

**AN ASSESSMENT OF THE ROLE OF THE PRIVATE SECTOR IN URBAN
INFRASTRUCTURE SERVICE PROVISION: A CASE OF SOLID WASTE
MANAGEMENT IN THE CITY OF NAIROBI. //**

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**A THESIS SUBMITTED IN PART FULFILLMENT FOR THE DEGREE OF
MASTER OF ARTS (PLANNING) OF THE UNIVERSITY OF NAIROBI.**

SEPTEMBER, 1997

DECLARATION

This thesis is my original work and has not been presented for a degree
in any other University.



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DEDICATION

This thesis is dedicated to my parents, for the tireless support they have given me throughout my academic life.

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The completion of this thesis has been made possible through the generous and tireless assistance accorded me by a number of institutions and people (far too many to mention individually) who have directly and indirectly helped in reinforcing my efforts. I would particularly like to express sincere gratitude to the Department of Physical Planning of the Ministry of Lands and Settlement for their financial assistance without which I might never have undertaken the course.

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ABSTRACT

Urban infrastructure services, which include facilities and services such as roads, mass transportation, water systems, garbage collection and disposal, drainage and flood protection, electric installations, and telecommunications, are essential in making human settlements (including urban areas) places of sustainable living by enhancing their environmental quality and aiding human activities.

However, in developing countries, urban infrastructure facilities and services have been recording poor performance both in terms of quantity and quality standards. In Kenya, the situation has not been any different as evidenced by the inefficiency and inadequacy of Solid Waste Management services in the city of Nairobi. By reviewing a wide range of issues connected with infrastructure services, and by posing the problem in the context of the developing world, this study aims at establishing possible explanations for the above situation.

A review of literature indicates that the bulk of urban infrastructure service problems both in the developing world and in Kenya, are a consequence of a variety of factors including high urban population growth rates and administrative and management malfunctions in the urban management systems. But more specifically, this poor performance has been blamed on the institutional framework under which urban infrastructure services delivered. Critics argue that the public sector, traditionally responsible for service delivery in developing countries, is insensitive to internal and external factors which impinge on the efficiency and effectiveness of service delivery systems.

The study therefore seeks to establish from existing examples in the developing world, available institutional arrangements and particularly examines role that private sector participation plays in solving urban service delivery problems. Specific attention is paid to the contribution of the private ^{Sector} in the provision of solid waste management services in the city of Nairobi.

The involvement of the private sector in solid waste management in Nairobi is a relatively new phenomenon. However, the findings of the study indicate that prompted by frustrations with the infrequent and inefficient services provided by the Nairobi City Council, city residents are increasingly turning to private solid waste entrepreneurs as a means of getting their garbage collection needs met. The study has established that as demonstrated in numerous other experiences in the developing world, private solid waste entrepreneurship in Nairobi seems to be useful in addressing solid waste management problems in the city. However, the current private sector involvement does not address the needs of all areas within the city especially low income areas and open spaces.

Taking into consideration the above facts, and considering important contextual issues, the study recommends the privatization of garbage collection services in the city of Nairobi not as a panacea, but as an important step towards the solution of the problem.

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CHAPTER ONE: INTRODUCTION.

1-1 Statement of the Problem.

The growth of the world's population, and especially the rapid growth of human settlements and the built environment in developing countries is due to increasing population pressure and the process of structural economic change in predominantly agricultural societies. In many developing countries, rapid urbanization has created huge demands on the government and local authorities to provide land, shelter, basic services and infrastructure to the majority of urban dwellers. However, in many cities, the development of basic services and infrastructure has not kept pace with the population increase and municipal authorities function under pressure due to increased rural-urban migration and the resultant high density settlements.

In Kenya, cities have not been spared from this experience. In Nairobi, and other towns, a whole range of environmental problems are evident and include, problems arising from overcrowding, lack of clean water supply, proper sanitation facilities and solid waste management. These have led to serious environmental and public health problems.

Of critical importance however, are problems resulting from, and facing the management of solid wastes in the city. The World Health Organization defines waste as being something which the owner no longer wants at a given place and time, and which has no current perceived market value (Suess & Huisman:1993). Municipal solid wastes are composed of wastes generated by households and wastes of similar character from shops, manufacturing and service industries, markets and offices. Van Tassel (1970) observes that because waste is by definition of little or no value to the generator, there is little financial incentive to handle it in a

careful manner and on the whole, there is an in-built temptation to relinquish responsibility for it at the earliest opportunity.

Increasing population in the city, rising standards of living and rapid developments in technology have all contributed to an increase both in the amount and variety of solid wastes generated by domestic, industrial, commercial and other activities. These, coupled with a lack of awareness amongst city residents, inadequate technical and financial ability facing municipal agencies, have made not only the city of Nairobi, but also many urban centers in Less Developed Countries incapable of carrying out efficient solid waste management (Otieno:1992).

In Nairobi, the degree and efficiency of solid waste collection and disposal is inadequate. Currently, about 1000 tones of mixed municipal refuse is generated in Nairobi each day with 57% being from residential and 43% from commercial and industrial areas. Over the years, the amount of solid waste generated in the city of Nairobi has been increasing from an annual total of 165,222 tones in 1973 to 365,675 in 1998. However, within the same period, the amount of solid waste collected as a percentage of the total has been reducing from 98.32% in 1973 to 21.54% in 1988 (Otieno:1992). This crisis is a result of two basic factors namely, careless handling and failure to organize collection schemes. Collection and disposal of solid waste is facing a lot of inadequacies as evidenced by unsightly heaps of refuse rotting in peoples backyards, along the streets and around shopping centers. This has major environmental and health implications. Within residential areas for instance, when refuse is not collected in good time and regularly, there is a tendency for residents to spill it all over the place. Such piles of refuse form breeding grounds for rodents, flies and other types of vermin (Mbuyi:1995).

And within the town, litter is an eyesore, despoiling and impairing the aesthetic quality of road-sides, open spaces, access roads, etc. On another extreme, solid waste related problems may reduce the attractiveness of a town as a destination for investors.

The problems of dealing not only with greater volumes of, but also more dangerous waste materials are particularly acute in developing countries especially where these have not developed efficient waste management technologies. These include; generally poor control of pollution, a lack of financial resources, shortage of people with special technical and managerial skills and a low level of public awareness on environmental issues(UNEP:1992) leading to problems of insufficient maintenance of existing infrastructure, mis-allocated investments, lack of responsiveness to users demands and technical and institutional inefficiencies (World Bank:1994). All these present daunting challenges for the future — challenges compounded by new demand and constrained resources.

In an attempt to explain what accounts for the poor performance in the provision of urban infrastructure services in the third world, two schools of thought have emerged: The first points to problems of management. Poor performance, they contend, results from the absence of effective governance. Critics of the present, often centralized, structure of government in developing countries argue that such structures are incapable of responsive administration (Dillinger:1994). Governments for instance, have failed to implement pollution control — a problem resulting not from a lack of, but more from a failure to enforce existing legislation. In so doing, they have failed to promote good practice in occupational health and safety standards (UNCHS:1991). Urban service delivery failures can therefore be expressed as a problem of internal

administration malfunctions - specifically poor tax administration, poor accounting and, poor capital investment budgeting. In affirmation therefore, the traditional focus has been on the application of good technique (accounting, organization planning, financial analysis) as a strategy for improving the management of infrastructure service delivery agencies. It was this kind of thinking that led governments, with donors giving technical advise and financial assistance, to embark on a process of institutional reform, emphasis being heavy on the improvement of the internal efficiency of organizations responsible for the provision of infrastructure services (Ilies:1992).

However, the performance of infrastructure systems in the third world continue to record poor performance and in retrospect, the arguments of the above school of thought now appear to be a narrow definition. Recently, frustration with the above approach has prompted a shift in focus from administrative procedures to factors motivating individuals within the organization - citing incentives to employees as a major example. Attention has also been directed to the role played by factors outside the organization e.g; pressures from consumer interest groups, worker's unions and central government regulators whose behaviour influences the performance of service delivery systems (Ostrom, Schroeder & Wynne:1993). It has been argued that, since incentives rarely exist for central government ministries and public corporations to perceive citizens as their clientele, the extent to which their policies respond to the needs and priorities of their populations is found wanting (Rondinelli:1990).

An analysis of environmental problems in the third world shows that the problems of solid waste management and other infrastructure are the result

of inappropriate institutional frameworks and service delivery systems. In an attempt to remedy the situation therefore, governments in developing countries and recently Kenya, are considering various institutional options with a view of coming up with an efficient solid waste management system. Most governments and donor agencies alike are now turning to the private sector in preference to other agencies as an effective alternative to the public sector. The strength of the private sector, it is presumed, lies in the efficiencies traditionally associated with it in terms of resource use efficiency, accountability to clients in service delivery, the ability to harness private initiative, and action and to mobilize private capital. In Kenya, this is a recent phenomenon and not much has been done to find out the extent to which the private sector is actually involved and, the feasibility of such an involvement if and when it becomes widely acceptable as a method of solid waste management. It is for this reason that the study seeks an in-depth consideration of this issue with a view of coming up with important insights that may be used to facilitate meaningful implementation of the process.

1-2 Study Objectives.

i). General objective:

To establish the extent to which private sector participation can be relied upon to bridge the gap of inadequacy facing urban infrastructure services in the third world with particular reference to solid waste management in the City of Nairobi.

ii). Specific objectives:

1. To find out the level to which city residents are sensitized to the need for public cleanliness and the problem of limited resources (or inefficiencies) of government of government in providing for Solid Waste Management services.

2. To solicit from urban dwellers suggestions as to how the solid waste menace in the city could be abated and specifically to find out the level of acceptance and/or rejection of private sector involvement as a means for achieving the above.
3. To find out the level at which private sector firms are involved in the management of solid wastes in the city of Nairobi, and the extent to which such involvement can be said to be preferable to public sector management.
4. Make policy recommendations that will facilitate the careful implementation of such a process if found feasible.

1-3 Study Assumptions.

The study is based on the following assumptions:

1. That the current institutional framework of publicly managed solid waste collection and disposal is no longer tenable as evidenced in the Nairobi City Council's dwindling capacity to handle waste.
2. That the potential for private sector involvement exists not a panacea as but as an opportunity which if carefully considered and supported, will help deal with a substantial share of solid waste in the city.

1-4 Scope of the Study.

To facilitate contextual understanding, this study begins with a broad examination of the different institutional framework that exist, especially role of the private sector in urban infrastructure service provision. It does so by assessing the modes of private sector involvement as practiced, seeking to highlight the benefits accrued, and

problems encountered in cases within the third world. Narrowing down specifically to solid waste management, it examines examples of institutional options that exist and have been used to secure an efficient solid waste management system especially in developing countries.

The study briefly examines the performance of the Nairobi city council with regard to it's role as the sole agent mandated by law to carry out the waste management process in the city. It also examines the seriousness of problems emanating from inefficient waste management, and how the city's residents have undertaken to abate these. It specifically examines the extent to which the private sector is currently involved to supplement the deficit in public sector provision of solid waste management services in the city. Considered here are formal private sector firms engaged in the collection and disposal of waste within the boundaries of the city of Nairobi, the waste generating activities being the various categories of residential areas, manufacturing and service industries, commercial premises, institutions and their surroundings. Disposal here is limited to transfer and dumping at a sanitary landfill.

The study poses questions as to whether the effective participation of private firms in municipal solid waste management will be in the interest of the government and most important, the city's residents. The assessment is carried out in the light of various contextual factors including, the extent to which these firms contribute to the efficient use of scarce resources, the place of the consumer vis a vis the accountability of the private firms, the legislative and statutory framework for effective implementation of such a process and, the institutional management capacity that such a process would demand. The implications are assessed taking cognizance the fact that solid waste

management, due to its implications on public welfare, public health and environmental protection, is a public good of which local government is traditionally responsible.

Finally, the study settles on the issue of how best to implement a privatization process for the solid waste management service. In order to do so, it incorporates the views of consumers (or the generators of solid waste), current actors including the city council, the central government and private firms already engaged as entrepreneurs in the activity. The forms of private sector involvement considered include, contracting, open competition, franchise and concessions.

1-5 Justification of the Study.

Solid Waste Management is an area that has been taken for granted in Kenya for quite a long time now. However, it is becoming increasingly obvious that current practice - of public financed, and operated solid waste management - is becoming inadequate for today's needs especially in the light of growing urban populations in Kenya. Although legislation to control waste disposal exists, these are seldom enforced. Although other approaches have been developed to try and minimize problems related to improper waste handling - including community based initiatives for improved waste handling, it is evident that the majority of Nairobi's people are either too busy, or do not want at all, to be involved in dealing with waste they have generated. As such we expect that the unsightly unattended heaps of garbage that continue to litter spaces within the town's boundaries will only become a worse scenario in the future.

Although Kenya has no elaborate policy on the privatization of most urban infrastructure services, the aim of the government is to expand the resource pool for urban infrastructure service provision. For the solid waste management service, this would be sought as a means of promoting efficiency in solid waste collection and disposal thus safeguarding environmental quality and ensuring public health.

There have been a number of studies conducted on this subject by planners and scientists. Some have concerned themselves with the technical aspects of Solid Waste Management i.e.; methods of disposal (Otieno:1989, Mwangi:1990), while others have concerned themselves with the role of urban communities in Solid Waste Management in the city of Nairobi with specific references to residential (Mwaura:1991, Mbui:1995) and industrial wastes (Fadamula:1991). Without down-playing the contribution made by these studies to our understanding of the magnitude of, and the possible solutions to the problem of solid waste in the city, it is important to observe that none of these has critically, and in detail assessed the role of the private sector in the delivery of solid waste management services. Yet as we know it, there has been a growing dependence by the city's people on private companies in the collection and disposal of solid waste as evidenced by the growing number of collection firms and recycling companies.

In order therefore to develop frameworks within which effective waste management strategies can be planned, it is essential to know not only the amounts of waste generated and their sources, but also the reasons as to why this waste is not handled in a proper manner. In promoting the role of the private sector as a strategy for solid waste management, it is essential that more studies are conducted to establish the possibilities

and constraints to this endeavour from the point of view of the source, the government and the private sector actors. Besides studies have shown that the city's residents are willing to share some of the costs of solid waste collection and disposal (Davinder:1987). Since cost is not the only determinant of private sector participation, this study seeks to explore the existing and foreseeable potentials and constraints that together enhance or limit private sector participation in this activity.

1-6 Methodology.

i). Secondary Data Collection.

This was carried out to get an overview of theory on the elements of Urban management with particular reference to the delivery of intra-urban infrastructure services. Aspects considered included policy, legislation, finance, and the existing institutional framework for service delivery in Kenya. In general, literature on the workings of the private v s a vis the public sector in relation to service delivery was read. Of specific reference was the privatization of public goods and enterprises in Kenya and in other parts of the developing world. In greater detail, literature on various aspects of solid waste management was consulted with specific reference to the participation of the private sector in the delivery of this service in Kenya in other third world countries and cities. Information concerning the study area was also collected. Sources used included books written by various experts in the field and studies conducted of similar nature in and out of the study area.

ii). Primary data collection

Owing to the large size of the study area, stratified sampling techniques were applied to ensure that the whole area is adequately covered. Seven areas were sampled in total including four residential areas of different

income categories, industrial area, institutions and commercial enterprises. Twenty questionnaires were administered in each zone to heads of households or their spouses, shop and business owners or managers, managers of industries, offices and institutions.

In addition, interview schedules were administered to officers in the city council, the Ministry of Local Government and solid waste entrepreneurs (i.e companies currently involved in the exercise). Questionnaires were administered to establish the general views of city residents concerning the idea of the private sector handling of their wastes, their capacity to support private waste collection firms and their misgivings to the whole idea, if any. This was also aimed at establishing the level of awareness of the city residents on environmental issues.

1-7 Analysis.

The analysis of collected data was conducted through the use of descriptive techniques. Statistical Packages for the Social Sciences (SPSS), was used to compute frequencies and simple distribution statistics including means modes and medians where necessary. Cross-tabulation were done to get a more detailed analysis as to the nature of relationships between variables.

1-8 limitations of the Study.

Because of time limitations unavailability of data from the city council, it was difficult to carry out a comprehensive comparative analysis between the cost of private and public service provision. However, elementary analysis was carried out on the cost (to the private firm) of setting up a waste collection venture and the cost of access to private service by the consumer.

It was also not possible to compare the effectiveness of all possible private sector participation methods since only a few options were currently available to consumers. However, the efficiency of open competition as a method is evaluated based on the relative preference for city residents to deal directly with private firms as compared to other methods that involve partnerships with the public and non-governmental sectors.

CHAPTER TWO: CONCEPTUAL FRAMEWORK.

2-1 Urban Infrastructure Services.

2-1.1 Definition.

One of the main roles of urban government is the provision of infrastructure services for urban dwellers. Urban infrastructure can be defined as those services derived from the set of public works traditionally supported by the public sector to enhance private sector production and to allow for household consumption (Fox:1994). As defined, it includes services such as roads, mass transportation, water systems, garbage collection and disposal, drainage and flood protection, electric installations, and telecommunications. The definition here is limited to urban based infrastructure services. In many instances, infrastructure entails investment in a physical facility. However, any meaningful definition of infrastructure must center on the service since consumers are more often than not interested in the services derived from the physical facilities.

2-1.2 Role and Importance of Infrastructure Services.

The old unsettled argument on the historical order between the 'egg' and the 'hen' pervades the debate on the importance of infrastructure. The supply-side perspective, which has the support of industrialists and other investors, stems from the expectation that productive activity will be located somewhere because a basic infrastructure is in place. On the other hand, for demand-side proponents, who comprise mainly of infrastructure funding agencies, evidence of substantial productive activity and economic potential must exist before any capital is committed to the development of infrastructure in a particular location. Meeting a demand for services thus becomes the criteria for decision making pertaining to investment in infrastructure projects. The former

influences government policy in new towns or the so-called 'Growth Centers' in developing countries, while the latter is mostly the scenario in older, well established cities.

Whether the existence of potential for development necessitates investments in infrastructure projects, or investments in infrastructure increases a location's development potential, the importance of infrastructure in society cannot be overlooked. For instance, there is a general consensus on the role that infrastructure plays in stimulating economic development i.e, better water, sewer, roads, etc, expand overall economic potential by allowing firms to be more productive and thus attracting more investment to a particular area (Fox:1994). Some infrastructure may therefore be demanded to meet the basic life support needs thus improving living conditions. In other words, the decision by firms, labourers and others to invest, work or live in a place is greatly influenced by the availability of adequate and appropriate infrastructure.

On another level, a two way relationship exists between infrastructure and the environment. Many infrastructure investments are used to offset the negative consequences of population concentration such as overcrowding and environmental degradation resulting from the production and consumption of certain goods. Infrastructure can also cause environmental degradation. For instance, the availability of improved water services can change the water level in neighborhoods and dramatically increase the need for sewerage systems. Rapid run-off problems can be exacerbated by a road system. Infrastructure also allows manufacturing expansion which in the long run, creates environmental effects. But despite the possible negative consequences on the environment, infrastructure, more often than not is used to aid human activities, improve environmental quality and

living conditions.

2-1.3 Framework for Delivery.

According to Rondinelli (1990), there are two aspects that impinge on infrastructure service delivery policy. Differentiating between 'provision' and 'production' aspects, he defines the former as the determination of the quantity and quality of a service demanded and ensuring that they are financed and executed, while the latter entails the deployment and management of staff, and other resources to deliver the service.

These two aspects culminate in the making of decisions that involve three sets of actors. First, policy makers create the basic environment in which decisions are made and in many cases establish policies to determine overall spending, what type of agencies deliver the services, etc. On another level, infrastructure managers determine policy within service delivery organizations and make major decisions in areas such as technology employed in delivery, etc. Last but not least very important, there are those decisions that emanate from the users of infrastructure services. These make choices pertaining to the quantity of service required vis-a-vis the quality offered.

All over the world, substantial differences exist across countries and, types of infrastructure regarding the institutional responsibility for provision and production (delivery). However, whereas in many countries the responsibility for the provision of infrastructure is usually the role of the government (central or local), the responsibility for service delivery and management is often shared amongst various partners in a participatory strategy whereby there is a clear division of tasks in line

with the interests and capacities of each partner. Where possible, each of the partners tries to enlist the participation of people as consumers in various aspect of infrastructure service provision including the formulation of goals, planning and programming, implementation, operation and maintenance, monitoring and evaluation. The main partners in participatory infrastructure management are;

i) The Public sector.

In most countries, the public sector is responsible for investment for a wide range of infrastructure categories. This responsibility may lie with central, state or provincial corporations, or municipal governments through a formidable array of organizational options (enterprises, boards e.t.c). Generally, within the regional and national context, massive infrastructure investments are made directly by the central government which is also charged with the operation and maintenance of the same. In the urban setting however, this is usually through a system of devolution or transfer of authority and responsibility from central to local governments (Fox:1994).

In addition to being the main public sector agency traditionally responsible for urban management, local government is vested with the responsibility of performing a wide variety of infrastructure related functions namely; a) the provision of infrastructure essential for the efficient operation of cities, b) the provision of services that develop human resources, improve productivity and raise the standards of living of urban residents, c) regulating private activities that affect community welfare and the health and safety of the urban populace and, d) providing services and facilities that support economic activity and allow private enterprise to operate efficiently in urban areas (Rodinelli:1990). As can

be seen, the bulk of these deal directly or indirectly with the provision of infrastructure services.

In order to accomplish the above roles, and depending on the type of infrastructure, urban government may either go it alone or as is common, through joint ventures with the central government. In such instances, the two may be responsible for different aspects of the infrastructure service provision process. For instance, the central government may finance the development of the physical facility while leaving its operation and maintenance entirely in the hands of the local authority.

ii) The Private Sector.

Many governments are coming to the realization that demand-orientation, competition and accountability in infrastructure service delivery may be more readily achieved through the involvement of the commercial private sector in selected infrastructure delivery functions, rather than attempting to incorporate these commercial principles into public institutions. They may thus allow private entrepreneurship or contract out the provision and delivery of selected services to private firms.

Private sector actors range from individual garbage collectors hired at a neighborhood level to large enterprises that may be entrusted with the task of developing and (or) operating whole segments of an infrastructure such as solid waste collection or water supply. As is normally the case with the private sector, participating firms are primarily concerned with the profitability of a venture. The role of the private sector is further discussed in chapter four.

iii) Community Based Organizations.

Every inhabitant of the city is an infrastructure user. With regard to residential areas, it is important to note that the basic unit of decision-making and action regarding infrastructure is always an individual or, in practical terms, a household. In addition to households, infrastructure users include commercial and industrial establishments, and institutions. However, while important in economic terms, these are less numerous compared to households.

Beyond the role of consumer, individual households may produce services through the construction of and use of facilities such as sanitary latrines and wells. However, the potential for the participation of a single household is quite limited. To establish facilities that go beyond a single household level (for example footpaths, local drains, community wells, sanitary facilities and waste collection services), a certain level of organization among users is necessary. For communal efforts that relate to infrastructure services, households normally form more specific user associations or Community-Based Organizations. In the context of residential areas, these are often formed when neighbours join forces to improve local security, housing quality, environmental quality, basic utilities, and social services.

In Orangi, a large squatter settlement in Karachi, Pakistan, small construction entrepreneurs and workers contracted by lane level community organizations have constructed a local sewer network. While technically not optimal for planning a sewer system, the lane (20 to 30 households), proved to be a workable self-managed social unit with sufficiently strong common interests. Lane organizations selected their own leaders and took complete responsibility for works-contracting and site supervision as well

as subsequent maintenance. All investments were financed 'up front' by lane organizations through collections from their members (Khan:1991, Hassan:1991).

On another level, though not very common, owners of industry and commercial establishments are primarily concerned with the level of service access, the reliability and quality of available services, and the relative cost and affordability of services. Land and property owners on the other hand are interested with the impact of infrastructure services on property values. Together or separately, these two may form user groups and through collective contribution, make infrastructure investments for the purpose of achieving the above interest.

iv) Non-governmental organizations.

These may be understood as a 'third system' between the public and private domains. N.G.O's normally originate outside the community with which they work. They are semi-autonomous, external to political power structures and non-commercial in their motives. Their main functions include mediating between communities and government authorities, advocating community interests, consulting and providing support for community efforts and, occasionally, managing project activities.

FUNDASAL in El Salvador is a highly successful self-built housing program. Although largely government dominated, FUNDASAL remains a private Non-Governmental Organization (NGO) that has assumed the typical government role of directing low-cost housing production on a large scale by delivering a coordinated package of services that integrates community-based self-help house construction into processes of community building, cooperative formulation, and research. With the assistance of the NGO,

community groups confronted a range of technical, economic, social and political issues - organizing funding, and facilitating the inputs of members. By assisting the community development process, FUNDASAL achieved considerable success in terms of technical effectiveness as well as a high level of cost recovery for projects undertaken (Moser:1987).

2-1.4 Financing Urban Infrastructure Services.

Adequate financing is necessary for sustainable infrastructure systems. The role of finance is more than to ensure that sufficient funds are in place, because financing schemes can affect incentives and other goals, such as equity. The finances for initial infrastructure investments, operation and maintenance are normally derived from a variety of sources including the government, the private sector, user charges (internal sources) and donors (external sources).

i). Government Funding.

Government financing of infrastructure facilities and services normally happens at two levels namely; a) central government and b) local government. For the former, own source revenues and borrowed funds constitute financing sources. These include taxes charges for services, fees, net profits from government owned companies, and miscellaneous revenues such as the sale of assets and interest earnings. Although borrowing is not a unique financing source in developing countries, resources can be borrowed through a conventional bond market or from the banking sector, individual savers or pension and other accounts, many of which may be controlled by the government. Borrowing could also be from the central bank. In this case, infrastructure investments may be financed by the creation of money, and greater inflation is the likely consequence.

In developing countries, Local governments frequently have limited ability to borrow, either because a fully operating credit market does not exist in the country or because local governments have inadequate own-source revenue for debt repayment. The most common sources of finance for local governments are inter-governmental transfers and user charges. Normally, the former constitutes the transfer of financial assistance from central to local governments. This assistance may be given to improve the efficiency of service delivery, to share the greater revenue-raising ability of the central government, or to improve distributive equity. The transfer may be in the form of a loan or grant (Fox:1994).

ii) Private Equity Financing.

Private equity financing could come from the resources of parastatals or private sector companies. Self-help is another form. Private equity financing occurs when the private sector has ownership or partnership interest in the infrastructure. The most common example is the Build - Operate - Transfer (BOT) arrangement in which the private sector builds and the operates the facility for some period, after which the facility is transferred to the government. A more detailed account on the role of the private sector in financing infrastructure investments is given in chapter four.

iii). User Charges.

Charged by both central and local governments, and private firms, user fees can finance the full cost of infrastructure services that are private goods but probably cannot be the sole source for infrastructure services that have significant externalities. Water, roads and telephones are private goods and can be fully financed with user fees. Sewerage, solid waste disposal and urban mass transit can be partially financed with user

fees but may need contributions from other sources. User fees can be imposed in a variety of ways. The traditional means is a price levied per unit of purchased services. A specific per cubic meter of water is an example with household metering being a necessary precondition to levy effective charges. The fee should be equal to the long run marginal cost of delivery. A second type of fee is a charge levied on a proxy for infrastructure consumption. Gasoline taxes are often levied with the expectation that gasoline consumption is a proxy for the use of roads. A tax levied on the rental value of land or the increase in rental value (that resulted from improved infrastructure services) can be intended as a surrogate for a charge on infrastructure services. A third form of fee is a lump sum charge for access to a service. A monthly charge to access all the water the user wants is an example.

iv). Donor Financing.

Donors are the next group that finances infrastructure. Donors provide financial resources to an indigenous, often the central or local governments. They provide resources from outside the domestic economy. The funds can be granted or loaned. It has been estimated that less than US\$ 4 billion of housing and infrastructure is financed by donors in developing countries each year thus providing 3 to 4 percent of total investment financing. The world Bank, for instance, lent US\$ 1.66 billion for infrastructure in 1991, representing about 40% of total bank lending (Fox:1994).

2-2 Solid Waste Management.

2-2.1 Solid Waste: Definition and Nature.

The World Health Organization defines waste as being something which the owner no longer wants at a given place and time, and which has no current

perceived market value (Suess & Huissman:1993). Schubeller (1996), defines municipal solid waste to include refuse from households, non-hazardous solid (excluding sludge or semisolid) waste from industrial, commercial and institutional establishments (including non-pathogenic waste from hospitals), market waste, yard waste and street sweepings.

It has been argued that the main culprit in solid waste management problems is packaging - especially the use of material inorganic non-biodegradable material for the packaging of goods. Packaging and the solid waste problem are closely linked. Largely due to rising standards of living, people in urban areas all over the world discard as much of their packaging material as possible. As a result, it is impossible to stroll through city streets, drive in the country, walk in a park or ride a boat in the worlds rivers and lakes without encountering the tell-tale signatures of affluence; discarded bottles, cans, cigarette packs, paper sacks and similar objects, all these creating aesthetic blight.

While in the past, packaging mostly comprised of durable containers which could be fed back into the industrial production line, (e.g milk bottles, beer crates, etc), within the last decade, there has been a trend towards disposability. Consumers have given convenience packaging their wholehearted endorsement. In fact, as one scholar observes, the popularity of disposable containers has been such that the consumers are willing to pay a premium for the convenience of throwing away a container. As a result, billions of tones of mixed solid wastes are now heading straight into the waste disposal channels, markedly magnifying the problem of getting rid of them (Van Tassel:1970). These cans, glass and plastic bottles, paperboard cartons and wooden crates, most of which consumers are no-longer bothering to return to the to packaging companies, are thrown

away in massive numbers, never to be used again.

2-2.2 Municipal Solid Waste Management: Definition.

Municipal Solid Waste Management (MSWM) involves planning, forecasting, organization and execution of the functions of collection, transfer, treatment, recycling, resource recovery and disposal of solid wastes as defined above (Schubeller:1996). It is a complex task which depends as much upon organization between households, communities, private companies and municipal authorities as it does upon the selection and application of appropriate technical solutions for collection, transfer, recycling and disposal. It is an essential task which has important consequences for public health and well being, the quality and sustainability of the urban environment and the efficiency and productivity of the urban economy.

2-2.3 The Importance, Goals and Principles of S.W.M.

Because waste is by definition of little or no value to the generator, there is little financial incentive to handle it in a careful manner and on the whole, there is an in-built temptation to relinquish responsibility for it at the earliest opportunity. This action however, cannot be permitted as it has far reaching implications. If not properly handled, solid waste can result in health hazards. Within residential areas, when refuse is not collected in good time and regularly, there is a tendency for residents to spill it all over the place. Uncollected piles of refuse form breeding grounds for rodents, insects and other animals (i.e vermin). This poses a health problem especially when such vermin find their way into peoples houses (Mbuyi:1995). And within the town, litter becomes an eyesore, which apart from despoiling and impairing the aesthetic quality of road-sides, open spaces, access roads, unleashing foul odour that makes the daily carrying out of commercial and other activities a nightmare.

On the rural scene, the dumping of solid waste on open ground causes water pollution from the leachate, contaminating both ground and surface water sources (Otieno:1991).

On the other hand, the solid wastes have some positive consequences. For instance, waste can be used to fill up huge open grounds and, with proper engineering, help reclaim these lands for use in other urban activities. Refuse can also be transformed into other forms through a recycling process that reduces the volume of waste needing disposal. For instance, fertilizers (manure) can be made from vegetative waste while old newspaper is usually recycled into other reusable forms. Solid waste management can also generate revenue for a sizeable proportion of the urban poor who, in many developing countries, are driven to work as waste collectors or scavengers by poverty and the absence of more attractive employment opportunities (Schubeller:1996).

For the above reasons therefore, waste management is an essential task which has important consequences for public health and well-being, the quality and sustainability of the urban environment and the efficiency and productivity of the urban economy. Effective solid waste management can therefore help in ameliorating health hazards arising from poor environmental conditions while facilitating the effective utilization and conservation of scarce resources and to a large extent, creating employment for a sizeable proportion of the urban poor populations. Sound management of solid waste is essential for any civilized society.

Municipal solid waste management has several goals including; a) to protect the environment, b) to promote the quality of the urban environment, c) to support the efficiency and productivity of the urban

environment and, d) to generate income. To achieve the above goals, it is necessary to establish sustainable systems of Solid Waste Management which meet the needs of the entire urban population. Since waste is generated by urban residents in the course of their daily activities and in pursuance of personal goals, the essential condition of sustainability implies that waste management systems must be absorbed and carried by the society and its local communities. In the words of Schubeller (1996), these systems must be appropriate to the particular circumstances and problems of the city and locality, employing and developing the capacities of all stakeholders. The stakeholders here include households and communities requiring service, private sector enterprises and workers (both formal and informal), and government agencies at the local, regional and national levels. All must come to the realization that the aggressive pursuit of personal goals, accruing in the enjoyment (by the individual) of a vast array of positive benefits, sometimes yield regrettable negative consequences that affect a majority, if not the entire population - the abatement of which requires collective action.

2-2.4 The Process of, and Institutional Responsibility for S.W.M.

The process of solid waste management begins at the generation stage. At this stage households, industries and other activity areas practice simple handling of refuse, garbage and other solid wastes. In most places, this is done through the use of receptacles such as dust-bins, plastic bags and big containers. This waste is then transported by the households to a central location (or transfer station) for collection by the waste collection agency.

In many countries however, domestic refuse is collected using the house to house method where the waste collection agency comes around collecting

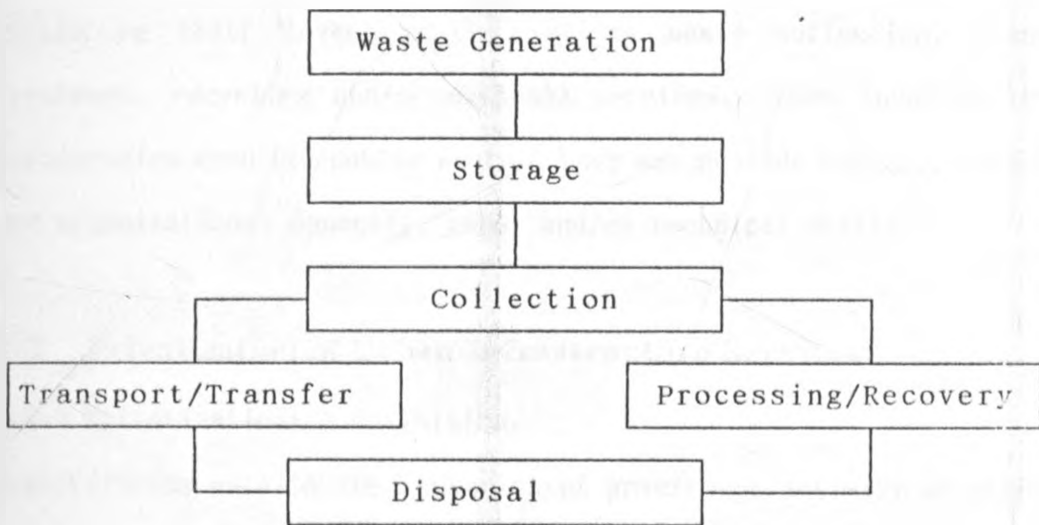
waste from door to door. This method is efficient in sparsely populated areas such as middle and high income neighborhoods but has proved inefficient in highly populated areas and those areas with poor or no access roads. Collection is by use of primary and secondary collection vehicles and equipment. The former comprises of modern mechanized vehicles such as tippers (open and closed trucks) and compressors, while the latter comprises of human or animal pulled carts. In many low income countries, informal private sector entrepreneurs (scavengers) collect waste upon receiving payment from generating activities. They either dispose off this waste in open spaces or sell to recycling firms.

The collected waste then heads for disposal channels where they are dealt with using a variety of waste disposal techniques. The most common ones include, open dumping, sanitary landfill (controlled burying of refuse under compacted earth), burning and other similar methods (incineration or pulverization to mention a few). The above are essentially waste destruction methods. Upon collection, waste can also be transformed into other uses through a recycling process where some forms of disposed wastes are recovered for re-use or transformed into other useful products. Inorganic waste such as paper waste, glass containers, metals and plastics are categories of waste usually targeted for recycling. On the other hand organic (biodegradable) waste such as food waste and vegetative matter can be used as soil fertilizers through a process of composting.

A wide range of individuals, groups and organizations are concerned with municipal solid waste management as service users, service providers intermediaries and/or regulators. Since solid waste management is mainly an urban problem, the level of government responsible for it is typically local (local government authorities). This responsibility is usually

specified in by-laws and regulations and may be derived, more generally from policy goals regarding environmental health and protection. National governments, on their part, are responsible for establishing the institutional and legal framework for MSWM and ensuring that local governments have the necessary authority, powers and capacity for effective Solid Waste Management.

Figure 3-1: Simplified diagram showing the process of solid waste management from collection to disposal.



Source: Tchobanoglous:1997

The responsibility for solid waste management usually involves other actors as partners ranging from Community Based Organizations (CBO's), Private Sector Enterprises (PSE's) and Non-governmental organizations (NGO's). CBO's are usually formed by poorly served urban residents to upgrade local environmental conditions, improve services and/or petition the government for service improvements. They become partners of the local government in local waste management. When sufficiently managed, CBO's have considerable potential for managing and financing local collection services and operating waste recovery and composing activities. NGO's operate between the private and government realms. Originating outside the communities in which they work, NGO's are motivated primarily

by humanitarian and/or developmental concerns rather than an interest in service improvement for their own members. They may help increase the capacity of local people or community groups to play an active role in local solid waste management by increasing environmental awareness, assisting in the impartation of technical solid waste management know-how (waste handling skills and practices), etc. The formal private sector includes a wide range of enterprises, varying from informal micro-enterprises to large business establishments. As potential service suppliers, private enterprises are primarily interested in earning a return on their investment by selling waste collection, transfer, treatment, recycling and/or disposal services. When involved through partnerships with the public sector, they may provide capital, management and organizational capacity, labor and/or technical skills.

2-3 Privatization of Urban Infrastructure Services.

2-3.1 Privatization: A definition.

Privatization entails the reduction of government activity or ownership within a given service or industry - either when government enterprises are divested to unregulated private ownership or, when government agencies are commercialized, i.e re-organized into accountable and financially autonomous semi-private enterprises (Cointreau-Levine 1994). As defined here, privatization is a non-governmental role in the provision and production (delivery) of services - private firms being involved as non-governmental organizations. Privatization can also be viewed as a form of decentralization of management functions from government to private enterprises (Gidman et.al:1995).

2-3.2 Importance of Privatization.

Privatization is often taken as a pragmatic means of improving service delivery. It is thought to be one means of creating efficiency in the production and distribution of services on the account of a variety of factors. First, by encouraging competition, privatization lowers the cost of services to the consumer. Secondly, since the activity is in private hands, the profit maximization motive devises ways of minimizing costs thus ensuring the effective and efficient utilization of often scarce resources. Thirdly, competition allows for more effective articulation of demand, and through the scramble for markets, ensures that the demand for services is effectively met. Another advantage of involving of the private sector in the production or delivery of infrastructure services is its ability to ensure greater participation of people in the management of human settlements. Through privatization, a wider range and different levels of services become available thus allowing the consumer the opportunity to exercise a greater choice over the services. By facilitating frequent provider-consumer interactions, it allows greater opportunities for consumers to lobby for better services thus ensuring better performance standards. Overall, people become aware of identify with and hence more willing to support the governments policies, programs and developmental efforts.

Where privatization has been undertaken, there have been various pay-offs. These include; the reduction in subsidies from the government to public service provision agencies, technical gains to suppliers and, as we have seen above, numerous gains for the users. The World Bank observes that governments of developing countries save 10 percent of their total revenues and 60 percent of annual infrastructure investment when subsidies are eliminated through privatization. Service producers also benefit

greatly from improved technical efficiency. The savings possible from raising operating efficiency from today's levels to best practice levels are estimated at around \$55 billion annually or an equivalent of 1 percent of all developing countries' Gross Domestic Product (World Bank:1994) - in this way availing additional funds to expand the distribution of the service.

2-3.3 Conditions for Effective Privatization.

The advocacy for privatization stems from the presumption that public sector infrastructure service producers have poor incentives for efficient operation because they lack the pressure characteristic of the private sector producers who, are subject to competitive forces. It is however important to note that the public sector does not always have poor incentives and the private sector does not always face competitive pressures, so benefits do not always result from privatization. For example, private firms may be set up as monopolies with little incentives to operate efficiently. If they operate at low costs, they may not have the incentives to pass on the benefits to consumers. Research in this field has shown mixed results depending on a countries economic environment and the type of infrastructure being privatized. The private sector cannot provide a service where no comprehensive charging is feasible e.g, where service involves collective benefit as opposed to individual. In the third world, this is further complicated by the fact that quite a substantial percentage of urban residents cannot afford the service unless prices are highly subsidized and, returns on investments are low, risky and slow (Fox:1994). Private enterprise can also not effectively provide services which are traditionally considered public goods because of their potential negative consequences on the environment when inadequately provided for, or the inability of the majority of the

residents to pay for the service.

There are certain conditions that must be given if the privatization of urban infrastructure services is to be efficient. The first set of these conditions has to do with the attributes that an infrastructure service must bear if the private sector is to be attracted into the provision of the same. For instance, private provision of infrastructure is always possible and feasible if consumers can be charged and there are no obstacles (technology or scales of investment) to parallel services in competition. These conditions are likely to apply to housing, transportation, solid waste management, education and, health-care albeit with subsidy options to protect poorer consumers. Private provision is especially effective when the benefits from service delivery accrue to local residents and therefore economies of scale are limited to the same. It is also effective where local choice is strongly desired and different tastes for service exist as this will foster competition. Services in which operational efficiencies are likely to be available are also good candidates for wide scale privatization. Privatization also appears to offer the greatest potential cost savings for services that are already delivered by the private sector. The main reason is that the private sector is better able to identify the profitability of services, and obviously has experience and know-how in producing such services.

It is not doubtful that private enterprises play a vital role in responding to the overall development challenges facing a city and may effectively direct the development of individual neighborhoods. However, there needs to be conditions to ensure that the private sector is effective in meeting the demands for a given service and ensuring that it's distribution is not skewed in favour of society's more privileged

groups (economically, politically e.t.c), or because of the desire for profit maximization, sacrifice quality to earn greater profits and in so doing, yield undesirable consequences. It is important therefore, that services to be privatized are those that can be easily monitored and regulated especially by the public sector to ensure that the quality of privately produced services is not compromised and prices are kept at levels affordable to majority of consumers.

Overall, a key to obtaining the benefits of privatization in any infrastructure service is to aggressively encourage competitive market forces. Neither government production nor close regulation may be necessary if the market is 'contestable' and not colluding. A market is contestable if potential entrants restrain the price setting behaviour of current producers. The most effective way of ensuring contestability of markets is to allow free entry and exit into the markets to the maximum extent possible. As Fox (1994) observes, contestable markets require low sunk costs. This means that firms have limited losses if they enter an industry (or choose a location). Low sunk costs is a characteristic often not present in delivery of infrastructure services, some of which require high costs and slow or no recovery for capital invested. Since private firms are interested in making quick and huge profits it is expected that they will only invest in the production and delivery of services that will offer high profit opportunities. The investment environment should be favourable to the attainment of these interests.

Telecommunications, electricity generation, solid waste disposal and urban transportation appear to have the greatest capacity for wide-scale privatization. This is because these services have the quality of being private goods to a considerable level. But some aspect of every

infrastructure can be privatized. However, for privatization to be effective, final responsibility for service provision remains with the government through established mechanisms that ensure that the supply of privately delivered services is equitable, quality acceptable and, affordable.

2-3.4 Common Privatization Modes.

In practice, privatization represents a continuum from purely private production through a range of public/private co-operation. On one extreme, privatization could take the form of direct private sector production and delivery of services with little, if any, public involvement e.g; private telecommunication and courier services. In this case, several firms compete in an free market for their own economic gain. On the other hand, the service may be for captive users, often as a backup for public sector failure to provide an efficient service e.g, the generation of electricity by manufacturers for their own use during public sector provided power failure. Here, the element of competition is lacking and a private firm engages itself in service production to meet it's own needs. On another level, privatization could take the form of a small intermediate step in delivery of a larger service such as when firms are hired to undertake a specific aspect of that service (e.g; maintenance). Another intermediate form of privatization is when firms are contracted to operate public sector facilities. In view of the foregoing therefore, services may be provided by; a) the public sector (with or without contracting out production to the private sector), b) the public and private sectors in parallel, c) the public and private sectors in partnership d) private sector under public supervision through franchised monopolies or regulated competition, and (or), e) the private sector (including self help,) without public intervention. Below is an

analysis of the various methods of private sector participation.

i) Contracting.

This is a method of privatization where the government awards a finite term contract to a private firm for the delivery of a particular service. The private firm is paid for service delivery by the government under the terms of the contract. The contract specifications here include standards of service that the private firm is expected to achieve and the sanctions that the government is to impose for non-performance. It also defines clearly the period under which the private firm is to operate. It is a viable means of securing a service so long as it is possible to adequately describe outputs anticipated from the contract.

ii) Franchise.

A local government may award exclusive franchise to a qualified private firm for the right and responsibility to provide a service to consumers within a zone. In return, the private firm pays a license fee to the government and subsequently charges its customers appropriate fees to cover the cost of service. The fees charged may be regulated by ceilings fixed by municipal ordinance. Local governments retain responsibility to monitor the performance of the private firms having franchise agreements, and to regulate user charges. It also retains the right to renew or revoke licenses in accordance with pre-established criteria (Stevens:1980).

iii) Concession.

The government may get into a concession arrangement with a firm that utilizes government owned resources such as wildlife, water etc. The concession is in the form of a long term contractual agreement whereby

the private firm builds the facility. In some cases, the private firm may maintain indefinitely the ownership and operation of this facility while in others, it may transfer ownership to the government after a specified period of private ownership and operation. The concession agreement might specify performance standards, methods of judging performance, penalties for delay or non-performance, risk assignment, insurance requirements, and standards for worker safety and environmental protection (Augenblick:1990).

iv) Open Competition.

In open competition, the government freely allows and licenses qualified individual private firms to compete in service provision. Individual consumers make private agreements with individual firms and are billed for services rendered. No firm holds a zonal monopoly, and any number of firms may compete within the same zone. The government's role here includes licensing, monitoring and, as needed, sanctioning of the activities of private firms. Open competition is straightforward when services can be provided competitively and, in many infrastructure sectors, it is possible to identify such services and allow private provision. Where competition among suppliers is possible, private ownership and operation require little or no economic regulation beyond that applied to all private firms. The necessary competition can also occur across sectors - between road and rail, or between electricity and gas. Where systems are being fully or partly privatized and there is no cross sectoral competition, regulation may be necessary to prevent the abuse of monopoly power.

2-4 Privatization of Solid Waste Management Services.

2-4.1 Nature of Solid Waste Management.

Solid waste management, which includes the collection, transfer, recovery and disposal of municipal solid wastes, is a service for which local government is responsible. It is considered a public good for various reasons. The service is nonexclusive, meaning that once it is provided to some part of the community, it benefits the overall public welfare, not only the resident who specifically receives the service. The service is also non-rivalled, meaning that any resident can enjoy the benefit of the service without diminishing the benefit to anyone else (Cointrieau:1994). It is therefore not feasible to exclude from service those who do not pay, because public cleanliness and the safe disposal are essential to public health and environmental protection. The qualities of being nonexclusive, non-rivalled places responsibility for solid waste management within the public domain as a public good.

Because solid waste management is an urban issue, the level of government responsible is typically local. This however does not mean that local government can accomplish this role entirely on it's own. Rather, different partners, including non-governmental organizations, community based organizations and the private sector are responsible for effective waste management. It is however important to observe that many activities within the overall purview of solid waste management vary in the extent to which they can be regarded as public goods. For instance, taking into consideration the degree to which the solid waste activity is exclusive or rivalled, public cleansing which involves public street sweepings and cleaning of public parks and lands, public education regarding the individuals civic duties in maintaining a clean environment, communal refuse collection and transfer to disposal site and, the sanitary landfill

and safe refuse disposal, are often considered to be public goods (Cointreau:1994). They are considered so because each of them benefits the public at large and not any specific individual and are required for environmental protection. As public goods therefore, the cost of these services is expected to be covered through general revenues of local government. On the other hand, depending on the education and culture of the city residents, door to door collection of refuse to households, institutions, industrial and commercial enterprises, resource recovery which includes the door to door collection and sale of recyclables, can comfortably be considered private goods. This is especially so in communities where residents have been sensitized to the need for public cleanliness and to the problem of limited resources (or efficiencies) of government (Schubeller:1996). The assumption here is that those being serviced will be more readily willing to pay. However, in communities where residents have not been similarly sensitized, there will be resistance to direct user charges and a tendency towards indiscriminate dumping. In this case therefore, solid waste collection cannot be discontinued without jeopardizing public welfare.

2-4.2 Contextual Issues in Privatizing S.W.M.

The aim of the government and the private sector in providing solid waste management services is based on two entirely different perspectives; for the private sector, the fundamental concern is whether the delivery of service will make money. For the government, one of the many considerations is whether it will save money through private sector participation. In developing policies for private sector participation in solid waste management, a number of contextual issues are usually considered as criteria for decision making. These include issues of cost recovery, efficiency, accountability, management, economies of scale,

legislation, institutional management, finance and cost.

i) Resource Recovery Context.

In developing countries, resource recovery (composting, waste to energy incineration, etc), can provide more environmentally safe disposal of solid waste compared to the sanitary landfill (Cointreau:1994). Resource recovery, though usually significantly more costly than the sanitary landfill, helps in saving foreign exchange, the conservation of natural resources and the minimization of waste disposal costs. While this is true, recycling is seldom achieved at an optimal level when left entirely to market forces. Even in the poorest countries, many recyclable materials that could have been effectively recycled to the benefit of these countries remain in disposal sites. Thus recycling can be labelled a merit good. And in recognition of this, many governments are beginning, through a variety of strategies, to promote recycling. It is important that the strategy for privatizing this aspect of solid waste management is such that it will encourage more firms to participate in it.

ii) The Cost Context.

Second to efficiency, the main objective in privatizing municipal solid waste management services is cost reduction. In this case, aggregate costs include the cost of purchasing, operating and maintaining equipment (including depreciation), debt service, personnel benefits, and disposal costs including land acquisition and human resettlement. In developing countries, the cost of solid waste management is higher than in industrialized countries since incomes in the former are relatively lower. Solid waste management therefore consumes a higher percentage of personal income. Similarly, costs attributable to equipment purchase, debt service, spare parts, fuel and oil are typically much higher because of

the high tariffs and interest rates that characterize these countries' economies (Cointreau:1994).

A low cost of service delivery would be one that is lower than the cost of government service (including the cost that the government incurs in monitoring the performance of the private sector). Since the bulk (95%) of resources for municipal solid waste management are usually spent on collection and public cleansing, this is one area that should be given priority for privatization as competition and efficiency are likely to yield the benefit of lowering costs. And because solid waste disposal and transfer systems are more capital intensive than the collection and sweeping systems, private sector participation could be examined as a way to mobilize the financial resources necessary for the execution of these very crucial aspects of solid waste management.

iii) Economies of Scale Context.

One reason that solid waste management is viewed as a possible arena for private sector participation is that the economies of scale are not pronounced. This is in contrast to the case of water, electricity and telecommunications that have significant economies of scale over large geographical areas that they are often referred to as natural monopolies (Sicular:1991). In solid waste management, there are economies of scale to a limited extent depending on the specific aspect in the solid waste management process and the area under which the waste management agency is set to operate. Each of these aspects has at least one characteristic that brings about economies of scale. For low income solid waste collection, it is the high density population, coupled with lower waste quantities per capita, that offers economies of scale. Assuming a daily neighborhood waste generation of about 0.35 kilograms per capita in these

areas, one 3-tonne vehicle, making 5 trips a day (thus ferrying 15 tonnes) can serve 10,000 to 40,000 residents. For high income areas, it is the easy accessibility to households that creates economies of scale. This allows for large capacity compaction vehicles to be used. Assuming a daily neighborhood waste generation rate of about 0.6 kilograms per capita, a 6 tonne capacity vehicle, making 2 trips a day (thus ferrying 18 tonnes), can serve about 20,000 residents. In transfer systems, it is the large carrying capacity of the hauling vehicle that yields economies of scale. Assuming a city wide waste generation rate of about 0.7 kilograms per capita per day, one 20 tonnes vehicle, making 4 trips per day (thus ferrying 80 tonnes), can serve 115,000 residents. In systems that use compaction devices to fill the trailer trucks, one stationary compactor moves about 60 tonnes per hour (480 tonnes per day) thus serving about 685,000 residents. For the sanitary landfill, the centrality of the location makes it possible to use minimum equipment (i.e., a few bulldozers) to spread and grade refuse for their daily soil cover. Assuming a citywide generation rate of about 0.70 kilograms per capita, one bulldozer of 200 horsepower can handle about 400 tonnes a day, thus dispose off large quantities of waste and serving about 570,000 residents. All these aspects lend themselves to situations that create economies of scale that are area or activity specific thus making it easier for specialized private sector participation.

iv). The Management Context..

One of the most frequently noted advantages of the private sector over government is its management flexibility. In most developing countries, whenever government manages a service provision process, its performance is constrained by a variety of factors. Public service agencies for instance have restrictive working hours and hiring and dismissal laws,

inadequate supervision of an overly redundant labour force and, inadequate remuneration for supervisors. All these contribute to low supervisor/worker, productivity and, consequently, poor execution of the solid waste management functions (Shirley:1991). Developing countries also experience inadequate skilled manpower (mechanics and technicians) for the maintenance of waste collection fleet. In addition, repair operations are bogged down with burdensome bureaucratic procedures that constrain spare part acquisition, and consequently strangle the waste collection and disposal exercise (Cointreau:1989). On the other hand, private sector management has greater ease in firing personnel for non-performance and in providing upward mobility for workers with good performance. Also, the private sector is not constrained to government working hours and overtime restrictions.

Private sector participation is not the only way to introduce management flexibility into the system. The goal can be effectively accomplished by commercializing the public solid waste management entity. However, lack of political will by government to induce such changes in the public sector makes private sector involvement a more feasible option.

v). **The Efficiency Context.**

Solid waste management in developing countries is characterized by low level of service despite the relatively high level of expenditure committed to the process. In response to this, the main argument raised for private sector participation is that the private sector might be more efficient in the use of scarce resources and in the provision of services than the public sector. Private sector efficiency is said to derive from management flexibility, freedom of action, greater financial discipline, and accountability to market forces. Presumably, in a competitive

environment, private firms must perform efficiently to make a profit and to maintain their position in the market place. For the private sector to achieve optimum efficiency however, there must be true competition with many non-colluding firms in the market. In general, conditions leading to efficiency captured by the private sector in many countries include; smaller firms, younger crews, lower absenteeism, wages and benefit costs, more flexible scheduling, efficient vehicle routing, better vehicle design, managerial incentives, faster vehicle repairs, vehicle standardization and competition (Dillinger:1988, Leite:1991, PURSE:1991, ISW:1975).

vi). The Institutional Context.

Privatizing some aspect of municipal solid waste service delivery does not in any way take away the need for local government to be fully responsible for the solid waste management service. In order to decide on the role that local government must play in solid waste management, it is important to delineate the levels of waste management that may be easy candidates for privatization, and those that are not. Collection and street sweeping activities are aspects in solid waste management that are mostly targeted for privatization (Wiradisastira:1991). While there is a notion that these services are simple and do not require specialized knowledge and equipment, to do it efficiently requires substantial planning ability, appropriate equipment and, continuous managerial optimization of vehicle and worker productivity. On the other hand, governments are usually hesitant to privatize solid waste transfer and disposal activities (Wunsch:1991). This is because of the significant externalities (spillovers) such as water and air pollution likely to be a consequence of improper handling of these aspects.

Both central and local government need to maintain a significant role on these two levels of solid waste management. For instance, some issues that are directly related to enabling private sector participation to realize low costs can be dealt with only at the central level. These include the minimization of risks related to national inflation, currency convertibility, fuel prices, pricing policies, and taxes. They also include incentives such as guarantees for any borrowing, assumption of foreign exchange risk, tax incentives, duty exemptions and special lines of credit. There is also need for central government to establish a standardization policy and an effective regulatory framework to deal with possible externalities in the solid waste management process. On another level, local government must be have adequately designated responsibility, with commensurate authority to negotiate, manage, monitor, and enforce competent contracts with private sector participants. To do so, it must have a willing political leadership and be staffed with competent personnel as part of the decision to privatize solid waste management services.

vii). Legislative context.

Laws influence the private sector significantly in it's assessment of whether to become involved in solid waste management services. Reputable firms want an environment where they can compete equitably, fairly and with minimal risk. For example, before investing in building, owning and operating a sanitary landfill for public use, they will want environmentally sound safe disposal practices to be required by law and enforced on all competitors by penalty. And before signing documents in response to government procurement, they will want an assurance that the government will follow procurement regulations governing fair competition (Cointreau:1994).

iix) The Public Accountability Context.

Government, which represents the public at large, has a special obligation to be accountable to public values. In this capacity, each government needs to carefully consider the decision to privatize in a manner that will ensure equitable distribution of services, good pay, benefits and working conditions for those who produce them, and the promotion of public safety and environmental protection. In many instances, the government, which seldom has the incentives to view the consumer as a client fails to be accountable. Donahue (1989) observes that it is for this reason that governments would be willing to privatize solid waste management services. This way, it is prone to blame the private sector whenever citizens are unhappy with the service being received. All in all, the private sector, under pressure from competitors, presents more chances of being accountable to the public than the public sector.

2-4.3 Common S.W.M Privatization Modes.

i). Contracting.

Contracting is well suited for discreet activities within the solid waste system, such as the operation of a transfer station or sanitary landfill. In Bogota and Buenos Aires, private firms operate the sanitary landfill under contract with the local authorities (Bartone:1990). Contracting to lease equipment, rather than obtain service, is another way of obtaining equipment especially when resource for purchasing new equipment is limited. This has been practiced in Bolivia where private firms provide 70% of the waste collection fleet including vehicles, drivers fuel and maintenance (Wunsch:1991). Contracts can also be given to private firms to collect refuse.

ii). Franchise.

Franchise is applicable to solid waste systems because economies of service are attainable only when waste is collected along a contiguous route or within an exclusive zone (Dillinger:1988). The government, recognizing this, sometimes awards a franchise or a finite long-term monopoly to a private firm for the delivery of the solid waste collection service. However, for such a franchise to be effective, it is important that in those areas, all of the households and establishments can be readily educated to be concerned about public cleanliness. Only then would it be possible for a public company holding a franchise to obtain full cooperation and cost recovery (Cointreau:1994).

iii). Concession.

By national law in most countries, local governments own all waste within their boundaries, once it has been discharged for collection and disposal. For the self-serving reason of reducing it's work load and cutting down on costs, if not for humanitarian and environmental purposes, local governments usually offer concessions to private sector firms to encourage the recycling and recovery of resources from refuse. The concession may enable the private firm to recycle materials (paper, plastic, metal, glass) from refuse, to recover resources (compost, heat, electricity) from refuse, or to transfer or dispose of refuse. As with all private sector arrangements concessions clearly specify the rights and responsibilities of each party - namely; the right of the private firm to recover and sell the recyclable found in the waste brought to the landfill and responsibility to operate the landfill to meet specified environmental standards and, the city's right to monitor the environmental conditions of the landfill and the responsibility to bring a guaranteed quantity of non-hazardous municipal waste to the landfill (Cointreau:1994).

iv). Open Competition.

The government may also freely allow private companies to compete for refuse collection, recycling or disposal services. In open competition (often termed as private subscription), households and firms make private arrangements with individual firms for refuse collection and/or disposal. Consequently, private firms bear the costs of billing and collecting waste from customers. No firm holds a zonal monopoly and any number of firms may compete within the same zone. Because of this, "economies of contiguity" that would be received if one firm served the area and in turn picked up the waste from each establishment (Dillinger:1988).

CHAPTER THREE: BACKGROUND TO THE STUDY PROBLEM.

3-1 Urban Infrastructure Services in Developing Countries.

3-1.1 General Characteristics.

To assesses the status of infrastructure services in developing countries various indicators are used. These include; a) the amounts of resources that governments and other actors allocate to infrastructure investments, b) the level of access to infrastructure services by the users and, c) the efficiency of operation and delivery of infrastructure facilities and services respectively.

i) Investment Volume.

In general, in terms of value added, infrastructure investments account for between 7% and 11% of GDP in developing countries. They constitute about 20% of total investments (and 27% of public investments) in low income countries. Among medium income countries, infrastructure is even more important, constituting 22% of total investment and 58% of public sector investments (World Bank:1994). The level to which infrastructure services are viewed as being important varies from country to country and determines the amount of resources allocated to their provision.

ii). Service Access.

Access to infrastructure in urban areas of developing countries has improved somewhat in recent years. Between 1980 and 1990, the coverage by electrical power distribution rose from 70% to 74% of the urban population, while water supply coverage increased from 77% to 82% and sanitation from 69% to 72% (Israel:1992). However, estimates show that the accessibility to services still falls way below the expected levels. The world Health Organization estimates that more than 25% of the urban population does not have access to safe drinking water and that less than 60% of the

urban population worldwide had access to adequate sanitation in 1987 - less than 30% were connected to sewerage systems. Typically, between one quarter and one half of the solid waste generated in urban areas is actually collected and disposed off (UNDP:1991). The low income urban populations generally tend to be the losers when it comes to gaining access to infrastructure services. For instance, in Mexico, 50% of the poorest fifth of households were found to be connected to the public water supply as compared to 95% of the wealthiest fifth. This is a typical scenario in many other developing countries (UNICEF:1992, World Bank:1994).

iii). Operating Efficiency.

Losses and excessive costs resulting from inefficient infrastructure operation are enormous. Studies by the World Bank indicate that the savings which could theoretically be achieved by raising technical operating efficiency of three sectors (electricity, water and rail-roads) up to the level of current best practices would amount to \$55 billion - the equivalent of about one quarter of the annual infrastructure investments in these countries. Improvement of fiscal efficiency - for example, the collection of payment for delivered services which are presently not recovered from users - would raise an additional \$123 billion, equal to about 60% of the annual infrastructure investment (World Bank:1994).

3-1.2 The Kenyan Case.

i). Institutional Responsibility for Delivery.

In Kenya, basic needs and facilities are provided by the central government through Local Authorities. Initially, the central government was itself involved in the production or delivery of most urban services. However, with the growth of urban areas and resources, this role was relinquished to local authorities. For instance, as is the tradition in many other urban

centers within Kenya, the provision of urban infrastructure services in the city of Nairobi is the responsibility of the City Council. These include; the construction and operation of water and sewerage systems, and the provision of electricity and services such as sanitation and garbage collection, among others. The Central Government however still retains its role as the chief policy making body regarding the provision of infrastructure services.

ii) Financing Urban Infrastructure in Kenya.

Although the government may get involved in financing major infrastructure investments, their role is limited to financing the construction and operation of major facilities such as ~~such as~~ electric power generation plants. In some cases, it may be involved in the direct provision of services such as tele-communication. The delivery of most urban infrastructure services in Kenya is to be facilitated by the use of finances accruing from taxes levied on the towns residents. These include service charges and user fees charged by local authorities. Recently however, due to the increasing demand for welfare improvement facilities and services, the role of the public sector (government) in financing service provision has become increasingly difficult. As a result, there has been increased involvement of other actors including the private sector, Non-governmental Organizations and Local communities to this end.

3-1.2 Explaining Poor Performance.

Although by virtue of their substantial contribution to Gross Domestic Product (GDP) the urban sector is a principle engine of development (Dillinger:1994), cities do not deliver on the promise of a better quality of life to the extent that they could. And despite the relatively high level of finances dedicated to the development and delivery of infrastructure

facilities and services respectively, the quantity and quality of infrastructure services in major cities is poor. Together with the somewhat universal agreement that the rate of urbanization and urban growth far outstrips the capacity of local governments to respond to infrastructure demands, two major schools have emerged in an attempt to explain what accounts for this poor performance. One blames it on malfunctions inherent in urban management institutions while the other, more specifically on the nature of the urban infrastructure delivery system. The arguments advanced for each are further outlined below.

* i). **Urbanization trends and Consequences.**

In recent decades, most third world nations have experienced a very rapid growth in their urban populations. In the developing world, urban centers have grown from the ancient trading posts or forts based on the divine rule of a king or emperor, through the colonial trading and administrative centers, to the large metropolis of the post colonial era. Currently, the third world remains essentially on the frontiers of an urban explosion similar to the one experienced in the developed world in the late nineteenth and early twentieth century. For instance, despite the generally low levels of urbanization in the rest of the world (including other developing countries), Africa is experiencing the highest rates of urbanization averaging 4.6% per annum (United Nations:1991). Here, the urban population has increased from 33 million in 1950, to 176 million in 1985. It is estimated that this is likely to reach 903 million by the year 2025 (Obudho et.al:1994).

The percentage of population living in cities with over 500,000 inhabitants rose rapidly from 6 to 41 between 1960 and 1980 with the number of urban centers themselves rising from 3 to 28. Forecasts show that the largest

urban centers will continue to grow faster than the middle sized and small ones and indeed, urban centers with more than one million inhabitants are likely to triple in size - reaching as many as 64 'millionaire' urban centers by the turn of the century (Obudho:1994).

Ideally, urbanization may yield positive consequences. For instance, the concentration of population provides many cost advantages for a cleaner environment, better environmental health and comprehensive coverage for health-care and emergency services. It greatly reduces the unit cost of providing each building with piped water, sanitation, garbage collection, paved roads, electricity, drains, etc. Whereas this has been the case in developed countries, the high rate of urbanization in developing countries poses grave developmental challenges for governments and other agencies concerned. The spatial impacts and consequences are uneven among countries as well as within urban areas themselves.

In Africa, urbanization has created many practical administrative difficulties in planning and implementation of local public services thereby making urban centers sites of a wide variety of social, economic and environmental problems. With such high growth rates, most urban governments have simply been unable to grasp the implications of a population that doubles every nine years. As a result, general urban management problems now affect both large and secondary cities. For instance, much of the population lives in shelters and neighborhoods with little or no provision of the infrastructure and services which are essential to health in an urban environment (Satterthawait:1993).

ii). Urban Management and Administration.

Many scholars express their dissatisfaction with the administrative framework within which urban management and consequently, the provision of infrastructure services takes place in developing countries. On one level, they point to the administrative malfunctions between the two levels of government responsible for service provision. Critics of the present, often centralized, structure of government in developing countries argue that such structures are incapable responsive administration (Dillinger:1994). In most cases, they are usually too centralized, proscriptive and control oriented (UNCHS:1991), hence denying local authorities and other public infrastructure service delivery agencies the administrative independence they need to be efficient. Excessive control by the central government prevents them from making any meaningful decisions locally (UNCHS:1991).

iii). Urban Management Malfunctions.

Criticism is directed at public agencies (parastatals, boards, etc) which, alongside local authorities, are usually responsible for service delivery in developing countries. These exist as monopolies and bestow on themselves the sole responsibility for the provision of a wide range of urban services and in so doing, claiming to do much more than they can handle. To complicate the situation, they are riddled with numerous management malfunctions and internal administrative problems. These include: bureaucratic dysfunctions, corruption, financial mismanagement and other elements of malfeasance (Hines:1992). In addition, they lack skilled and committed personnel and frequently do not ensure adequate supervision and maintenance of service delivery operations and existing facilities respectively.

iv) Urban service delivery system.

As has been demonstrated in the paragraphs above, much of the earlier work on urban service delivery systems (particularly by the donor community), focused on the internal administration of municipal government. Urban service failures were seen to be resulting from administrative problems emanating from the relationship between the two levels of government (central and local), which tended to interfere directly or indirectly with the provision of services. They were also seen as a problem of internal administration malfunctions - specifically poor tax administration, poor accounting and, poor capital investment budgeting. In retrospect however, these explanations now appear to have been a narrow definition as approaches taken to address them have yielded little success.

Some scholars contend that urban service delivery problems cannot be addressed by taking the organizational context as given and attempting to change the behaviour of one organization - municipal government or public service delivery agencies Dillinger (1994). Rather, they see it as a problem with the public sector system as an agent of service provision. They argue that the public sector is insensitive to internal and external factors which impinge on the efficiency and effectiveness of the organization. These may range from factors motivating individuals within the organization (such as incentives to employees) and the behaviour of, and pressure from consumer interest groups, workers unions and central government regulators respectively (Ostrom et al:1993). It has been argued that, since incentives rarely exist for central government ministries and public corporations to perceive citizens as their clientele, the extent to which their policies respond to the needs and priorities of their populations is found wanting (Rondinelli:1990). For instance, governments have failed to adopt to the rapid demographic and economic. Similarly, they have failed to articulate

demand and as a result, have been incapable of ensuring adequate provision of water supply, solid and liquid waste management systems, e.t.c.

3-2 Solid Waste Management in Developing Countries.

3-2.1 General.

Over the last few years, the problem of solid waste management has received considerable attention in both developed and developing countries. Municipal solid waste management has attracted increasing attention from bilateral and multilateral development agencies, due to the mounting urgency of urban environmental problems (as identified, for example, in Agenda 21 chapters 7 and 21) and increasing concern for capacity building at the level of municipal management (United Nations:1992).

In developed countries, forward planning, availability of technical and to a large extent, financial resources and fairly static population growth rates have made possible the provision of adequate facilities and services. In developing countries however, proper collection and disposal of solid waste is a major problem. Rising growth rates, coupled with increasing volumes of waste, rising collection and disposal costs, decreasing availability of resources and above all, the rising environmental awareness among the urban populace, have made the challenge of municipal solid waste management quite immense. In most cities of developing countries, waste management is inadequate: a significant portion of the population does not have access to a waste collection service and only a fraction of the generated waste is actually collected. In Guatemala city for instance, of the 1100 tons of garbage generated daily, only some 750 tons are collected by private and municipal agencies; the rest is thrown into clandestine garbage dumps or left to rot in the

rains surrounding the city (Di Pace et al:1992). In Port-au-Prince, only 37% of the solid waste generated is collected. Inhabitants living close to rivers throw their garbage directly into the river. In other areas, waste is disposed of through open air burning close to housing. The fumes from incomplete combustion of the waste cause significant air pollution (Benoit et.al:1991). There are however exceptions to this seemingly terrible situation. In some developing countries, the situation is slightly different. In a research conducted by Leitmann (1991), almost 95% of the households in the Sao Paulo Metropolitan area reported that their waste was collected. In Jakarta, about 80% of the solid waste is collected and transported to open dump sites (Clarke et al:1991). Though the situation in these two cases may seem much better in terms of collection efficiency, the authors observe that this may not be the case. There is evidence of improper and inappropriate waste handling practices. In the former, though the private sector collects and disposes a total of 16,000 tons of solid waste daily, 3,600 tons are left to be collected and disposed of informally. Much of this waste is industrial, of which 20% is hazardous. In the latter, considerable amounts of waste are buried, burned and thrown away thereby clogging drainage channels and causing extensive flooding during the rainy season.

3-2.2 The Kenyan Case.

i). Institutional Responsibility.

In Kenya, the responsibility for solid waste management is vested in the Ministry of Health, Local authorities and local communities. Basically, the present waste management system in Kenya borrows heavily from the 1875 Public Health Act of London. This entails the removal of garbage from activity areas by a sanitary authority on appointed days. Under the Public Health Ordinance of 1920, the occupier of any activity premise is

obliged to place refuse in a moveable receptacle to facilitate collection by the sanitary agency (Mwaura:1991). These acts has since been transformed into the Public Health Act Cap 242 of the laws of Kenya (specifically section 188b). This act is further reinforced through the Local Government Act Cap 265 which gives local authorities the powers to formulate and enforce by-laws to govern the management of solid wastes within their areas of jurisdiction.

ii). An analysis of Performance.

According to the Kenyan government, the accumulation of refuse remains a serious problem in most urban centers. A recent survey on garbage collection revealed that 65% of the towns needed improved services. Only 35% of the towns collected garbage at least once a week; most of them being the smaller towns (GOK:1985). However, the majority of them record poor performance. In most urban areas, collection is infrequent and often exhibits poor handling of refuse. While priority is given to the central business district and high income areas, little attention is given to low income areas and slum settlements. As a result, indiscriminate dumping in poorly served areas is rampant. Burning of mixed solid wastes is also practiced often leading to air pollution thereby increasing health risks (GOK:1994). This deplorable state is even more serious in the major cities of Nairobi, Mombasa, Kisumu and Nakuru where daily refuse accumulations out-pace the quantity disposed off despite the acquisition of more vehicles, an increased injection of funds and the involvement of the private sector in garbage collection (GOK:1995).

Problems of solid waste in Kenya's urban areas can be attributed to a variety of problems emanating from malfunctions and management problems of local authorities and the culture and attitude of urban residents and other waste generating activities. Collection inefficiencies are mainly

caused by serious financial constraints facing local authorities which makes it difficult to acquire enough equipment. Since the cost charged for service to the consumers is inelastic, the overall revenues collected are inadequate and do not cover the total cost of solid waste management. As a result, the local authorities are unable to purchase garbage collection trucks and are forced to use old vehicles which breakdown frequently. Local authorities in many urban areas also use inappropriate vehicles such as open trucks/tractors and highly automated vehicles. The problem with the former is that they are slow and have lower capacities as they do not compact waste resulting in fewer trips per day and higher costs. The latter are normally meant to be used in developing countries and therefore inappropriate for the Kenyan scene. Since they are imported, spare parts are frequently unavailable and thus remain grounded for long. With this kind of scenario, it would be unrealistic to expect the solid waste situation in Kenyan towns and cities to improve.

On another level, departments responsible for solid waste management lack skilled and administrative personnel - a problem leading to wrong prioritization, use of poor waste handling practices, poor supervision of waste collection activities and other inefficiencies.

3-3 Privatization in Developing Countries.

3-3.1 Privatization of Infrastructure services.

As we have already seen in preceding chapters, as a result of a number of factors, the state of urban infrastructure in the third world is deteriorating at an alarming rate. Infrastructure projects and facilities do not match the ever-growing urban population while those that exist are plagued by problems of insufficient maintenance and mismanagement. As a result, infrastructure services in the third world are seldom responsive

to users whose demands for services of varying quality and affordability often go un-met even when they are willing and able to pay for them. As the World Bank observes, the problem lies mostly in the institutional arrangement for providing infrastructure services. The bank identifies three reasons along these lines that could be taken to account for the poor performance. First, it takes cognizance of the fact that in most third world countries, the delivery of infrastructure services usually takes place in a market structure with one dominating characteristic - the absence of competition. Most infrastructure services in developing countries are provided by centrally managed monopolistic public enterprises or central government departments. Secondly, those charged with the responsibility for delivering infrastructure services are rarely given the managerial and financial autonomy they need to do their work properly. They are compelled to deliver services below cost. On the other hand they are rarely held accountable for their actions. Thirdly, users of infrastructure both actual and potential are not well positioned to make their demands felt and investment decision are all the often based on extrapolations of past consumption rather than on time assessments of affective demand and affordability (World Bank:1994). Individually, each of these three points is important. Together, they go a long way toward explaining the disappointing past performance of much infrastructure. The bank contends that rival suppliers and infrastructure users might have exerted pressure for better services, but they were prevented from doing so. And governments by confusing their roles as owner, regulator and operator - have failed to improve service delivery.

It appears that, while aiming to enhance the role of cities in national development, governments in developing countries tend to ignore the institutional-management-capacity dimension. Instead most governments in

past decades have tended to merely expand capacity by making new investments as a solution to infrastructure problems. The poor performance of planned economies has however provoked a re-assessment of the state's role in economic activity. As a result, an awareness is growing in many countries that government provision has not been, and seldom will ever be, adequate. Aware of this, governments in developing countries are increasingly putting in place institutional and organizational innovations aimed at ensuring that supply systems are more efficient and responsive to the needs of users and, capable of adequately meeting the ever-growing demand for infrastructure services. While many of these governments have in the past tried to remedy the situation by reforming the public sector, continued failure in their efforts has prompted many of them to consider other options. In recent years, governments have recognized the importance of the private sector in bringing about development through industrialization and job creation. Similarly, upon the realization that the private sector is a stakeholder in the development process, they have sought to enlist private sector participation in the implementation of government policies and projects. This is especially the case where infrastructure investments are inadequate and services poor. Emerging clearly among these efforts is the trend towards privatization of infrastructure service delivery systems as evidenced by numerous examples in developing countries. Most dramatic have been the privatization of such enterprises as the telephone system in Mexico, and the power system in Chile (World Bank:1994). Elsewhere, various forms of partnerships between government and the private sector have evolved. Port facilities have been leased to private operators e.g in Malaysia and, concessions granted to private firms as in the case of road maintenance in Kenya. On another level, the provision of infrastructure services under franchise terms has been pursued by many

especially under the build-operate-transfer (BOT) arrangement under which private firms construct an infrastructure facility and then operate it for a number of years before finally transferring ownership and operation to the client (the government and other public sector agencies). The approach has been used to construct power generating plants in China and The Philippines (Schubeller:1996). Leases and concessions are working well for railways in Argentina, for water supply in Buenos Aires and Guinea and port facilities in Colombia, Ghana and the Philippines (Fox:1994).

Private ownership and operation of infrastructure facilities is increasing - both through new entry by private firms in infrastructure markets and through divestiture of public ownership of entire systems. In Kenya, the huge profit margins make the public bus system's market contestable and easy entry is almost assured by favourable government policies. As a result, public transportation (apart from rail transport) is fully privatized and adequately meets the transportation needs of both inter-urban and intra-urban commuters and goods transit. Operation and maintenance of a number of services is already performed by the private sector in some developing countries. For instance, many cities in China have periodic and routine road maintenance performed by the private sector. Operation and maintenance for water supply is less frequently contracted out although many cities allow private involvement in some aspects (Fox 1994:64). With diminishing availability of donor funds, and recognizing the need to mobilize resources to expand and improve services, most countries are now relying on domestic sources to sustain their infrastructure programs. As a result, private financing, in one form or another, now accounts for 7 percent of total infrastructure financing in developing countries. This figure is expected to double by the year 2000

(World Bank:1994).

3-3.2 Privatization of Solid Waste Management Services.

There is substantial evidence that the participation of the private sector in Municipal solid waste management is becoming increasingly common in recent decades. A study on private sector participation in Seoul showed that approximately 35% of the solid waste is collected by 85 private contractors (Cointreau:1984). Many other countries have been experimenting with the private contracting of collection service. In 1988, Jakarta begun experimenting in 261 subdistrict (10% of the city's waste generating area) comprising of middle to high income residential areas in relatively laid out developments (Powell:1991). In 1985 in Nigeria, after a five year period of open competition among private refuse collection, the Lagos Solid Waste Disposal Board (LSWDB) divided the city of lagos into zones and awarded contracts to about 100 selected contractors to collect industrial and commercial waste from large generators in these zones (Cointreau:1989). In most of these countries, private contractors are relatively small firms with an average of not more than 6 vehicles. Although no comparative study has been done in developing countries to measure the effectiveness of solid waste contracts, it is generally observed that contracting holds the greatest promise for developing countries as a way of lowering costs (Dillinger:1988). And in Jakarta, residents in the neighborhoods served by the private sector expressed satisfaction with the quality of service and the price they were paying (Powell:1991).

Other forms of private sector involvement have also been implemented in the third world. In Ibadan (Nigeria) for instance, private franchise of residential collection in high income laid-out areas was implemented in

1985. These were divided into ten zones and six firms contracted to collect refuse. Significant improvements in city cleanliness resulted. Many Ibadan residents however, complained that they were not given free choice to select their designated company and indeed, some of the companies turned out not to be reliable performers (Cointreau:1984).

In developing countries, concessions are also common. The most common form of concessions in the third world is the "Buy back center" where recyclable are purchased from individuals, processed into usable products, and sold to industries. These centers are purely market driven and receive no government support. Their profits are solely based on the difference in price received from industry versus that paid to individuals. Due to numerous problems that recycling firms face, the activity is not very common in the third world. In some cities, limited competition exists among buy-back centers because there is limited competition for recycled materials among industries or because access to waste is politically manipulated by local government officials. In these cities also, the price paid for recyclable is both controlled and nominal. As a result, the waste workers enter into a patronizing relationship with and become highly dependent on one buyer (Shirley:1991). In cities like Bangkok however, extensive competition, free access to waste and relatively good pay for waste pickers, have led 1000 licensed buy-back centers to aggressively participate in waste recycling with significant cost recovery, economic, and environmental benefits (Cointreau:1989). Another form of private sector involvement in solid waste management in the third world is open competition. As discussed earlier, in 1985, private franchise of residential collection in high income laid-out areas was implemented in Ibadan. In 1987, the city switched to an open competition system for the high income households and establishments,

wherein licensed private companies were allowed to compete for clients throughout the city (Sudol:1991). However, in Ibadan and other cities of developing countries where open competition has been tried, the system has tended to be more costly than public service, franchise or concession. This is because in most cases, true competition at a significant level does not exist, and there is a tendency for private firms to collude especially in price setting. In Nigeria for instance, there are associations of private refuse companies in the states of Lagos and Oyo. These companies make agreements on prices thereby making the burden to the consumer unbearable. Also, Unfavourable economic conditions especially constant fluctuation in the value of local currencies, makes it difficult for sustained and reliable private sector participation in solid waste management as there is easy exit of firms when the profit potential of the refuse collection business is down (Cointreau:1989, 1994).

It appears that all forms of private sector involvement in solid waste management, are found in the third world. Each experience bears a considerable share of successes and failures depending on the context. However, it has been shown adequately that the greatest opportunity for involving the private sector in solid waste management lies in having private firms provide collection service under contract terms. This is because of the many advantages inherent in such an arrangement. First, contracted firms are unlikely to be faced by internal organizational problems that commonly plague the public sector such as excessive staff, obsolete equipment, cumbersome procurement procedures for spare parts, inflexible work schedules, limitations on management changes and, inadequate supervision among others. Secondly external factors also contribute to the efficiency of the contracted firm. Municipal government, liberated from the preoccupation of managing a huge

unresponsive work force and from routine task supervision, finds it much more easier to reprimand a contractor at arms length thus ensuring that standards are adhered to (Davey:1993). It has also been observed that contracting assists in making the public sector more efficient when it provides services in competition with private contractors (Cointreau:1994).

3-3.3 The Kenyan Case.

In Kenya, the government recognizes the inadequacies in basic urban infrastructure facilities and emphasizes the urgent need for the expansion and rehabilitation of such facilities and structure to improve human settlements' environment and pledges commitment to undertake appropriate measures to remedy the situation (GOK:1994). The government observes that, to fulfil their role effectively, cities and towns will have to be properly administered and competently managed and must have adequate resources to operate and maintain public services efficiently. In financing urban infrastructure, the government commits itself to formulating policies that encourage the involvement of the private sector in the provision of services (GOK:1997). In sessional paper number 1 of 1986, the government recognizes the role of the private sector in fostering development. Though it claims to retain substantial responsibility for basic needs and services, it emphasizes the needs for beneficiaries to contribute increasingly to the cost of services. It however expresses concern that those least able to pay should still have access to these services (GOK:1986).

CHAPTER FOUR: THE SITUATION IN THE STUDY AREA.

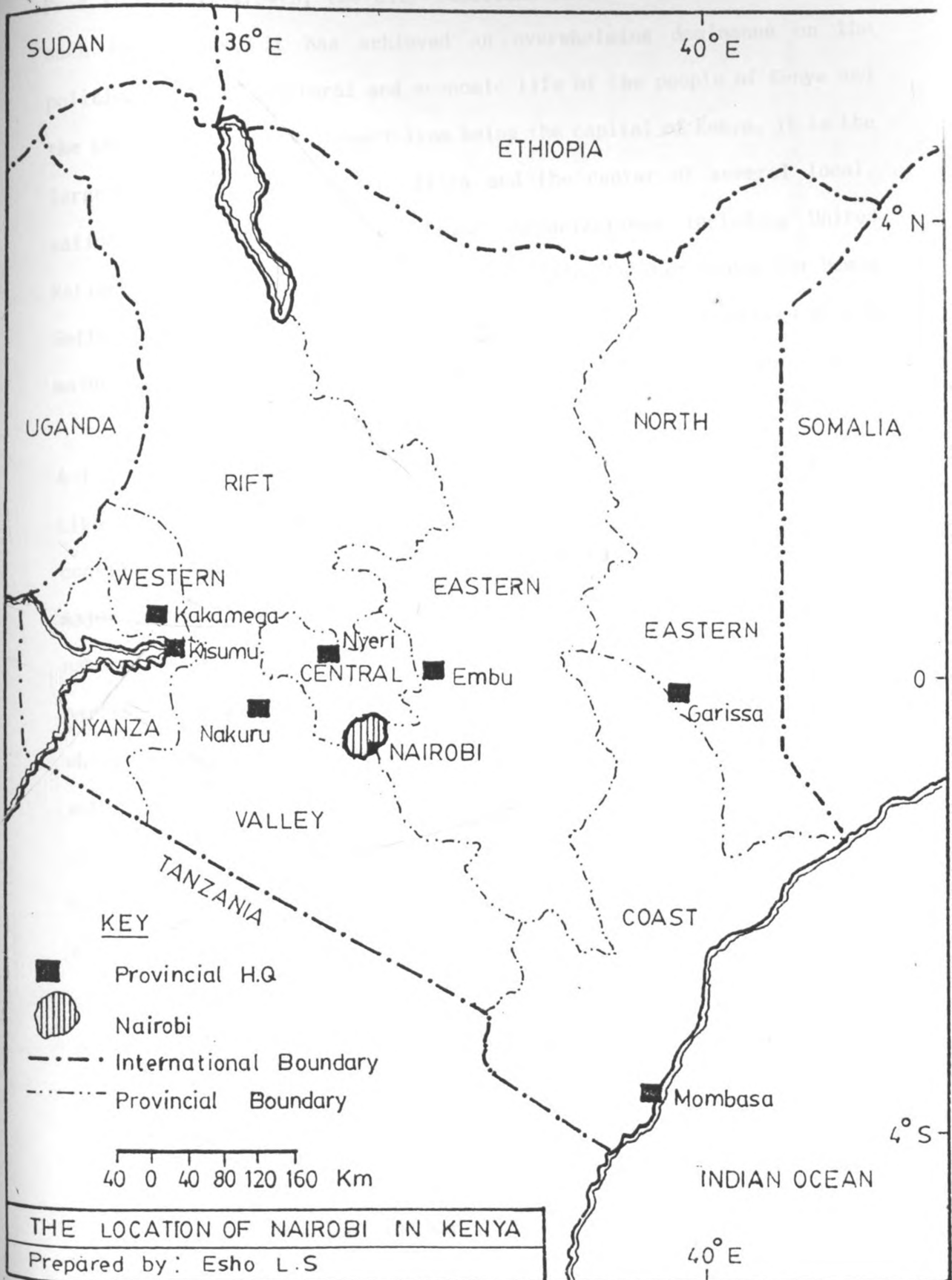
4-1 Background of the Study Area.

4-1.1 Location and Historical Evolution.

Nairobi is situated at the southern end of the agricultural heartland of Kenya, 1.19 degrees south of the Equator and 36.59 degrees east of the Prime Meridian (see map 4-1). The city was first established as a transportation station and later grew to be an administrative center. The site, due to the many advantages it offered, was of strategic importance to the Kenya - Uganda Railway (KUR) erectors, who chose it. The new settlement was named after the Maasai name 'Enkare nairobi' which means 'a place of cool waters'. The railhead reached the site in June 1899 and by July the same year it had become the K.U.R headquarters which moved from Mombasa (Boedecker:1936 and Foran:1950). In August, the line was opened to the travelling public. This was followed shortly afterwards with the establishment of Nairobi as an administrative and transportation center.

By 1909, much of the internal structure of Nairobi, especially the road network in the C.B.D was already established. Since then, the towns boundary has undergone various transformations. In 1927, it was extended to cover 30 square miles as a result of rapid growth of the urban center in terms of population and infrastructure. In 1963, the population had swelled to 270,000 people. At that time, the towns boundary was extended to cover an area of approximately 266 square miles. Presently, Nairobi's administrative boundary covers 690 square kilometers (268 square miles) with a population of roughly 2.5 million according to 1993 estimates (Obudho:1987 & Muganzi and Obudho:1987). It is by far the smallest administrative province in Kenya but yet the most important in terms of the activities and functions it performs.

MAP 4-1



KEY

- Provincial H.Q
- ▨ Nairobi
- · - International Boundary
- · · Provincial Boundary

40 0 40 80 120 160 Km

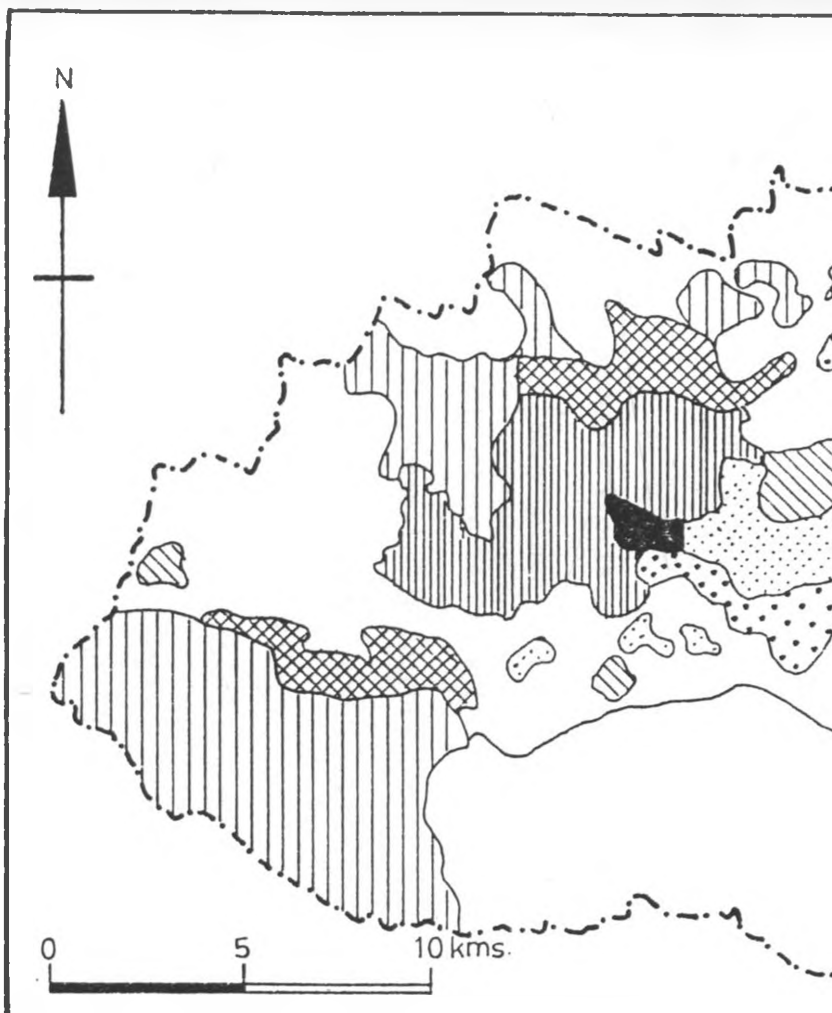
THE LOCATION OF NAIROBI IN KENYA
Prepared by: Esho L.S

From its early growth, the city functions have developed and expanded such that today, it has achieved an overwhelming dominance on the political, social, cultural and economic life of the people of Kenya and the East African region. Apart from being the capital of Kenya, it is the largest urban center in East Africa and the center of several local, national, regional and international organizations including United Nations Environmental Program (UNEP), and United Nations Center for Human Settlements (UNCHS- Habitat). The city is also the headquarters of the majority of African based multinational and transnational corporations.

4-1.2 Internal Structure and Population Distribution.

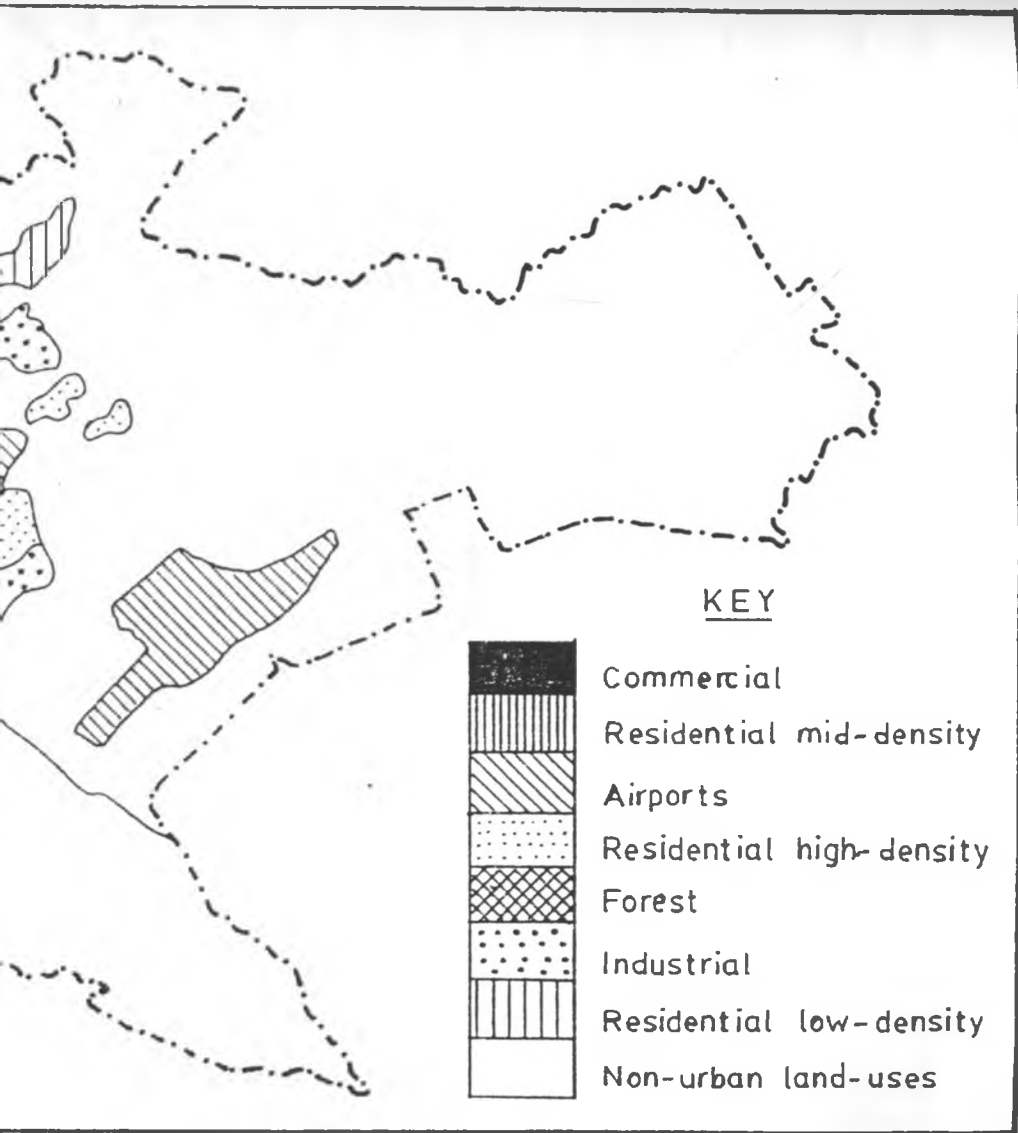
Like many other primate cities in Developing Countries, Nairobi has continued to grow at a very rapid rate (estimated at 6%) compared to other major towns in Kenya (GOK:1983). This growth is attributed partly to natural increase and, rural to urban migration. The latter is particularly brought about by the various attractions found in the city which include, the promise of higher living standards, availability of substantial and diverse employment opportunities as compared to the rural areas, and a host of many other reasons. Initially, the expansion of Nairobi was expected to take place within the built-up area and mainly on the 20 square miles of the black cotton soil and ranching land to the east of the town. This is presently shown by the heavy settlement of previously 'virgin' lands in Umoja, Donholm, Embakasi and Kayole. These are areas of high density housing with more than 70% of the city's population concentrated on 30% of the total urban area. The western side of the town comprises low density residential settlements inhabited by 20% of the city's population (see Map 4-2).

MAP 4-2



LAND-USE PATTERNS IN NAIROBI

Prepared by: Esho L.S



The present organization of Nairobi bears a strong legacy of the colonial and post colonial government policies. Spatially, its internal structure is divided into at least six well marked divisions based on land-uses and income levels. Four of the six regions are residential areas covering 84% of the total urban area. The largest of these is Upper Nairobi, where most of the city's rich reside. The other residential areas are Parklands to the north-west, Eastleigh and Eastlands to the east and Southlands to the south. The industrial area, which was established in 1948 has over 91% of the industries and 84% of all the warehouses located in Nairobi (Obudho:1992). 80% of the city's population occupies less than 20% of the available residential land in high density settlements while less than 20% of the population (mostly the rich) sprawls over the remaining 80% of the land in low density settlements. The most striking feature of the city of Nairobi today is the rapid growth of modern high-rise buildings at the CBD and the sprawling peri-urban area made up of low income housing. This built-up area has already spilled outside the city's legal boundary, mainly due to the continuing rapid influx of rural immigrants.

4-1.3 Infrastructure Services Provision and Performance.

As is the tradition in many other urban centers within Kenya, the provision of urban infrastructure services in the city of Nairobi is the responsibility of the City Council. In Nairobi, local government was set up in 1924 initially as a 'Native Council' charged with the responsibility of managing the town by coming up with by-laws to regulate and control the activities of the city's residents. In 1928, municipal government in the form of a Municipal Council was established for the town. It was vested with a wide range of responsibilities, the execution of which was to be independent of the central government (Fadamulla:1991). Central to these was the provision of urban infrastructure such as; roads, water and

sewerage systems, electricity, and services such as sanitation and garbage collection, among others. The efficient provision of these tasks was to be facilitated by the use of finances accruing from taxes levied on the towns residents.

The financing and provision of urban services have however been met with serious shortages, a situation attributable to; lack of finances, misappropriation and mismanagement of available, meager resources, inadequate, and poor maintenance of facilities for service provision, lack of skilled and committed personnel, bureaucratic dysfunctions and a lack of administrative independence from the central government.

A more serious problem constraining the provision of urban infrastructure services in the city of Nairobi has been the rapid population growth. As in many other cities in Developing Countries, the rate of urban growth in Nairobi far outstrips the capacity of the government to provide basic services and infrastructure for the city's residents. As a result, high density habitation, with the attendant increase in human activity, have created excess pressure on existing infrastructure. On the other hand, the urban sprawl, which has produced a rather scattered distribution of human settlements and activities over the urban space, has made the provision of especially physical infrastructure difficult and costly.

As the population has grown, capital requirements have increased at least proportionately, if not faster, due to the rising expectations of the city's residents for improved services. Yet approved expenditure on infrastructure in the recent past represents not only an absolute decline in available resources, but a marked decline in investment per urban resident (GOK:1990). While expenditure cuts have helped the government

to reduce the current budget deficit, they have led to the postponement of urban projects awaiting funding and an increased backlog of unmet demands for water supply, sewerage, solid waste management, and other important infrastructure services.

4.2 Solid Waste Management.

4-2.1 History of Solid Waste Management in Nairobi.

According to Mbui (1995), the beginning of solid waste management in the city of Nairobi dates back to the early periods of this century. The first attempts were in 1904 when rules pertaining to sanitary matters were laid down for the entire Kenya Colony. For Nairobi, an ordinance was formulated in 1905 and enacted in 1906 with regulations aimed at ensuring environmental quality in the town. Consequently, a private company was contracted to clean, sweep, collect garbage and light the city's streets. With time however, this company could not be relied upon to provide an efficient solid waste management service. In 1928 therefore, the government established a Municipal Council for the town which consequently took (and still does), responsibility for solid waste management among other roles.

4.2.2 Waste Generation Trends.

i). Per-capita Waste Generation Levels.

There are conflicting reports as to how much solid waste is produced per person per day in the city of Nairobi. The UNDP pegs this at 1.36 kg (NCC:1984), the Ministry of Local Government at 0.375 kg (NCC Project:1988), the UNCHS at 0.5 kg (UNCHS:1989) while the Nairobi City Council at 0.4 kg (NCC:1990). Various studies (Kiogora:1993, Mbui:1995) show that per-capita waste generation levels vary according to household income levels with low, middle and high income households generating

average per capita waste quantities of 0.35 kg, 0.6 kg and 1.2 kg respectively. On average therefore, the current per-capita solid waste production for the city is 0.6 kg. As would be expected, residents with higher incomes generally generate more waste than lower income earners. Similarly, it would be expected that as the country develops and standards of living for city residents rise, the above levels are bound to rise.

ii). Total Quantities of Waste Generated in Nairobi.

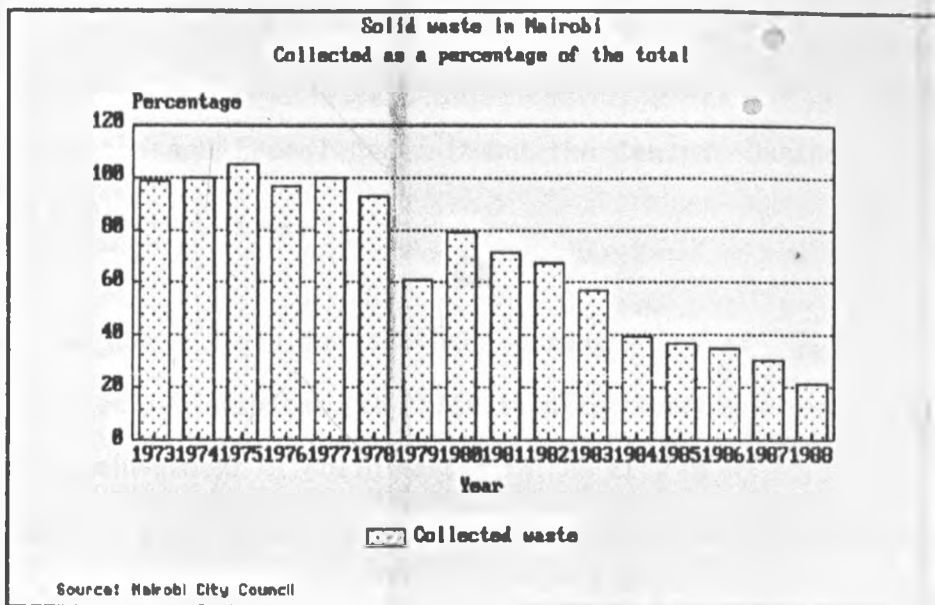
Over the years, the total amount of solid waste generated within the city has been rising with the rise in population human and economic activities. In 1973, only 165,222 tones of waste were generated per day compared to the current 365,675 tones in 1988. It is not known how much waste is generated presently but it is estimated to stand at 438,000 tones per year or 1200 tones per day (Kiogora:1993). Of this, 50% is residential and institutional waste while 30% and 20% is commercial and industrial respectively (NCC:1997). It is estimated that by the year 2000, with a projected population of 3 million, and an average per-capita solid waste production being 1.5 kg, the total amount of solid waste produced in the city is expected to reach 4500 tones per day (GOK:1994).

4-2.3 Solid Waste Collection Trends.

In the 1970's, the role of the council in providing the Solid Waste Management service was adequate and efficient. The figure below shows that, although the amount of wastes generated has been increasing steadily, the collection capacity of the Nairobi City Council was quite high - averaging about 90% in the 1970's. In the 1980's however the capacity of the City Council to handle solid wastes began to dwindle, averaging about 50% in the decade and reaching as low as 21.54%. The situation in the recent past has not improved with the city council

maintaining an average collection efficiency of 25% in the 1990's (Otieno:1992).

Fig 4-1



4-2.4 Organization of Collection Activities.

The Nairobi City Council's Department of Environment has been responsible for the collection and disposal of solid wastes in residential, commercial, industrial areas and in institutions. In addition to this, it is also responsible for soil collection, street sweepings and dead animal collection. To provide this service, it uses specialized refuse containers including bins and trucks, together with storage yards and properly equipped workshops for repair and maintenance. Qualified personnel to carry out a variety of tasks ranging from collection, repair, administration and maintenance are also required. For purposes of garbage collection, the cleansing section has divided the city into two jurisdictions namely;

- i). Division One - comprising of the Northern (Ngara, Lower Kabete and Muthaiga), Eastern (Eastlands) and Southern districts (Industrial Area) and,
- ii). Division Two - comprising the Western (Kilimani, Kibera, Kawangware, Lavington and Karen) Central and the Central Business districts (C.B.D).

Whereas the above divisions show the organization of the Nairobi City Council collection services, the situation in recent years may not be the same as the management of solid wastes in the city of Nairobi has seen the involvement of other actors including the private sector, Non-governmental Organization and Community Based Organizations. Findings in sampled areas indicate that 60% of the respondents depend on private companies to collect their garbage while about 35% handled their own garbage through a variety of methods including open dumping (16%), burning (19%), scavengers (42%) and recycling (23%). The activities of the Nairobi City council and community based organizations were minimal constituting a mere 6% and 4% respectively.

Responsibility for garbage collection however varied with activity type. For instance, 73% and 50% of households and industries respectively are served by private companies service while institutions and commercial enterprises tended to take responsibility over their own wastes. Those who were not served by the city council took their own initiative to deal with their wastes.

Fig
4-2

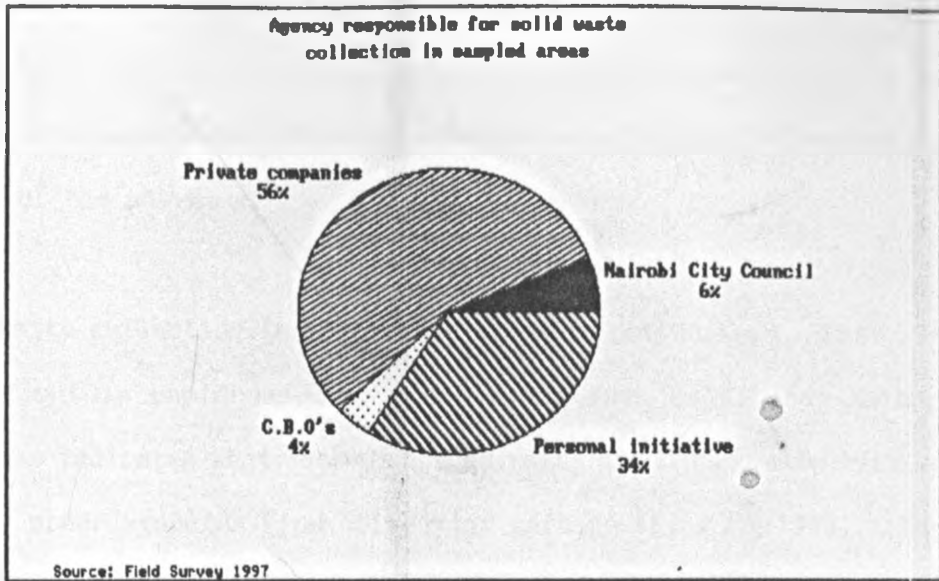


Table 4-1: Area specific responsibility for solid waste collection.

Collection Agency	Activity area							
	Residential		Institutions		Industrial		Commercial	
N.C.C	1	1%	4	21%	-	-	3	17%
Private Sector	57	73%	6	32%	10	50%	3	17%
C.B.O's	5	6%	-	-	-	-	-	-
Personal initiative	15	19%	9	47%	10	50%	12	66%
Total	78	100%	19	100%	20	100%	18	100%

Source: Field Survey 1997

Below is an account of solid waste collection activities in the city's activity areas.

i). Low Income Neighborhoods.

Low income neighborhoods are those areas within which the poorest of the city live. Incomes here are seldom beyond 1000 Ksh per month and the majority of people are engaged in casual employment or self-employed in the informal sector (Kiogora:1993, Mbui:1995). The average household size here is about six. Technically, there are two categories of low income

areas namely; i) unplanned and ii) planned residential areas. While the latter have a fairly good distribution of infrastructure services such as roads, water and electricity, the former are frequently lacking in some or all of the above.

Solid waste collection in low-income areas is not uniform. Past research carried out in unplanned low income areas such as Kibera, Mathare and Korogocho indicates that lack of access roads discourages the city council and any other agencies from collecting garbage (Kiogora:1993). In spite of the relatively good road conditions in planned low-income areas such as Dandora and Kawangware, waste is frequently not collected. The city council admits that low income settlements receive collection services once a month or no service at all. As a result, indiscriminate dumping is a frequent occurrence. In Kawangare for instance, more than 75% of the residents dump waste in open ground. The situation is self evident in other low income areas like Kibera and Mathare (Mwaura:1991).

ii). Middle Income Neighborhoods.

Due to the wide income bracket this area can be said to have two categories of residents namely; i) lower middle income earners such as Umoja and Eastlands and ii) upper middle income earners such as Plainsview, Southlands and Nairobi West. The former comprises of people who earn an average monthly income of 15,000 ksh while the latter earn an average of 30,000 ksh. Infrastructure here is good and the areas are accessible by all means. Within the lower middle income areas, the city council provides collection services once in 14 days. In the upper middle income areas, collection frequency is slightly higher - once a week. However, frequency of collection depends on the collection agency. For instance, in Plainsview, a residential neighborhood south of Nairobi, 85%

of the respondents rely on private firms to collect their garbage of whom 55% have their waste collected twice a week.

iii). High income Neighborhoods.

These are areas such as Muthaiga, Kileleshwa, Lavington and Karen, where the rich live. For instance, in Loresho, a high income residential neighborhood at the north western side of the city, the majority of the residents earn over 50,000 ksh per month and are owners of industry, managers of business establishments, senior government officers and high ranking officials in non-governmental and international organizations. The frequency of collection services here also depends on the area. For densely populated areas such as Muthaiga, Westlands and Lavington, collection is once a week. However, in sparsely populated areas such as Karen, waste is collected once in 14 days. This is because residents in these areas bury or burn most of the waste in their large compounds.

iv). Institutions.

Nairobi is the center of many institutions including schools, colleges, research centers, hospitals and civic institutions. Together with residential areas, these generate 50% of the city's total solid wastes or 600 tones per day (NCC:1997). Collection is mostly done once a week. However, in institutions handling vegetative and food waste, waste is collected more frequently. Although 53% of waste is collected by the city council and private firms, a substantial number of institutions take responsibility for their own waste either by burying or by burning.

v). Commercial.

Commercial areas, including the Central Business District are major waste generators. They include office premises and commercial enterprise such

as shops and hotels. In total, these areas generate 30% of the city's waste or 360 tones per day (NCC:1997). The frequency of collection depends on the location of the enterprise and the type of waste generated. Collection is twice a week for those enterprises within the CBD and once a week for those at the outskirts. For some enterprises, for instance hotels the nature and composition of waste necessitates a daily removal of waste.

vi). Industrial.

There are about 635 industrial units in the city of Nairobi 42% of these being agro-based, 33% engineering and construction while chemical industries comprise the remaining 25% (Fadamula:1991). The bulk of these industries are located in Nairobi's main industrial area encompassing 960ha of land. In total, industries areas generate about 20% of the city's total waste (or 240 tones per day). Since a single industry generates alot of waste per day, each industry is supplied with bulk containers for purposes of storage. Consequently, the city council collects waste once in 14 or 30 days. However Fadamula (1991) observes that the frequency of collection by the City Council is much lower resulting in indiscriminate dumping on open spaces and into the adjacent Nairobi river. Considering the obnoxious nature of most industrial waste, the potential for environmental pollution of major proportions is high .

4-2.5 Problems of Solid Waste Collection in Nairobi.

The performance of solid waste management services in the city of Nairobi has been poor. This has been due to a variety of problems the bulk of them emanating from resource constraints as outlined below.

i). Financial Constraints.

Perhaps the most serious problem facing the provision of solid waste management services in the city of Nairobi is that of inadequate financial resources as manifested in the inability to employ adequate staff, procure equipment and maintain the existing fleet. To finance solid waste management activities, the Nairobi city council's department of Environment derives money from about three sources namely; i) dustbin charges (ksh 40 attached to monthly water bills), ii) conservancy fees and iii) a significant share from the general revenues which in turn are derived from service charges levied to all persons employed within the city (a graduated personal tax or GPT ranging from ksh 10 to 100 per month). In total, the approved expenditure estimates by the Nairobi City Council on public health for the year 1994/95 amounted to 8.9 million Kenyan pounds with about 84% going to public cleansing and refuse removal.

Table 4-2: Estimated Expenditure on Public Health for the Year 1994/95.

ASPECT	TOTAL EXPENDITURE (K£)	% OF THE TOTAL
Administration	1,330,800	15.0
Cleansing	6,349,800	71.6
Refuse Removal	1,117,200	12.6
Conservancy	74,600	0.8
TOTAL	8,872,400	100.0

Source NCC:1997

However, an analysis of actual expenditure shows that while administrative costs consume about 40% of total revenue, expenditure on public cleansing and refuse removal is only 50% - way below the developing country average of 95% and that of developed countries which is 70%. Similarly, actual total expenditure is way beyond the approved estimates by about 42%. This is an indication of poor budgeting and allocation of finances.

Table 4-3: Actual Expenditure on Public Health for the Year 1994/95.

	TOTAL EXPENDITURE (K£)	% OF THE TOTAL
Administration	5,074,904	40.2
Cleansing	6,300,840	50.0
Refuse Removal	1,212,583	9.6
Conservancy	24,494	0.2
TOTAL	12,612,821	100.0

Source NCC:1997

On the other hand, the total estimated revenue from two possible internal and external revenue sources amounts to K£ 3.8 million. However, the actual revenues collected for the year amount to a mere K£ 1.6 million.

Table 4-4: Revenues Collected for Service Offered.

SOURCE	ESTIMATED (k£)	ACTUAL (k£)
Charges to Other Departments	200,000	65,902
Refuse Removal Charges	3,600,000	1,570,130
TOTAL	3,800,000	1,636,032

Source: NCC:1997

This is not only a clear indication that a majority of the city's population does not pay for the services they receive, but also of the council's inability to collect taxes from those who should pay. This may be attributed to the fact that the city council collects refuse removal charges through water bills meaning that only those with water meters can be charged. Secondly, the council faces many practical difficulties in collecting service charges from a vast majority of city residents such as the unemployed and self-employed. There is also the question of delayed remittance of deductions from employees by employers. All these factors reduce the city council's potential revenue base.

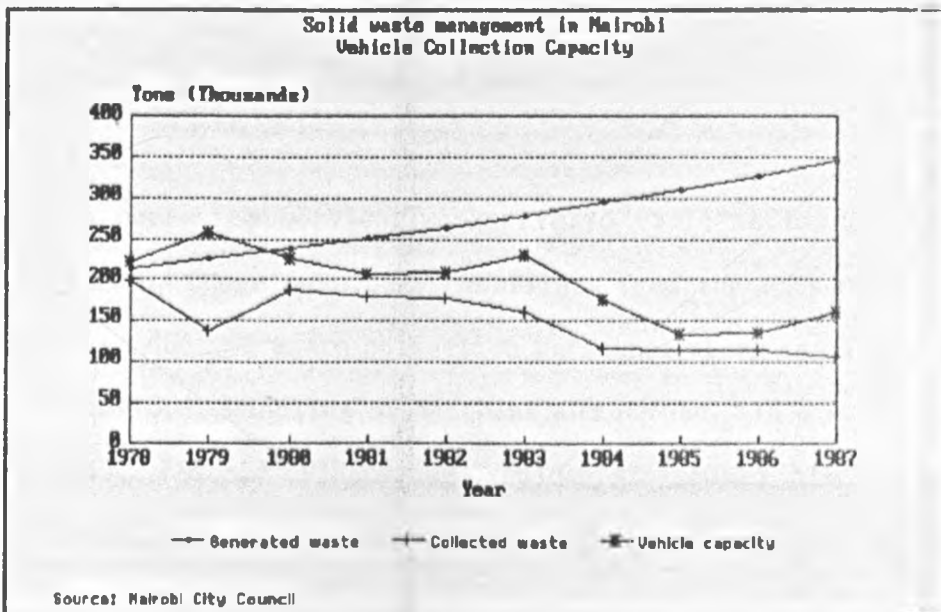
Overall, the over-reliance on service charges by a variety of uses within the city council has reduced the amount of financial resources available for the provision of services. This situation is further complicated when available resources are mismanaged and misallocated.

ii). Inadequate Collection Vehicles.

As was stated earlier, financial problems always manifest themselves through inadequacies in other aspects of the solid waste process. Kadhaka (1988) observes that the city council is greatly constrained in offering an efficient and effective waste collection service due to inadequacies vehicular capacity for solid waste transportation. Most of the city council's waste collection vehicles are poorly maintained and when they break down, are seldom repaired or replaced. This situation arises due to lack of spare parts and financial resources required to put them back on the road.

Over the years, the council's waste collection capacity has been reducing as the amount of waste generated increased. The figure below shows the trends during the 1980's. The situation has continued to deteriorate.

Fig 4-3



Presently, the vehicle collection capacity of the Nairobi City Council, excluding those that are grounded, and considering an average of two trips per day for all the vehicles, the total possible vehicle capacity is 286 tones (see Table).

Table 4-5: N.C.C's Vehicle Collection Capacity - 1995.

TYPE	CAPACITY (Tns)	NUMBER	TRIPS (p.d)	TOTAL CAPACITY
Compactors	14	2	2	56
Tipplers	6	3	5	90
Side loaders	5	12	2	120
Bulk bins	5	2	2	20
TOTAL			11	286

Source NCC: 1997

To achieve the required minimum city wide collection efficiency of 75%, this capacity will need to triple if the 1200 tones generated daily have to be handled.

iii). Inadequate Personnel.

The NCC lacks adequate human resources to conduct an efficient waste collection service in the city. As shown in table 4-6, the number of workers falls far below the recommended numbers for an efficient city wide collection service.

Although the current supervisor/worker ratio (1:7) is higher than the recommended 1:18, there have been complaints from the consumers against the improper conduct of waste collection personnel which manifests itself through the improper handling of dustbins and refuse. In a study done by Mwaura (1991), 68% of Plainsview residents accused the collection personnel of being cruel and causing unnecessary nuisance by hooting provocatively. Similarly, because of careless driving, the drivers not

only strew garbage all over the estate, but pose a danger to the residents. All these are indications of poor supervision.

Table 4-6: N.C.C's Waste Management Labourforce.

JOB CATEGORY	RECOMMENDED	PRESENT	% OF RECOMMENDED
Cleansing Superintendent	1	1	100
Deputy C.S	2	2	100
Assistant C.S	2	2	100
Inspectors	8	5	63
Senior Foremen	12	9	75
Foreman I	15	11	73
Foreman II	15	3	20
Senior Headman	50	36	72
Senior Cleansing Officer	2	2	100
Clerical Officer I	4	2	50
Clerical Officer II	2	2	100
Clerical Officer III	36	10	28
Headmen	225	225	100
Manual -Drivers -Sweepers -Loaders	6000	120 1500 500	35
TOTAL	6374	2420	

Source: NCC, 1997

All the above problems translate to inefficient and ineffective waste management and in effect lead the current poor environmental quality and health conditions evidenced in present day Nairobi.

CHAPTER FIVE: PRIVATE SECTOR SOLID WASTE MANAGEMENT IN NAIROBI.

5-1 The Evolution of Private Solid Waste Entrepreneurship.

Formal private sector entrepreneurship in Kenya is a relatively new phenomenon. The earliest attempts at privatizing solid waste management services in the city of Nairobi were in 1906 when a private company was contracted to sweep and clean city streets, collect garbage and provide street lighting. This company did not succeed in effectively executing these duties and the role had to revert back to the city council (Mbui:1995). Initially, the city council performed this role relatively well. In recent decades however, with increasing quantities of waste being generated, the capacity of the city council to provide an adequate and efficient waste management service has dwindled. This has resulted in the increased involvement by city residents of actors other than the city council in solid waste management activities. According to report by Undugu, private solid waste collection and disposal at the individual level has been in operation for some time (initially through the activities of scavengers). But it is only in 1988 that organized commercial garbage collection was initiated with two private firms namely; Bins (Nairobi) services Limited and Domestic Refuse Disposal Services Limited collecting waste from industries institutions and commercial establishments, together with high income residential areas (Undugu 1991). The 1990's have experienced the rapid growth of private solid waste entrepreneurship not only in the city of Nairobi but in other major towns in the country (GOK:1997).

Various individuals and organizations have stressed the importance of privatization of solid waste services. For instance, in 1991, the World Bank, responding to a request by the Nairobi City Council for funds to

finance the purchasing of specialized waste collection vehicles, proposed the subcontracting of garbage collection to private entrepreneurs who would supply collection vehicles and manage the collection operation (Kiogora:1993). Until recently however, the city council had not given private entrepreneurs the go-ahead to collect garbage other than in high income areas.

The responsibility for solid waste management is still the domain of the city council. Similarly, it is only the city council which is mandated by law to collect charges from urban residents for solid waste management services. The current private sector entrepreneurship is unguided and is taking place without any necessary institutional and legal changes. However, early this year (1997), the government directed the Nairobi City Council and other local authorities to work out modalities of privatizing refuse collection activities with a view to making the management of waste collection disposal more efficient. The city council with assistance from the Japanese government is carrying out a research that will lead to a pilot privatization of solid waste collection in Nairobi's central business district. It is hoped that experiences gained will assist in determining whether and how to embark on a city-wide privatization process.

5-2 Present Realities of Solid Waste Management.

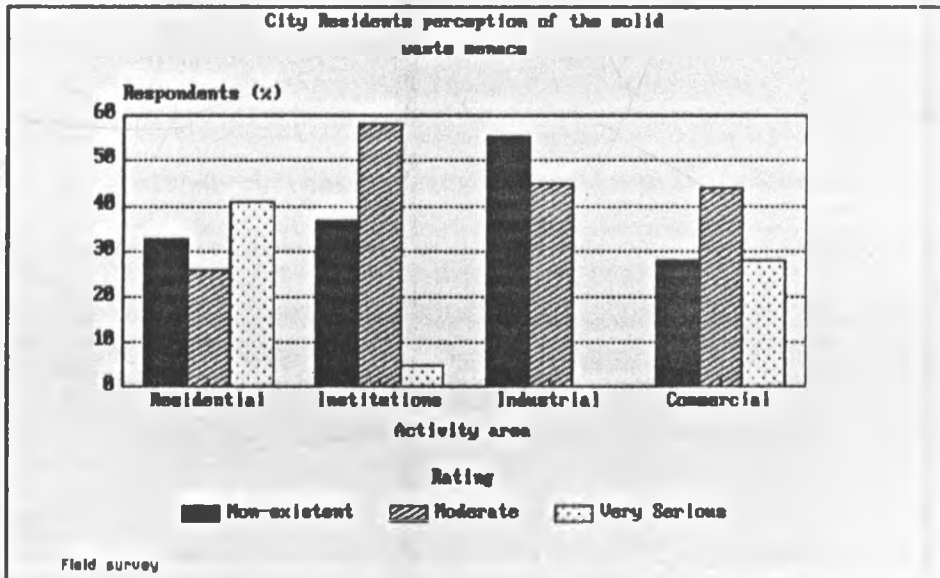
To help us understand further the current situation of solid waste management in the city of Nairobi and the extent of private sector involvement, we look at the responses of individuals from four activity areas namely, residential, commercial, industrial and institutions. For each of these, we consider their perception on the seriousness of the solid waste situation in their areas, what they think would be the best

framework for dealing with the inadequacies currently experienced in the provision of solid waste management services and the extent to which they have solicited the service of private firms to abate the situation. In general, 55% of the people interviewed were from residential areas while each of the rest comprised 15% of the sample.

5-2.1 Magnitude of the solid waste problem.

Regarding the solid waste situation, 36% of the respondents saw the problem to be very serious in their areas while 36% and 28% perceived it as moderate or non-existent respectively.

Fig 5-1



Their rating was however influenced by several factors such as area, activity type, level of education etc. For instance, in residential areas, 41% of the households tended to view the solid waste problem as being very serious compared to 28% of commercial enterprises. This is further elaborated in table 5-1 and in the sectoral analysis (section 5-3).

Table 5-1: City Residents' perception of the Solid Waste menace.

Rating	Number and percentage of respondents							
	Residential		Institution		Industrial		Commercial	
Non-existent	26	33%	7	37%	11	55%	5	23%
Moderate	20	26%	11	58%	9	45%	8	44%
Very-Serious	32	41%	1	5%	-	-	5	23%
Total	78	100%	19	100%	20	100%	18	100%

Source: Field Survey 1997

5-2.2 Frequency of collection.

More than 50% of the respondents had their garbage collected once a week while about 25% had theirs collected daily. Respondents from virtually all activity areas seemed to express their satisfaction with the frequency of the collection service. However, as can be seen from the table 5-2 below, the majority of those who thought the frequency of collection was adequate were either currently being served by private companies, or were themselves actively involved in disposing of their garbage. It is important to observe that the majority of those served by Nairobi City Council expressed their dissatisfaction with the frequency of the waste collection service.

Table 5-2: Satisfaction with agency collection services.

Response	Agency currently collecting respondents waste							
	NCC		Private firms		CBO's		Personl Initiative	
Adequate	3	38%	66	88%	3	100%	39	91%
Inadequate	5	62%	9	12%	-	-	4	9%
Total	8	100%	75	100%	3	100%	43	100%

Source: Field Survey 1997

5-2.3 Suggested Options for Service Improvement.

i). The Preference for Privatization.

It is not surprising therefore that, although 86% of all respondents expressed their satisfaction with the frequency of collection, 70% of them thought it was about time that city authorities privatized the service. Other suggestions, though not heavily supported, included improvement of public sector (NCC) provision and the involvement of other actors such as Non-governmental organizations and community based organizations.

Table 5-3: Perception of most responsible actor in solid waste management as against agency currently responsible for collection.

Most responsible Actor	Agency currently collecting respondents waste							
	N.C.C		Private firms		C.B.O's		Own Initiative	
N.C.C	2	25%	1	1%	-	-	7	15%
N.G.O's	-	-	1	1%	1	20%	3	7%
C.B.O's	-	-	1	1%	3	60%	2	4%
Private Firms	6	75%	72	96%	-	-	19	41%
Personal Initiative	-	-	1	1%	-	-	15	33%
CBO's/Private Firms	-	-	-	-	1	20%	-	-
Total	8	100%	76	100%	77	100%	46	100%

Source: Field Survey 1997

This romanticism with privatization can be understood from various perspectives. As already demonstrated, most of the respondents already depend on private firms to deliver the waste collection service. Their advocacy for privatization can therefore be attributed to an acquired preference for private sector service provision based on benefits accrued from current association, in comparison to previous experiences with public sector provision. Of the over 70% of the respondents who feel that the private sector is the most reliable actor in solid waste management, 74% are currently being served by private firms. Probably due to their

dissatisfaction with the service they get from the Nairobi City Council, 63% of them suggest privatization preferably in partnership with the NCC. Overall, 78% of the respondents generally feel that the involvement of the private sector (either purely or through partnerships with other agencies), might ensure the city of an efficient waste collection and management service. This response is influenced by a variety of factors ranging from the respondents activity type/employment area, level of education, level of income and the extent to which he/she has already incorporated the private sector in solid waste collection and disposal. For instance, owners of industry favour whole-heartedly any initiative that will incorporate the private sector in solid waste management. These and other examples can be deduced from table 5-4 below.

Table 5-4: Suggestion for effective management as against activity area.

Suggestion	Activity area							
	Residential		Institutions		Industrial		Commercial	
Private Sector	26	33%	7	37%	20	100%	8	45%
N.C.C	7	9%	3	16%	-	-	6	33%
C.B.O's/N.G.O's	5	6%	2	10%	-	-	-	-
Private firms/NCC	18	23%	5	26%	-	-	4	22%
Private/CBO's/NGO's	7	9%	2	10%	-	-	-	-
NCC/CBO's/NGO's	3	4%	-	-	-	-	-	-
Total	78	100%	19	100%	20	100%	18	100%

Source: Field Survey 1997

ii). Preferred Privatization Mode.

Having given private involvement their wholehearted support, the respondents went on to suggest what form of involvement might be desirable if and when privatization takes place. Over 70% favoured direct involvement whereby private firms in competition, would get into individual contracts with service consumers. Others suggested indirect

involvement through public private partnerships between the private firms and the Nairobi City Council or with Community based organizations or Non-governmental organizations. Their views on this were mainly influenced by the respondents activity area/type such as residential, commercial, institutions and industrial, among other factors (see section 5-3). Apart from residential areas, which advocated for the three forms of involvement i.e, direct contracting in an open market (68%), government franchise (14%) and indirect contracting with community based organizations (18%), the other activity types/areas preferred an almost complete direct involvement with private firms (72% for commercial, 95% for institutions and all industrial respondents). This also tended to correspond to the level of education where 95% of college/university graduate seemed to favour direct involvement in preference to the other two options. On the other hand none of those below secondary school education seemed to favour direct involvement and instead preferred the government maintaining some role or they themselves being involved through community based organizations.

5-2.4 Cost of Privatized Services.

The charges currently levied by private companies, and those that respondents were willing to pay vary depending on several factors such as, the activity area and income of the respondent (see section 5-3). It is however interesting to observe that people are generally willing to pay much more than they are currently paying. For instance, while 53% of those paying below Ksh 100 did not want to pay more, 47% indicated that they were willing to pay more than Ksh 200 per month. The same applies to those who were paying between Ksh 100 and 200. Similarly, 50% of those paying between Ksh 300 and 400 indicated a willingness to pay up to Ksh 800 per month. This rather strange phenomenon is probably the result of

the much publicity that privatization of the service has received in the recent years. It could also be an indication of the level of frustration that city residents have had due to the poor services currently being offered.

5-3 Sectoral Involvement of Private Entrepreneurs.

5-3.1 Residential Areas.

Regarding the seriousness of the solid waste menace in their areas, the majority (41%) thought the problem was very serious while 27% and 33% saw the problem as moderate or non-existent respectively.

Table 5-5: Perception of the solid waste menace by residential area.

Rating	Respondents residential neighborhood							
	Kawangware		Umoja		Plainsview		Loresho	
non-existent	-	-	3	15%	5	25%	18	90%
Moderate	12	67%	1	5%	7	35%	-	-
Very-Serious	6	33%	16	80%	8	40%	2	10%
Total	18	100%	20	100%	20	100%	20	100%

Source: Field Survey 1997

The majority (63%) of respondents in residential areas had their garbage collected once a week while 21% and only 6% had their waste collected twice and thrice a week respectively. Although 86% of the households were satisfied with the frequency of collection, 77% of these respondents went on to suggest the solid waste management service should be privatized either in a pure form or in partnership with the City Council, or with community based organizations. 64% of the residential respondents pay below 200 Ksh per month. Those who do not receive privatized services indicated a willingness to pay the same amount. Below is a an area based analysis of the extent of private solid waste entrepreneurship.

i) **Low Income Residential Areas.**

Kawangare is a low income residential neighborhood west of the city of Nairobi. Unlike many slum dwellings it is an upgraded planned settlement with paved roads and has a fairly good distribution of infrastructure services such as water, electricity and in the recent past, solid waste collection. All the residents interviewed here earn less than Ksh 5,000 and the average resident here has only attained below secondary level education. Previous research indicated that 80% of the residents were of the opinion that private sector involvement could abate problems of solid waste management currently experienced in the area (Kiogora:1993). The study also revealed that community based organizations play a big role in waste management and as such indiscriminate dumping is not a common eventuality. The activities of informal private solid waste entrepreneurs or "scavengers" are also common here. There is absolutely no formal private sector solid waste involvement in this area. While 72% of the respondents handle their own wastes, the rest depend on community-based organizations. The majority of residents dispose of their garbage on a daily basis. 67% of the respondents perceived the solid waste situation to be moderately serious. 56% of the respondents think that Non-governmental Organizations and Community-based Organizations are the most responsible actors in solid waste management. On the other hand only 6% and 11% think that private firms and the City Council have a good reputation as being responsible and neither think that, left on their own, individual households can handle waste responsibly. As a result, 61% of the residents do not favour private sector involvement in their area and instead tend to prefer the role of the Nairobi City Council, Non-governmental Organizations and Community-based Organizations. However, 38% of the respondents suggested that the private sector could be involved in partnership with any of the others. In the event that the garbage

collection service is privatized, 72% of these favour indirect as opposed to direct contracting with individual consumers or possibly franchising. There is currently no private sector waste collection in Kawangware. However all the respondents indicated that they will not be willing to pay a monthly charge of more than Ksh 100.

ii). Lower-middle Income Residential Areas.

Umoja is a middle income residential neighborhood east of the city of Nairobi. All residents interviewed here earn more than 1000 Ksh per month but not more than Ksh 31,000. Of these, 50% earn between Ksh 20,000 and Ksh 30,000. All the respondents are literate 80% of them being graduates of institutions of higher learning. The roads here are in relatively good conditions. This may explain why solid waste collection for all the respondents is carried out by private firms. 95% of them receive the service once a week and are satisfied with the collection frequency. 80% of the respondents perceived the solid waste situation as being very serious. All the respondents are satisfied with the way private companies handle their refuse and suggest that the service be privatized. The majority (71%) however, hasten to suggest that this should be done in partnership with the Nairobi City Council, Community Based Organizations's or NGO's. However, as if to contradict the above suggestion, all the respondents suggest that private companies should in open competition, get into direct contracts with individual clients. 95% of respondents currently pay less than Ksh 200 with 57% of these paying less than Ksh 100 per month. While 79% of them are committed to continue paying the same amount, 21% indicate a willingness to pay up to Ksh 300 if the need arises.

iii). Upper-middle Income Residential Areas.

Plainsview is a settlement south of the city of Nairobi. Although this is usually considered an upper middle income neighborhood, it is clear that all income categories reside here. All respondents interviewed are spread out evenly among the income categories with 30% earning between Ksh 1,000 and Ksh 20,000, 24% earning between Ksh 21,000 and Ksh 40,000 and over 50% earning above 50,000 Ksh. All the respondents are educated beyond the secondary school. The majority (85%) of the respondents hire private firms to collect and dispose of their garbage. 55% of them have their waste collected twice a week and express satisfaction with the frequency of collection. The majority (40%) of the respondents from this neighborhood perceived the solid waste situation to be very serious. Through experience, 90% of the respondents have come to appreciate the handling of solid waste by private firms. As a result therefore, 78% of the respondents suggest that privatization could be a good way to ensure the effective management of solid wastes in the city. This is a replication of previous findings in this area which indicated that 87% of the residents were willing to involve the private sector in solid waste management (Mwaura:1991). 60% of the respondents prefer complete privatization in open competition. 60% of also prefer direct contractual arrangement between them and private collection firms while the remaining 40% see franchising as an option. All the respondents pay between Ksh 100 and Ksh 200 per month. Of these, 59% pay Ksh 100. However, while 40% are comfortable with these charges, 40% would rather pay less than Ksh 100 per month. A few (20%), indicate that the are willing to pay up to Ksh 400.

iv). High Income Residential Areas.

Loresho is a high income neighborhood north west of the city of Nairobi. Most (68%) of the residents interviewed here earn more than Ksh 30,000.

Like Umoja, most (90%) of the respondents in this area have been to college or university. Again, like umoja, all the responsibility for solid waste management in this area is in the hands of the private sector. All the respondents in this area received the service once a week and were satisfied with the frequency of collection. Most (40%) of them perceived the solid waste problem in the area to be moderately serious. 95% of the respondents have come to view the handling of waste by private firms as being efficient. As a result, 79% of them think that the best way to deal with the inadequacies that face the solid waste management service in Nairobi is to privatize. All prefer dealing directly with the private solid waste collection. 45% of the respondents pay between Ksh 700 and Ksh 800 while 40% pay between Ksh 200 and Ksh 300 for waste collection services every month and are all comfortable with these charges. As a matter of fact, quite a few (13%) indicate their willingness to pay way beyond Ksh 800 per month.

5-3.2 Institutions.

Institutions interviewed comprised of educational institutions, hospitals, churches e.t.c. While 21% and 31% of the respondents have their wastes collected by the Nairobi City Council and private firms respectively, 47% take responsibility for solid waste management in their establishments mainly through burning (45%) and selling their wastes to scavengers (55%). Of those being served by the City Council and private firms, 53% receive the service once a week and were satisfied with the frequency of collection. 58% of those interviewed saw the solid waste situation as being moderately serious. 68% of the respondents have come to view the handling of waste by private firms as being very efficient and consequently suggest that the service be privatized. Of these, 95% prefer direct contracting between them and private solid waste entrepreneurs.

The charges currently paid by institutions varies according to the size of institution. 73% of the respondents however indicated that they were willing to pay less than 200 Ksh per month.

5-3.3 Industries.

Industries interviewed comprised of large scale and small scale manufacturing industries within the City's main industrial area. Half the respondents depend on the private sector while the other half manage their own wastes mainly through recycling (60%) open dumping and by selling to scavengers. Of those receiving service from the City Council and private firms, 40% receive the service once a week and 30% daily. Most (85%) were satisfied with the frequency of collection. 55% of those interviewed did not think the solid waste situation in their areas was that serious and in fact did not think the problem exists at all. 60% think that private firms handle solid waste quite responsibly while 40% still think that left on their own, they are capable of handling waste in a responsible manner. However, all think that the best way to deal with the inadequacies that face the solid waste management service in Nairobi is to privatize. This is the same view held in 1991 when 85% of the industries, in a research conducted by Fadamulla indicated that the city might be better off with a privatized waste collection service (Fadamulla:1991). They all would prefer direct contractual dealings with private solid waste collection firms. And while 70% of industries receiving privatized service currently pay more than 800 Ksh, those who do not indicated a willingness to pay the same.

5-3.4 Central Business District.

A number of commercial establishments were interviewed including retail shops, supermarkets, offices, and food based businesses within the central

business district. While a few depend on the private sector and Nairobi City Council, 67% of the respondents handle their own solid waste mainly by selling it to scavengers. A substantial percentage (36%) however practice open dumping. 75% of the respondents in this activity receive the service daily and find that this arrangement is adequate. There were differences on their perception of the seriousness of the solid waste menace with 44%, 28% and an equal percentage perceiving it as being moderately serious, very serious and non-existent respectively. 78% of the respondents think that private firms handle solid wastes responsibly and suggest the privatization of the service. 72% of them prefer to contract directly with the private firms while the rest would prefer the government giving out a franchise to companies to provide the service. Only large scale commercial enterprises indicated that they involve private companies in waste removal. In general however, 44% of them showed a willingness to pay more than Ksh 800 per month in the event that the service is completely privatized.

5-4 Private Solid Waste Entrepreneurship.

The Nairobi City Council does not license these entrepreneurs as private waste collection companies but rather registered as business establishments. Hence it is not possible to know exactly how many private solid waste entrepreneurs operate within the city. The Nairobi City Council however estimates that there are probably 100 such firms. Field survey indicated that the bulk of these are small ventures owned and run mostly by households. There are not more than five large scale private waste collection firms. Since private solid waste collection in Nairobi is a relatively new phenomenon all the firms currently operate in open competition.

Taking a sample of 10 (8 small and 2 large ones), the analysis below attempts to examine the general characteristics of these firms and the extent to which they participate in managing solid wastes in Nairobi. For purposes of analysis, the firms are grouped in to three categories i.e; i) large, ii) medium sized and iii) small firms based on their sizes, volume of activity and business turnover. Bins (Nairobi) Services Ltd and Domestic Refuse Disposal Services Ltd represent the first and second category respectively while an average of the eight small firms represents the third.

5-4.1 General Characteristics of Private Collection Firms.

i). Ownership and setting up.

50% of the small firms started their operations within the last 5 years while the rest were established within the last 10 and 15 years. As mentioned earlier, they are mainly owned by households and are managed by one or two partners, specifically young entrepreneurs. The majority of them use neighbourhood based premises as their base of operation.

On the other hand, the two medium and large scale firms interviewed were established within the last 10 to 15 years. Domestic Refuse Disposal Services Ltd (DRDSL) and Bins (Nairobi) Services Ltd are probably the oldest and most active. Like the small firms, they are licensed as business enterprises. They are however owned by larger partnership groups and operate as established formal business entities. Similarly, they are situated and operate from formal business premises.

ii). Size of Labour-force

Including the owners or partners, small solid waste firms employ a maximum of five labourers. While partners consider themselves to be employed on

permanent basis, the other employees comprise of 2-3 collectors and loaders employed as casuals.

On the other, larger firms have a larger labour force often employed on a permanent basis. Bins for instance has a labour-force of 68 workers, while DRDSL employs a total of 25. Table 5-6 shows how these workers are distributed among different ranks.

Table 5-6: Size and Composition of Labour-force.

Rank	NUMBER OF LABOURERS PER FIRM		
	Bins	DRDSL	Small firms (Avg)
Top managers	5	1	2
Supervisors	4	1	-
Clerical	5	2	1
Maintenance	3	1	-
Drivers	12	8	-
Loaders	39	12	2
Total	68	25	4

Source: Field Survey 1997.

The labour force in each of these firms is relatively young with an average of 28 years. While the bottom ranks in the labour hierarchy are occupied by people with up to secondary education, the higher positions are occupied by people with post secondary education (college and university).

iii). Size of Fleet (Vehicles).

60% of small firms interviewed do not use their own equipment and instead hire vehicles in the open market. They either use pick-up trucks of below two tones or for purposes of efficient resource use, hire large capacity vehicles of about Above 7 tones. However, none of these equipment was

purchased for the purpose of refuse collection. They are either old dilapidated vehicles no longer useful for long distance hauling or goods transit, or small family pick-up trucks used for other purposes as well. Whether hired or privately owned, all the small firms use an average of one vehicle.

Table 5-7: Size and Capacity of Fleet.

Vehicle Capacity	NUMBER OF VEHICLES PER FIRM		
	Bins Ltd	DRDSL	Small Firms (Avg)
Below 2 Tones	1	-	1
2-3 Tones	-	5	-
3-5 Tones	7	1	-
Above 5 Tones	3	-	1
Total (Vehicles)	10	6	1 or 2
Total Capacity (Tns)	50	17	1 or 7

Source: Field Survey 1997

The larger firms on the other hand have larger fleet. Bins and DRDSL for instance have a fleet of 10 and 6 vehicles respectively, all of which are owned by the companies themselves. While Bins purchases equipment for the sole purpose of garbage collection, DRDSL, which as a subsidiary of Fidelity Security Systems, makes use of vehicles retired from the latter's cash transit and courier operations. The larger firms use vehicles of different capacity as shown in the table below.

iv). Finance.

The costs of establishing a small solid waste collection venture are limited to the costs of hiring a vehicle and labour, stationery and other running costs. At the onset, small firms would thus require a capital of about ksh 32,000 on average. This is to cater for the cost of hiring a truck for the first month at an average of ksh 7,500 per week.

For the larger firms however, these costs usually include capital, operation and maintenance costs, staff emoluments, rents and overheads. The total amount depends on the size of the firm (size and composition of fleet and labour-force among others). The table below shows the recurrent costs incurred by both Bins and DRDSL, and the typical monthly cost of running a small solid waste collection venture.

Table 5-8: Typical Costs for Private Solid Waste Collection Firms.

EXPENDITURE ITEM	MONTHLY RUNNING COSTS (in ksh) PER FIRMS		
	Bins Ltd	DRDSL	Small Firms (Avg)
O and M costs	600,000	240,000	40,000
Salaries	400,000	144,000	30,000
Rents	100,000	4,000	-
Overheads	35,000	7,000	2,000
TOTAL	1,135,000	395,000	72,000

Source: Field Survey 1997.

To finance their operations, small firms derive finances from fees charged to clients for services offered on a monthly basis. While large firms also depend on service charges to finance recurrent expenditure, they rely on finance institutions for to fund additional investment and expansion.

The cost of solid waste management to the consumer usually includes the cost of refuse collection and the price of plastic disposal bags. The latter costs approximately Ksh 5 per bag. Small firms generally offer cheaper services (Average Ksh 200) monthly compared to larger firms (Average Ksh 500). For large generators of waste such as institutions, and industries, the firms charge according to the size of the bulk load. Specific differences in collection costs are also influenced by the area being served and, on some occasions (as in the case of DRDSL), the distance the client is from the premises of the private firm. The larger

companies do not take economic differentials between residential areas as a factor in determining collection costs and have uniform charges. The cost of service offered by the smaller firms tends to be affected by the amount of competition within a specific area. For instance, whereas most of the firms start by charging Ksh 200 per month for garbage collection, they adjust the price downwards as more entrepreneurs venture to the area.

Table 5-9: Monthly turnovers for private solid waste collection firms.

FIRM	AVG CHARGE(kshp.m)	SIZE OF CLIENTELE	TURNOVER (ksh)
Bins	500	5,000	2,500,000
DRDSL	500	1,400	700,000
Small Firm	200	5,000	100,000

Source: Field Survey, 1997

The turnover for these firms depends on the charges levied which in turn depends on the activity area served and type of clientele. Table 5-9 shows the monthly turnovers for the three categories of firms.

5-4.2 Level and Nature of Participation.

To assess the level at which private firms are involved in the management of solid wastes in the city, we will consider the particular aspect in the solid waste management process that the firms are engaged in, the areas served and the quantities of waste collected. For the latter, it will not be possible to assess the total amount of waste collected by all private entrepreneurs since a complete census was not conducted. However, for purposes of shedding light on the collection potential of these firms, the actual and average collection capacities for the firms interviewed are computed.

i). Aspect Handled.

All the firms interviewed are involved specifically in the collection and disposal of solid waste. The former involves the removal of waste from the generating source while the latter involves the transfer of waste to public (City Council) landfills such as the one in Dandora. However, it does not include waste destruction (composting, burying, incineration, e.t.c) and recovery (recycling) activities.

ii). Areas Served.

Although private solid waste entrepreneurs are spread all over the city, most of their activity is concentrated in residential neighborhoods. And even there, the participation is biased towards the middle and higher income residential areas. There is absolutely no private sector activity in low-income areas. The explanation for this bias is not only because of the inaccessibility of these areas but most importantly due to lack of effective demand for the services of private firms. 70% of the small firms interviewed mainly serve middle income areas and some lower-middle income areas such as Umoja, Eastleigh and Kariobangi. They generally find it difficult to penetrate high income areas which are mostly a preserve for the larger firms. The operations of most small firms seldom go beyond one residential neighborhood. However, few may occasionally collect refuse from institutions, commercial and industrial establishments. In average each of these small firms serves about 500 clients.

Both Bins and DRDSL collect refuse from residential, institutional, industrial and commercial sources. Unlike small firms, medium and large sized firms may serve more than one residential area, and a variety of the other waste generating activities. In total, Bins and DRDSL serve about 5000 and 1400 mixed clients per week. Currently, these are the numbers

of clients that the capacities of these firms can allow. However, demand for private service is higher than the present number of companies can meet.

5-4.3 Method of Privatization.

Most of the private solid waste activities are carried out under the open competition framework. It is haphazard and unplanned, with small scale entrepreneurs having the freedom to choose the areas they want to serve. Many of these firms are concentrated mainly in the middle and upper income areas with small and large-sized firms operating in the former and latter respectively. Informal private sector waste entrepreneurs or "scavengers" on the other hand, operate anywhere they wish. All these categories of entrepreneurs compete openly with one another with some areas having a heavy concentration of these while others almost none. There is no evidence that collusion in price setting, which is a common practice where open competition is allowed and, especially in the third world where true competition does not exist.

CHAPTER SIX: SUMMARY AND INTERPRETATION OF FINDINGS.

6-1 Background.

As we have seen in the preceding chapters, the performance of urban infrastructure services in developing countries is generally poor. Although earlier explanations attributed this situation to internal shortcomings of infrastructure delivery agencies, the emerging theoretical understanding points to the overall institutional framework for service delivery - with many expressing dissatisfaction with the public service delivery system. Based on the precept that all public infrastructure facilities and services are common goods, policies, laws and institutional arrangements in developing countries necessitate that they be provided by local authorities or the central government through boards, parastatals and other public agencies. However, due to a variety of problems (c.f Chapter 3), the capacity of the public sector to adequately provide for infrastructure services in urban areas has been diminishing in recent decades.

In Kenya, the situation is not any different as evidenced by the poor performance of transportation, water, sanitation, drainage, sewerage and drainage systems among others. Of particular concern is the poor performance of solid waste management systems especially in large cities like Nairobi. The Nairobi City Council, which is the sole agency mandated by law to manage solid wastes generated within the city, has admitted to being incapable of meeting the demands for refuse collection services and in ensuring the maintenance of a clean city environment. To cope with the situation, city residents have increasingly assumed the responsibility for disposing off the wastes they generate. With not so many options available, they have more often than not resorted to indiscriminate dumping on open spaces all over the city thereby causing not only massive

environmental pollution, but also creating the aesthetic blight that has become one Nairobi's dominant characteristics.

In recent years however, more responsible means of waste handling have emerged with the increased involvement of other actors such as the Private Sector and Community-based Organizations in waste management activities (specifically collection). Initially, private sector participation was through the activities of informal solid waste entrepreneurs (variously referred to as scavengers, friends of the environment etc). It is only within the last couple of years that the formal private sector (through established private enterprise) has shown increased interest in solid waste collection as a viable business venture. Until now, these firms have been operating without any legal or administrative approval. There are considerations (following advise from the government) to privatize solid waste management activities in the city of Nairobi. It is however not clear how and when this will be implemented.

The remainder of this chapter seeks to establish the possibilities, constraints and implications of private sector involvement in solid waste management in Nairobi. In order to do so, various contextual issues identified in chapter two are considered. These include; cost recovery, efficiency, public accountability, management, financial, economies of scale, legislative, institutional and cost context. The feasibility will also be assessed against the background of field findings, and in the light of the political, socio-cultural and economic realities of the study area.

The main national goals of infrastructure facilities and services may be summarized as; i) the promotion of a better quality of life (i.e. public

health, well being, security and comfort), ii) economic development (i.e. productivity and efficiency of economic activities), iii) the promotion of environmental quality (i.e. sustainability of the natural environment) and, iv) the promotion of effective governance (i.e. contribution to civil harmony and guidance). In order to determine whether the solution to solid waste management problems in the city of Nairobi is privatization, it is important to assess the performance of current private sector involvement against this background. And since the choice here is between the private and public sector, it is necessary that a comparative analysis of the two systems as they measure up to these challenges be carried out. In general, the achievement of the above goals or failure to achieve them can be attributed to strengths and weaknesses of either of the two systems. This in turn can be assessed by comparing various indicators such as; i) benefits that the current private sector involvement has yielded to consumers, ii) economic benefits and, iii) resource use efficiencies. These are further outlined in section 6-2.2.

6-2 Establishing Possibilities for Privatization.

6-2.1 The Existence of a Favourable Environment.

i). Consumer Preferences.

One of the strengths of private sector involvement is that consumers have the opportunity to influence the quantity and quality of services offered to them by exercising their freedom of choice and their right to voice their complaints to service delivery agencies. This is one of the major factors in determining whether the private sector will provide a service. If consumer preferences are of diverse tastes, the possibilities for private sector involvement are many. This situation is prevalent in the City of Nairobi where currently, the private sector has found favour with urban residents. Increasingly, private firms are being involved in the

collection of waste from middle and high income residential neighborhoods and in Nairobi's formal industrial and commercial establishments (c.f Cap 5).

ii) **Economies of Contiguity.**

One of the major reasons used to advocate for the privatization of solid waste management services is that unlike water, roads, and sewerage systems among others, there are no economies of scale found in the former. Instead, in solid waste management, there are what could be referred as "economies of contiguity" which arise when waste generating activities are concentrated in one area. These are present in all activity areas in Nairobi. And even in low-income areas, where due to a myriad of problems door to door collection of waste by private companies is seldom practiced, the possibility for private collection of refuse in these areas exists. Since the amount of refuse generated by low income residents (approximately 0.35 kgs per capita), is significantly lower than that which is generated by high income residents (0.60 kgs per capita), a group of residents may be able to share the cost of collecting one bag of solid waste. Similarly, the accumulation (as is the current practice) of waste at a central point for collective disposal presents massive "economies of contiguity". It is therefore still possible to engage private firms in waste collection. However, the activities of Community Based Organizations would be very essential especially in organizing residents and pave the way for feasible private sector involvement.

iii). **Ease of Entry.**

The private sector is very shy. It often does not venture into areas where the risk on investment is high, and where there are numerous barriers impinging on their operation. In Nairobi, another possibility

for privatization emanates from the ease with which private solid waste entrepreneurs enter the solid waste activity as a business. Many of them observed that private solid waste entrepreneurship has minimum barriers to entry as collection involves technological simplicity and to a large extent, moderate investment costs. Hence it is feasible for local firms with modest financial resources to set up and run a solid waste collection venture. The private firms did not in any way complain that the costs were high. The study revealed that most of the firms are small-sized using an average of one vehicle, and four employees. Most of the private solid waste collection companies lease equipment (i.e., collection vehicles) from individual owners. These provide the vehicles, drivers, as well as fuel and maintenance leaving the private entrepreneur with the responsibility for acquiring and paying collection personnel.

iv). Cost Recovery Potential.

Private sector participation is only feasible if revenues from paying consumers can ensure the private entrepreneur of a quick recovery for capital invested. In Nairobi, although solid waste management involves labour intensive street sweeping and waste collection techniques, labour costs in the city are relatively low thereby presenting an attractive environment for private sector participation. The issue of cost for the entrepreneur is further simplified by the fact that the majority of those served by private firms currently do not think that the charges levied are high. This could be because of the value that they attach to accountable service delivery (which city authorities do not guarantee), or because the involvement of private firms is still a relatively new phenomenon. Anyhow, the above factors combine to yield huge profits for the entrepreneur as roughly demonstrated in table 6-1 below. This also means that it is easy for these companies to quickly recover money (capital)

invested in establishing a solid waste collection venture.

Table 6-1 Monthly Profits for Private Solid Waste Collection Firms.

FIRM	TURNOVER (ksh)	EXPENDITURE (ksh)	PROFIT (ksh)
Bins	2,500,000	1,135,000	1,365,000
DRDSL	910,000	395,000	515,000
Small Firm	100,000	72,000	28,000

Source: Field Survey, 1997

With profits as a percentage of total income being 55%, 44% and 28% respectively for the three types of firms, cost recovery is assured. Eventually therefore, the only challenge for the solid waste entrepreneur is to organize and ensure that clients get a reliable and efficient collection service.

6-2.2 Strengths of the Current Private Sector Involvement.

i) Benefits to consumers.

The current private sector participation has contributed, though to a small extent at present, to better environmental conditions and consequently better quality of life for the residents of areas served. As indicated in the findings (c.f cap 4), the majority of urban residents, especially in areas served by private firms attributed the improved solid waste situation to increased private sector activity. Presently, it may not be possible to assess the aggregate contribution that these firms make in terms of preventing environmental pollution as data on the actual number of private firms operating in the city and consequently the total amounts of waste collected by them, is unavailable. However, their present contribution, as depicted in statistics of the two large companies interviewed, and an average for the small firms (table 6-2), is significant.

$$\text{Contribution of Private Firm} = \frac{\text{Waste Collected by Private Firm}}{\text{Total Amount of Waste Generated}} \times 100$$

Table 6-2 Quantities Collected Monthly by Private Firms.

FIRM	AMOUNT COLLECTED (tns)	% OF TOTAL WASTE
Bins	4500	1.25
DRDSL	180	0.5
Small Firms	45	0.125

Source: Field Survey, 1997

Private sector involvement has also assured city residents of a more accountable service - frequent service and better waste handling practices. For these, clients are willing to pay higher rates than are charged by the city council.

ii) **Economic Benefits.**

One of the greatest constraints hindering the city council from offering effective and efficient service is that of inadequate finance. Not only has the current private sector involvement contributed in securing investment finance for solid waste management activities, but has through the use of old non-conventional vehicles, helped in saving large amount of foreign exchange required to purchase conventional waste removal and hauling equipment.

Presently, Bins, DRDSL and small firms collect 1.25%, 0.5% and 0.125% of the city's waste respectively. Hence one will need about 80, 200 and 800 firms of the respective capacities to collect all the waste generated in the city. Assuming that only one type of firm is involved in city-wide waste collection and using the amount of capital invested by Bins, DRDSL and the average small solid waste entrepreneurs, table 6-3 below shows

ceteris paribus possible resource mobilization scenarios for large, medium and small sized private solid waste collection firms respectively.

Table 6-3 Resource Mobilization Potentials of Private Solid Waste Entrepreneurs.

FIRM	Capital (K£)	Total # of firms required	Possible Resource Mobilization Scenarios (K£)
Large firms	1,000,000	80	80,000,000
Medium	600,000	200	120,000,000
Small firms	1,600	800	1,280,000

NB/ Capital for the small firms does not include the cost of purchasing equipment (cf. Section 5-4.1).

iii). Resource-use Efficiencies.

In situation where resources needed for infrastructure investments are scarce, it is important that the available resources are used efficiently. It is argued that the private sector is more efficient in the use of scarce resources in service delivery than the public sector. This efficiency is said to derive from internal and external factors unique to the operation of private sector enterprise such as management flexibility, freedom of action, greater financial discipline and accountability to market forces, flexible scheduling, efficient vehicle routing, faster repairs and the pressure of competitive forces among others. An comparative analysis between the public and private sector solid waste collection firms seems to confirm the efficiency of the latter on some of these aspects such as, labour productivity and vehicle collection efficiencies.

In solid waste management, efficient labour use necessitates that more personnel be dedicated to collection activities (drivers and loaders) than to any of the other tasks. This situation is prevalent in almost all of

the private firms interviewed with manual labourers taking up above 80% of the total labourforce.

Table 6-4 Distribution of Labour force Between Agency Tasks.

CATEGORY	NUMBER AND PERCENTAGE OF WORKERS PER FIRM							
	NCC		BINS		DRDSL		SMALL FIRM	
Managers	21	0.9%	5	7%	1	4%	1	25%
Supervisors	239	10%	4	6%	1	4%	1	25%
Clerks	14	0.6%	5	7%	2	8%	-	
Manual	2120	88.5%	54	80%	21	84%	2	50%
Total	2420	100	68	100%	25	100%	4	100%

Source: Field Survey, 1997

Although the city council seems to have a higher percentage of it's labourforce in manual positions than the private firms, an analysis of labour productivity shows that loaders in the private firms are generally more productive as they lift more quantities of waste per day compared to those of the city council.

Table 6-5: Comparative Analysis of Labour productivity.

FIRM	Waste Collected tns/pd	Loaders p.d	Productivity tns, pd
NCC	300	250	1.2
Bins	90	20	4.5
DRDSL	36	6	6.0
Small Firms	9	2	4.5

Source: Field Survey, 1997

NB/ Small firms collect garbage only on Saturdays (five times a month) while labourers from all other firms work three shifts a week. Since the working week is six days, the larger private firms and the city council have only half their labourforce working on any given day. The formula below were used to arrive at the labour productivity.

i)
$$\text{Shift per day} = \frac{\text{Length of Working Week}}{\text{Number of shifts per week}} = \frac{6}{3} = 0.5$$

ii) $\text{Number of loaders per day} = \text{Total Number of Loaders} \times \text{Shifts per Day}$

iii) $\text{Labour Productivity} = \frac{\text{Amount of Waste Collected per Day}}{\text{Number of Loaders per Day}} = \text{Tones/Day}$

For efficient waste collection and better labour productivity, the supervisor/worker ratio must be high so as to allow for adequate and practically efficient supervision. The presumption here is that the less number of labourers assigned to a supervisor, the better the quality of supervision more and hence the higher the quality of service offered. All the private firms interviewed have a good ratio. It may seem from the analysis below that the city council has a higher ratio than most of the private firms. While this may be true, it is commonplace that the quality of supervision in the city council is poor as evidenced by the poor services offered (c.f sect 6-2.2:ii).

Table 6-6: Supervisor/worker Ratios of Different Waste Collection Agencies.

CATEGORY	DISTRIBUTION OF LABOURERS PER FIRM			
	NCC	BINS	DRDSL	SMALL FIRMS
Supervisors	239	4	1	1
Manual Workers	2120	54	21	2
Ratio	1:9	1:14	1:21	1:2

Source: Field Survey, 1997

The collection of refuse depends as much on the efficient use of vehicles as it depends on the use of other resources. The most efficient use of a vehicle would be one that comes near to using its full carrying capacity. The carrying capacity not only depends on total load that can be ferried per trip but also on the number of trips that a vehicle can make to the dumping site. In Nairobi, due to a variety of factors (e.g. distance to the dumping site, Spatial arrangement of waste generating

activities e.t.c) the average number of trips a vehicle can make per day is two. The table below shows how the city council and the different categories of private firms make use of their vehicle collection capacities.

Table 6-7: Comparative Analysis of Vehicle Collection Efficiencies.

FIRM	Vehicle Capacity (tns)	Waste Collected p.d	Vehicle use Efficiency (%)
NCC	348	300	86
Bins	100	90	90
DRDSL	34	36	105
Small Firms	14	9	64

Source: Field Survey, 1997

$$\text{Vehicle Collection Capacity} = \text{Total Carrying Capacity} \times \text{Average Number of Trips/day.}$$

$$\text{Efficiency of Vehicle Use} = \frac{\text{Amount of Waste Collected per day}}{\text{Vehicle Collection Capacity}} \times 100$$

As can be deduced, the private firms seem to be more efficient in their use of vehicle capacities. The somewhat low efficiency of vehicle use by the small firms is explained by the fact that their current clientele does not allow them to carry more than one trip. However, against one trip, the efficiency of vehicle use would be about 128%.

6-2.3 Weaknesses of Current Private Sector Involvement.

To assess the weaknesses of private sector solid waste collection, the same criteria as above is used. The two major weaknesses of the current private entrepreneurship in solid waste are the higher costs both to consumers and to the private firms, and the number of existing and expected externalities.

i). **Cost of Collection.**

The cost of private solid waste collection to Nairobi residents is substantially higher than that public service. Compared to the city council, private firms charge more fees per month for their collection services. For instance, whereas the city council charges only ksh 40 per month for domestic refuse removal, private firms charge a minimum of ksh 150 and have no ceiling on the upper limit. Similarly, whereas the city council does not charge for any extra waste collected at the household, private firms on the other hand impose an extra fee for any additional bag of waste collected within the week. Bins for instance charges ksh 80 while DRDSL charges ksh 50. This adds to the aggregate monthly costs to the consumer.

Secondly, the cost of collecting one tone of refuse is much higher for private firms than for the city council. This could be explained by a number of factors. For instance, while the city council uses more technologically superior vehicles such as compactors which allow for the removal of more waste per trip, the private firms often use vehicles not designed specifically to handle large quantities of waste. In addition to this, the sheer lack of experience for most of the private firms makes it difficult for them to route vehicles efficiently as compared to the city council which has been in the trade for a much longer period.

Table 6-8: Collection Costs per Tone for NCC and Private Firms.

FIRM	Expenditure(K£/yr)	Waste Collected Tns/year	Collection costs K£/Tn
NCC	1,212,583	108,000	11.2
Bins	681,000	5,400	126.1
DRDSL	237,000	1,512	156.7
Small Firms	43,000	540	80.0

Source: Field Survey, 1997

$$\text{Collection costs} = \frac{\text{Annual Expenditure on Waste Collection}}{\text{Amount of Waste Collected}} = \text{KE/Ton}$$

However, it is important to observe that even though solid waste management services by the city council are cheaper, heavily subsidized operation and maintenance costs usually exceed the revenues received from service charges collected by local authorities.

ii). Externalities on the Environment.

There are numerous complains both from consumers and the City Council about private firms not dumping the wastes they collect in the official dumping site. To cut down on costs, and due to the lack of effective monitoring of their activities by the city authorities, some private firms remove waste from their clients premises only to dump it on sites not so far from the point of generation and in so doing not solving the problem.

iii). Loss of Employment Opportunities.

Kenya is now experiencing high levels of unemployment. The demand for employment opportunities far outstrips the rate of job creation. Although private solid waste management is among the newest set of a livelihoods providing jobs for many school leavers, there are indications that increased private sector involvement will not necessarily help create employment opportunities. In fact, assuming that any of the private companies was to be contracted to solely handle all the waste generated within the city, it's potential for creating employment opportunities would be far much less than that of the city council operating at required capacity. Besides the public sector is always better at creating job opportunities as contrasted with the labour minimization tendencies of the private sector. Within the public sector however, excess employees are commonly characterized by limited performance and excessive absenteeism.

Table 6-9: Job Creation Potentials of Private Solid Waste Entrepreneurs.

FIRMS	Current # of jobs	Total # of firms required	Job Creation Scenario
Large firms	68	80	5440
Medium	25	200	5000
Small firms	4	800	3200
NCC	2420	4	9680

Source: Field Survey, 1997

iv). Ease of Exit.

In section 6-2.1, we identified that private sector involvement in solid waste collection in Nairobi is made possible by the ease of entry and the existence of minimum barriers to entry. Unfortunately, the existence of no barriers to exit poses a problem to the effectiveness and efficiency of waste collection firms. Since there are no laws at the present to regulate the behaviour of private solid waste entrepreneurs, some of these firms abdicate their responsibilities to clients and sometimes abandon them without any justified explanation. This kind of behaviour reduces the level to which these companies can be accountable to the public. However, the situation is not critical and the performance of private firms on this aspect is certainly better compared to the city Council.

6-3 Constraint to Privatization.

The above account seems to suggest the absence of current and potential constraints to private solid waste collection and disposal initiatives. This is however not the case. There exist constraints identifiable at various levels. These include;

6-3.1 Political.

In Kenya, the relationship between the two levels of government responsible for urban management (Central and Local) is such that there

authorities have no significant autonomy to make meaningful decisions, formulate and implement policies that would improve the overall efficiency and effectiveness of urban management functions. Local Authorities serve as extensions to the central government whose political interests may not be in line with those of city residents. In Kenya, the above situation is further complicated in the present multi-party era whereby the management of cities, including Nairobi, is the jurisdiction of opposition political parties while the central government is under the control of the ruling party. This has led to the deterioration in the condition of most urban-based infrastructure facilities and services. The solid waste situation in Nairobi has especially deteriorated since the introduction of multi-party politics in 199. For the private sector to be effective, Local government autonomy is crucial.

On another level, the extent of meaningful citizen participation in the public processes in Kenya is minimal. Despite the increasing level of awareness, and their right to accountable service for payments made, service consumers have absolutely no say in decision-making. They are reduced to mere voting machines and often, their lobbying activities are misconstrued as being anti-government. However, for effective private sector involvement, the voice of the consumer must come first.

6-3.2 Socio-cultural.

In low-income areas, communities bear the qualities of mutual self-help and co-operation. These have significantly aided the use of community action in dealing with solid waste management problems. However, in other areas, such as the Central Business District, these qualities are not guaranteed and the individualistic attitudes yield a culture of indiscriminate dumping that may to a large extent be responsible for the

solid waste situation in recent years. In communities therefore, wherein residents have not been similarly sensitized about the importance of maintaining a clean environment, and their responsibility as waste generators, there will be resistance to direct user charges and hence private sector involvement.

6-3.3 Legislative Framework.

The current legal and institutional framework does not allow for private solid waste collection and disposal. This creates a situation of uncertainty which in turn limits the possibilities for more private sector participation. Similarly, at the present, there are no specific legislation and regulations to guide and regulate the activities of private entrepreneurs. This may (and indeed currently does) affect the effectiveness of solid waste management efforts (c.f sect 6-2.3-ii).

6-3.4 Economic.

The prevailing economic conditions in the country could be a major factor in the determination of the feasibility and effectiveness of private sector involvement. If the people are poor, as is the case in present day Nairobi, they may not be able to afford the cost of private sector refuse collection and may thus be opposed to any attempts at privatization.

6-4 Implications.

Notwithstanding the above constraints, the current experience is proving that the feasibility for private sector involvement in solid waste management activities exists. Although the private sector could be said to be more efficient than the public sector on several accounts, the weaknesses identified suggest that private sector participation in solid waste management is not a panacea, but nevertheless a significant step in

solving the problem. Consideration should thus be given to the possibility of privatizing the service. This means that efforts should be dedicated to removing the constraints and capitalizing on the strengths inherent in private sector participation. The way forward is outlined in chapter seven.

CHAPTER SEVEN: POLICY IMPLICATIONS AND RECOMMENDATIONS.

The potential for improving performance in urban infrastructure service provision is substantial as is the quantity of resources devoted to infrastructure investments. Thus both the need and the broad direction for reform are clear. In Kenya and other developing countries, additional investments on infrastructure facilities and services will obviously be needed. However, unless the government will initiate a local government reform process, giving public infrastructure delivery agencies (local authorities, parastatals, boards e.t.c) the autonomy necessary for promoting internal efficiency and functional effectiveness, and unless these agencies will attract more competent personnel, more investment will not in it-self avoid wasteful inefficiencies, improve maintenance, or increase user participation in service delivery functions. Achieving these improvements in performance therefore, will not only call for adjustments in policies but also for fundamental institutional changes in the way that the `business' of infrastructure is conducted. Below are possible policy and structural approaches that may help solve problems in infrastructure in Kenya and specifically, the solid waste situation in the City of Nairobi.

7-1 Towards an Infrastructure Service Delivery Policy in Kenya.

Although the government of Kenya recognizes the role that infrastructure plays in promoting economic development and sustainable living conditions, there is no elaborate policy to guide infrastructure investment and service delivery decisions. Most infrastructure related decisions to-date have been made on an ad-hoc basis - often as a response to crises and frequently influenced by the political will of the powers that be.. An elaborate infrastructure delivery policy for Kenya would be one that clearly defines goals and objectives of infrastructure investments and

systems and outlines the criteria for assessing the performance of infrastructure management. The policy should also give a general guideline as to the possible strategies that could be used in meeting the country's infrastructure demands. More specifically, there is need to adopt a demand-oriented approach so that infrastructure investment decisions are linked to effective demand for facilities and services. Consequently, infrastructure decisions should focus more on the users/consumers of services giving consideration to their satisfaction for services offered. Figure 7-1 gives an overview of the policy framework for infrastructure management.

7-2 Directions for Urban Infrastructure Management Reforms.

The performance of urban infrastructure systems also depends on the effectiveness of urban management systems and the management efficiencies of infrastructure delivery agencies. In Kenya, as saw established in chapter three, the former is constrained by the centralized framework within which local governance and administration of development takes place while the latter are confronted by internal and external problems (Cap 4 & 6). Both these have rendered infrastructure management systems in the country ineffective to a considerable extent. If the performance of infrastructure systems is to improve, fundamental institutional and structural changes must be effected. Below are some of the approaches that might go a long way in reforming urban and infrastructure management systems.

7-2.1 Institutional development.

The government should enhance the management capacity of local government through administrative decentralization and establish mechanisms to ensure accountability of infrastructure institutions to users by building their

technical, financial and organizational capacities and by improving the operational capacity of institutions responsible for, policy making, long-term planning, medium-term programming, implementation, operation and maintenance, monitoring and evaluation.

Figure 7-1: Infrastructure Service Delivery: Overview of the Policy Framework.

Goals of Infrastructure Systems:

- a) Improve the **quality of life** of the population and alleviate the consequences of poverty,
- b) Promote **economic productivity and growth**,
- c) Protect the **urban environment** and,
- d) Reinforce the effectiveness of **municipal governance**.

Performance of Infrastructure Management:

- a) **Impact** -contribution of infrastructure systems to policy goals
- b) **Effectiveness** -correspondence of types, qualities and quantities of delivered services to the real needs of society,
- c) **Efficiency** -lowest life-cycle cost of delivered services and,
- d) **Sustainability** -long-term technical, ecological, financial and institutional delivery of service.

Principles of Demand-Oriented Service Delivery:

- a) Responsiveness of service delivery to **market demand** for services,
- b) Public processes to internalize the cost of **externalities** to society,
- c) **Equitable distribution** of service access by adapting supply patterns of poor users and generating **public demand** to cover the remaining needs.

Adopted from: Schubeler, 1996

7-2.2 Private Sector Participation

Local Authorities and other Public Infrastructure Service Delivery Agencies (PISDA's) should unbundle service delivery processes into their component functions and activities. Consequently, they should determine which functions and /or activities are contestable and suitable for

privatization and determine the appropriate form of public-private partnership for each supply process and activity. Most important, they should invent adequate mechanisms for public regulation and control of the privatized service delivery.

7-2.3 User Participation

The Central Government, Local Authorities and both public and private (non-governmental) Infrastructure Service Delivery Agencies should support community-based service provision by establishing programs for collaboration with user communities in area-based infrastructure development, operation and maintenance and where possible, other infrastructure processes and management functions.

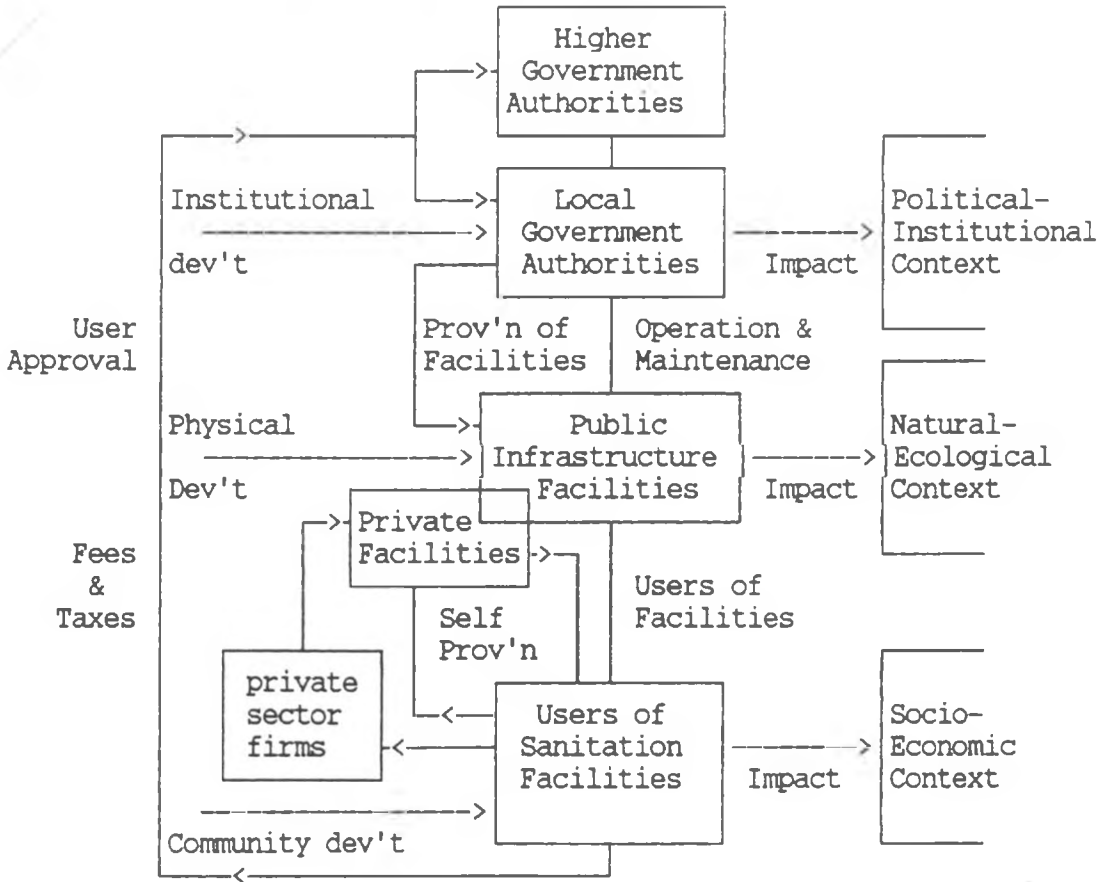
Figure 7-2 (Overleaf) is a conceptual representation of an appropriate infrastructure service delivery framework showing linkages between infrastructure needs, actors in provision, private and public facilities and the impacts of infrastructure processes.

7-3 Privatization of Solid Waste Management Services.

In line with the findings (Cap 5 & 6), the study recommends that solid waste management activities in the City of Nairobi be privatized. Presently however, the ideal arrangement for the city of Nairobi may be a mix of public and private sector provision. This is because the city is not prepared for an immediate total privatization of the service. For instance, there are not as many private firms engaged in the activity at the present and though the possibilities as have been identified in chapter six exist, the predictability of investment decisions by the private sector in the near future is uncertain. Secondly an immediate public sector pull-out from waste management activities may create a

vacuum - leading to far reaching, undesirable consequences. It may for instance lead to externalities such as high costs to the consumer and, environmental degradation arising from inadequate competition, indiscriminate dumping by those who cannot afford private service respectively. A slow and gradual privatization process is thus desirable to avoid these and other consequences and to ensure a smooth transition to private sector solid waste management - giving ample time to the laying down of an appropriate institutional and regulatory framework. The following measures could be useful if the possibilities and potentials of the private sector in solid waste management are to be harnessed and realized.

Figure 7-2: Schema of Urban Infrastructure Systems.



Adopted from Scubeller, 1996

7-3.1 Institutional framework.

Consideration should be given to review Section 162 of the local Government Act to allow participation and partnership amongst various actors in the management of solid waste in urban areas. Significant actors in this case would be the central government, the city council and non-governmental organizations such as the private sector. The repealed act should clearly specify the functions of each of the actors and define the nature of relationship between the governmental and non-governmental entities.

i) The private sector.

Many solid waste management activities may be unbundled to the private sector. For starters, the provision of solid waste collection activities should be left to private entrepreneurs. In the meantime, the City Council should determine what other aspects of the solid waste management process are contestable and prepare them for eventual private sector delivery.

ii) The city council.

Although many of the solid waste management activities should be left to private entrepreneurs, the City Council should maintain the overall responsibility for solid waste management. However, its role, through the Department of Environment should be to monitor and regulate the activities of private solid waste management agencies. This office should also ensure that, in the interest of public health and environmental quality, all people and areas within the city should receive solid waste management services. This may mean that the council itself could be involved in the provision of services in the initial stages of privatization to areas where private enterprise may shun such as low-

income areas. Similarly, the city council, together with partners from the private sector, should maintain responsibility for waste actual destruction and recovery activities.

iii) **The central government.**

Beyond the strengthening of local government, there is obvious need for the central government to play an active role especially in establishing expectations of local performance and in retaining some degree of oversight to ensure accountability over some areas of local decision-making. It should also maintain responsibility over the creation of a suitable environment for enabling private sector participation.

7-3.2 Creating an Enabling Environment.

i) **Minimizing Barriers to Private Sector Participation.**

For the private sector to be attracted to an infrastructure service delivery function, a suitable environment for their operation should exist. This can be ensured by the use of incentives and through the reduction of barriers to entry. To encourage private sector participation in solid waste management activities therefore, free entry and to a minimum extent free exit into solid waste markets should be encouraged. Private firms should be allowed equal access to consumers of solid waste management services. An effort should be made to eradicate complexities in the qualification, registration and equipment procurement processes as a way of encouraging more solid waste entrepreneurs to be involved. Contractual terms stipulated in tenders and licenses should be clear and must specify the expectations of the contracting partners to avoid confusion, ambiguities and duplication of responsibilities.

ii) Incentives to Entrepreneurs

For private sector involvement in service delivery to be effective, there has to be an environment suitable for the realization of maximum efficiencies at the lowest costs possible through the provision of incentives such as guarantees for any borrowing, assumption of foreign exchange risk, tax incentives, customs duty exemption and special lines of credit.

7-3.3 Monitoring and Regulation.

For privatization to be effective, there is need to establish ways of monitoring and evaluating the activities of private solid waste management agencies. This involves not only the carrying out of routine checks on the said agencies, but also involves an assessment of performance based on various environmental and efficiency criteria. In order to do so, the department within the city council in charge of solid waste management (Department of Environment) should be adequately staffed with skilled personnel and equipped with the technology to carry out a meaningful monitoring and evaluation process. Inspectors for instance, should be people knowledgeable in environmental matters so that they can be able to monitor pollution levels that may arise from failure by collection agencies to adhere to performance standards. The monitoring and evaluation team should therefore involve technical and legal personnel such as environmentalists, engineers, physical planners, lawyers and other professionals that may be deemed necessary.

i) Setting Performance Standards.

Whether services are produced by public or private sectors, in either case, a clear specification of service standards is critical to both effective control, coverage and efficiency. To facilitate easy monitoring

of private sector activities, it is important that the Department of Environment should come up with what may be considered standards for evaluating performance. These should be clear on the output of service required of the solid waste agency and clearly define the sanctions that are to be imposed for non-performance. There should be for instance minimum standards of waste handling practices such as the type of vehicles to be used, the frequency of collection for different waste generating activities, etc.

ii) Civic Education.

The effectiveness of private sector involvement can be influenced by the level of awareness of waste generators on the importance of maintaining a clean environment and the implications of irresponsible waste handling practices such as indiscriminate dumping. Where people are least aware of the above, there will be rejection to private sector involvement especially if it necessitates that they pay for services offered. The City Council therefore, should take responsibility for educating city residents not only on the above issues, but also on the enormity of the real costs of solid waste management activities. This way the residents' level of awareness will not only rise, but they will also be more willing to share in the costs.

iii) The Use of Legislation.

One of the major setbacks to solid waste management efforts in the city of Nairobi is the lack of, or lack of adequate enforcement of existing legislation and regulations. The Central government and the city council should come up with laws and by-laws both to regulate activities and punish any wrong doing. About three sets of legislation are needed for effective private sector participation in waste management activities.

These include;

- i) those that regulate the activities of waste generators and consumers of solid waste services. Open dumping of refuse should be outlawed as a way of protecting the environment and simplifying private sector initiatives in waste management. Consequently the enforcement of regulations that minimize the possibility of indiscriminate dumping should be pursued vehemently.
- ii) those that define and regulate the activities of private solid waste entrepreneurs. These may include regulation and legislation on standards that private entrepreneurs must adhere to in order to protect the environment against indiscriminate dumping and other unsafe waste handling practices. Another set of regulations should be established to protect consumers from exploitation by private entrepreneurs. They should state clearly the contractual terms between the solid waste firms and their clients,
- iii) those that define the role of the government and local authorities - especially laws relating to tendering and licensing which specify contractual terms between private solid waste management agencies and the local authorities and (or) the government. If possible, these laws minimize the ease of exit caused by limited barriers as this may lead to serious environmental health implications.

Consequently, full sets of these regulations should be circulated to all parties to facilitate easy adherence and enforcement. The department of Environment should be given the necessary authority to enforce these laws and take legal action against those who contravene them. The department

should also open it's doors to receive complaints from the public about solid waste agencies with a view to increasing the accountability of these firms to individuals and the public at large.

7-3.4 Organization of Collection Activities.

i) Zoning.

The city council should come up with clearly delineated zones of operation not only to ensure that the solid waste management service covers all areas adequately and efficiently, but also to ease the privatization process. Various instruments could be used to discourage over-concentration in high income areas and encourage venture in low income areas. This for instance, could be achieved through the use of disincentives and incentives respectively. The council might consider coming up with minimum consumer charges and impose high corporate taxes in high income areas while setting maximum consumer charges and low corporate taxes in low income areas. In this way, the high income areas will not only subsidize the low income zones but also attract entrepreneurs to areas which they would otherwise have shunned.

ii) Involvement of Communities.

Whereas in middle and high income areas, where elaborate transport network exist, door to door collection of waste is feasible. The same cannot be guaranteed in low income areas. However here, the communal collection system, whereby members of the community dump their garbage in a central location for disposal (through burning and composting), or to a communal container for collection, is common practice. As was established in chapter six, this creates "economies of contiguity" making private sector participation possible. For private sector involvement to be economically feasible, the activities of community based organizations should be

supported through technical and financial assistance by the government, voluntary organizations or international agencies. Local communities in areas other than low-income areas should also be involved whenever possible in city-wide clean-up operations.

iii) Waste Disposal.

Disposal services should be separated from collection services. Collection should be earmarked for eventual full privatization. To avert possible negative externalities to the environment, disposal should be left to the public sector for now. However, when legislation and an institutional framework for monitoring the activities of private firms is in place and capable of ensuring the enforcement of regulations, the privatization of disposal services should be encouraged. Consequently, the establishment of more waste disposal sites at varying locations within the city should be considered as a means of increasing accessibility and saving of transportation costs for the private firms.

7-3.5 Costs

i) Cost Sharing Proposals.

Service to all consumers, whether paying or non-paying, is in the public interest. Unlike water supply or electricity, which can be readily cut off for non-payment of user charges, solid waste collection can not be discontinued without jeopardizing the public welfare. The cost of solid waste management should be shared between the generators, the solid waste collection agencies and the government. While the cost of those solid waste management activities considered as private goods such as collection should be borne by the waste generators, the cost of providing those services that are considered as public goods such as the collection of refuse from low income areas, street sweepings, and the cleaning of public

spaces should be covered through the general revenues of local government. For disposal, tipping fees (user charges on a per tone basis) can be readily collected from private refuse haulers and from individual industrial establishments that bring their waste to the landfill.

The current service charge payments (dust-bin hire charges) to the Nairobi City Council should be discontinued in order to facilitate private sector involvement. These should be replaced by taxes levied on solid waste entrepreneurs as a means to cover solid waste costs such as, monitoring and evaluation activities of the solid waste department. This should give the solid waste agency some autonomy by eliminating the need to compete with all other government agencies for their share of general revenue.

ii) Dealing with the Negative Effects of Cost.

Costs can sometimes be a cause of solid waste problems. Many people, finding that the costs are high, may not be willing to contract out collection and instead prefer the easier option of dumping in open sites. Similarly, waste collection firms, aiming to cut down on costs, may not desire to incur the costs of transporting collected waste to the dumping site and may instead dump it not so far from the source. In both these cases, the government should, through the enforcement of regulations and legislation, make it mandatory for all to pay for services received regardless of the agency. And for tipping fees to be levied in a manner that does not encourage clandestine dumping, relevant local government laws and sanctions need to be comprehensive, and inspection and enforcement systems need to be consistently vigilant in their monitoring of such.

iii) Cost Determination and Regulation.

The government should also be more involved in the regulation of tariffs charged by limiting collusion and price-setting. The government, reserving the main responsibility for ensuring that private companies are accountable to their clients, should carry out an analysis to establish the apparent and hidden costs of private versus government service, showing the hidden subsidies and costs that might exist in either service. This should establish a basis for the setting of user charges or collection costs. The services should also be costed in relation to both investment and operating implications - the latter including regular maintenance and budgeted provision for depreciation of say, vehicles and other limited life plant, and the appreciating cost of investment finance. The relative cost of providing the service to any particular category of consumer must also be assessed with the consideration of sourcing the wealthier residents for the cross-subsidy of service to poorer residents. The mechanism of service delivery should undergo constant changes in order to increase affordability to as many consumers as possible but without compromising standards. In the case of chargeable services, effective coverage means that tariffs are updated to ensure cost recovery.

7-3.6 Method of privatization.

Open competition, which results in higher service charges for the consumer, is not advisable for low income areas. Neither is it possible for areas with no specific waste generator such as public open spaces and streets. For these areas therefore, concessions, contracting or franchising may work better at least in the short term. It may however be feasible for areas where residents consider their "freedom to choose" an issue of paramount importance and are willing to pay for services under this framework. The study recommends privatization in open competition

for almost all areas of collection such as commercial, industrial and institutional waste, and refuse generated from high and middle residential neighbourhoods. It is important to acknowledge the fact that private firms, are more often than not motivated to offer services where a possibility for profit maximization exists. Considering the above facts, it is also likely that it will be difficult to convince private firms to collect refuse low income areas under the open competition framework. In the short-term therefore, the most appropriate method of privatizing solid waste collection in these areas would be by franchise or contracting. However, possibilities for eventual privatization in open competition should be explored in collaboration with Community-based Organizations.

7-3.7 Areas of further research

In Kenya, there is relatively little activity aimed at recycling or re-using waste and the only method of disposal used is the sanitary landfill. Many materials that could have been effectively recycled remain in Nairobi's disposal sites. This is because such activity costs significantly higher than the cost of sanitary landfill. For reasons of reducing it's work load and cutting down costs, and for humanitarian and environmental reasons, the government should encourage resource recovery activities through private sector initiatives. It is in resource recovery that the activities of the informal private sector or "scavengers" are prevalent. This is very important for the creation of employment opportunities and for the reduction of waste heading for disposal channels. However, their initiatives need to be supported. Resource recovery through recycling, composting and re-use should be encouraged as a way of saving foreign exchange, minimizing waste disposal costs, conserving natural resources and promoting industrialization. Further research needs to be done to identify the best ways in which their

potentialities can be tapped.

7-4 Conclusion.

Effective urban management requires not only competence in delivering individual services. An integrated approach to service delivery (whole package concept) should be applied in responding to the various challenges that face urban areas today. Criteria for effectiveness will thus include the capacity of urban service provision to respond to rapid urban growth, sensitivity to the needs of the poor and the concern for environmental protection. Amongst other options, private enterprise and community action play a vital role in responding to the overall development challenges facing a city and may effectively direct the development of individual neighborhoods estates and some parts of the Central Business District. In situations where existing service delivery is either too costly or inadequate, private sector participation should be examined as a means of enhancing efficiency (thus lowering costs) and, mobilizing private investment (thus expanding the resources available for the provision of infrastructure). These, and other factors have been considered in deciding whether to enlist private sector participation in solid waste management in the City of Nairobi. Finding it feasible, the study has recommended the privatization of mainly the collection aspect of the service, and the possible future privatization of other aspects. The expected outcomes of privatizing solid waste management include; i) the promotion of environmental quality, ii) the promotion of a better quality of life, iii) economic development and, iv) the promotion of effective governance. The extent to which these goals can be achieved depends as much on the political will of the powers that be and the culture of urban residents, as it depends on the efficiency of private waste collection firms.

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HOUSEHOLD QUESTIONNAIRE

Household Characteristics

1. What is your relationships to the household head?
 - i) HH/Head ii) Spouse iii) Son
 - iv) Daughter v) Other
2. Sex
 - i) Male ii) Female
3. Age (Optional)
4. Main occupation?
5. Income from main occupation (monthly)
6. Income from other sources (monthly)
7. Educational level
 - i) No education ii) Lower primary
 - iii) Upper primary iv) Post secondary
 - v) University

#	RL.HH	SEX	AGE	OCCUPATION	MAIN.INC	OTHER.INC	EDU
1.							
2.							
3.							
4.							
5.							
6.							
7.							
8.							
9.							
10.							

Household Solid Waste Management

8. How serious is the solid waste menace in your neighborhood?
 - i) Non-existent,
 - ii) Very serious.
 - iii) Moderate,
9. Who is responsible for the collection and disposal of solid waste generated in your house?
 - i) N.C.C,
 - ii) Private companies.

- iii) C.B.O's,
 - iv) Personal initiative.
10. If (iv) above, how do you go about it?
 11. What is the weekly waste collection (or disposal) frequency for your house?
 12. Do you find this service adequate?
 - i) Yes,
 - ii) No.
 13. Give suggestions on how solid waste in the city of Nairobi can be effectively managed.
 14. In your opinion, which of the following actors can be relied upon in the effective collection and disposal of solid waste in your neighborhood?
 - i) N.C.C,
 - ii) N.G.O's,
 - iii) C.B.O's,
 - iv) Private companies,
 - v) Personal Initiative.
 15. Supposing the private sector were to be involved in collecting and disposing off your garbage,
 - a). What would you consider to be the advantages?
 - b). What would you consider to be the disadvantages?
 16. If the private sector were to be responsible for your garbage, which amongst the following forms would you prefer that the involvement take?
 - i) Direct involvement through contractual arrangements with you,
 - ii) Indirect involvement through franchise by the City Council,
 - iii) Contractual arrangements with a community based management body.
 17. How much are you willing to pay (or are you currently paying) on a monthly basis, for an improved garbage collection service in your area? (do not include service charge paid to N.C.C).
 - i) Willing to pay,
 - ii) Currently paying.
 18. What is your monthly expenditure on the following,

i) Rent	ii) Telephone,
iii) Food	iv) Electricity
v) Water	vi) Transportation

BUSINESS, INDUSTRY AND INSTITUTIONS QUESTIONNAIRE.

1. How serious is the solid waste menace in your area?
 - i) Non-existent,
 - ii) Moderate,
 - iii) Very serious.

2. Who is responsible for the collection and disposal of solid waste generated in your premise?
 - i) N.C.C,
 - ii) Private companies,
 - iii) C.B.O's,
 - iv) Individual initiative.

3. If (iv) above, how do you go about it?

4. What kind of solid waste is generated from your daily activities?

5. On average, how much solid waste does your premise generate per day (in Kgs)?

6. What is the weekly waste collection (or disposal) frequency for your premise

7. Do you find this service adequate?
 - i) Yes,
 - ii) No.

8. Give suggestions on how solid waste in the city of Nairobi can be effectively managed.

9. In your opinion, which of the following actors can be relied upon to effectively collect and dispose off solid waste for your kind of business?
 - i) N.C.C,
 - ii) Private companies,
 - iii) C.B.O's,
 - v) Individual initiative.

10. Supposing the private sector were to be involved in collecting and disposing off your solid wastes,
 - a). What would you consider to be the advantages?
 - b). What would you consider to be the disadvantages?

11. If the private sector were to be responsible for your solid wastes, which amongst the following forms would you prefer that the involvement take?
 - i) Direct involvement through contractual arrangements with you,
 - ii) Indirect involvement through franchise by the City Council,
 - iii) Contractual arrangements with a community based management body.

12. How much are you willing to pay (or are you currently paying) for an improved solid waste collection and disposal system. (do not include service charge paid to N.C.C).
- i) Willing to pay
 - ii) Currently paying

SOLID WASTE ENTREPRENEURS QUESTIONNAIRE

Participation Data.

1. To what extent are you involved in the management of solid wastes in this city?
- i) Collection,
 - ii) Disposal,
 - iii) Transfer,
 - iv) Cleansing.
2. If you are involved in collection,
- a) Which areas do you cover?
 - b) What number of clients do you serve?
 - c) Total quantity of solid waste collected (tones)?
- AREA
- i) Res low income
 - ii) Res lower mid income
 - iii) Res upper mid income
 - iv) Res high income
 - v) Commercial
 - vi) Industrial
 - vii) Institutions
 - iix) Public spaces
3. If you are involved in disposal, which of the following methods do you use?
- a) Dumping,
 - b) Recycling,
 - c) Incineration,
 - d) Sanitary landfill.

Costs & Finance.

4. What capital costs did you incur at the beginning of your activity?
- i) Purchasing of fleet
 - ii) Acquiring premises
 - iii) Securing a license
 - iv) Other overhead costs
5. Quote your sources of finance.
6. What recurrent (monthly) costs do you incur on,
- i) O & M of fleet,
 - ii) Staff emoluments,
 - iii) Rent,
 - iv) Overheads

7. How much do you charge for service delivery to the following categories of consumers?

	CLIENT	CHARGES (In Ksh)	UNITS
i)	Res low income		
ii)	Res lower mid income		
iii)	Res upper mid income		
iv)	Res high income		
v)	Commercial		
vi)	Industrial		
vii)	Institutions		
viii)	Public spaces		

8. What is your gross annual income in Ksh?

Resource use Efficiency.

9. On average, how much solid waste do you collect per day?
10. a) How large is your fleet?
b) What is the ownership status? (own(a), hire(b))
11. What is the composition of your fleet?
12. What is the total distance your fleet covers per day?
13. Give an outline of the composition and nature of your labour force.
14. How long is your working day?
15. Do you require to go into overtime to collect solid waste?
16. What is the contractual agreement between the company and its employees?

Setting Up.

17. On which year did your involvement in solid waste management start?
18. Under which license are you operating?
19. Comment on the licensing procedures for private waste collection agencies. What problems did you experience while in pursuit of an operation license?
20. What problems do you experience while providing this service?
21. Give suggestions on how your involvement in the management of the solid waste menace can be enhanced.

NAIROBI CITY COUNCIL-INTERVIEW SCHEDULE

Topic: Privatization of Solid Waste Management

1. Approximately how much does the council spend annually on cleansing services?
 - i) Administration
 - ii) General Cleaning
 - iii) Refuse Removal
 - iv) Conservancy

2. Approximately how much does the department of Environment spend on solid waste management?
 - i) Operation and Maintenance
 - ii) Staff salaries
 - iii) Overheads

3. How much do the following categories of consumers pay for Council provided garbage collection and disposal services?
 - i) High income residential areas.
 - ii) Middle income residential areas.
 - iii) Low income residential areas.
 - iv) Institutions.
 - v) Industries.
 - vi) Commercial enterprises.

4. What is the weekly collection frequency for the following areas?
 - i) High income residential areas.
 - ii) Middle income residential areas.
 - iii) Low income residential areas.
 - iv) Institutions.
 - v) Industries.
 - vi) Commercial enterprises.
 - vii) Central business district.

5. What is the number composition and capacity of your fleet?

6. What is the composition of your labour force?

CATEGORY	NUMBER	SALARY	AGE(AVG)	E D U C LEVEL
Management				
Supervisors				
Clerical				
Maintenance				
Drivers				
Loaders				
Others				
TOTAL				

7. What aspects of the solid waste management process does the council intend to privatize, and to what extent?

8. What aspects of the service does the council intend to continue offering?

9. In the event that this service is fully privatized, what do you intend to do with
 - i) Employees of the council previously involved in garbage collection?
 - ii) Equipment previously used by the council?
10. What institutional framework has the council put in place to ensure the effective involvement of private firms in solid waste management i.e, to ensure that all areas are adequately served?
11. What statutory and regulatory measures have you or do you intend to put in place,
 - i) To protect consumers from exploitation?
 - ii) To protect the environment from possible pollution?
12. What benefits does the council expect from the privatization process?