruments such as tax credits, low-interest credit lines, accelerated depreciation, and relief from custom duties can provide financial incentives for the private sector to invest in production changes that reduce hazardous substances, increase recyclability, generate less waste, and to participate in solid waste service delivery, including resource recovery. But these instruments must be carefully evaluated against revenue scarcity, and low efficiency in targeting. Where applicable, charges and market strengthening activities have advantages. Non-revenue instruments that strengthen liability for damage to the environment or public health could also be useful assuming the legal system is adequate.

Eighth, instruments that target areas of significant pollution loading and environmental consequences should receive priority.

Other design considerations identified by IDB (2003) include:

- Instruments that focus on long-term behaviour modification should be implemented.
- New instruments should be introduced in steps, gradually.
- Instruments should be in tune with broader economic development objectives in terms of use of labour, energy and capital.
- Consideration should be given to how revenues from economic instruments will be used.

3. Overview of solid waste management in Kenya

There is not much literature on the Kenyan solid waste management (SWM) sector with the exception of Nairobi. Even for Nairobi, the available literature dwells largely on performance description and its causes, household waste generation behaviour, and waste characteristics.³ This section borrows liberally from one of these studies, Ikiara *et al.* (2004). While poor management of solid waste is a general problem in Kenya, it is probably worst in Nairobi. Because of the lack of consistent data in other parts of the country, the remainder of this section will be based on Nairobi data.

3.1 Extent and nature of the problem

Solid wastes in Nairobi are a by-product of a broad spectrum of industrial, service and manufacturing processes. Primary high-volume generators of industrial solid wastes include the chemical, petroleum, metals, wood, paper, leather, textile and transportation industries. Secondary smaller generators include auto and equipment repair shops, electroplaters, construction firms, dry cleaners and pesticide applicators. Figure 1 shows the relative proportions in which various types of solid wastes are generated in Nairobi. Mismanagement of these wastes typically results in pollution of the natural environment and may pose substantial danger to public health and welfare.

With respect to manufacturing industries, the bulk of solid wastes are generated from:

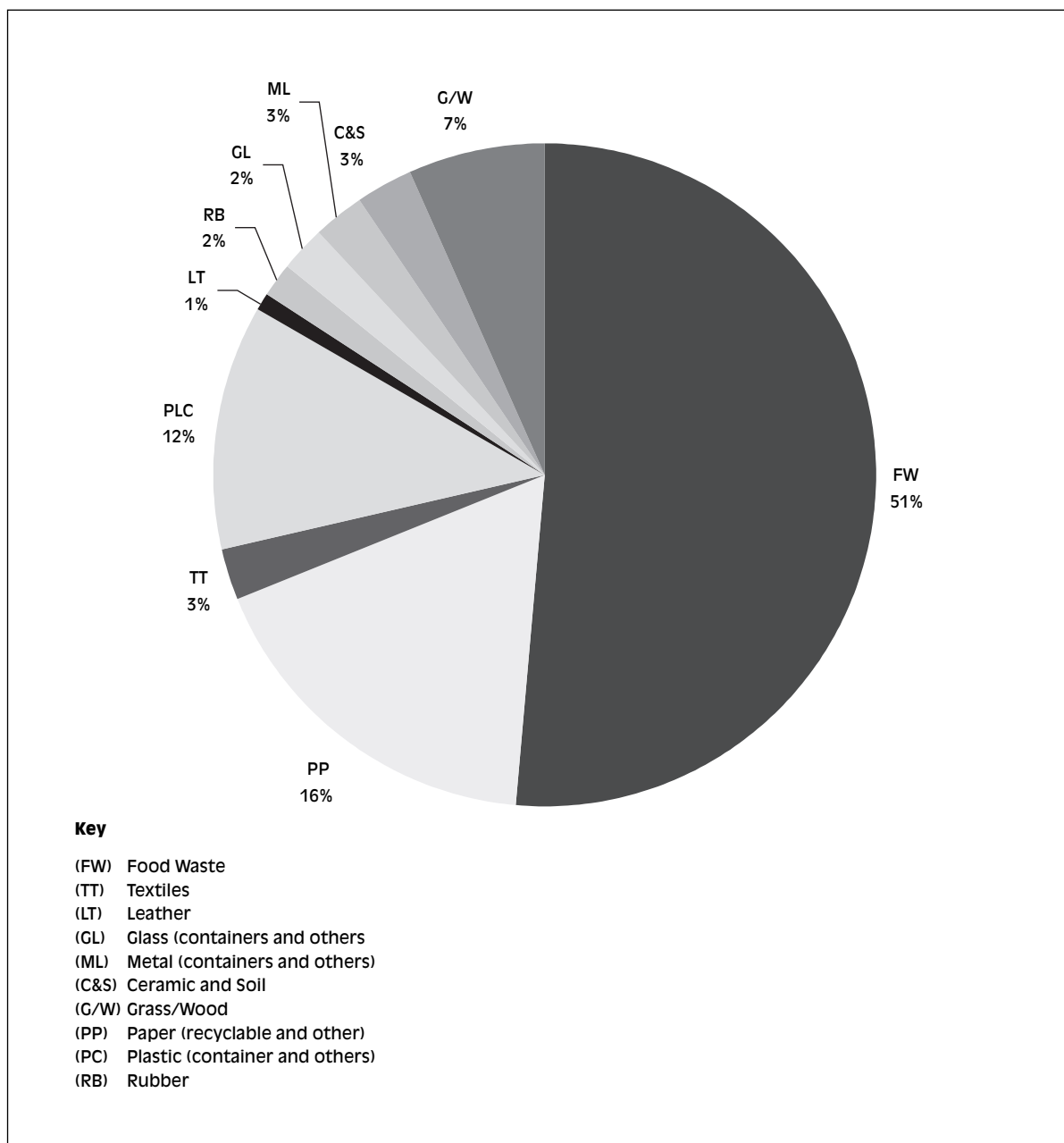
- Pesticide repackaging, formulation and distribution
- Pharmaceuticals, where there are over 30 manufacturing companies
- Plastics industry, where there are about 100 producing thermo setting, flimsy packaging
- Soap, Perfumes, Cosmetics, Toiletry, Cement and Lime
- Ceramics, glass and petroleum.

Industrial wastes constitute about 23 per cent of the total solid wastes generated in the city. The collection and disposal of industrial waste in Nairobi is done by industries themselves. Though its disposal is done at a Municipal dumpsite, the industries have the responsibility to collect and dispose the waste at the designated dumping site.

Only about 25 per cent of the estimated 1,500 tons of solid waste generated daily in Nairobi gets collected. Yet, until the mid 1970s the Nairobi City Council singly collected over 90 per cent of the waste. In the mid 1980s, the appalling NCC performance and demand for municipal solid waste management services

³ Some of this literature includes NCC (2001), Esho (1997), Gatheru and Shaw (eds., 1998), Moyo (1998), JICA (1998), Mulei and Bokea (eds., 1998), Kwach and Antoine (2000), Ikiara *et al.* (2004), Karanja *et al.* (2004) and Davies *et al.* (2004).

Figure 1: Types of solid wastes generated in Nairobi



Source: JICA (1998).

attracted private sector providers. It is now estimated that there are at least 60 private companies engaged in solid waste collection services in the city (JICA, 1998).

The extent and nature of the solid waste management problem can be summarized as follows. First, the collection ratio, that is, the proportion of the solid waste generated that is collected, is low. As mentioned, this is estimated to be as low as 25 per cent. Second, marked inequality in the geographical service distribution characterizes the service. Broadly, the Western part of the city is well serviced by the private firms and the NCC while the Eastern part is hardly serviced. High-income and some middle-income residential areas together with commercial areas are well serviced by private companies and even the NCC. Small private firms are increasingly servicing some of the relatively better-off low-income areas.

The core low-income areas (slums and other unplanned settlements) where 55-60 per cent of Nairobi residents live, however, receive no waste collection service, save for localized interventions by community-based organizations (CBOs). The 1998 JICA study found 26 per cent of households in high-income areas, 16 per cent of those in middle-income areas, 75 per cent of those in low-income areas, and 74 per cent of the surrounding area do not receive any service. Not surprisingly, thus, residents in low-income areas are dissatisfied with waste collection services, are aware of the health risks associated with the problem, and are willing to pay for improved services in spite of their low incomes (Table 2).

Table 2: Relative perceptions of waste collection service in Nairobi, 1998

Item	High Income Area	Medium Income Area	Low Income Area	Surrounding Areas
Existence of waste collection service	Yes: 74% No: 26%	Yes: 84% No: 16%	Yes: 25% No: 75%	Yes: 26% No: 74%
Collection by:				
– NCC	27%	83%	64%	–
– Private company	73%	17%	36%	–
Satisfaction with the waste collection service	Yes: 76% No: 24%	Yes: 78% No: 22%	Yes: 39% No: 61%	– –
Awareness of health risks from solid waste	Yes: 31% No: 69%	Yes: 89% No: 11%	Yes: 86% No: 14%	Yes: 69% No: 31%
Willingness to pay for improved services	Yes: 76% No: 47%	Yes: 59% No: 41%	Yes: 58% No: 42%	Yes: 67% No: 33%

Source: JICA (1998).

Third, there is widespread indiscriminate dumping in illegal dumpsites and waste pickers litter the city with unusable waste materials without control. Fourth, there is only one official dumpsite (NCC-owned and operated), which is full and located in a densely populated part of the city, a whole 7.5km from the central business district along a road with heavy traffic. Moreover, waste pickers and dealers ‘control’ this dumpsite, forcing the NCC and private companies to ‘bribe’ to access the dump.⁴ Fifth and related to fourth above, the city has no transfer facilities.

As a result of these disposal problems, almost all enterprises tend to use uncontrolled and unhygienic landfills as the predominant mode of disposal. To cut costs, many generators of solid wastes have now taken to combustion at the site, which causes air pollution problems. The bulk of these wastes contain plastics, which when burnt generate carcinogenic vinyl chloride monomers and dioxins. The generators and private waste collection firms, again to avoid costs, dump in illegal places since an effective monitoring system lacks.

A survey conducted on the residents around the dumping site during the JICA study (1998) revealed that there are serious complaints about smoke, smell, and broken glasses. Respiratory and stomach problems among children are common in the nearby clinics and were cited by the people interviewed. School children passing through the dumpsite often picked objects, which were dangerous to their health.

⁴ Through gangster-like waste dealership cartels.

Sixth, solid wastes in the city are not segregated, with the exception of unstructured reuse of some waste materials at the household level. The private sector waste collectors, in addition, do not process waste in any way, which affects effective and efficient SWM. Consequently, the Dandora dumpsite is littered with all types of wastes from hospital wastes, manufacturing/industry wastes, paper and biodegradable materials.

3.2 Principal actors

The NCC and private commercial companies are the principal providers of SWM services in Nairobi. A small number of other actors, including some industries and bulk generators, however, store and transport waste to the dumpsite by themselves. Surveys show that private companies and personal initiative are very important in the city's waste collection sector and that many households are not served (Table 3).

Table 3: Relative importance of SW collection agencies in Nairobi

Solid Waste Collection Agency	Activity area (Clients served)				
	Residential	Institutions	Industrial	Commercial	
Nairobi City Council	1 (1%)	4 (21%)	–	3 (16.7%)	4 (3%)
Private Companies	57 (73%)	6 (32%)	10 (50%)	3 (16.7%)	58 (45%)
CBOs	5 (6%)	–	–	–	5 (4%)
Personal Initiative	15 (19%)	9 (47%)	10 (50%)	12 (66%)	61 (48%)*
Total	78 (100%)	19 (100%)	20 (100%)	18 (100%)	128 (100%)

* The figure refers to those households that indicated that they did not have any collector.

Source: Ikiara *et al.* (2004).

In 1998, the NCC accounted for 22 per cent of the solid waste collected in the city per day while a private firm contracted by the NCC to offer SWM services in the central business district (CBD) accounted for 46 per cent and the other private companies the balance.

Private companies serve 45-73 per cent of the households, 32 per cent of the institutions, 50 per cent of the industries and 16.7 per cent of the commercial enterprises (Table 3). About 81 per cent of the households served by private companies live in the high and middle-income areas (largely the western part) of the city. The majority of the private companies are either small family ventures or a hybrid between a community based organization (CBO) and a private firm. However, there are about 10 fairly large firms.

Even the NCC, which has the social responsibility of providing SWM services to all citizens, concentrates its efforts on residential areas and institutions that can afford private service at the expense of areas inhabited by the poor.

Other actors: CBOs, RAs, farmers, informal agents

With NCC's appalling performance and the failure of private service to extend into low-income and unplanned settlement areas, community-based initiatives in waste collection, transport, storage, trading and recycling started to emerge in 1992. There are now a number of community based organizations (CBOs), including charitable organizations, ethnic associations, welfare societies, village committees, self-help groups, and residential (or neighbourhood) associations (RAs). The majority of the CBOs are

engaged in waste composting although the main activity of about 44 per cent of them is neighbourhood cleaning (Ikiara *et al.*, 2004). One-third of CBOs are involved in waste picking. Despite individual and localized performances, the community in general plays a small waste management role.

NGOs and international organizations support CBOs through training, marketing and provision of tools and equipment, among other ways. About 55.6 per cent of the CBOs report having been sponsored or facilitated by local and international NGOs and such United Nations agencies like the UNFPA and UNCHS (HABITAT) (Ikiara *et al.*, 2004). Important NGOs include Foundation for Sustainable Development in Africa (FSDA), Uvumbuzi Club and Undugu Society of Kenya. Other institutions offering assistance to CBOs in Nairobi include the National Council of Churches of Kenya (NCCCK), the private sector, Norwegian aid institutions, and the Japan International Cooperation Agency (JICA). Donor agencies play a direct role and also an indirect one, by funding the NGOs that assist CBOs (King, 1996).

Neighbourhood or residential associations (RAs) have emerged in many middle and high-income residential areas to organize provision of failed public infrastructure services. It is estimated that there are over 200 registered RAs in the city, engaged in improvement of security, roads, and cleanliness. They are putting the NCC on its toes and contracting, organizing, and monitoring private SW collection service. The pioneering RA, Karen and Langata District Association (KARENGATA), for example, obtained a court order stopping the NCC from collecting service charge without improving service quality. This has emboldened similar associations enormously.

Like KARENGATA, the Nairobi Central Business District Association (NCBDA) has emerged as a highly organized, resourceful, and influential group, made up of private businesses operating within the central business district. The association advocates for election of effective leaders in the city's management and participation of stakeholders in the city's governance. Through a memorandum of understanding with the NCC, NCBDA has not only donated garbage storage bins for use in the CBD but also engaged in policing (security) and road and public toilet rehabilitation projects. There is now visible improvement in security (NCBDA has provided patrol vehicles and police kiosks) and in availability and cleanliness of public toilets, not to mention the storage of solid waste in the CBD.

RAs in Nairobi have formed two umbrella associations 'We Can Do It' and Kenya Alliance of Residential Associations (KARA), which lobby for improved services, facilitate formation of new RAs, and provide technical assistance to potential RAs.

Farmers are also becoming important actors in Nairobi's SWM sector. The increasing number of urban and peri-urban farmers collect poultry waste, green vegetable waste, and cow dung as well as food waste from hotels, markets and other institutions, and transport it to use either as animal feed or as organic fertilizer. The actual amount of waste removed from the municipal waste stream through this route is not known.

Many informal agents (waste pickers, traders and dealers, itinerant buyers, informal dump service providers and informal recycling enterprises) are also involved in Nairobi's SWM sector, albeit as a secondary activity (Ikiara *et al.*, 2004). These actors are involved in all SWM domains, including waste collection, separation, storage, reuse, recovery, recycling, trading, transport, disposal, and littering. They reduce the waste that has to be disposed, more significantly, in non-serviced areas inhabited by the urban poor. Like urban farmers, the actual contribution of these informal actors to SWM in the city and other parts of the country is not known.

Public-private partnerships

Partnerships between local authorities and other agents (the private sector, NGOs and communities), to facilitate sharing of SWM responsibilities and financial burden, are only beginning to emerge in Nairobi

(Ikiara *et al.*, 2004). There are hardly any deliberate and active processes of collaborative action between stakeholders and relationships are largely informal. Effective coordination among the numerous actors in the city's SWM sector is absent. Private garbage collection firms largely operate in an environment of open competition, with little or no cooperation from the municipal authority. Even the waste management activities of these firms are not geared in any way towards waste recycling, reuse or minimization. Due to limited public awareness and negative perception of informal actors, there is in fact little public support for source separation of waste, and waste recycling, reuse, and minimization. Support for partnerships is increasing, however, even within NCC, as is evident, for instance, in the city council's policy on private sector involvement (NCC, 2001).

The only formal public-private partnership in the city's SWM sector to date was the pilot one-year service contract awarded in 1997 to one of the private companies, the Kenya Refuse Handlers Limited (KRH), by the NCC.⁵ The contract involved daily sweeping of streets, roads, lanes, pavements and markets in the city's Central Business District (CBD), SW collection and transportation from the same area, and disposal of the waste at the Dandora dumpsite, at an agreed monthly rate of Kshs 1,312,500 (US\$ 20,275). The private company did very well initially and the CBD became noticeably clean. Payment problems led to poor performance, however, particularly due to sit-ins by unpaid workers. The contract, which ended in 1999, had been financed from NCC's general taxation, as revenue from waste charges was inadequate (JICA, 1998). The contract was renewed in 2000 but without clear indications that the problems that led to the failure of the first contract had been fully addressed.⁶

The NCC also has some informal relationships with CBOs, aimed at helping people living in slums and other unplanned settlements, and promotion of composting activities and environmental clean-ups.

Use of economic instruments

From the overview presented in Chapter 2, we have seen that only a few economic instruments are used in Kenya's current waste management practice, and even these are not used effectively. The instruments that have been used in a limited manner include user charges, financial instruments (fees, licenses), fiscal instruments, import duty waivers, deposit refund system, and property rights including institutional reforms. Flaws with the application of the instruments in the country include low rates devoid of incentive and that do not change in tandem with the cost of service or the damage caused by wastes, use of uniform or flat rates, and tipping charges based on loads rather than weight and blind to the differences in how dangerous wastes are. The low use and poor design of economic instruments in the country's solid waste management sector represents a missed opportunity considering the huge potential of these instruments.

3.3 Explaining poor performance

The poor SWM performance in Nairobi is attributable to many factors. Expansion of urban, agricultural and industrial activities has generated vast amounts of solid and liquid wastes that pollute the environment and destroy resources. Pollution problems are mainly due to lack of appropriate planning, inadequate political will and governance, poor technology, weak enforcement of existing legislation, as well as the absence of economic and fiscal incentives to promote good practice, and lack of analytical data concerning volumes and compositions of waste substances is also lacking. Some of these factors are briefly discussed below.

⁵ With the exception of the 1996 privatization experiment and the memorandum of understanding between the NCC and the NCBDA.

⁶ The contract has not been revived again. However, the NCC hires garbage collection and transport equipment from the private companies. There are plans to invite international bids from private companies to offer solid waste management services in the city.

Weaknesses in NCC

Administration of Nairobi is chaotic, with the NCC and the Central Government (particularly the Ministry of Local Government and the Provincial Administration in the Office of the President) often clashing, duplicating roles, and causing confusion. Moreover, policymakers (NCC councillors) are generally poorly educated and lack any power to discipline NCC workers. The mayor, who is elected by the councillors, must facilitate their corrupt deals to keep the seat. Consequently, mismanagement, corruption, laziness, and general chaos have become the hallmarks of the NCC. NCC by-laws, prohibiting illegal disposal of waste, specifying storage and collection responsibilities for SW generators, and indicating the Council's right to collect SWM charges are not adequately implemented. The Central Government has also failed to play its oversight role effectively.

This dysfunctional local administrative system has led to decline in the efficiency of NCC operations; unprecedented deterioration of physical infrastructure; lack of such critical facilities as transfer facilities; widespread indiscriminate waste dumping; lack of system-wide coordination and regulation of actors; absence of strong and effective partnerships between the NCC and other SWM actors; lack of policy and support for waste reuse and recycling; urban agriculture and community involvement in SWM; and prevalence of casual littering due to lack of public education and non-enforcement of NCC bylaws (Ikiara *et al.*, 2004).

Rapid population growth and urbanization

Nairobi, like other developing world cities, is characterized by rapid population growth and urbanization. The city has a population of about 3 million people who are generating substantial amounts of solid waste. In addition, the city is surrounded by 4 satellite towns that are also fast growing and do not have waste disposal facilities. The Nairobi City Council budgets enormous amounts of funds on recurrent and development expenditures on solid waste management but the problem still persists.

Lack of SWM policy and framework

Solid waste management problems in Nairobi are largely a result of lack of a waste management policy and framework that would aim at improving the standards, efficiency and coverage of waste from “cradle-to-grave”.

Before enactment of the Environmental Management and Coordination Act (1999), local authorities had monopoly control over sanitation and solid waste management services in Kenya, largely under the Local Government Act (CAP 265) and Public Health Act (CAP 242).⁷ The former empowers LAs to establish and maintain MSW management services while the latter requires them to provide the services. The Acts, however, neither set standards for the service nor require waste reduction or recycling. In addition, the Acts do not classify waste into municipal, industrial and hazardous types or allocate responsibility over each type.

The community and CBOs play only a small role in SWM because they are not integrated into the formal system. Policies on community-based SWM service, in addition, have been lacking although the situation is changing. Current policy, for instance, emphasizes development of environmental partnerships with stakeholders, including promotion of environmental NGOs and CBOs (Republic of Kenya, 2000).

⁷ There are many other laws, but of marginal relevance.

Considerable progress has been made with respect to the policy and legal/regulatory framework for SWM over the last few years, however. Thus, EMCA (1999) allocates considerable property rights as far as various aspects of environmental management are concerned. The most important of these is the right to a clean environment allocated to the citizens. The citizens can now compel polluters, including indiscriminate solid waste dumpers, to pay for the damage or nuisance caused. In reality, however, the cost of litigation (both in term of finances and time) makes it difficult for most of the citizens to exercise this right.

Other important rights are those allocated to NEMA, for example, with respect to licensing (through lead agencies such as local authorities) of waste disposal facilities. Institutional weaknesses in NEMA and the lead agencies also affect the effectiveness with which this right has been exercised.

Unregulated private sector participation

In general, the private companies are operating in open competition purely on a willing-buyer-willing-seller basis. They simply obtain a business license and start offering SW collection services, without vetting or regulation.⁸ For most of them service commences once a client completes (often name and address only) and signs a form prepared by them, which then becomes the only “contract”. The forms specify the monthly charge, the frequency of the collection service, and the storage facilities to be supplied by the company. Because of increasing competition and cases of unsatisfactory service, moreover, some of the firms include (in the form) a promise to refund money for unsatisfactory service. Some of the “contracts”, especially those involving small companies, are usually verbal. They are also short term. The “contracts” have no provision for sanctions and there is no legal framework for the companies to deal with payment defaulters or for clients to secure legal redress when service quality is unsatisfactory. The wronged party simply walks out of the relationship. Some of the private companies, however, retaliate for non-payment.⁹ There are no bylaws specifying the rights and obligations of the companies and their clients, or specifying the standards that must be observed. Encouragingly, the Nairobi City Council has developed a policy document that will provide for the involvement of private sector investors in solid waste management when it is implemented.¹⁰

Low rate of waste recovery and recycling

Recycling, including of products such as papers, tyres, plastics, used clothes, and metals, is becoming increasingly popular. A kilogram of old newspapers sells for between Kshs15 to Kshs 27 while old tyres go for Kshs 50-300 depending on the degree of tear and wear, and size. Organic wastes are also increasingly being recycled to produce compost products. For example, CBOs managed by women are recycling market waste from Korogocho Market to produce organic manure for sale.

The percentage of solid waste that is recovered from the Municipal point of view is only 8 per cent of the recyclable and 5 per cent of the compostables, however. There is recovery going on in the industries but the rate is unknown. Composting by groups has potential but the groups are facing a number of constraints, the most important of which is procurement of land to conduct the business. Another problem is lack of a stable market for the recovered materials, especially for wastepaper and compost. Thus, for example, the self-help activities of the Mukuru project earned Kshs 1.55 million in 1996 from the recovery of 1,018 tons of materials per year. This income was not sufficient for the project’s 60 members and for financing investments required to improve efficiency.

⁸ Private waste collectors have suggested that laws, rules and regulations pertaining to solid waste management should be enforced.

⁹ For example, by depositing waste collected from other clients at the defaulters’ entrance (Ikiara *et al.*, 2004).

¹⁰ NCC (2001).

A survey was conducted as part of this study at the Dandora dumpsite where scavengers recover recyclable materials from municipal solid waste. The scavengers were found to be recovering more than 30 different types of materials, with the major ones being ferrous metals (aluminium and copper). While there is considerable potential in recycling, there is a problem of recyclables being contaminated with un-recyclable wastes. In addition, there is no policy on recycling in the country, which has led to the practice of some recycling companies importing waste materials, and to the exploitation of waste pickers by middlemen and recycling firms. Industry operators encourage the setting up of recycling schemes (such as for aluminium cans, bottles, and polythene materials) to improve environmental conditions while also generating incomes to the poor.

3.4 Focus on plastic shopping bags

In Nairobi and indeed all other urban centres in Kenya, plastic bags of all sizes and colours are found dotting the landscape. Besides this visual pollution, plastic bag wastes contribute to the blockage of drains, are consumed by livestock at great danger, and take many years to degrade. Furthermore, Wangari Maathai, the assistant environment minister in Kenya and 2004 Nobel Peace Prize winner, has linked plastic bag litter with malaria. The bags, when discarded, can fill with rain water offering ideal and new breeding grounds for the malaria-carrying mosquitoes.

It is the magnitude of this problem and the attention it is receiving in the country that motivated its choice as a pilot project. Top politicians, members of parliament, environmental lobbyists, and ordinary people have complained about the problem from time to time. Additionally, there is international experience on the use of environmental policy packages to manage this problem, which can inform intervention in Nairobi.

Overview of the problem

Plastic has revolutionized the carrier bags industry around the world. Bags made from plastic are not only durable, versatile and convenient, but also inexpensive, easily available and easy to store and transport on account of their thinness and lightness. Alternatives such as boxes and paper bags cannot handle liquids as well as plastic bags do. Simply put, plastic bags are popular with consumers because they are functional, lightweight, strong, inexpensive and hygienic. In addition, the environmental impact of plastic bags in landfills is low due to their inert (or un-reactive) nature. In fact, plastic bags may have some benefits to landfills such as stabilizing qualities, leachate minimization, and minimization of greenhouse gas emissions (EPHC, 2002). However, the very problem with plastic bag waste emanates from some of their advantages.

First, because they are cheap there is excessive consumption and a tendency for misuse. In Australia, for example, an individual uses one new bag per day on average because they are free. While it is free to the customer, however, a plastic shopping bag costs the retail facility in that country about 1 cent (wholesale price), with a real average cost per household US\$ 10-15 per year (EPHC, 2002). Second, most of the plastic bags produced are too thin and fragile to be reused. This characteristic of plastic bags lends them to inadvertent littering, which has become a serious problem in urban centres the world over.

Littering of plastic bags is associated with numerous environmental problems: First, it causes visual pollution that affects such sectors as tourism. Second, plastic wastes block gutters and drains creating serious storm water problems. Bangladesh, for instance, imposed a ban on plastic bags in March 2002 following flooding caused by blockage of drains (EPHC, 2002). Third, plastic wastes that find their way

into the sea and other water bodies kill aquatic wildlife when the animals ingest the plastics mistaking them for food. Fourth, consumption of plastic bags by livestock can lead to death. Fifth, plastics take 20 to 1,000 years to break down.

Thus, even though supermarkets and other market outlets give “free” plastic bags to customers, in reality they are not free. The real costs of the bags include production, consumption and disposal costs. Production costs include (i) dependency on petroleum and often natural gas for the production of plastic bags, and thus, dependency on non-renewable resources and in many cases foreign suppliers; (ii) destruction of fragile habitats and ecosystems in the process of prospecting and drilling for petroleum and natural gas; (iii) pollution from the toxic chemicals required for the production of plastic bags; and (iv) the energy consumed in the production and transportation of the bags, which not only depletes resources but also generates global warming emissions. Consumption costs are the costs passed on to consumers by retailers and other market outlets.

Status of the problem in Nairobi

As elsewhere in the world, the problem of overuse, misuse and indiscriminate and inadvertent littering of plastic bags is serious in Nairobi. Because the plastic bags are either free or inexpensive there is widespread use and because most bags are thin and highly fragile, reuse is minimal. According to discussions with one of the leading supermarket chains in Kenya, supermarkets give out approximately one million plastic bags every year to shoppers in Nairobi alone. A similarly high number of bags are given out by the fast-growing informal business sector as well as the food industry. (The figure for the whole country is approximately eight million bags given out every month by supermarkets and two times as many in the informal sector.)¹¹

Many street children and other informal sector operators are found in markets and outside supermarkets selling the plastic bags at very low prices, ranging from Kshs 5 to 20 depending on size. There are also ‘designer’ plastic bags, mainly used to pack customer shopping in supermarkets and other wholesale and retail shops. While these are given to shoppers free, the cost of plastic bags is becoming a concern to the supermarkets for whom the cost for an average sized ‘designer’ bag costs about Kshs 3 a piece.

¹¹ Personal communication, Director of Operations, Nakumatt Holdings, January 2005.

4. Process for the selection, design and implementation of an appropriate environmental policy package

4.1 Introduction

There are a great many instruments (either revenue raising, revenue providing or non-revenue instruments, see Chapter 2) that can be used for solid waste management, making the task of choosing the right instrument and approach daunting (IDB, 2003). This chapter aims at assisting policymakers or managers in choosing an effective environmental policy package that will address the target solid waste management problem. This choice is made subject to the constraints posed by current policies, institutional capabilities and factional or vested interests. UNEP has prepared a report that guides policymakers and managers on the practical steps of making such choice.¹² This chapter borrows heavily from this report. Four phases are critical in the choice and implementation of the final policy package:

- Phase 1: Data assembly
- Phase 2: Development of initial policy proposals
- Phase 3: Stakeholder consultation
- Phase 4: Policy implementation and evaluation.

4.2 Phase 1: Data assembly

In phase, one the decision maker or analyst gathers all the relevant information that is available with respect to the problem being focused upon. This should be done in a way that makes the analysis easy and helps to identify information gaps. In addition, the problem should be defined and the interests of various stakeholder groups considered carefully. To help in structuring the data assembly exercise, key questions to ask include:

What is the goal of the policy?

In defining the goal, the analyst should identify or specify both the primary and secondary goals. Primary goals relate mainly to protection of human health and environment. Examples include reduction of waste

¹² UNEP (2004), *The Use of Economic Instruments in Environmental Policy: Options and Challenges*.

littering and avoidance of pollution from disposal-related leachate. On the other hand, secondary goals revolve around socio-economic and cultural objectives such as protecting informal waste operators, poverty reduction, employment protection or generation, and culture preservation. In some circumstances, there may be trade-offs between primary and secondary goals.

What are the baseline conditions?

An analysis of the baseline conditions where the policy package is to be implemented is critical to ensure that the policy is realistic and will be successful. Baseline conditions include institutional capacities, political realities, and the relative power or influence of vested interest groups, among others. For example, if the level of competence or corruption of the institution expected to implement the policy in question is ignored, the policy may not be successful even if well designed technically.

Institutional baselines

Many economic instruments require functioning tax, legal or fiscal systems to be effective. In Kenya, for example, the Kenya Revenue Authority (KRA) has demonstrated considerable versatility in tax revenue collection and is therefore an important base for implementation of economic instruments. In contrast, economic instruments pegged on local authorities would fail miserably on account of the leadership and administrative weaknesses of the authorities.

Mandate and level of power

The political influence of the ministry or agency pushing for the environmental policy relative to other ministries or agencies is a major determinant of whether the policy will see the light of day. The analyst and policymakers therefore need to assess their relative power and plan how to enhance it. Approaches that generate revenues as well as solve environmental problems through a levy on the use of materials that generate waste, for instance, can get support from the ministry and agencies in charge of government finances.

In Kenya, while environmental issues receive considerable political attention, it is also true that policies that demand financing from the government budget have a lower chance of adoption than those that generate their own resources. This is so largely because of limited government resources and serious competition from various sectors, especially the social sectors. To enhance their likelihood of adoption and implementation therefore, environmental policy packages need to build sustainability aspects into their design.

Factional analysis

For policy design to be realistic, it is important for the analyst to carry out a factional analysis in Phase 1, and continue it in Phase 3 when stakeholder input into policy selection and design is solicited. Such an analysis involves assessing all the actors, their interests and rights, their relative power or influence, and the options available for buffering any transitional dislocations that may accompany implementation of the policy reform. An example in the Kenyan plastic shopping bags sector is the likely opposition to a levy that can be expected from the manufacturers of the bags. Through the Kenya Association of Manufacturers (KAM), manufacturers have considerable influence on public policy.

What is the long-term viability of the package?

Since external funding (from government or donors) cannot be expected to continue forever, a long-term plan for sustainable implementation and oversight of the policy should also be considered in Phase 1. Through such consideration a relatively less environmentally effective policy but one with less dependence on external funding could be chosen. This is very important especially in a developing country like Kenya where resources available for development are limited.

The UNEP report presents a detailed template (Exhibit 3.1, pp. 38-43) on the process of data assembly that could be completed during Phase 1 based on existing knowledge or impressions to inform subsequent selection, design and implementation of the policy package.

4.3 Phase 2: Development of initial policy proposals

With the information gathered in Phase 1, policymakers or analysts are able to develop a shortlist of policy options that can solve the defined problem most cost-effectively given the existing baseline conditions. To develop this shortlist, which is the task of Phase 2, policymakers or analysts need to recognize policy trade-offs and make realistic assessment of policy limitations.

Recognizing policy trade-offs

All policy packages involve trade-offs and these need to be described and taken into consideration during the process of short-listing policy options. Thus, while one instrument may be less efficient than another, it may score higher with respect to the ease and timeliness of implementation given the social and political realities. In order to make packages acceptable to key stakeholders, moreover, subsidies may be included even if they are not well targeted. Whether subsidies or an alternative solution such as a gradual phase-in of policies is better, however, should also be evaluated in this phase. There are a number of criteria upon which all different policy options should be assessed. These include:

Environmental effectiveness

This criterion refers to how well each of the policy options achieves the primary environmental objectives defined in Phase 1. An example is comparing how well two policy options, say a levy on plastic shopping bags and a voluntary code of practice by retailers, are likely to perform with respect to the objective of reducing plastic bag littering. Environmental effectiveness should be treated as the main criterion and there should be vigilance against strong lobbyists replacing this with secondary or tertiary objectives.

Policy windows

Since new laws and regulations take a long time to implement and getting rid of the old ones is difficult, policy options should also be compared on how well they can operate within the legal and regulatory status quo. In Kenya, for instance, many laws (such as price controls) remain unchanged even though liberalization was effected in the early 1990s. Thus, choosing policy options that can work well within the existing rules reflects political realities and provides a foothold for more effective environmental protection.

Ease of introduction

Because various interest groups often oppose environmental controls and also because, in many cases, such opposition strengthens when there are delays in the introduction of the controls, policies that may achieve slightly less but do so much more quickly may be more realistic. Policy options whose stringency

could be increased gradually over time as opposition is reduced may not only be more acceptable but the longer phase-in can also reduce implementation costs.

Acceptability by key stakeholders

Although full consensus among stakeholders over any policy option is practically impossible on account of the varied nature of their composition and interests, policy options should be compared on how likely they are to receive acceptance by the key stakeholders. Policymakers and analysts therefore need to be cognizant of which groups have the most power and work around these constraints to achieve the policy objectives. Reliable data on the sources of the solid waste or general environmental problems is extremely helpful in this regard. Attention should also be paid to highly affected groups or individuals. Policy proposals should include appropriate flanking measures to ameliorate these impacts, for example, transitional support for displaced individuals or poor segments of society. Solutions should adhere to the polluter pays principle as closely as possible. Acceptability can be enhanced if policies have an easy-to-understand technical basis; the oversight agency demonstrates adequate capabilities to perform the monitoring and evaluation tasks for which it is responsible; and credible penalties and sanctions are introduced.

Making realistic assessment of policy limitations

Realistic assessment of the limitations of the chosen policies, and of the implementing and oversight institutions, is very important. How can such assessment be done?

Match policy plans to institutional capabilities

Policymakers and analysts must align their expectations of the policy achievements to the supporting capabilities of baseline institutions. What this means is that, sometimes, a less effective policy theoretically is actually the most appropriate one given institutional capabilities. While theoretically possible, assuming extensive changes to the structure or performance of baseline institutions, the solutions adopted may be unrealistic. In matching expectations and plans to institutional realities, there is a need to give priority to simpler solutions where they can work; local solutions where the problem is local; solutions that generate new revenues; and solutions that establish new markets (such as tradable permits) where actors compete.

It is important to analyse cash flows associated with the policy as a way of making realistic assessment of existing institutional leverage. Other considerations include: if revenues are to be collected, how are fees to be set? Who will collect the money, and do they have appropriate experience? Will the revenues be linked to solving the solid waste problem or simply diverted to the Treasury?

Ensure predictability

To facilitate long-term planning and investment, the policy options being considered should have clear operational rules to ensure predictability and transparency to both market participants and citizens. The options should, in addition, have inbuilt flexibility or spelt-out processes to accommodate knowledge about the environmental and health risks of particular investments as they continue to grow.

Economic instruments do not fit all situations

Economic instruments do not work in all situations. In some instances, they cannot work without the support of regulatory safeguards. Examples of such situations include:

- *Emergency conditions.* When problems have severe implications or there is an emergency and behaviour

needs to stop immediately, directive bans may be the most appropriate. As will be discussed in the next chapter, for example, many countries have resorted to banning of the production and use of thin plastic bags due to their high susceptibility to inadvertent littering and their unsuitability for recycling.

- *Excessive monitoring costs.* When monitoring costs are too high to achieve a specific solid waste management outcome, as when there are a large number of very small transactions, command and control instruments may be better.
- *Fragmented oversight authority.* Where authority to set and enforce regulations is highly fragmented across institutions, oversight of market-based instruments might be difficult. Command and control instruments tailored to the existing oversight authorities might be more efficient.
- *Social stigma.* Societal factors can also make market-based approaches more difficult. For example, communal societies may not adapt well to individual members of the society holding particular rights or paying particular fees. In other societies, the activities that would be affected by the economic instruments may have a close link to social status, generating strong resistance to change.
- *Strong opposition.* Where political power and interest group factions remain strong, policymakers need to judge the most prudent course on a case-by-case basis, as there is not clear-cut evidence that either economic instruments or command and control instruments are superior over the other.
- *High level of dislocation.* Where large numbers of people will be displaced or unemployed as a result of economic instruments, regulatory exemptions, transitional payments, or some other flanking measures would be needed to ameliorate such hardships.
- *Lack of ability to make transitional payments to affected sectors.* Although it is more efficient to replace broad-based subsidies with direct payments to the poor, such transfer payments are unlikely to occur in corrupt societies. In such societies therefore, broad-based subsidies have to remain and monitoring and enforcement are essential to ensure that they reach the right sector of society.

4.4 Phase 3: Engaging stakeholders and refining initial proposals

Phase 3 involves engagement of various stakeholders in the process of evaluating and refining the shortlist of policy options developed in Phase 2. Building on the initial analysis of actors in Phase 1, the process of stakeholder engagement pays particular attention to whom to involve and how to structure their input.

Which stakeholders should be engaged?

The main challenge for the process of stakeholder engagement is to ensure that all the core viewpoints on the issues of interest are taken on board. This requires that the three main stakeholder groups, that is, those responsible for the problem, those affected by it, and those affected by one or more of the proposed solutions, are engaged. The challenge involved in this process is to ensure that the more organized, powerful and influential (economically, socially and politically) do not derail the policy process or bias it in their favour. Special measures have to be taken in order that the uneducated, the unorganized, the powerless and the local communities that often lack the financial resources, skills or political clout to influence policy, can contribute to the process. These measures are critically important because these same groups are usually the most affected by the lack of environmental controls or by the planned policy changes.

Some of the special measures that can enhance the participation of the weak and disadvantaged groups include financing their participation in meetings, providing public access to Internet facilities, visiting geographic areas where the poor are concentrated, and other measures that promote information flow to them.

How can the input of stakeholders be made useful?

The main way to make stakeholder input into policy design and implementation useful is to make sure they have adequate opportunity to do so and to make adequate preparation. This can be done through a variety of means, including:

- Soliciting input early. Doing this sends an important signal that the decisions will be made in an informed and unbiased manner, which ensures stakeholder buy-in.
- Using a variety of outreach methods including formal meetings, which can allow affected parties to air the complaints publicly, and less formal contacts and briefings that may improve information gathering by providing people anonymity and thus opportunity to be more truthful.
- Being transparent and clear to stakeholders over how the information being sought will be used.
- Setting up of a structured process, including a transparent pre-set formal timeline for sharing information and comments. Transparency of the policy assessment process gives stakeholders confidence that they will be heard fairly and that attempts to hijack the process are likely to become public. In addition, built-in transparency protects environmental authorities from pressure tactics. Stipulating deadlines for particular input, moreover, reduces the space that third parties can exploit to hijack the process.
- Publication of the list of all individuals and groups consulted for transparency and to ensure a balanced and broad stakeholder representation.
- Explanation of decisions taken and why they went against the stated interests of some of the stakeholder groups, in order to ameliorate resentment by the affected parties.
- Provision of a data provision window, that is, a specified time range within which stakeholders can provide any data relevant to the issue being analysed.
- Provision of a policy comment window, that is, a short period before the release of the short-list of policy options during which stakeholders can make comments to the issues being addressed.

Strict enforcement of deadlines for these two windows is critically important to ensure that stakeholders take them seriously, and to engender confidence that all stakeholders, including government officials, are being treated equitably.

Definition of zones of agreement between parties rather than full consensus, as well as clarification of the trade-offs among various options, may be sufficient to map out the refined policy framework. Input from stakeholders then feeds back into the information compilation done in Phase 1, documenting the refined understanding of the problem. This allows refocusing of the Phase 2 'short-list' of policy options, narrowing the choices and identifying the flanking measures required to implement with a particular economic instrument. Flanking measures commonly involve exemptions, deferrals, or transitional subsidies to help those groups most adversely affected by a policy change.

4.5 Phase 4: Policy implementation and evaluation

It is during this last phase that a final policy package is chosen, implemented and evaluated. This is done with the help of the information gathered, the shortlist of policy options made and input received from stakeholders.

Choice of policy instrument

The choice of the most appropriate policy option given the baseline conditions, the problem to be solved and stakeholder feedback is the central decision of Phase 4. To facilitate comparison of the short-listed

policy options for ease of choice, the options should be ranked. Depending on the needs and preferences, different ranking methods (such as numbers and criteria-based weights) and evaluation criteria can be used. Table 4 provides a template that can be used to compare the final options across key criteria. As no option can score the highest with respect to all evaluation criteria, the one scoring highest on more criteria than the others will be the best.

Stakeholders in Nairobi’s solid waste management sector, for example, have demonstrated the robustness of the criteria summarized in Table 4. According to them, economic instruments appropriate for the sector are those that:

- Promote poverty reduction, employment and economic growth
- Improve the efficiency of resource use and economise on scarce resources
- Take into account the available technical and human capacity for their administration and monitoring
- Are affordable, considering low and declining per capita income in the country
- Are politically acceptable to ensure support
- Are environmentally effective in improving human health and environmental quality, and
- Engender equitable distribution of costs and benefits of the instruments, especially by ensuring that the ‘polluter pays principle’ is adhered to.

Table 4: Template for comparing policy options

EVALUATION PRINCIPLE	Ranking (High, Medium, Low)		
	Policy Option 1	Policy Option 2	Policy Option 3
Environmental effectiveness – does the instrument lead to the desired environmental improvements, such as reduction in waste generation, increased waste recycling, reduced emissions from transport and disposal?			
Economic efficiency – does the instrument create incentives for investment and innovation toward reduction of pollution control costs?			
Administrative cost efficiency – i.e., does the instrument require affordable and available levels of skill and effort to implement and monitor?			
Revenue usefulness – are revenues generated able to be applied to address the environmental objectives of the instrument and adequate to create measurable improvement?			
Ease of implementation and replicability – are the relative costs and benefits easy to assess and are the legal requirements for introducing the new instrument reasonable?			
Acceptance – do the general public and the affected industries accept the instrument as a viable means of cost-effectively achieving environmental improvement without adversely affecting competitiveness, employment, income distribution, and trade?			
Distributional effects – is there distributional disparity or inequity in the application or impact of the instrument, particularly regarding effects on lower income households, small businesses, and disadvantaged parties?			
Short-term results – does the instrument have the potential to result in sufficient short-term improvement to motivate political administrators to undertake commitment to the costs associated with the instrument during their political term?			
Economic development enhancement – does the instrument provide an environment that maintains trade competitiveness and encourages industrial development and employment generation?			
Waste type applicability – does the instrument address a wide range of waste types and have significant impact on overall urban waste quantities, or does the instrument address only a limited number of unique and important waste types?			

Source: Constructed from IDB (2003).

Flanking measures to mitigate severe effects

In some cases, implementation of a policy option under consideration may cause undue hardships on some segments of the population. An example, as will be discussed in Chapter 5, is the loss of employment that may accompany banning of the production of plastic shopping bags. When such severe effects are anticipated, transitional (or flanking) measures to ameliorate such effects need to be built into the initial policy package. Such measures may include gradual phasing-in of limits to avoid sudden changes in prices or access rights; exemptions for groups who face high costs but are minor contributors to the problem; or transitional subsidies to highly affected groups. Aside from the reduction in hardship, the flanking measures mitigate political opposition to the new policy.

Inter-institutional cooperation

The policy option chosen will influence the inter-institutional relationships that need to be established. The options that bring in public revenues or solve problems for other ministries as well as protecting the environment, for example, attract support quickly. Strong existing relationships between the government and some stakeholders may tilt the policy choice in a particular direction and a common vision can be built into the policy directly.

Marketing

Marketing of the chosen policy option is an important determinant of its successful implementation. During such marketing, the implementers should explain the policy package being implemented, why it was chosen, and the steps being taken to ensure that this decision makes sense and incorporates stakeholder feedback. Information used for marketing should be precise and easy to understand. In addition, the information should be released at the same time with the chosen policy package. Explanations of why the decisions made are contrary to some of the stakeholder groups engaged in Phase 3 should also be given. Follow-up is also needed to address questions and to provide continued updates of progress or resistance to the policies.

Monitoring and evaluation

As the chosen policy package is being implemented, measurement is needed to evaluate progress, assess policy modification requirements, and to learn from the ongoing process. This is necessitated by the fact that the solid waste problem being addressed and the baseline conditions change over time. The monitoring and enforcement programme should be as simple as possible for success, especially in the developing world. Monitoring and enforcement measures should be included in the policy package from the outset, with data collection starting even ahead of policy implementation where possible. Policymakers should plan to track relevant parameters over time and to make them public. Parameters that should be tracked include:

- *Environmental effectiveness.* Are solid waste generation rates declining? Is illegal dumping of waste being reduced?
- *Economic efficiency.* Are costs of solid waste management stable or declining? Are they less expensive than projected in advance by government or industry? Are new solid waste management technologies entering the market?
- *Administration and compliance costs.* Is there an effective administrative programme for the policies? How expensive is this to run relative to the benefits realized? How expensive is it for the private sector to comply with the policy requirements? Are institutions cooperating to achieve the policy objective?

- *Revenues.* Are user fees sufficient to cover the full costs of providing particular public services? Are fees appropriately levied to different user groups? Are environmental taxes high enough to trigger the targeted behaviour change? Are revenues retained to support additional environmental protection efforts or diverted to the general Treasury?
- *Wider economic and social effects.* Are there noticeable effects of the environmental policy being evaluated on employment, poverty, trade, competitiveness, growth, or rates of innovation? If there are negative impacts, are they permanent? Can policy modifications mitigate the transitional dislocations?

Like in the stakeholder engagement phase, the implementation phase also requires establishment of policy credibility for it to be taken seriously. Establishing such credibility requires maintenance of strict control of the input process and timeline during the policy evaluation phase. Credible and strong enforcement actions are also critical, as are outreach and compliance support to struggling actors.

5. Development of policy proposal

Using the guidelines and material presented in the preceding chapters, this chapter develops a proposal for an integrated economic instruments-based policy package to manage waste caused by plastic shopping bags in Nairobi.¹³ Specifically, this chapter:

- Provides a concise account of the nature, extent, and impact of the problem;
- Identifies key aspects of the problem (level of waste generation, trade, and disposal, among others) that the integrated policy package is designed to address;
- Discusses the short-list of EIs that can be considered for inclusion in the policy package;
- Presents options for the integrated policy package;
- Designs an implementation plan for the integrated policy package;
- Discusses the potential economic, social and environmental impacts of implementation of the designed policy package; and
- Recommends a pilot implementation project to test the policy proposal.

5.1 Data assembly (Phase 1)

This phase involved collection of as much information as possible, from published and unpublished literature and through formal and informal stakeholder consultations. Due to lack of information on the nature, structure and dynamics of both the plastic shopping bag industry as well as the solid waste management sector in general, interviews and other forms of consultation with industry participants and other stakeholders were critical. A major stakeholder workshop was held in February 2001 for data assembly and a number of insightful recommendations were made:

- Solid Waste Management is a major challenge in the city of Nairobi that requires concerted collaboration between the public and private sectors.
- The Dandora dumpsite should be closed since it has attained its capacity and is already posing an environmental hazard. Arrangements to make the new Ruai dumpsite operational for this purpose were recommended.
- Economic instruments should be developed and applied to create the necessary incentive for solid waste management.
- The industrial sector should adopt cleaner production methodologies to encourage waste reduction. This will in turn reduce the waste reaching the dumpsites.

¹³ In this chapter, we use polythene bags, plastic bags or simply carrier bags interchangeably, to refer to shopping bags made of plastic material.

- There is the need to promote recycling and reuse of materials in order to reduce waste. Product charges and rebates should be introduced on a wider range of products such as plastic bags and containers in order to encourage reuse and recycling.
- Waste segregation should be promoted. This would help categorize waste and promote efficiency in its collection, transportation and management.
- The Environmental Management and Coordination Act (1999) should be implemented. The Act has clear provisions on solid waste management including set standards for various management aspects.

This was complemented with expert meetings held in both Geneva and Berlin. The literature, mainly from published books and papers from UNEP and other institutions, was also critical in helping to narrow down the policy instruments that could be considered for tackling the identified problem. Unpublished literature from the Internet was also quite useful in providing the experience various countries have had with different instruments. These data assembly efforts yielded the information presented in the remaining part of this section, besides that presented in the preceding chapters.

The plastic shopping bag industry in Kenya

There are two major types of plastics produced in Kenya namely, hard plastics and ‘flexibles’. The flexibles, into which category plastic shopping bags fall, can be categorized into:

- a) High-density polyethylene or HDPE bags. These are usually non-branded and used in supermarkets, take-away food and fresh produce outlets, and small retail outlets. Bread bags also fall under this category.
- b) Low-density polyethylene or LDPE bags. These are ‘boutique’ style types of bags, generally branded (designer) and are used by stores selling higher value goods, such as department stores, clothing and shoe outlets.
- c) Others: Dry cleaning bags, garbage bags, plastic in-store product bags, and other packaging.

According to industry estimates, about 4000 tons of flexibles are produced monthly in the country, with an estimated 2000 tons going into the waste stream.¹⁴ About half of the flexibles produced in the country are less than 15 microns in thickness. For instance, the plastic bread bags are between 6 and 7 microns. It is these thin plastic bags that are most prone to inadvertent littering.

Most shopping bags (about 90 per cent) are produced from virgin material, with the rest produced from recycled material. Although almost all of these flexibles are produced within the country, all the raw materials are imported from Saudi Arabia, Japan and Europe. However, the inks for printing the designer bags are locally produced, although the base is imported and reformulated locally.

The Kenyan flexibles industry is lucrative and is growing at an estimated rate of 8-10 per cent per year. This growth is driven not only by local demand but also demand from the regional market – demand from Uganda in particular is very strong, as plastics produced there attract an excise duty. There is thus a considerable risk of capacity over-development driven by the regional market, which may not be sustained owing to increasing pressure to reduce plastic bag usage. However, due to policy uncertainty, there is currently less investment in the sector. Ownership of the plastic firms is predominantly Kenyans of Asian origin. Besides offering considerable employment, the industry also supports many street families who are engaged in the distribution of the plastic bags.

¹⁴ This may be an underestimate considering that, from the municipal point of view, only 5-8 per cent of the solid waste in Nairobi is recovered.

The level of recycling and reuse of post-consumption flexibles is very low, with at most only four firms in the country involved in the activity. Recycling has not been widely practiced as a result of various factors including: lack of technology, high costs (especially on energy and water) and available space. In addition, the market for recycled products is not well developed. However, some firms are already recycling flexibles and a leading supermarket chain has initiated a collection programme although it is yet to decide what to do with the bags it collects. Products like water tanks, for which there is a great demand, are made almost entirely from plastic wastes.

With the exception of some paper bags, there are not many alternatives to plastic shopping bags in the country. Shopping bags made from natural products are available but are hardly used because of the easy and free availability of plastic shopping bags in market outlets, and the low price at which the plastic bags are sold in outdoor markets.

Plastic bag waste management in other countries

Numerous instruments have been used around the world to manage the problem associated with plastic bags, with various degrees of success. The instruments range from such command and control tools like outright bans, to voluntary schemes such as codes of practice and promotion of alternative bags. The economic instruments used include taxes or levies.

Nepal, Bangladesh, Taiwan, parts of India, Philippines, and South Africa have banned the manufacture and distribution of some types of plastic bags with mixed success. Distribution of free single-use thin plastic bags is the major focus of these bans. In Canada, almost all big grocery chain stores accept plastic bags for recycling. Plastic bags are reused as bin liners or waste bags, lunch bags, and general carry bags. Recycling of plastic bags has been minimal, as the low volume of resin contained in each plastic bag requires that the bags be collected in large quantities for economic viability (EPHC, 2002). In some countries, used bags are collected and exported for reprocessing while other countries have built local reprocessing capacities. Denmark and Italy have 'hidden' taxes on plastic shopping bags, which are absorbed into the overall cost of the products bought. The experience of some of these countries is presented below and summarized in the Appendix.

Ireland

In 2002, Ireland imposed a 15-euro cent levy or surcharge (the PlasTax) on plastic bags provided by grocery stores and other shops. It is estimated that this reduced the use of plastic bags by 90 per cent. The revenue collected goes to an Environmental Fund, which planned to spend 35 million euros on recycling centres in 2003. A comprehensive education campaign, in which pamphlets were sent to each household outlining why the levy was being introduced, how the revenue generated would be used, and how the consumers could avoid it by using reusable bags, was implemented when PlasTax was introduced.

Australia

Management measures used for plastic waste include public awareness strategies (such as consumer awareness and anti-litter programmes), voluntary measures (such as codes of practice), legislation (with littering fines, including on-the-spot fines ranging from \$ 60 to \$ 4000). IKEA (a retailer of homewares) introduced a 10-cent charge on their plastic bags while also providing a reusable alternative in 2002, and reported a 97 per cent reduction in plastic bag use (EPHC, 2002). Similarly, ALDI supermarkets introduced a charge of 15 cents for a LDPE reusable bag while also offering alternatives (a cooler bag at \$ 1.49, reused boxes, and a 69 cents cotton bag, and consumers were found to prefer the reused boxes or no bag for small purchases).

In another alternative bag trial in Australia, shoppers were given a 2 cents deduction from their shopping bill every time they used a calico bag, which was selling at \$ 2. The trial scheme recorded great success. Similar trials with paper bags were less effective.

South Africa

In 2003 South Africa introduced a new plastics legislation that sought to prevent plastic pollution, promote the repeated use of bags, and encourage the bags' recycling. Plastic bags thinner than 30 microns were banned while the others attracted a levy of 10 Rands¹⁵ per kilogram. The levy was targeted at the manufacturers, who were expected to pass it on to the consumers. The industry opposed this level of the levy, arguing that a reasonable level should have been 1 Rand per kilogram. The revenue collected was targeted to, among other environmental projects, the establishment of a plastic bag recycling company. Following these measures, several effects were evident by November 2003:

- Reduction of the plastic bag litter
- Reduction in the manufacture of plastic bags, accompanied by layoffs
- Growth of alternative sectors, particularly canvas bags, and plastic recycling.

Besides the legislation, South Africa has also made significant strides in voluntary interventions. Thus, the tourism stakeholders in the Free State introduced environmentally friendly bags, made of sail and denim cloth. A Durban-based company (East Coast Flexibles), moreover, became the first company in the country to produce biodegradable plastic in 2003, using technology from the UK.

Italy

In 1989 Italy introduced a tax on plastic bags aimed at ensuring that the price of plastic bags reflected the cost the bags imposed on society and on the environment. Set at 100 Lira (or \$ 6 cents) per plastic bag on importers and producers, which was about 5 times the manufacturing cost of the bag, the tax made the plastic bags more expensive than the alternatives. Between 1989 and 1992, the government collected \$ 150 million through the pollution tax.

Denmark

In Denmark, plastic bags are taxed within the larger packaging tax introduced in 1994 with the aim of promoting the use of reusable bags. The tax is paid by the retailers when they purchase the bags rather than by the shoppers. This was found to have a lower impact than in Ireland, with the consumption of paper and plastic bags declining by 66 per cent.

Rwanda

In Rwanda, a participatory approach involving the private and public sector, consumers and other stakeholders has been put in place to rid the country of plastic bags. Some CAC instruments, for instance, banning of plastics less than 100 microns and import bans, have been applied stringently. Together with these, some EIs like provision of information through the media have succeeded in raising the level of awareness and understanding on plastic bags among the populace. A significant impact of this has been the disappearance of the black plastic bags in Kigali. However, the cost of implementation of this project has not yet been assessed and at present there are no known impacts on the economy with regard to taxes as the plastic bags were very few. This success could perhaps also be attributed to the relatively small size and population of the country.

¹⁵ Or 1.73 US Dollars

Identification of policy objectives

The description of the problem and the status of the industry would indicate that, in a best-case scenario, the primary goals of the policy should be to:

- Control production and consumption of the plastic bags by internalizing the associated externalities, especially with respect to the low quality single-use plastics;
- Stimulate reuse and recycling as much as is possible given the available technology;
- Ensure best practice collection, transport and disposal of the plastic waste that can no longer be reused;
- Discourage littering and indiscriminate disposal of plastics;
- Enhance communication, information exchange and raise public awareness; and
- Encourage the production and consumption of ‘cleaner’ packaging alternatives.

The secondary goals of the policy would be to:

- Create employment in the shopping bag industry; and
- Contribute to poverty reduction.

This means that, in scenarios short of best-case, a subset of these primary and secondary goals could be targeted. Alternatively, the policy choice could be a gradual and incremental approach towards the best-case scenario.

Baseline conditions

Some of the baseline conditions were identified and analysed in Chapters 2 and 3. The main problems of solid waste management in Nairobi were identified to include:

- Very low disposal rates, mainly because of the poor management of the only available dumping site, its poor location and the attendant high transport cost, lack of transfer facilities and sanitary waste disposal facilities, and weak surveillance and enforcement.
- Very low collection rates, mainly because of low efficiency and coverage of both the municipal and private sector provided SWM service and low cost recovery of the service.
- Lack of wastes separation, which affects reuse and recovery. This is mainly attributable to lack of policy and to absence of a strong reuse and recovery industry. The high content of organic wastes is also a significant constraint.

With respect to institutional baselines, local authorities in the country are very weak. They are bogged down by excessive work forces, weak leadership and poor governance in general, and low efficiency in not only service delivery but also revenue collection. The vast majority of residents, moreover, have no confidence in the ability of local authorities to deliver services. Fortunately, however, the enactment of EMCA in 1999 and the creation of NEMA to oversee its implementation provide a strong institutional base for the design and implementation of a policy package to manage plastic shopping bags.

Even though EMCA provides for the use of economic instruments in environmental management, however, NEMA has yet to develop operational guidelines for that purpose. Although economic instruments like user charges, financial instruments, fiscal instruments and property rights have been used in the solid waste management sector (see section 2.3), there are various weaknesses. These include weak

incentive or disincentive content (by being very low and not based on volume or toxicity), bluntness, weak enforcement capacity, inadequate awareness creation regarding the instruments, and failure to recognize and encourage voluntary initiatives such as the deposit-refund system for beer and soda bottles.

More importantly, there is political support for controlled use or ban of plastic shopping bags as noted in section 3.4. However, since one of the current political regime's main election pledges was employment creation, the policy package has to be designed in a manner that does not contradict this pledge. Members of parliament too are under pressure from their constituents to protect existing jobs and create more.

Factional analysis

The main players in the plastic shopping bags industry are the manufacturing and wholesale/retail sectors. The manufacturers are interested in the status quo and have strong influence through the Kenya Association of Manufacturers (KAM). The supermarkets, however, would welcome an intervention as the cost of supplying free bags to customers is becoming significant. The National Environment Authority (NEMA), the voice of the 2004 Nobel Peace Prize winner Wangari Maathai and environmental lobbies are also key stakeholders.

In summary, the baseline conditions, stakeholder consultation and an analysis of the situation on the ground indicate that, for economic instruments to be effectively used in solid waste management, the following issues have to be addressed:

- Data collection, storage and sharing systems have to be improved;
- Coherence of policies, regulations and standards will have to be reviewed and improved;
- Enforcement mechanisms have to be strengthened and capacity enhanced in order for waste generators and handlers to respect and adhere to existing laws and regulations. Stiff penalties should be instituted including for contract cancellation. The current penalties and fines are not deterrent enough, they need to conform to the polluter pays principle, cost of environmental restoration and rehabilitation, and long-term monitoring;
- Project design has to be flexible and systems and appropriate technology adapted to the needs of the collectors rather than attempt the reverse;
- Coordination between the various actors, including NCC, private sector firms, and others, is critical;
- A waste classification system and standards to avoid mixing of hazardous and non-hazardous wastes has to be developed; and
- Appropriate disposal methods for the various wastes have to be defined in line with international conventions and the law.

Lessons learned from other countries

The experience of countries that have used various instruments to manage the problems associated with plastic shopping bags provides various lessons for the selection, design and implementation of an appropriate policy package in Nairobi. These lessons include:

- A package of instruments, including command and control, voluntary and economic instruments rather than a single economic instrument is required. For instance, introduction of a tax on plastic bags may not work well without a comprehensive education and awareness campaign.
- A ban on single-use thin plastic bags seems to be a logical element of the policy package.

- As plastic shopping bags are banned or taxed, another key element of the policy package becomes the provision of an alternative bag.
- A tax or levy, especially when directly targeted at the shoppers and set at an appropriate level, has a huge impact on the use of plastic shopping bags. Directing the tax at the producers and importers has considerable impact too.
- Even developed countries lack the elaborate data required to calculate the optimal level of tax, levy or surcharge. In most cases, regulators and the industry negotiate the level.

Long-term viability

The financial difficulties facing local authorities, inadequate funding for NEMA, and overall budgetary constraints confronting the central government make it imperative for the policy package to be designed and implemented in a way that ensures sustainability over time.

5.2 Development of initial policy proposal (Phase 2)

Using all the information assembled in Phase 1, an initial policy package to address the plastic shopping bag problem was defined and elaborated. Information on the status of the plastic shopping bag industry in Kenya, the primary and secondary goals of the policy package, the baseline conditions pertaining in the country, and the lessons learned from the experience of other countries was used to:

1. Recognize policy trade-offs inherent in each of the policy instruments considered; and
2. Make realistic assessment of policy limitations, as per the guidelines presented in Chapter 4. The guidelines emphasize the need to put into consideration such factors as environmental effectiveness of the policy, ease of the policy introduction and the existence or otherwise of policy/legal windows to facilitate the process, likelihood of acceptability by the main stakeholders, institutional capabilities, and the expected administration costs and impact of implementation.

Policy windows and ease of introduction

The initial design of the policy package benefited from stakeholder initiatives that were already in place. As per the lessons from Latin America and also because of the higher likelihood of acceptability by stakeholders, it was imperative to build on what already existed. NEMA had brought a wide range of stakeholders together in the form of a consultative stakeholder committee on plastic waste management. The stakeholders include NEMA itself, the Kenya Association of Manufacturers (KAM), KAM's plastics sector group, the Ministry of Environment and Natural Resources, the Ministry of Local Government, the Ministry of Trade and Industry, the Kenya Industrial Research and Development Institute (KIRDI), plastics retailers, and plastics consumers.

The committee had, moreover, drawn up a roadmap for plastic management in the country (Table 5) with focus being on banning of plastics thinner than 30 microns, encouragement of recycling, collection of plastics already in the environment, reduction of littering through legal instruments, development of disposal guidelines, and design of economic instruments to improve the management of plastics. Viewed from this roadmap, the policy package being designed can be seen as elaborating on and improving the activities agreed upon, and fast tracking of the economic instruments activity.

Currently, a committee to oversee implementation of the roadmap is already in place and a Kenyan Standard (KS-1794) for polythene bags has been approved. The committee has set up a contributory fund

Table 5: Stakeholder negotiated roadmap for plastics management

Activity	Target	Implementation date
Ban very thin or flimsy plastics through a standard on thickness (minimum of 30 microns)	Complete and immediate phase out; complete enforcement within a year	By July 2005. Kenya Bureau of Standards to publish the standard by end of 2004
Encourage recycling of plastics through incentives such as differential power tariffs and investment tax allowances (140%) for recycling machinery	Plastic manufacturers to recycle 15% of their output; Local authorities and outlets to recover 75% of plastics used	By 2006; incentives to be included in the 2005 Finance Bill
Collection of plastics already in the environment	No plastic wastes in the country's major cities	By July 2005
Put in place legal measures on littering	Each city and municipal council to have by-laws on plastics	By July 2005
Development of better plastic disposal methods	Develop plastic disposal guidelines	By July 2005
Study the possibility of introducing appropriate economic instruments	Politically, socially and economically acceptable instruments	By 2006

Source: NEMA (2001)

to raise resources for awareness creation and public campaigns against littering and improper disposal of plastics. It recognizes the value of establishing linkages with best practice global efforts towards effective and efficient management of plastics.

The process of stakeholder consultation has not been perfect, however. Thus, the Ministry of Health has announced its plan to table in parliament a policy paper aimed at banning plastic packaging in the country. In fact, a motion was passed in Parliament on 8 December 2004 calling for the use of sisal bags as opposed to polythene bags.¹⁶ During the debate, some members of parliament recommended a ban on polythene bags. There is, thus, considerable support for measures aimed at minimizing the use of plastic bags. This project will ride on this support, the on-going stakeholder initiatives, and the efforts being made to operationalize EMCA (1999).

The analysis led to the conclusion that a package of instruments rather than a single instrument is required. Even stakeholders are in agreement that addressing these problems requires a combination of command-and-control and economic strategies. For the problem associated with plastic shopping bags in Nairobi to be comprehensively tackled, that is for a best-case scenario; the integrated policy package would have the following seven instruments:

1. A ban on plastic shopping bags that are less than 30 microns in thickness
2. Consumer awareness and anti-littering campaign
3. Promotion of voluntary schemes such as a national code of practice for retailers
4. A plastic bag levy collected from either suppliers or directly from shoppers
5. Support for development of environmentally-friendly alternative bags
6. Support for development of an effective plastic bags recycling system
7. Support for development of a managed disposal system to cater for the plastic bags that will enter the waste stream irrespective of the measures taken.

¹⁶ *Daily Nation*, Thursday, December 09, 2004

As far as implementing the proposed integrated policy package, there are three options open to policymakers:

Option 1: Maintain status quo

Option 2: Implement all seven instruments at once

Option 3: Implement all seven instruments but gradually.

Before a comparative analysis of these three options, it is important to discuss the seven instruments first. These instruments are very important and some of them have no credible alternatives. Some of them, moreover, such as awareness campaigns are supportive of the other instruments.

1. A ban on plastic shopping bags less than 30 microns in thickness

The production and consumption of plastic bags of less than 30 microns should be banned, within a year of the commencement of the pilot project's implementation, to take care of inadvertent littering. Thin bags tend to be easily dispersed by wind and water, thereby clogging drains, choking livestock and littering landscapes. As the experience of many countries has shown, a ban is the most effective way to deal with very thin plastics considering their high vulnerability to littering, single-use character, low price, and poor recycling feasibility. Lightness acts as a barrier to recycling. Not only are very many bags required to make a small amount of resin, their light weight also makes the plastic bags very difficult to sort using mechanical separation.

Considering the industry estimates that about half of the flexibles produced in the country are less than 15 microns in thickness, the proposed ban can substantially reduce the amount of plastic bags produced and consumed, littering, and the amount of plastic wastes that have to be disposed off in a given period. If this were the only instrument in the policy package, however, production and consumption would switch (though not necessarily in absolutely the same quantity due to price differences) to the legal thickness.

The cost of implementing such a ban should be reasonable, especially if the penalty for non-compliance is high, because there are only a few firms that manufacture the plastic bags in the country. In addition, that this command and control instrument is included in the stakeholder agreed roadmap improves its social and political acceptability.

2. Consumer awareness and anti-littering campaigns

Active support should be extended to existing consumer awareness and anti-litter programmes, which are few and mainly voluntary. In addition, coordinated anti-littering and consumer awareness campaigns should be further developed in the city. While consumer awareness and anti-littering campaigns are often the interventions most favoured by the industry, it has the shortcomings that (i) a segment of the population will always continue to litter, and (ii) it cannot prevent inadvertent littering of plastic bags. Litter education is, nevertheless, an important support for other initiatives aimed at reducing plastic bags and their impacts.

The awareness and education campaign should focus on, among other things, the:

- Adverse impacts of plastic bags and the contribution those targeted by the campaign can make to environmental protection and quality by reducing their use of plastic bags
- How to avoid littering
- Need to use and the net benefits of using reusable bags and other available alternatives to single-use plastic bags. This should include net economic, social, and environmental benefits of using the alternatives.

3. Promotion of voluntary schemes (A national code of practice for retailers)

Codes of practice for plastic bags among retailers are common in many developed countries. Such codes commit retailers to, among other things:

- A specified reduction of the number of plastic bags issued within a specified period
- An increase in the recycling rate of plastic bags within a specified period
- Introduction of plastic bags made from recycled material
- A specified period within which thin plastic bags made from non-recycled plastic can be phased out
- Targeted reduction in plastic bag litter within a specified period
- Availability in retail outlets of multiple use bags
- Provision of convenient and accessible recycling stations to customers
- Objective audit of code effectiveness
- Targeted minimum participation in the code by the retailers within a specified period.

Designed in such a manner, a code of practice for retailers in Nairobi has potential to reduce the use of plastic bags and the amount reaching the waste stream. However, such a code on its own cannot be relied upon to phase out thin bags or reduce the production and use of plastic bags in general due to vested interests, as evidence from many countries has shown. That the stakeholders in Nairobi did not include it in their roadmap (Table 5) is an important pointer of such interests. Another challenge that would face the code includes the structure of the retail sector in the country. Many small retail outlets, including kiosks, some of which are not even licensed, characterize the sector.

The threat of a levy/tax or other mandatory measures on plastic bags may push retailers towards a code of practice in order to avoid the administrative and operational inefficiencies that may be associated with implementation of the levy.

4. A plastic bag levy

As the experience of other countries, *albeit* mainly developed countries that have implemented a kind of levy or tax on plastic bags has shown, such an instrument reduces the consumption and therefore production of plastic bags considerably. It is on this basis that introduction of a levy on plastic bags in Nairobi is highly recommended. The aspect(s) of the waste problem regarded as the most prevalent and therefore targeted by the policy should inform the design of an effective levy or tax. If the main problem to be addressed is the amount of plastic used, models similar to the Danish tax on plastic bags may be considered. The Danish model is a weight-based tax, which has considerably decreased the amount of plastic used for the manufacture of shopping bags. On the other hand, if the main problem is visual litter the Irish tax on plastic bags is ideal. It is levied on each plastic bag, thereby reducing the number of bags used and increasing the reuse of bags. This levy resulted in a 90-95 per cent decrease in the consumption of plastic bags within a very short period.

The tax or levy can be collected either from suppliers of the plastic bags (domestic producers or importers) or directly from shoppers at the retail outlets. While experience has shown the latter to yield bigger reductions in the consumption of plastic bags, the choice between the two modes of implementation must also take cognizance of the baseline conditions as discussed. Targeting suppliers who are far less in number than shoppers, for example, may be the most cost-effective where the implementation and administration capacity is weak.

In order for the levy collected from suppliers to achieve maximum effectiveness it should be passed on in full from the suppliers to retailers and then to consumers. As the levy may cause a reduction in demand for the bags, however, suppliers may absorb some of the cost of the levy up to the point at which it is no longer profitable for them to manufacture and sell bags. By raising the cost of the bags to retailers, the levy would increase the incentive for retailers to encourage a change in consumer behaviour. Experience shows that this has some limited effect on bag consumption (Fehily Timoney and Company, 1999, as cited in NOLAN-ITU, 2002). The higher the levy, the more incentive the retailers would have to reduce their customers' use of bags until it is no longer viable for them to provide the bags free of charge. If the levy were high enough, retailers would then be forced to pass at least some of the cost of the bags directly on to customers. All this means that the levy should be set high enough so that the component that is ultimately passed on to the shoppers is high enough to induce a reduction in their consumption of plastic bags.

What is done with the revenue collected from the levy is also an important design issue, as it influences the levy's effectiveness. Experience from countries that have implemented such levies shows that, for acceptability and therefore effectiveness of the levy, the revenue collected from it should be earmarked for environmental protection projects.

How should the levy be collected in Nairobi?

In Nairobi, the interest is to reduce both plastic waste generation and littering. A levy on each bag collected from shoppers at the retail outlets may not be the most effective in the city because of the many small ('informal') outlets, including *kiosks*, through which plastic bags find their way to the consumers and thus the litter stream. Many of these informal outlets are not even licensed and do not operate a receipt system, which is necessary to facilitate entry of the cost of plastic bags as a separate item in the shopping. A weight-based tax incident on producers and importers is therefore the most practical in the case of Nairobi, as there are less than 200 of these and they are easily identifiable.¹⁷ Furthermore, so long as the tax is high enough, wholesalers and retailers (including the informal kiosks) will be forced to pass on the extra cost to the consumers by charging for the bags. To enhance this process, all licensed or formal retail outlets should be compelled by law to enter their charge for the plastic bags on each shopper's bill or receipt. Revenues collected from fines for non-compliance with this law should also go to the environmental protection kitty.

Table 6 presents a more consistent comparison of the two alternative forms of the levy, and the levy incident on the suppliers is clearly superior given the present baseline conditions in Kenya.

How should the levy be set?

The fact that the levy should be set at an appropriately high level in order for it to induce behaviour change has been emphasized. How can this appropriate level be identified? Ideally, the consumer should pay for each bag an amount of money that covers the entire cost of producing, distributing and consuming it. The cost should not refer only to the direct cost of producing the bag but also the social and environmental costs. Calculating such a cost requires a huge amount of data, especially that required to establish the marginal benefit and cost curves of the plastic bags.

Due to lack of detailed information on the life cycle analysis of plastic bags and alternatives, and on the elasticity of demand for plastic bags relative to alternatives, the ideal rate for the levy has not yet been identified. Nevertheless, there are at least two ways of solving the problem. First, the relevant stakeholders

¹⁷ The actual institutional responsibility over the levy collection is discussed in Chapter 6.

Table 6: Comparison of levy on suppliers versus levy on shoppers

Evaluation Principle	Ranking (High, Medium, Low)		
	Option 1: Levy on suppliers	Option 2: Levy on shoppers	Best Option
Environmental effectiveness	Medium, from experience of Denmark	High, from experience of Ireland and others	2
Economic efficiency	High, as it is weight-based and reduces plastic use per bag	Low	1
Administrative cost efficiency	High, only 200 or so suppliers to deal with, KRA has capacity and experience	Low, as there are too many 'informal' outlets for the bags	1
Revenue	High, revenue capture likely to be higher due to administrative cost efficiency	Low, revenue capture likely to be much lower	1
Ease of implementation and replicability	High	Low	1
Acceptance	Medium, as they can pass on the cost to the buyers	Medium, as the environmental benefits arising from the use of levy revenues become apparent	None
Distributional effects	Low, as it is largely distributional neutral	Medium, as a sizeable proportion of the poor who normally use the informal outlets can evade the levy	2
Short-term results	High, on account of high administrative cost-efficiency	Medium, because even though the environmental benefits are high, the administrative cost-efficiency is low	1
Economic development enhancement	Medium-High, depending on how the alternative bag sector responds	Medium-High, depending on how the alternative bag sector responds	None
Waste type applicability	High, as the plastic bag waste is a serious problem in Kenya	High, as the plastic bag waste is a serious problem in Kenya	None
Better Option			1

Source: Analysis by authors.

negotiate and agree upon a realistic and effective levy, based on their experience with the industry and demand. Second, the stakeholders can use benefit transfer, that is, the level of charges applied elsewhere with the required impact, to determine a realistic and effective rate. Whichever way the starting level is determined, however, its effect should be closely monitored and adjusted in an iterative mechanism to arrive at the optimal levy. The producers, wholesalers and retailers can be monitored (through simple data collection and legal instruments) to generate the data required to evaluate performance.¹⁸ For successful operation, moreover, the levy ought to be implemented on a nationally consistent level across all producers of the bags.

¹⁸ More details on monitoring and evaluation are presented in Chapter 6.

5. Support for development of environmentally friendly alternative bags

Considering that limited alternatives to plastic shopping bags are available in the country, availability of such alternatives is a must to facilitate consumer behaviour change in response to the plastic bag levy and policy interventions proposed. The development of more durable, reusable, and recyclable bags should be supported using the revenue collected from the levy. Many alternative carry systems have been tried out around the world. In Annex B of EPHC (2002), for example, 21 such systems are detailed including cardboards, paper bags, biodegradable plastic bags, reusable heavy-duty plastic bags, and calico/cotton bags or natural fibre bags more generally.

Boxes, cartons and paper bags

Box and carton alternatives are cost effective but are difficult to carry especially for pedestrians, older people, children and pregnant women. Although production of paper is more expensive than plastics, paper recycling is better defined and resourced. However, forests are an important and scarce resource in Kenya, making the option of supporting development of paper and related bags undesirable.

Biodegradable bags

In 2002 UK's supermarket chain, Cooperative, launched the first 100 per cent biodegradable plastic carrier bag.¹⁹ The bag has several benefits: it starts to degrade in 18 months only; is as strong as conventional plastic bags; and degrades completely within 3 years. There are some problems associated with the degradable bags option though. First, the price of such a bag is 2.5-10 cents depending on size while the conventional bag costs only about 1 cent. Second, introduction of degradable bags can interfere with plastics recycling as they lead to product failure when they enter the recycling stream. Third, degradable bags tend to break down into smaller particles that also cause pollution. Other problems with this option include contribution to littering before the bags degrade, use of resources like petroleum products and crop starches, leachate problems attributable to slow degradation of the bags, and the likelihood of increasing consumerism and littering by sending the wrong signals to consumers that a solution is available.

Reusable heavy-duty plastic bags

Reusable heavy-duty plastic bags have the advantages of good resource use, longevity, and recycling outcomes. Some supermarkets around the world offer strong carrier bags ('bag for life'), which can save up to 25 conventional carrier bags. Since almost all inputs for the manufacture of plastic bags in the country are imported and these bags ultimately end up in the waste stream (once further recycling becomes unfeasible), it would, however, be a misallocation of resources to support their production from the environmental protection kitty.

Natural fibre bags

Natural fibre bags have a positive image and good variety of uses. Since the country is struggling to revive its cotton industry, moreover, support for the development of a cotton shopping bag should be provided as a double-dividend strategy. Creation of demand for cotton will not only boost its production but also enhance the capacity of the country, through economies of scale, to exploit the export market opportunities presented by the American Growth and Opportunity Act (AGOA). The exploitation of the backward and forward linkages this would stimulate would contribute considerably to the country's development goals and poverty reduction, the secondary goals of the integrated policy package.

¹⁹ This information and the discussion on biodegradable bags that follows were obtained from various sources on the Internet.

Another argument in support of a cotton bag is the fact that this would have an almost zero negative externality compared with the plastic bags. Jobs created in the cotton farming-ginning-textile manufacturing, bag manufacturing and finishing chain can more than compensate for those that would be lost in the plastic bag industry. Thus, even though the financial cost of producing the cotton bag may be much higher than that of producing a plastic bag and the cotton industry is a large user of chemicals,²⁰ consideration of economic, environmental and social costs may actually favour the cotton bag. Similar arguments could be made for sisal and, in fact, a motion calling for the use of sisal bags instead of plastic bags was presented in Parliament in early December 2004.

It makes a lot of sense therefore to subsidize the production of natural fibre-based shopping bags with resources raised from a tax or levy on plastic shopping bags. Such a subsidy, however, should not be perpetuated. It is expected that as soon as the production of alternative bags expands with the demand, the unit cost of production will fall, and therefore have less need for subsidization.

6. Support for development of an effective plastic bag recycling system

Only a very limited number of firms are currently engaged in recycling of plastic shopping bags yet this has potential of diverting (at least delaying) these bags from the waste stream. The development of a plastic recycling system, which will use recycled resin to produce plastic carry bags, should be supported using the revenue collected from the levy. There are a number of compelling reasons for this. First, it is of great importance to minimize the amount of plastics reaching the disposal stage during any period. Second, there will always be some use of plastic shopping bags regardless of the level of the levy. This includes the use of plastic bags for some food items; there will always be some people who will express demand for plastic shopping bags; and then there will always be need to use plastic bags in the retail outlets for impulsive shopping. Third, such support is justified as a flanking measure especially for the manufacturers of thin plastic bags that will be thrown out of business with the commencement of policy implementation. Fourth, such a recycling system has considerable potential in employment creation and poverty reduction, which are the secondary goals of the policy being designed. The livelihoods of the many informal actors who depend on the city's solid waste management sector would be boosted by such a recycling system.

There are considerable challenges as far as development of a recycling system in Nairobi is concerned, due to lack of critical systems such as source separation of waste and waste transfer facilities, an inefficient waste collection and transportation system, and the weak recycling industry. Low demand for and therefore price of recycled plastics is also a big challenge, especially when considered in the context of the high cost of collection.

Other challenges confronting the recycling of plastic shopping bags include:

- The bags are extremely lightweight, making it very difficult to sort them using mechanical separation;
- The bags are low in value; and
- It is very difficult to clean plastic bags yet they have to be free from contamination before recycling.

²⁰ Frequent washing of the bags will also consume water, energy and detergents. From the social perspective, moreover, such bags are less convenient to consumers than plastic bags, as the consumers need to bring their own bags back to the supermarket. Note that alternative bags are more likely to be used in shopping trips that are planned in advance, and for occasions on which a number of items are likely to be purchased. Consumers are unlikely to have them when shopping on impulse.

7. Support for development of a managed disposal system

As mentioned already, even with a levy on plastic bags and an elaborate recycling system, some plastics will always reach the disposal stage. In general, Nairobi has enormous disposal problems as discussed in Chapter 3, ranging from indiscriminate dumping, existence of only one open dumpsite which is actually full, distant location of the dumpsite along a road with heavy traffic and without transfer facilities, location of the dumpsite in a highly populated residential area, lack of fencing, lack of basic landfill management operations like compaction, and inaccessibility of the dumpsite due to gangs, among others. With respect to plastics, disposal-related problems include the many years (20-1000) it takes them to degrade, and their high susceptibility to wind-blown littering especially during offloading operations.

Guidelines on the proper disposal of plastics therefore need to be urgently developed, borrowing from best cost-effective practice. A policy window exists for this in that the Nairobi City Council has been, for quite some time now, considering the closure of the full dumpsite and opening of a new one. These guidelines should be developed before the new dumpsite is opened in order to inform the site's management.

Analysis of the options

In the adoption and implementation of the seven instruments, policymakers have at least three options open to them, as mentioned earlier. In this subsection, each of the options is described briefly before their comparative analysis is summarized in Table 7.

Option 1: Maintain status quo

This is the 'business as usual' option, that is, the management of plastic shopping bags is left as it is currently. In other words, none of the seven instruments discussed above is implemented. This is a naïve option considering the widespread concerns with the plastic bag waste problem, but it is important to consider its implications. These include:

- The benefits associated with plastic bags continue, including convenience, cheapness, hygiene, and rapid growth in the industry. If the policy of status quo is announced, in fact, growth of the industry will be spurred by the removal of policy certainty.
- The problems associated with the plastic bags continue, including visual pollution worsened by the 20-1000 years plastics take to break down in the environment, blockage of drains which can lead to flooding in serious situations, and ingestion by livestock, among others.
- The problems mentioned above worsen as the population increases.

Option 2: Implement all seven instruments at once

This option involves going for the best-case scenario, that is, implementing the seven instruments at the same time. In essence this amounts to addressing both pre- and post-consumer management issues simultaneously. The implications of adopting this option include:

- Quick and large reduction in the consumption of plastic shopping bags, accompanied by environmental benefits. Additional quick environmental benefits would emerge from recycling and improved disposal practices. Over time, the benefits of enhanced cleanliness will include attraction of investments and higher economic growth.
- In the short term, some jobs will be lost especially because of the ban but over time these will be more than compensated through job creation in the alternative bags industry and in recycling.

- The administrative cost of implementing this option will be high because of the weaknesses with the baselines and thus the sheer amount of systems and structures, including legislation, that need to be put in place. In addition, opportunity to learn from the process as implementation proceeds would be lost.
- Considerable financial resources from government and, possibly development partners would be required at least in the initial periods of the policy package implementation before the process of levy collection gains momentum.
- Acceptance is more likely as the manufacturers displaced especially by the ban could immediately join recycling.

Option 3: Implement all seven instruments but gradually

The third option involves going for the best-case scenario but gradually and incrementally, starting with the pre-consumer stage and, with learning and resource mobilization from this, extending into the post-consumer stage after 2-3 years. More specifically, this would require immediate implementation of the following instruments:

- A ban on plastic shopping bags that are less than 30 microns in thickness
- Consumer awareness and anti-littering campaign
- Promotion of voluntary schemes such as a national code of practice for retailers.
- A plastic bag levy collected from suppliers
- Support for development of environmental-friendly alternative bags.

Later on, the other two instruments would be added:

- Support for development of an effective plastic bags recycling system
- Support for development of a managed disposal system to cater for the plastic bags that will enter the waste stream irrespective of the measures taken.

The implications of adopting this option include quick and large reduction in the consumption of plastic shopping bags as with option 2. However, the environmental benefits arising from recycling and better disposal practice would be delayed until the instruments for post-consumer management are implemented. The short-term employment implications would also be less attractive than those for option 2, as recycling would be delayed. This option would, however, involve lower administrative costs on account of taking into consideration some of the baseline conditions and allowing for learning as implementation proceeds. Lesser financial resources would be required from government and development partners in the initial period of the policy package implementation. Acceptance of the option may be reduced by the fact that the flanking opportunities provided by plastic recycling would be delayed.

Table 7 provides a more consistent comparative analysis of the three options, as per the guidelines presented in Chapter 4. From the table, it is evident that options 2 and 3 are very competitive as they tie on half of the evaluation principles. Option 3, that is, to implement all the seven instruments gradually starting with those that target reduction of plastic bag use, emerges to have a slight edge over option 2.

5.3 Engaging stakeholders and refining proposal (Phase 3)

Considerable stakeholder consultation has already taken place and the outcome of this has been used in making policy proposals presented above. The government has, moreover, already put in place some stakeholder-represented institutional mechanisms for the management of plastic wastes. Through these

Table 7: Comparative analysis of the options

Evaluation Principle	Ranking of the options (High, Medium, Low, No change)			
	Option 1: <i>Maintain status quo</i>	Option 2: <i>Implement all instruments at once</i>	Option 3: <i>Implement all instruments gradually</i>	Best Option
Environmental effectiveness	No change	Medium-High, depending on how efficient implementation is	Medium in the short term, high in the medium term	2
Economic efficiency	No change	High	High	2 or 3
Administrative cost efficiency	No change	Medium, as efficiency may be affected by thinly spread effort	High, as effort is spread out well and there is opportunity for learning	3
Revenue	No change	Medium, compliance may be reduced by implementation efficiency	High	3
Ease of implementation and replicability	No change	Medium-Low	Medium-High, because of opportunity for the learning effect	3
Acceptance	No change	High, as the option provides some flanking opportunity	Medium, as the flanking opportunities would be delayed	2
Distributional effects	No change	Low	Low	2 or 3
Short-term results	No change	Medium-High, depending on how efficient implementation is	Medium-High, depending on how efficient implementation is	2 or 3
Economic development enhancement	No change	High, in the natural fibre, bag manufacturing & plastic recycling sectors	High, in the natural fibre, bag manufacturing & plastic recycling sectors	2 or 3
Waste type applicability	No change	High, as the plastic bag waste is a serious problem in the country	High, as the plastic bag waste is a serious problem in the country	2 or 3
Better Option				3

Source: Analysis by authors.

mechanisms, the stakeholders have agreed on a roadmap (see Table 5), although many of the targets have been missed. It is evident from this that the relevant stakeholders have been identified, with the exception of those likely to be brought into the enterprise through development of an alternative bag industry, and the informal actors in the solid waste management sector.

The remainder of this phase will involve the following tasks:

- i) Identifying the remaining key stakeholders (such as the associations of cotton farmers, ginner, textile manufacturers, garment manufacturers, waste recyclers, and informal actors in the solid waste sector) and incorporating them in the pilot project. Associations of Nairobi residents, in particular the umbrella association 'We Can Do It' that has shown tremendous commitment to demanding quality services from the Nairobi City Council, will also be drafted into the pilot project.
- ii) A stakeholder workshop during which the proposed policy package will be presented and discussed. The stakeholder input received during the workshop will be used in the final selection of the instruments and tightening of their implementation modalities.

- iii) Informal discussions with various stakeholder groups to receive feedback on the proposed instruments. This feedback will be critical in the refinement of the proposals. Such informal discussions, as discussed in Chapter 4, provide a forum to stakeholders, who may not be vocal enough to make their contribution in a conference or workshop, to speak out.
- iv) Agreeing on a timeframe during which stakeholders can express their opinions on the proposed policy packages.
- v) Engagement with the stakeholder task force established by the government and the government itself in order to input into the improvement of the task force and revision of the road map.

5.4 Next steps: Policy implementation, monitoring and evaluation (Phase 4)

A pilot project to implement the final policy choice along with important flanking measures, monitoring and evaluation of their performance is proposed. The first three phases are nearly completed, extensive stakeholder consultation has already taken place and final consensus for the policy proposal is almost achieved. The proposed pilot project is presented in the following chapter (Chapter 6) as well as an outline of the key impacts expected from implementation of the policy package.

6. Pilot project to implement proposed policy package

The analysis in the preceding chapter recommended the option of implementing the seven instruments proposed gradually. The final proposal now needs to be again presented for stakeholder discussion and debate before the final choice is made. Once the final consensus has been reached, the institution responsible for implementation of the policy package will market it to the wider public, explaining why the package was chosen, how it will be implemented in a fair, efficient and transparent manner, and the expected benefits, among others.

6.1 Implementation plan

Proper implementation of the chosen policy package, and therefore its impact, will depend strongly on the institutional set up considering the operational weaknesses of the Nairobi City Council, and also on the quality of monitoring and evaluation. Currently, a committee to oversee implementation of the roadmap is already in place and a Kenyan Standard (KS-1794) for polythene bags has been approved. The committee has set up a contributory fund to raise resources for awareness creation and public campaigns against littering and improper disposal of plastics.

Institutional set up

The pilot project should be managed by a Plastics Levy Management Committee (PLMC), constituted and chaired by the National Environmental Management Authority (NEMA). Building on the consultative stakeholder committee established by NEMA, the PLMC should have representation of all the relevant stakeholders without it being too large to discharge its responsibility cost-effectively. The existing committee has the following membership:

- NEMA
- Ministry of Environment and Natural Resources
- Ministry of Local Government
- Ministry of Trade and Industry
- Kenya Association of Manufacturers (KAM)
- KAM's Plastics Sector Group
- Plastics wholesalers and retailers
- Plastics consumers

To make the PLMC, the consultative stakeholder committee should be expanded to include also:

- Ministry of Finance
- Kenya Revenue Authority (KRA)
- Nairobi City Council (NCC)
- Kenya National Chamber of Commerce and Industry (KNCCI)
- Federation of Kenyan Employers (FKE)
- KAM's Textiles Sector Group
- We Can Do It (the umbrella association of residential associations)
- Nairobi Central Business District Association (NCBDA)
- Kenya Bureau of Standards (KBS)
- Kenya Cotton Ginners Association (KCGA)
- Kenya Industrial Research and Development Institute (KIRDI)

The PLMC should be established by law to give it credibility and power, and its function should be to ensure that the plastics levy is collected and the resulting revenue allocated to the earmarked activities, which include:

- Development of alternatives to the plastic shopping bags and in particular a cotton/sisal shopping bag
- Development of a plastic recycling system and related infrastructure
- Contribution to the development of a well-managed plastics disposal system
- Data collection and, in general, monitoring and evaluation of the pilot project
- Public awareness and anti-littering campaigns on the use of plastic shopping bags and regarding the operations and benefits of the levy, including how one could avoid it
- Operations of the PLMC
- Other priority programmes decided upon by the PLMC.

To discharge its responsibility, the committee should utilize contracts, memorandums of understanding (MOUs) and other forms of engagement with other actors. Thus, the committee should contract the Kenya Revenue Authority (KRA) to collect the levy on its behalf. The KRA has the required capacity and experience and is highly efficient. The Authority, moreover, accepts such contracts. For example, it recently entered into an agreement with the Nairobi City Council and Mombasa City Council to collect for the councils land rates, at a collection of 1.5 per cent of the amount collected. Since the collection of the plastics levy will be much easier than land rates, the PLMC can negotiate for a lower collection fee.

In the design and production of the cotton/sisal bag, moreover, the committee should sign an MOU with KIRDI for the latter to research and design the most convenient and cost-effective prototype. This will serve to identify the level of subsidy, if any, that commercial producers of the bags will require. Subsequently, PLMC will make arrangements with the private sector on the modalities of commercial production of the bags.

While the operations of the PLMC will be funded from the levy, in the initial period of establishment the PLMC will require funding from the government and/or donors.

Flanking measures

Implementation of either of the two options is likely to have adverse impact especially on producers of thin plastics and plastic carrier bags in general. A flanking measure that should be considered is to aid them, using the levy, to participate in the manufacture of recycled plastic bags and multiple use plastic bags. An additional measure is to set a reasonable period within which producers of the thin plastic bags have to stop the activity. Such a period should not be longer than a year, however, considering the tendency of agents to wait until the last minute to comply with regulations. Exempting informal market outlets from the requirement to provide evidence, through shopping receipts, of passing over the levy on plastic bags to the consumers (shoppers) is another measure that can mitigate potential difficulties to this sector upon which the majority of the poor rely.

Monitoring and evaluation

Lack of data and information, and the fact that solid waste management problems and the baseline conditions keep changing over time, imply that a monitoring and evaluation system is critical for the successful implementation of the pilot project. In particular, the monitoring and evaluation system will enable the PLMC to gauge the reaction or responsiveness of the industry and shoppers to the levy and adjust it accordingly.

The PLMC will carry out research on consumer usage of plastic shopping bags while the policy is implemented and prepare a stakeholder-supported monitoring and evaluation log frame complete with measurable milestones and verifiable indicators including, but not limited to:

- Environmental effectiveness
- Economic efficiency
- Administration and compliance costs
- Revenues - adequacy, appropriateness of levy incidence and appropriateness of use
- Wider economic and social effects.

The PLMC will analyse the data after every six months to gauge responsiveness and for troubleshooting, and use the findings to make any required adjustments on the levy rate and/or operational procedures.

Potential impacts of implementing the policy package

Implementation of the policy package is expected to have considerable impact. First, reduced production and use of plastic bags will produce substantial environmental benefits. The nuisance associated with littering and all the other negative impacts of plastic bag waste will be lessened considerably. With the expected contribution to the improvement of the waste disposal system, moreover, implementation of the policy package will have benefits in terms of improvement in the overall operation of the solid waste management system in Nairobi. Ultimately, these improvements in environmental quality will contribute to improved economic performance through higher investments.

Second, reduction of the production of plastic bags will mean loss of jobs. However, this would be more than compensated for by employment in the natural fibre bag industry, the administration of a plastic bag levy, and in the recycling industry. In particular, while the production of plastic bags in the country is capital and import intensive, the manufacture of cotton bags will employ more workers for every bag produced, reduce reliance on imported inputs, and create strong forward linkages with cotton farming,

ginning, spinning and fabric manufacturing in general. The bags could even be exported to the US market through the preferential market access provided by the AGOA. The economies of scale created in the cotton-textile chain would, moreover, help the country to become more competitive internationally.

Once recycling infrastructure for plastics is put in place, many jobs will be created not only in the recycling factory itself but also in the collection of plastic bags already in the environment. There are many street children (and families) in Nairobi that draw their livelihood from waste picking. The recycling industry will provide a more stable market for their waste and thereby help to support livelihoods.

Third, learning from the pilot project will be used to introduce similar policy packages for the management of other solid wastes in Nairobi and the rest of the country.

Fourth, the introduction of an alternative bag will most likely raise the financial cost to the consumer. However, subsidizing the production of the alternative bag from revenue collected through the plastic bag levy would ensure that this increase is not excessive.

Fifth, administrative costs will increase on account of the establishment and operation of the PLMC and the actual levy collection effort by the KRA. Related to this, required purchase of alternative bags by customers may lead to increased theft and raise security cost for retailers and supermarkets. Experience from Ireland and other countries, however, have shown that such theft and security fears may be largely exaggerated. In any case, many retail outlets in Nairobi have put in place measures to deal with shoplifting.

Sixth, fears are often expressed that banning of some plastic bags and introduction of a levy on plastic shopping bags may lead to an increase in food contamination and food poisoning. The measure proposed in the pilot project to mitigate this, that is, providing for sale of plastic bags marked out for specific food types, has been used in Ireland successfully.

6.2 Summary and way forward

The process of selection, design and implementation of economic instruments to manage a selected solid waste management problem – plastic shopping bags in Nairobi – has reached a critical stage. Using UNEP's four-phase guidelines, this report has developed a comprehensive seven point policy package integrating both economic and regulatory (CAC) instruments. The report has outlined a clear implementation strategy, established strong links with relevant institutions and instituted an effective multi-stakeholder process. The policy package now requires general support and consensus from the larger stakeholder community in order to proceed with the implementation plan as a pilot project. A clear timeframe should be set based on the recommendation to introduce the package gradually over two to three years, and building on the stakeholder-negotiated roadmap.

Finally, this report can also be used as a case study or training tool for capacity building on the use of economic instruments for environmental management and as a model for designing similar environmental policy packages in Kenya as well as other developing countries.

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Appendix: Policy instruments applied around the world to tackle the plastic bags problem

Country	Instrument	Details	Outcome(s)
China	Charge system (EI)	A selection of supermarkets in Shanghai will charge shoppers for plastic bags from 2004 in an attempt to reduce waste.	This is expected to reduce the more than one million bags per day given away by the supermarkets-which either end up in landfills or blowing around the city as litter
Bangladesh	Ban (CAC)	A ban was put on production and distribution of plastic bags which had been the cause of blocked drains and severe floods	
Ireland	Earmarked charges (Levies) (EI)	The government has imposed a charge on all plastic shopping bags (of around 30 NZ cents per bag)	There have been reports of a (maintained) 97.5% reduction in plastic bag distribution. Consumers have accepted the change and are using a range of reusable bags offered by the supermarkets. The charge has generated approximately NZ\$ 5 million. This money will be channelled into a fund to promote waste management and environmental initiatives
South Africa	Charges (EI)	A charge has been imposed on plastic bags, which have assumed a new identity as the 'national flower' as a result of many getting caught up in trees and fences.	
Australia	Voluntary agreements (EI)	Environment ministers have challenged retailers to voluntarily reduce the 6.9 billion bags used each year	
	Bans (CAC)	In Coles Bay, Tasmania, plastic bags have been banned altogether and residents are being provided with alternatives such as 'calico' bags.	
India	Bans (CAC)	The northern state of Himachal Pradesh has implemented a total ban on plastic bags' production, storage, use, sale and distribution. Penalties are severe (include up to seven years in jail or a fine of up to 100,000 Rupees).	
		In Mumbai, the Council banned plastic bags. Market traders now hand out recycled paper bags	
	In the state of Tamil Nadu, a Bill to ban non-recyclable plastic from being sold, stored, transported and used was introduced to the state government for approval		
	Public information campaigns (EI)	The pollution control board of the same state is also educating the public on the dangers of improper disposal and the advantages of alternatives, using bus advertisements, exhibitions and media campaigns.	
		In Panaji, Goa, a community campaign involves donating old newspapers and magazines by individuals to local charitable organizations. These newspapers are cut into paper-bags of various sizes and sold to volunteering shops or pharmacies to reduce the use of plastic bags. Income generated from these bags is in turn helping the charity organizations to buy the much needed provisions and medicines.	

Selection, Design and Implementation of Economic Instruments in the Solid Waste Management Sector in Kenya

Country	Instrument	Details	Outcomes(s)
New Zealand	Introduction of cleaner alternatives	A consortium of organizations is importing the 'Green Bag' to provide an alternative to plastic bags to consumers. Leading retailers are introducing reusable shopping bags, such as cotton bags, for sale.	
	Public information campaigns	The 'Say No to Plastic Bags' campaign has been launched in Christchurch, South Island to raise awareness on issues associated with plastic bags. It has been encouraging the supermarkets to stock alternatives to plastic bags such as jute bags.	
	Recycling	Christchurch City Council collects plastic shopping bags for recycling through a process called thermo-fusion, which turns the bags into durable plastic planks suitable for boxing, pallets and fenceposts.	
Italy	Pollution taxes (EI)	In 1989, Italy introduced a tax on plastic bags. The new tax sought to have the price of bags better reflect the cost that they imposed onto society and the environment. By levying a tax of 100 lira per plastic bag on importers or producers, the Italian government created a new signal to the market—the cost of plastic bags was now greater compared to alternatives. The tax was about five times as great as the manufacturing cost per bag.	From 1989 to 1992, the government collected over 250 billion lira (around \$150 million) through this tax.
Hong Kong	Public information campaigns- (EI)	'Use Fewer Plastic Bags' campaign was launched with an initial target of reducing use by 10%. More than 1500 retail outlets agreed to take part in the drive and devised action plans to achieve the target.	The campaign was a resounding success. In the 1 st year, more than 30% of the participating retailers achieved or surpassed the 10% reduction target, leading to an overall reduction of more than 35 million plastic bags.
Taiwan	Bans (CAC)	Taiwan is moving towards banning the free distribution of plastic bags	
Singapore	Public information campaigns- (EI)	The government of Singapore is launching a campaign to discourage the use of plastic bags	
Canada	Recycling	Almost all of the big grocery chain stores accept bags for recycling. The average household produces 8.88 kilograms of plastic bags per year. 2.46% of the total waste stream consists of plastic bags and locally 44.93% of all plastic bags produced are recovered	
United States of America	Product/ technology/ Performance standards (EI)	California passed a law that required plastic trash bags (manufactured for waste disposal rather than shopping) to be made up of a minimum of 30% recycled content. California's requirement changed requiring plastic trash bag manufacturers to comply with one of the following two options: ensure that its plastic trash bags intended for sale in the state contain a quantity of recycled post-consumer plastic equal to at least 10% of the weight of the regulated bags; or ensure that at least 30% of the weight of the material used in all of its plastic products intended for sale in the state is recycled post-consumer plastic.	

