COMMERCIALIZATION AND MANAGEMENT OF WATER SUPPLY AND SANITATION SERVICES IN THE KENYAN URBAN AREAS.
A CASE OF MAVOKO MUNICIPALITY

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OCTOBER, 2007
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Commercialization and management of water
DECLARATION

I declare that this is my original work and has not been submitted for examination in any other University.

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DEDICATION

This research project is dedicated to my Dad and late Mother who were keen to see me through my education. The latter would have been very proud to read through this manuscript had she been alive.

With lots of love from your son!
ACKNOWLEDGEMENT

I wish to acknowledge the encouragement that I got from my wife Dolly, my children; Damien, Suzzon, Vincenza and Lucky, during my studies and research that I carried out at the same time I was working and fending for the family.

May I also take this opportunity to thank my close friends who inspired me to work and working colleagues who were keen to see me succeed and be a role model to them at our work place, the residents of Mavoko Municipality and council employees who candidly responded to the questions I put to them on commercialization of water in our Local Authority

Finally for those who in one way or the other participated in this research, may I say a big thank you and may God reward you abundantly.
ABSTRACT

Commercialization of water supplies and sanitation services, was initiated by the Kenyan government in 1986 by producing a session paper that stipulated the necessary measures to achieve these objectives and in 1987, the required institutional set-up. The government through various policy papers and development plans expressed its commitment to improve water and sanitation services by decentralizing and running the facilities on commercial basis. Such acknowledgement was essential for the good health on which personal well being and national productivity and wealth creation depends. For these benefits to be fully realized, the water and sanitation facilities provided must function continuously, effectively and to their full capacity.

Poor management coupled with inadequate operation and maintenance has led to more than a half the water supply being unaccounted for in many towns in the republic. In parts of these towns served by public supply, wastage is high and the tariffs are fixed arbitrarily without consideration of consumers and costs. By contrast, residents of these areas most who are poor remain largely unsaved by public supply and forced to pay the market price for this insufficient and unsafe water from private vendors uncertified providers. The price is often 10 to 20 times higher than that charged to users connected to the public water supplies.

This research project was conducted within Mavoko Municipality and was targeting all the residents, commercial entities industries pastoralists/farmers and employees of the Municipal Council of Mavoko. Sampling was through systematic sampling for the residents and various customers and stratified random sampling for the council’s
employees. The data collection tools were interviews as well as questionnaires which contained both closed ended and open ended questions. These questionnaires was administered through personal contacts, where the researcher dropped and picked them after three days to allow the respondents’ time to fill them. These questionnaires were then edited and the data collected analyzed using the SPSS computer package.

The researcher expected to come up with a research project that was to provide an in-depth analysis of the issues under investigation for use by different industry stakeholders such as the Council, the Government, as well as future researchers and scholars.

The research found out that the process of commercialization has not been finalized within Mavoko Municipal Council and hence recommends that the process be carried out to its completion. For the success of effective commercialization, Mavoko Water department, which has moved to form a company, must plan for the provision of adequate portable water, critically evaluate staff with the purpose of having qualified management and operational staff, come up with organizational structure that was to allow for future expansion and have a proper coordination of water activities in line with the modern management practices, and control the available water resources and revenue that accrues from it.

The department must also have adequate tariff design system that was to ensure financial autonomy of the organization, conserve water resources and have socially acceptable and affordable tariff.
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OPERATIONAL DEFINITION OF TERMS

Commercialization - is having financial sustainability of operations where primary objective was to break even and where possible earn profit.

Policy - A statement of the manner in which work activities are to be pursued.

Stakeholders - These are persons and organizations that have an interest in the development of the town and are often affected by the deficiencies in service provision or infrastructure.

Sustainability - The maximization of economic efficiency in the use of developmental resources.

Standard - Is a measure of performance which management was like an employee to achieve with some degree of deliberate effort.

Development - Is a long term educational process utilizing a systematic and organized procedure by which managerial process get conceptual and theoretical knowledge.

Management - A social process consisting of planning, controlling, coordinating and motivating.

Top Management - That level of managers, which are concerned, with defining the mission and objectives of the firm, and designing strategy to achieve them.

Middle Management - The middle level of an administrative hierarchy.

Water Scarcity – This is a relative intended to convey the imbalance between supply and demand under the prevailing legal, institutional regulatory and where applicable, price arrangements.

Water Shortage – This is an absolute concept indicating low levels of water supply relative to minimum levels necessary for basic need.

Water Stress – This signifies acute water shortages for prolonged periods.
LIST OF ABBREVIATIONS USED

ALGAK; Association of Local Government Authorities of Kenya
CBO; Community Based Organization
DSS; Decision Support System
EPZ; Export Processing Zone
GTZ; German Urgency for Technical Co-Operation
IDWSSD; International Water and Supply Decade
LAS; Local Authorities
MIS; Management Information System
MLA; Ministry of Local Authorities
MLRRWD; Ministry of Land Reclamation, Regional and Water Development
MMC; Mavoko Municipal Council
MOA; Ministry of Agriculture
MOE; Ministry of Environment
MOH; Ministry of Health
MWMP; National Water Master Plan
NGO; Non Governmental Organization
NWCPC; National Water Conservation and Pipeline Corporation
NWCPC; National Water Corporation
W&S; Water and Sanitation
WHO; World Health Organization
WSD; Water and Sanitation Department
WSOU; Water and Sewerage Operation Unit
CHAPTER ONE

INTRODUCTION

1.0 Background of the Research project

Water has been identified as the likely cause/trigger of future wars in the next millennium. Water shortage can be a catalytic factor pushing a poverty-stricken community to disaster and conflict. Water is a fundamental basic need for sustaining human economic activities. Availability of water in the desired quantity and quality, at the right time and place, has been the key to the survival of all civilizations. As human activities expand in scale and diversity, the demands for fresh water resources continue to grow. Fresh water lakes and rivers, springs, fountains, wetlands etc, which are the main sources of water contain an average of 90,000 m³, or just 0.26 percent of total global fresh water reserves.

1.1 Commercialization and Management of Water and Sanitation Services

Water and sanitation services should be viewed as potentially "commercial" because these are services for which it is easy to recover the cost of provision through users charge or tariffs, the basic condition for this are limited and well focused performance objectives, financial and managerial autonomy, and clear accountability both to customers and to providers of capital (WHO, 1994).

It is important to note that unlike other infrastructure, water and sanitation are listed as natural monopoly. This implies that it is uneconomical to duplicate the water and sewerage networks in the city and town streets, a condition that makes competition
difficult. It is therefore important to regulate their prices in order to protect the customer against abuses of monopoly power.

The sector although is capital intensive requiring much longer payback period than other infrastructure, it has important externalities, mostly related to public health and environmental effects. The social and economical benefits of full water supply and sewerage coverage or treatment are generally larger than apparent financial benefits of the operation. (World Bank, 1994). Commercialization, by definition is having financial sustainability of operations where primary objective was to break even and where possible earn profit (Oxford, 1993).

According to World Bank report, (1994) commercialization of water supplies and sanitation services, which are both infrastructure utilities, simply implies running the utilities on business lines characterized by factors such as, they have clear coherent goals focused on delivering services, their management is automous, and both managers and employ's are uncountable for results and they enjoy financial independence (ring fencing of water revenues).

The principles underlying these characters come naturally to private business, but by no means always to organization in the public sector (World Bank, 1994). Governments as well as their agents (local authorities) are forced to balance many economic, social and political objectives while the management of the sector employees is often hampered by numerous restrictions on establishing accountability and rewarding good performance. To enjoy financial independence, water supply and sanitation services must be able to
1.2 Statement of the Problem

Mwongera (1994) noted that in the period between 1979 and 1994, the Kenya government provided water services to an additional 3.2 million people. During the same period, the population grew by 11.6 million. To bridge the gap between the increase in population growth and water coverage, the Ministry of land Reclamation and Water Development, set an annual increase rate of 1.8% in water coverage. During this period, the annual coverage was however, only 1.1%. (very small with a fast growing population).

The government through the Sessional Paper Number One of 1986, on Economic Management for Renewed Growth, identified commercialization of water supplies and sanitation services as the only way to improve the provision of these services to the ever-growing population. The sessional paper stressed on importance of charging market price for water supplies and sanitation services in order to maximize return on public investment to stimulate urban development. It also encouraged the involvement of private sector in the provision of the facilities and services, either as partner or as principal agent. Since then, only a few towns in Kenya have ever fully commercialized the provision of the two services. One such example is Nyeri Municipal Council. This is despite the fact that the government commitment was evidenced by developing Sessional Papers, (Sessional Paper N0. 1 of 1986, section 4.27, 4.33 and N0. 1 of 1994), and continued support by donor agencies like the GTZ.
Barasa, (1997) noted that the tariffs (service charges) charged on water supplies and sanitation services are unrealistic, fixed arbitrarily and do not cover full costs of providing these services. Water rates cover only about 18% of Ministry of land Reclamation and Water Development recurrent expenditures, and indeed, for example, the 1995 tariffs were significantly less than 1990 if considered at constant 1989 prices. This implies that the 1995 tariffs were relatively lower than 1990 tariffs, given that the cost of production in 1995 were higher that in 1990. In the recent years there has been a continued decline in funding water supply utility development, operation and maintenance to meet the above noted set target of 1.8% increase in supply coverage. The reduction in funding has been due to the current structural adjustments (Mwongera, 1994).

This has contributed to high deterioration of the infrastructure of these services, which has continuously compromised the health of the people and increased their poverty level. The government policy of providing piped water to all Kenyans by the year 2000 has proven to be difficult if not impossible even in the near future. Though many developed countries like France and Britain have successfully applied the concept of commercialization of water supply and sanitation services (Brown and Jackson, 1990), many developing countries have not grasped the concept.

Little research has been done on application of this concept in developing countries given their economic and politician setups. Timeliness is critical to any policy development and implementation (Pearce and Robinson). Implementation of commercialization process in bits and pieces, while identifying and tackling each and
every isolated problem separately, has proven not only ineffective but also time wasting. Poor state of water supply and sanitation services in the past formed the headlines of both electronic and print media (Daily Nation, July 22 & 26, 1999).

The public has continuously blamed the local authorities for inefficiency in water supply and sanitation services. The move to commercialize these services to improve on efficiency in their provision has been echoed both by the public and executive arm of government. Then, why are local authorities in Kenya not commercializing water supply and sanitation services? Thus the central question in this is what are the critical factors in commercialization process of water supply and sanitation services in Kenya urban areas? And how best can commercialization process be implemented in future to avoid these limitations?

1.3 Objectives of the research project
1.3.1 General Objective
The main objective of this research project was to identify the factors that affect commercialization and management of water supply and sanitation services in the Kenyan urban areas, with a special reference to Mavoko Municipality.

1.3.2 Specific Objectives
The specific objectives of this research project were:

1) To determine the extent to which availability of funds and technology has affected the commercialization of water and sanitation services to the Kenyan urban areas.
2) To provide a framework for improved water provision and management by proposing a well co-coordinated commercialization process.

3) Propose effective water sector management and operation system through quality, performance monitoring and tariff setting.

4) To explore how Municipal Council of Mavoko can work in partnership and collaborate with CBOs, NGOS, Donor Communities and other water providers in order to enhance provision for water.

1.4 Research Questions

1) What are the factors that affect commercialization and management of water supply and sanitation services in the Kenyan urban areas?

2) To what extent has the availability of funds and technology affected the commercialization of water and sanitation services to the Kenyan urban areas?

3) How can a well co-coordinated commercialization process provide a framework for improved water provision and management?

4) Is there a water sector management and operation system which can be developed through quality, performance monitoring and tariff setting?

5) How can Municipal Council of Mavoko work in partnership and collaborate with CBOs, NGOS, Donor Communities and other water providers in order to enhance provision for water?
1.5 Significance of the Research project

The research project was useful to various groups in the following ways;

It provided the useful information to the government and other implementing agents like local authorities on the key factors that affect implementation and management process, and how to identify the intervention points to fasten the commercialization process.

The general public, who are the tax payers also benefited from the findings of this research project by getting an understanding as to the situation under which the commercialization of water and sanitation services in urban area is being carried out and the implementation and management of the same in order to improve service delivery to the public.

Future researchers and scholars also got a source of reference from this research project as they embark on their studies and conduct research on related topics. The research project also acted as a useful source of information for strengthening the operational and managerial capabilities required by managers to operate and maintain water and sanitation services according to acceptable norms of quality, continuity, reliability and costs. The research project can be used to improve efficiency in providing adequate and safe drinking water supplies and appropriate sanitation facilities, which forms a sound basis for improvement in community health.
CHAPTER TWO

LITERATURE REVIEW

2.0 Overview of Commercialization of Water and Sanitation Services in Kenya

Commercialization of water and sanitation facilities in Kenya was first featured in Sessional Paper Number one of 1986 on Economic Management for Renewed Growth. The paper suggested decentralization of the two facilities by the operations to local authorities through the Ministry of Local Government. They were urged to revise the pricing of the utilities and services to ensure that they reflect the real cost of operation, maintenance, and long term capital stock replacement (Lotz, 1995).

In 1987, German Agency for Technical Co-operation (GTZ) which was supporting water and sanitation projects in Kenya was shifted from the Ministry of Water Development headquarters to Ministry of Local Authority (MLA) since the latter was in charge of regulating, coordinating and advising the Local authorities. This led to formation of the GTZ supported Water and Sewerage Operation Unit (WSOU) in the MLA. The GTZ project was then one of the components of the Kenya-German Water team. The WSOU overall goal was to ensure water and sanitation services in the selected municipalities were self-sustaining (Lotz, 1995).

During the third phase (1994 to 1996), the GTZ project which was later named Urban Water and Sanitation Management (UWASAM) focused its interest to assist local authorities to form fully fledged Water and Sanitation Departments (WSD) which were fully autonomous. Nine municipalities namely Kisumu, Kericho, Kitale, Nyahururu,
Nakuru, Eldoret, Nanyuki and Nyeri Municipal Councils were identified as pilot towns for commercialization. These councils were granted water undertakingship meaning that they have the right to run water supply system independently (Lotz 1995). It was realized that despite intervention measures put in place, the water and sanitation services provision by local authorities was far from being self-sustaining. The physical infrastructure in water and sewerage had already deteriorated, maintenance activities were neglected, management of both systems and services to the public were poor, water losses had reached unacceptable levels, tariffs were not cost recovering and billing and revenue collection efficiency were below standards.

The workshop held in 1995 between the pilot towns, Ministry of Land Reclamation, Regional and Water Development (MLRRWD) and GTZ resolved to formation of Water and Sewerage Companies as the next step in commercialization. Between September and October 1997, three water and sanitation companies were registered in the Registrar of Companies Office. These were Kericho, Nyeri and Eldoret Water and Sanitation Companies. The Ministry of Local Governments, GTZ, and UWASAM Project assisted in the formation and establishment of the water companies by providing technical and financial support. The project has continued to provide technical assistance on the operation and maintenance of water and sanitation utilities in other project towns as well as preparing these towns for commercialization of water and sanitation services.
2.1 Institutional Structure of the Water Sector in Kenya

Decentralization and commercialization of water sector, has been supported by both the Government and public although very little power has been transferred since 1986 to the regional or local levels (Lotz, 1995). To the few local authorities that are in the process of commercializing water and sanitation services, water and sewerage tariffs have been increased. At present these tariffs covers operating and maintenance cost, but makes little or no contribution to covering capital cost. Moreover the institution is characterized by the fact that regulatory task are not clearly distinguishable from implementing tasks, and that in the field of hygiene education, there is frequently lack of executing agencies close to the target group.

At central Government level, at least five ministries play parts in the water sector in the wide sense that is, all users of water in agriculture, household and industry (Water Act, 1972). The ministry of Land Reclamation, Regional and Water Development (MLRRWD) was created at the beginning of 1994 by amalgamating three ministries (Ministry of Arid and Semi-Arid Land; Ministry of Regional Development; Ministry of Water Development). The MLRRWD is responsible for granting status of “water undertaker” to local authorities. This status has so far been granted to smaller local authorities on the grounds that from a technical and administrative point of view, they are not in position to run water supply on their own. It claims right to approve the water tariff of water undertakers.

However, the Water Act of 1962 (amended in 1972) leaves open the question of which ministry approves water tariffs. In most cases MLA have been approving tariffs of all
local authority that are water undertakers. The water and sewerage tariffs are proposed by the local authority for the ministry to approve. The MLRRWD is in charge of water management administration in Kenya, which is largely organized in parallel with general administration. The MLRRWD is thus responsible for both regulatory and implementation task.

The MLA is responsible on the one hand for supervising and on the other hand for supporting local authorities in the execution of their task. At the Central Government level the MLA coordinates the activity of other donor agencies involved with improvement of water and sanitation services in local authority. The MLA is responsible for the transfer of senior staff of local administration. The MLA’s view of its own role is evidently shifting in the direction that in addition to supervising local authorities, one of its central activities lies in assisting the local authority in the implementation of their task. (Local Government Act, Cap 265) The MLA administers the Local Government Loan Authority LGLA), which originally passed on economic cooperation loan – especially for water and sewerage projects and was intended to finance new investment out of the repayment. Since repayment by local authorities almost completely failed to materialize the LGLA was unable to perform its function hence constraining the development of water and sewerage sector in most local authorities.

The other agent responsible for water supplies is the National Water Conservation and Pipeline Corporation (NWCPC). This is state enterprise supervised by MLRRWD. It was set up in 1989 with personnel from then Ministry of Water Development (MOWD) and it took over 42 water supply system that had previously been operated directly by MOWD.
These systems include Kenya’s main long distance water supply line (National Water Master Plan, 1992). In some cases the NWCPC sell water in bulk to water undertakers who are responsible for distributing it to customers.

In other cases the NWCPC also runs the municipal distribution with examples of Mombasa and Malindi. In none of these cases does it run sewage disposal. The cooperation has also in recent years taken over the distribution which was previously in the hands of the local authorities as water undertakers, because the local authorities had not raised the tariffs and were in arrears with payments to the NWCPC. This trend runs counter to the quest for decentralization and consequent commercialization. (Lotz, 1995) The NWCPC covers its operating and maintenance costs from revenue from sales of water and receives grants for its capital costs. Its tariffs are standardized throughout the country.

2.2 Water Balance and Supply Level
The available water resources far exceed the demand. There are nevertheless regional and seasonal water shortages and this shortage was grow with increasing demand. The National Water Master Plan (1992) puts Kenya’s available water resources at 20,209 million cubic meters a year. A 97% of this is due to rivers and only 3% to groundwater. In 1990 some 1,148 million cubic meters, which is approximately 6% of the water resources were used by man (excluding hydropower). In order to remedy the regional and season shortages, the Master Plan put the construction of additional dams and long distance water supply lines as first priority.
Lotz, (1995) noted that in Kenyan towns, the proportion of the population with drinking water connection-supply level-is around 78%. In part of some towns and the city however, supplies are often interrupted for days or even months, with the result that can not be attributed to inadequate water supply sources. The urban population without drinking water supplies in their houses has to rely on water kiosk, rain water and water sellers. Water kiosks are leased and lessee lives on the difference between sales revenue and water bill paid. It is virtually impossible to control selling price in practice, and at the equivalent of Kshs. 25-75 per cubic meter, they are above the charges for household connection. Vendors charge as high as Kshs. 500 per cubic meter.

In sewerage services, 34.5% of the urban population has access to appropriate centralized or decentralized sewerage facilities though their conditions have been getting worse due to poor maintenance. About 16.5% of the urban population is served by simple larine leaving about half the population without any appropriate sanitary facilities (World Bank, 1994).

2.3 Alternative Management Options of Water and Sanitation Services

The following are the various management options of water and sanitation services that an agency or the local authority can adapt.

2.3.1 Option A: Public Ownership and Public Operation

This is the first alternative of institutional options suggested to implement commercialization process (World Bank, 1994) this option can be implemented by applying three core instruments to reinforce commercial operation in public sector:
corporatization establishes the quasi independence of public entities and insulates infrastructure enterprises from noncommercial pressures and constraints. Corporatization gives an enterprise an independent status and subjecting it to the same legal requirement as private firm. This means that the enterprise is subjected to standard commercial law, accounting criteria, compensation rules, labor laws and is less susceptible to government interference.

In practice, this transformation is not always complete because public organizations do not face adequate competition and at times no competition at all especially for services provided listed under natural monopoly like water supplies. Explicit contacts between managers or private entities involved in infrastructure services, which increases autonomy and accountability by specifying performance objectives that embody government – defined goals. This provides a pricing strategy designed to ensure cost recovery, which creates a desirable form of financial independence for public utilities and even at times for public works.

### 2.3.2 Option B: Public Ownership and Private operation

This option falls under the second category of the World Bank suggested institutional options and it’s based on the fact that water being a natural monopoly, the involvement of public sector is very important, so as to regulate quality, performance monitoring and tariff setting. In this option, the agent, local authority, still maintains the ownership of the water facilities and assets but enter into contracts with the private sector (Rodney, 1995). This option includes performance agreement, management and service contracts, leases and concessions.
Performance agreements retain all the decisions in the public sector. They try to increase the accountability of employees and managers and try to improve the focus of operations by clarifying performance expectation and the roles, responsibilities and rewards of all the public entity. In performance agreements, the local authority has to promise and increase managerial autonomy for the enterprises as well as rewards for workers in exchange for fulfilling agreed performance (World Bank, 1994). The duration of the agreement should be short. Short agreements of one year, are more effective because they allow more frequent assessment. The common incentive is the weight attached to various performance indicators after careful negotiation between the managers and the local authority. The weights were a sense of priorities so that the managers can concentrate on what matters most and not what might be easier to achieve.

Management contracts, transfer to private providers the responsibility of managing water and sanitation utilities. They give responsibility for a broad scope of operation and maintenance to the private sector, usually for three to five years. This method has been used where performance agreement has failed. However, when the local authorities service quality –such as staffing, procurement are in adequate, the contractor cannot be held accountable for overall performance, and generally the contract does not succeed (Dominique, 1995). Management contracts increase autonomy of management and reduce political interference in the day-to-day operation of the service provision.

Service contracts; transfer to private providers the responsibility for delivering a specific service at lower cost or obtaining specific skills or expertise lacking in the local authority
such as design, engineering or account preparations. Contracting provides a flexible and cost effective toll for increasing responsiveness of users and tap expertise too expensive to maintain permanently on Public (Local authority) payroll. It also permits competition among multiple providers each with short and specific contracts. Contracting out is most common for maintenance (World Bank, 1994).

Under a lease, the local authority supplies the major investment for production facilities and a private contractor then pays for the right to use the public facilities providing services. A lease generally awards the contractor exclusive rights to the streams of revenue for a period of six to ten years (Browns and Jackson 1990, World Bank, 1994). The contractor bears most of all the commercial risks, but not the financial risks associated with large investment. Lease allows a mix of ownership where the local authority owns the land and infrastructure facilities – water and sewerage utilities – while a private firm owns and operates the superstructure. Concession incorporates all the features of the lease but give the contractors the added responsibility of investment such as for specified extension of expansion of capacity or for replacement of fixed assets.

2.3.3 The “Natural Monopoly Problem” and Franchise Bidding

As noted earlier, a water supply and sanitation services industry is usually said to be a natural monopoly if the production can be conducted most effectively by a single entity. This was the case if the unit costs are declining over the entire relevant range of market demand for a product - that is, there are massive economies of scale in the production of a good. Under this condition, having two firms operating side by side would be undesirable and unlikely in the long run, since either of the rival could expand output,
experience lower unit costs, and drive the other from the market; a monopoly situation would “naturally” result. The field data analyzed by Hanke and Roland (1980) strongly supports this theory.

On the other hand, any firm that is the sole producer of a commodity enjoys some measure of market power, and the fear has long been unregulated natural monopolies would reduce output, charge prices substantially above costs, and thereby misallocating resources. To deal with the problem, governments have generally recognized and licensed a single producer in market identified as natural monopolies and the regulated the prices (or rates of return) received by these firms to foreshall monopolistic conduct.

Harvey and Leland (1973) noted that the rate regulation itself involves several problems since most rate regulation involves enforcing some sort of “Cost –Plus” pricing rule, regulated firms tend to allow their cost of drift upward-since, in most cases, they can reasonably confident that rates was set high enough to cover these costs and provide a “Normal” return on capital. Obviously, it was difficult for even a well-intentioned regulatory authority to determine which costs are legitimate. Chardwick noted that the crucial point is that bidding for monopoly franchise, should not be in terms of the sum to be paid for the franchise, but in terms of the price that the franchise would charge and the services the franchisee would provide the public on ward of the right to be exclusive seller. If the franchise were merely awarded to the bidder wasing to pay the highest price for this exclusive right, competition would drive bids up to an amount equal to present value of the expected future monopoly profits in the market. This would filter the profit where the net result would be underproduction and overpricing of the product.
Chardwick proposed that an auction be held in which franchise is awarded to whichever the bidder promises the best combination of price and quality to customers. This theory was applied by France in as early as 1782.

2.3.4 Option C. Private ownership and Private Operation (Full privatization)

This is the third option suggested by the World Bank (1994). Privatization transfers assets out of the public sector to private companies or individuals. Privatization is spreading rapidly in developing countries in provision of infrastructure. The sale and private ownership of water supply and sanitation systems may be prompted by desire to separate completely between ownership and operation and maintenance. The attractiveness to private buyers depends mainly on the rates they would be permitted to charge, because installation themselves have no alternative value. For example, Argentina, Chile, Hungary, Jamaica have all undertaken substantial privatization of telecommunication services. Ivory cost is an excellent example of private company providing water services to Abidjan, the capital city.

It is important to note that regardless of the option adopted, the objective was to achieve commercialization of the services. Commercialization can be viewed as a continuum (Ramanadham, 1991) as noted earlier and therefore at whatever level, there are key issues of management that each of the institutional options has to observe. Of most important is tariff design.

Tariff is the price charged for water sanitation services provided. Tariff design must be seen in terms of criteria of financial viability and social acceptability. In commercialized
sector, the basic aim should be the tariff that covers full costs; this applies to water supplies and sewerage disposal. In order to cater for the objective of social acceptability, a cross-subsidizing effect by means of progressive tariff for water supplies and sewerage disposal is acceptable (Lotz, 1995). When designing tariffs, special attention should be paid not only to the charge made for consumption but also to be “conditions of access” to water supplies and sanitation for poorer population groups.

The design of water utility tariffs plays a central role in the implementation of the objective of the organization. The price of water and sanitation services not only makes it possible to steer demand, both as regards the quantitative aspect of demand and the question of access to water supplies for poorer section of the population. Thus water tariff design must consider the following three aspects. The water tariff must (at least in the medium term) ensure the financial autonomy of water utilities, the water tariffs must create incentives to conserve resources and the design of the tariffs must be socially acceptable (Moigne, 1994 and World Bank, 1994).

Unregulated market systems may generate outcomes that do not satisfy a country’s social goals in terms of poverty alleviation, income distribution and public health. Although tariff design that creates appropriate incentive structure from a macroeconomic point of view and calculated on the basis of macroeconomic cost (Including opportunity cost) could be regarded as the best under prevailing market condition, such a demand can only, if at all, be achieved in the long term. (Moigne, 1994). A progressive requirement. In such a case, care should be taken not to set the consumption limit for the first progression stage too high and to ensure that communal
connection of the kind common in quarters where poorer population group live are not subjected to the same progression as individual connections.

Terms of payment for water and sanitation services are in general, an important criterion target-group appropriate pricing. A frequent reason for delayed payment by a customer is not unwasingness to pay or inability to pay, but simply inability to pay at the time in question. Experience has indicated that even population groups with low incomes have capacity to pay. Part of the problem of delays in payment in the case of water and sanitation is explained by insufficient flexibility in terms of payment offered. Making the terms of payment more flexible, therefore increases target group orientation and at the same time has a positive impact to the customers payment habits. Nevertheless, decision by water utility to introduce more flexible terms of payment is based on economic criteria. One of the biggest challenges of implementing full cost recovery tariffs is the high level of inefficiency in water distribution process.

In many cities especially in developing countries, more than half the water supply is unaccounted for. This loss is normally attributable to leakage, metering error or non-recoverable uses of water (WHO, 1994). Leakage represent loss due to spillage of water from the overflow devices of the services reservoirs and leakage from pipes or other parts of the distribution system, including house connections up to the meter leaks and overflow inside the properties where consumption is not metered are included under this heading.
Metering error account for a substantial part of total losses. These losses are caused by inaccuracy in macro metering and metering equipment that measures flow. This category of loss is an indication of the efficiency of metering systems. It has to do with the errors in the metered quantities of water rather than with actual loss of water. Non-recoverable uses present losses from quantities of water that are not accounted for in the supplier's invoices. This category includes operational consumption (washing and disinfection of pipes and services reservoirs). Special consumption (Fire fighting etc), Illegal connection which is very rampant and legally allowed or tolerated services which are supplied free of charge.

Water loss control programs should be devised. The overall objectives of a program to control water loss, was to diagnose how loss is caused and to formulate and implement action to reduce it to technically and economically acceptable minimum. Thus, a water loss control program should aim at; (WHO 1994).

2.4 Commercialization Process

Commercialization process as indicated in the model above begins by identifying institution option. There are three institutions options as explained earlier in this chapter and the local authority can select any of the three options. The stakeholders, both external and internal, play an important role in identifying the option to be adopted.

On identifying the institution option to be adopted, the necessary strategic management levels are established to undertake the managerial aspect of the organization. Three levels of strategic management, namely the corporate (organization) level, functional
level and operation level. Each level of strategic management formulates and implements various strategies aimed at achieving the overall organization objectives. To facilitate strategy formulation systems, decision support systems and goodwas from both internal and external stakeholders.

To guarantee the success of effective commercialization, the organization must have adequate tariff design system that was ensure financial autonomy of the organization, conserve water resources and socially acceptable tariffs. The organization must also ensure that operation and maintenance of both water sewerage systems that was guarantee adequate water distribution and sewerage services at the minimum cost. The organization must also have well trained and motivated employees to undertake all the activities in providing drinking water and sewerage services

2.5 THE CONCEPTUAL FRAMEWORK OF THE RESEARCH PROJECT

The main independent variables of this study were: institutional options for commercialization, strategic management, tariff design, operation and maintenance and personnel. These have been analyzed in relation to how they affect effective commercialization which is the dependent variable. This relationship can be operationalized as follows:

\{\text{Institutional Options for Commercialization, } (x_1)\} + \{\text{Strategic Management } (x_2)\} + \{\text{Tariff Design } (x_3)\} + \{\text{Operation and Maintenance } (x_4)\} + \{\text{Personnel } (x_5)\} \text{ are functions of effective commercialization } (y).
While the research to date on commercialization has provided valuable information for this research study, lack of detailed data specific to the commercialization of water supply and sanitation services in Kenya has limited the progress in addressing issues relating to the issue at stake, which is commercialization and management of water supply and sanitation services in the Kenyan urban areas. This study sought to fill this gap.
Fig: 2.1: The Conceptual Model

Commercialization Process Theoretical Model

Institutional options ($x_1$)
- Option A
- Option B
- Option C

External Stakeholders
- Central Government
- Public
- Business community

Internal Stakeholders
- Town management
- Policy makers
- Employees

Strategic management ($x_2$)
- Organization Level
- Functional level
- Operation level

Information System
- Information demand
- Information supply
- Information technology

Tariff Design ($x_3$)
- Financial autonomy
- Conserve water resources
- Socially acceptable
- Tariff

Operation and maintenance ($x_4$)
- Sufficient distribution process
- Minimum cost production
- Full cost recovery

Personnel ($x_5$)
- Training
- Motivating
- Retaining

Effective commercialization ($y$)
- Improved management
- High quality services
- Low priced services
- Profitable projects
- High maintenance and expansion of services
- High investment and sustained economic growth

Source: Author (2007)
CHAPTER THREE

RESEARCH METHODOLOGY

3.0 Research Design

In this research project, the following types of procedures or methods were considered suitable due to the nature of investigation. An exploratory research project was adopted, as it was imperative to gathering important primary data. A survey design was incorporated based on a descriptive research project. This method was used to describe the area of interest by bringing out the facts on the ground as they are without alterations. The descriptive research project attempted to provide information on the current status of the organization and provide a description of the commercialization of water and sanitation services. The design also had an exploratory aspect in that; the researcher collected data from a cross-section of respondents chosen to represent the entire Mavoko Municipality.

3.1 Research Project Location

Mavoko Municipality is located along the Nairobi-Mombasa road approximately 30 km South- East of Nairobi. Incorporated as an urban Local Authority in 1974, it took over the operations of the then Masaku County Council within its area of jurisdiction from 1st July 1984 before evolving into a Town Council in 1985 and Municipal Council in 1993. The Municipality has undergone tremendous socio-economic growth. It encompasses 693 square kilometers, and a population of 80,000 (2002 estimates) compared to 8.5 (approximately) square kilometers of area and population of 50,000 in 1969 (Koti, 2000; Okatcha 1979).
This area corresponds to Athi River Division. Her economy (Koti 2004) is dominated by cement, steel, ceramic manufacturing as well as Export Processing Zones (EPZ) and flower farming. As a result, the dominant water users in this municipality are industrialists and commercialists, residents and farmers. The economic and social set up of the town is diverse and complex. Lying on the peri-urban area of Nairobi, Mavoko houses a mixed population comprising rural communities and urbanites. Within the rural category, pastoralists and agriculturalists predominantly are Kamba in ethnicity, but also with significant traces of Maasai. The urban cadre comprises impoverished slum dwellers that provide labour to the rapidly growing industrial sector, a commuting working class and a fairly wealthy community operating from nearby and Machakos Town and Nairobi City.

The town hosts over 70 industrial entities; cement and mineral processing plants, steel and iron rolling mills, EPZA, Chemical industries among others. Since early 90s several flower farms have been established on the outskirts of the town, attracting a large workforce of mainly unskilled labor most of who live within the town. All these have made the town grow more rapidly than the water service providers can cope with, and this has placed huge strain on the town’s water infrastructure. This complex population composition poses water provision and management challenges for the Municipal Council.

According to the MMC Infrastructure Stock Assessment report for 2002, the town hosts 80000 residential and commercial built-up structures. Of these, 65 per cent are housing
structures in semi-permanent and lacks water. The Council is primarily responsible for providing clean water and sewerage services to the residents of the Municipality, in a financially sustainable manner and within the Government regulations which has not been the case. Consequently, many residents of MMC depend on nearby seasonal rivers, shallow wells, dams and boreholes whose water qualities are fit for human usage or questionable, while others have to buy water from EPZA and water vendors at high prices. Water quality assurance is poor as public health officers do not sample and analyze their quality (Regulatory Guidelines for Urban Upgrading Project- DFID).

Currently the council purchases its water from the EPZA at Sh.37 per cubic meter and sells it at Sh.50 per cubic meter. There are several boreholes within the council but these are not viable alternatives as some of them are sunk near pit latrines, (Society for the promotion Area Resource Centers-SPARC), hence polluted and hard water.

Access to water is further hindered by the cost of connection into the mains, for example a deposit required for connection is set at Ksh.10, 924 for all residential consumers and KShs.25, 000 for commercial and industrial consumers. The council also buys a smaller quantity of water from Athi Water Board at Kshs.15 per cubic meter.

The water supply system serves approximately 40 per cent (43,817) of the population while the sewerline supply serves 16 per cent (17,527) of the population. The average daily demand for water is 15,000 cubic meters, while the supply at Mavoko Town (i.e. Athi River and Mlolongo) is estimated at 5,000 cubic meters daily. Consumption is
estimated to be mostly by domestic users, which is approximately 78 per cent, while the industrial/commercial users is 22 per cent.

The National Water Master Plan for the area indicates very limited ground water. Potential exists within the Athi, Amboni, Mbagathi and Nairobi Rivers, which are the main surface, water sources. There is hardly water for harvesting throughout the year except in months of March and May when long rains are expected and scanty rainfall during the months of October when the short rains are expected.

The growth of Mavoko Municipality is due to the large population working in Nairobi who finds it affordable to live and commute to and from Nairobi while based in and around Athi River Town. The other factor that has contributed to the rapid growth of Mavoko since 1980 is the establishment and expansion of industries like cement factories, flower farming, horticulture, distilleries, quarrying, Tanneries, steel industries, garment making at EPZA and of late, housing estates. This rich industrial base has attracted a large number of semi skilled and skilled works from all over the country. All these have seen the town grow more rapidly than some service providers can cope with. It has particularly placed a huge strain on the town’s water infrastructure.

It has been estimated that some 80 countries, constituting 40% of the world’s population, are suffering from water shortages by the mid-1990s and that in less than 25 years from 2007, two-thirds of the world’s people was living in water-stressed countries, most of these in the Middle East, West Asia and Africa. In Kenya, which also suffers the same
fate of lack of adequate water, challenges include population growth agricultural expansion, industrial developments, pollution, droughts etc (G-WADI – ww.g-wadi.org).

3.2 Target Population

Municipal Council of Mavoko covers an area of 693km² with a population of 80,000 who are the water consumers. The consumers are broadly categorized as domestic, industrial/commercial and agricultural water consumers. The council is divided into six wards and has a total of 137 employees. These formed the sampling frame of the research project.

3.3 Sampling design and Technique

This research project adopted stratified random sampling approach for the council employees. Employees were chosen on the basis of their departments. The sample gave a generalized management findings about Municipal Council of Mavoko and the tentacles of the sample frame was spread over various departments. The sample size encompassed 50% of the total employees in each department and therefore yield a sample of 68.

This was as shown in the table here below:

Table 3.1 Sampling frame

<table>
<thead>
<tr>
<th>Department</th>
<th>Population Frequency</th>
<th>Sample Ratio</th>
<th>Sample Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Town Clerks</td>
<td>48</td>
<td>0.5</td>
<td>24</td>
</tr>
<tr>
<td>Treasurer’s</td>
<td>54</td>
<td>0.5</td>
<td>27</td>
</tr>
<tr>
<td>Engineers</td>
<td>35</td>
<td>0.5</td>
<td>17</td>
</tr>
<tr>
<td>Total</td>
<td>137</td>
<td>0.5</td>
<td>68</td>
</tr>
</tbody>
</table>

(Source: Researcher, 2007)
For the water consumers, the research project employed systematic sampling for commercial/industrial users. Here the researcher obtained the names of the industrial/commercial water consumers from the billing list at the Mavoko Municipal Council Offices. There are a total of 100 industrial/consumers consumers; therefore, the researcher selected every 5th name from the list. This yielded a sample of 20.

The researcher adopted simple random sampling technique to select the domestic water consumers whereby 20 respondents were drawn from each of the six wards hence this resulted in a total of 120 respondents.

Three agricultural/pastoral based water consumers were selected by simple random sampling technique one each from flower farmers, ranches and horticulturalists.

A total of 211 respondents were drawn for this research project. This number of respondents was accessible, available and representative of the entire population within Municipal Council of Mavoko.

3.4 Data Collection

Data for this research project was collected using questionnaires on various factors in commercialization process which was administered using "drop and pick" method. The questionnaire mostly targeted the customers or residents as well as employees of the Municipal Council of Mavoko. The questionnaire was structured so as to have ease of administration, ease of comprehension by the respondents and objectively measurable reliability. This is due to the large size of respondent who also included the residents and the business community of Mavoko Municipality. An interview schedule was also administered to council officers. For secondary data, both unpublished and published
sources were used to get more information about the subject matter under research project.

3.5 Data Analysis
Information collected were coded for analysis. A coding scheme was prepared based on response categories that was have emerged from collected data. Descriptive statistics such as the measures of central tendencies, frequencies, percentages and tables were used to analyze the information gathered. This was done using Statistical Package for Social Sciences. In questionnaire two, factor analysis was used where the respondent was indicate their opinion on 1-5 likert scale, to determine the key factors in the implementation of commercialization process of water supply and sanitation services in the Mavoko Municipality. SPSS Computer Package was used for analysis. The analyzed data was then presented in tables, graphs, pie charts and cross tabulations. Data obtained from the open-ended questions was presented qualitatively using narratives.

3.6 Expected Output
At the end of this research project, the researcher expected to come up with a research project paper that was kept in the university’s resource centre for review by future researchers and scholars who may be interested in conducting similar studies.
CHAPTER FOUR

DATA ANALYSIS

4.0 Introduction

This research project sought to identify the factors that affect commercialization and management of water supply and sanitation services in the Kenyan urban areas, with a special reference to Mavoko Municipality.

According to Mugenda and Mugenda (1999) in order for one to obtain quantifiable information from a sample population using a descriptive research survey design, one has to analyze detailed descriptions of documents. In view of this, all the details of the information contained in the documents used to collect data in this research were coded and analyzed according to the category of the respondents. Gay (1992) notes that the coding of data to develop meaningful categories and essential patterns is important in any research process.

In this research project, the numerical data and the opinions of the respondents were analyzed using quantitative and qualitative analysis procedures to obtain a balanced analysis and uphold freedom of expression (Mugenda and Mugenda, 1999). To begin with, the data was grouped according to the category of the respondents, the research questions coded and then edited to ascertain accuracy and completeness. Statistical Package for Social Sciences (SPSS) version 12.0 computer software was used to analyze the quantitative data. Qualitative data was organized on themes, categories and patterns.
pertinent to the research project. The analyzed data has been presented in Frequency Tables, Percentages, Pie Charts and Bar Graphs in this chapter.

4.1 Response Rate

The council is divided into six wards from which the Consumers were sampled for this research project. The consumers were broadly categorized as domestic, industrial/commercial and agricultural water consumers. A total of 146 respondents were reached in the research project. These comprised 12 industrial/commercial water users, 131 household consumers and 3 agricultural water consumers. Nineteen employees of the council were also interviewed in this research project on their opinions on the commercialization of water and sanitation services.

4.2 Demographic Details of the Respondents

Table 1 below shows the demographic details of the water consumers respondents interviewed in the research project. According to the table, 52.1% of the respondents were males while 47.9% were females. Majority of the water consumers in Mavoko Municipal Council are aged between 26 years and 32 years.

Most water consumers (39.7%) in the Municipality were employed while 38.4% were self-employed.

Majority of the water consumers (37.2%) had secondary education while 35.9% had college/University education.
<table>
<thead>
<tr>
<th>Demographic details</th>
<th>Frequency</th>
<th>Percent (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>76</td>
<td>52.1</td>
</tr>
<tr>
<td>Female</td>
<td>70</td>
<td>47.9</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
</tr>
<tr>
<td>&lt;18yrs</td>
<td>1</td>
<td>0.7</td>
</tr>
<tr>
<td>19-25yrs</td>
<td>22</td>
<td>15.3</td>
</tr>
<tr>
<td>26-32yrs</td>
<td>55</td>
<td>38.2</td>
</tr>
<tr>
<td>33-39yrs</td>
<td>33</td>
<td>22.9</td>
</tr>
<tr>
<td>40-46yrs</td>
<td>19</td>
<td>13.2</td>
</tr>
<tr>
<td>47-53yrs</td>
<td>11</td>
<td>7.6</td>
</tr>
<tr>
<td>54yrs+</td>
<td>3</td>
<td>2.1</td>
</tr>
<tr>
<td>Occupation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unemployed</td>
<td>23</td>
<td>15.8</td>
</tr>
<tr>
<td>Self-employed</td>
<td>56</td>
<td>38.4</td>
</tr>
<tr>
<td>Employed</td>
<td>58</td>
<td>39.7</td>
</tr>
<tr>
<td>Businessperson</td>
<td>8</td>
<td>5.5</td>
</tr>
<tr>
<td>Others</td>
<td>1</td>
<td>0.7</td>
</tr>
<tr>
<td>Educational Level</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Primary</td>
<td>39</td>
<td>26.9</td>
</tr>
<tr>
<td>Secondary</td>
<td>54</td>
<td>37.2</td>
</tr>
<tr>
<td>College/University</td>
<td>52</td>
<td>35.9</td>
</tr>
</tbody>
</table>

4.3 Duration of being a Customer/Resident of Mavoko Municipality

The respondents were asked how long they have been residents/customers of Mavoko Municipality and majority (37.0%) said they have been customers/residents for between 6 years and 10 years. See figure 1 below.
4.4 Main water Sources

Water is a fundamental basic need for sustaining human economic activities. When the respondents were asked to state their main water sources, more than two-thirds (66%) of the respondents said they get water from the council while 27% get their water from private suppliers and 6% get their from own wells. Only 1% of the respondents said they get their water from springs/rivers/lakes as shown in figure 2 below.

Customers of water from the council were divided on their level of satisfaction with council water with 41.6% of the respondents saying they are satisfied while another 41.6% saying they are dissatisfied. The remaining 16.8% of the respondents who draw water from the council were neutral. The respondents mentioned the following reasons to justify their dissatisfaction with the water from the council:

- Salty water
- Water contaminated with sewage
- Very expensive
- Water shortages
- Low pressure of water
- Poor response by council officers in cases of breakdowns
- Inadequate pipes
- Long distance from the water source

As for the respondents who draw water from the private suppliers, half were dissatisfied with the source of water while only 34.4% were satisfied. The remaining 15.6% were neutral about their satisfaction level with the source of water. When asked why the were dissatisfied, the respondents said it is because of:

- Cost/Very expensive
- Salty water
- Poor services
- Water shortages
- Unclean water

**Figure 4.3 Satisfaction with main water Sources**

<table>
<thead>
<tr>
<th>% Respondents</th>
<th>Council</th>
<th>Private Suppliers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Satisfied</td>
<td>41.6%</td>
<td>34.4%</td>
</tr>
<tr>
<td>Neutral</td>
<td>16.8%</td>
<td>15.6%</td>
</tr>
<tr>
<td>Dissatisfied</td>
<td>41.6%</td>
<td>50%</td>
</tr>
</tbody>
</table>

4.5 Water Shortages

When the respondents were asked if they ever experience water shortages, almost all the respondents (91%) said they do experience water shortages and only 9% said they don’t. More than three-quarters of the respondents (78%) said they experience water shortages
weekly. Lotz, (1995) noted that in Kenyan towns, the proportion of the population with drinking water connection-supply level is around 78%. He noted that in some towns, and which is also the case for Mavoko Municipality, water supplies are often interrupted for days or even months and this cannot only be attributed to inadequate water supply sources but possibly to frequent breakdowns of water pipes and mismanagement at the respective water points. See table 2 below.

<table>
<thead>
<tr>
<th>Table 4.1 Water shortages</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td>Yes</td>
</tr>
<tr>
<td>No</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>

4.6 Water Quality

Respondents were asked if they have ever suffered from any illness caused by drinking water supplied by the council and 77% of the respondents said they have not while only 23% said they have. See figure 4 below.

Figure 4.4 Ever suffered from any illness from council water

4.7 Revenue Collection

Most respondents interviewed were of the opinion that the revenue collected from the water and sanitation services were not commensurate with the services rendered. This
was indicated by 45.8% (n=142). While some (42.3%) of the respondents felt that the revenue collected were commensurate with the services offered. About 12% of the respondents said they did not know. See figure 5 below.

**Figure 4.5 Revenue Collection Commensurate with services offered**

<table>
<thead>
<tr>
<th>% Respondents</th>
<th>Yes 42.3</th>
<th>No 45.8</th>
<th>Don't Know 12</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes Response</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No Response</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**4.8 Effectiveness of the water and sewerage company**

When the respondents were asked how effective the water and sewerage company is, 37.0% of the respondents said they are fairly effective and 24.0% said they are well effective. This implies that 61.0% of the respondents feel that the water and sewerage company is effective. Only 29.5% of the respondents said that the water and sewerage company is not effective. See table 3 below.

**Table 4.2 Effectiveness of the water and sewerage company**

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Percent (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fair</td>
<td>54</td>
<td>37.0</td>
</tr>
<tr>
<td>Poor</td>
<td>43</td>
<td>29.5</td>
</tr>
<tr>
<td>Good</td>
<td>35</td>
<td>24.0</td>
</tr>
<tr>
<td>Excellent</td>
<td>7</td>
<td>4.8</td>
</tr>
<tr>
<td>Very Good</td>
<td>7</td>
<td>4.8</td>
</tr>
<tr>
<td>Total</td>
<td>146</td>
<td>100.0</td>
</tr>
</tbody>
</table>
4.9 Commercialization of water and Sanitation Services at the Municipality

According to World Bank Report (1994) commercialization of water supplies and sanitation services implies running the utilities on business lines characterized by factors such as clear coherent goals focused on delivering services, autonomous management and financial independence.

The respondents were asked if they were aware of the commercialization of water and sanitation services at Mavoko Municipality and about two-thirds of the respondents (61%) said they were aware while 33.1% were not aware (n=142). Four respondents failed to respond.

Table 4.3 Aware of the Commercialization of water and sanitation services at Mavoko Municipality

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Percent (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aware</td>
<td>87</td>
<td>61.3</td>
</tr>
<tr>
<td>Not aware</td>
<td>47</td>
<td>33.1</td>
</tr>
<tr>
<td>Not Sure</td>
<td>8</td>
<td>5.6</td>
</tr>
<tr>
<td>Total</td>
<td>142</td>
<td>100.0</td>
</tr>
</tbody>
</table>

The respondents gave the following comments on the commercialization and management of water supply and sanitation services by Mavoko Municipal Council:

- Encourage more commercialization
- Do more on public awareness on the commercialization
- It has made water more available
- It has improved service delivery
- It has reduced corruption rates
- License more private companies to serve the growing population
The above statements from the respondents are in line with the Sessional Paper No. 1 of 1986 on Economic Management for Renewed Growth that identified commercialization of water supplies and sanitation services as the only way to improve the provision of these services to the ever growing population of Mavoko Municipal Council.

4.10 Satisfaction with attributes of Commercialization of water and Sanitation Services

Respondents were asked to indicate their level of satisfaction to certain attributes of commercialization of water and sanitation services. According to the results in table 5 below, respondents seemed generally satisfied with almost all the attributes except for public awareness and information flow where 69.3% of the respondents indicated that they were not satisfied and only 30.7% were satisfied. This implies that there has not been adequate public awareness on commercialization of water and sanitation services to the customers.

<table>
<thead>
<tr>
<th>Attributes on commercialization of W &amp; S services</th>
<th>Satisfied (%)</th>
<th>Dissatisfied (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prompt response to customer complaints</td>
<td>59.9</td>
<td>40.1</td>
</tr>
<tr>
<td>Revenue collection and billing system</td>
<td>66.2</td>
<td>33.8</td>
</tr>
<tr>
<td>Cost of services</td>
<td>62.4</td>
<td>37.6</td>
</tr>
<tr>
<td>Public awareness and information flow</td>
<td>30.7</td>
<td>69.3</td>
</tr>
<tr>
<td>A motivated staff (efficient and effective)</td>
<td>72.0</td>
<td>28.0</td>
</tr>
<tr>
<td>Speedy reconnections after payments</td>
<td>58.4</td>
<td>41.6</td>
</tr>
<tr>
<td>Levels of corruption by the council officers and the water and sewerage company staff</td>
<td>79.4</td>
<td>20.6</td>
</tr>
<tr>
<td>Public relations</td>
<td>79.3</td>
<td>20.7</td>
</tr>
</tbody>
</table>
4.11 Formation and Composition of the W & S Company

An in-depth interview with Municipal Council of Mavoko employees revealed that commercialization of water & Sanitation Services in Mavoko Municipality was begun in the year 2006. The optimum representation of council in the Board of Directors of W & S Company is less than 50%.

The W & S Company has the borrowing power to finance capital investment.

The company does not contract private companies to carry out some of its operations.

According to the employees of the council, the public is informed about the commercialization of the W & S utilities.

Revenue collected from the W & S Company is always used for the operations of the company. Revenue collection efficiency was estimated at between 50-80%. About two-thirds of the employees said that the W & S tariffs cover full cost of provision of the service.

Several factors have been identified that affects implementation of full commercialization of water supply and sanitation services within the Municipal Council of Mavoko. Among the major factors identified by the council employees were; Lack of organization structure, lack of clear policy, poor management, high tariffs, poor coordination of activities, lack of community awareness, poor revenue collection, poor public relation, transfer of chief officers, lack of motivation, inconsistent and inaccurate billing, and lack of ringfencing and misappropriation of water revenues.
4.12 Problems of water supply encountered within the Municipality

Residents and customers of Mavoko Municipality listed the following problems which they have encountered in the last five years as far as water supply and sanitation services are concerned; delay in delivery of bills, inaccurate bills, high rates charged, water shortages, untreated water, pipe bursts, salty water, improper disconnection, poor drainage for sewerage, and poor quality of water.
CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.0 Introduction
This chapter presents summary of major findings, conclusions and recommendations in line with the findings from the research project.

5.1 Summary of Major Findings
Commercialization of water & Sanitation Services in Mavoko Municipality wasgun in June year 2006 as an amalgamation of two entities; the Mavoko Municipal Council and Export Processing Zone (the latter is a Government Parastatal). The respondents observed that as a result of commercialization there is prompt response to customer complaints, improved revenue collection and billing system, affordable cost of services, a motivated staff at the council, speedy reconnections after payments, and reduced level of corruption by the council employees. Many of the respondents (61%) were aware of the commercialization of water and sanitation services at the Municipality.

The employees of the council interviewed in this research project identified the following factors affecting full commercialization of water and sanitation services within the municipality; lack of organization structure, lack of clear policy, poor management of water resources, and lack of community awareness, poor revenue collection and misappropriation of funds. Other than the above factors, the employees were found to be highly demotivated and very poorly paid.
The research project established that the main sources of water for the users within the Municipal Council of Mavoko were the council water (66%) and private suppliers. The respondents generally complained that water from the council is salty, very expensive and that there are frequent water shortages.

The water and sanitation company was rated as effective by most respondents (61%) interviewed. In order for full commercialization to take place, respondents made the following recommendations;

That water be made more available, improve on sewer and drainage reticulation, increase water pressure by contracting water reservoirs to serve each urban areas within Mavoko Municipality. Control of water tariffs to manageable level and improvement of water quality standards, employment of qualified staff at management and operation which would assure the provision of effective and efficient service delivery; and finally reinforcing the water revenue so that water finances could be used specifically for water services provision.
5.2 CONCLUSIONS

The research found out that the process of commercialization has not been finalized within Mavoko Municipal Council and hence recommends that the process be carried out to its completion in line with the recommendations stated below.

5.3 RECOMMENDATIONS

For the success of effective commercialization, Mavoko Water department, which has moved to form a company, must plan for the provision of adequate portable water, critically evaluate staff with the purpose of having qualified management and operational staff, come up with organizational structure that was allow for future expansion and have a proper coordination of water activities in line with the modern management practices, and control the available water resources and revenue that accrues from it.

The department must also have adequate tariff design system that was ensure financial autonomy of the organization, conserve water resources and have socially acceptable and affordable tariff.

Mavoko Water Department must also ensure that operation and maintenance of both water sewerage systems that was guarantee adequate water distribution and sewerage services at the minimum cost.
The department must also have well trained motivated staffs to undertake all the activities in providing drinking water and sewerage services. More can also be achieved if the council is involved in community awareness and improve on the general service delivery.

The department was also benefit from involvement of private sector in the provision of the facilities and services in order to enhance provision for water. They can be involved either as partners or as a principal agent.
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Sanitation System; A guide for Managers. The word Bank, Washington, DC
## APPENDICES

### APPENDIX 1: WORKPLAN

<table>
<thead>
<tr>
<th>PERIOD / TIME</th>
<th>ACTIVITIES</th>
</tr>
</thead>
<tbody>
<tr>
<td>May-June 2007</td>
<td>Research proposal &amp; project writing</td>
</tr>
<tr>
<td>June 2007</td>
<td>Proposal discussions/ processes with the supervisor. Preparation of questionnaire and relevant forms to be used during the data collection.</td>
</tr>
<tr>
<td>July 2007</td>
<td>Proposal defense and Final submission/approval by supervisor and project panel</td>
</tr>
<tr>
<td>August 2007</td>
<td>Booking of appointments and liaising with the various respondents from whom the researcher intend to collect data. Organizing the population to be sampled. Actual distribution of the structured questionnaires to the sampled population. Collection and assembling of data.</td>
</tr>
<tr>
<td>September 2007</td>
<td>Data analysis should be done during this time. Report writing and editing. Other conclusions and Final research presentation.</td>
</tr>
</tbody>
</table>
## APPENDIX II: BUDGET PLAN

<table>
<thead>
<tr>
<th>ITEM</th>
<th>QUANTITY</th>
<th>UNIT PRICE</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Typed Proposal</td>
<td>1 (50 pages)</td>
<td>100</td>
<td>500</td>
</tr>
<tr>
<td>Proposal copies</td>
<td>4 (200 pages)</td>
<td>400</td>
<td>16000</td>
</tr>
<tr>
<td>Binding</td>
<td>8 copies</td>
<td>100</td>
<td>800</td>
</tr>
<tr>
<td>Diskettes</td>
<td>8 pieces</td>
<td>90</td>
<td>720</td>
</tr>
<tr>
<td>Questionnaires</td>
<td>500 copies</td>
<td>200</td>
<td>10,000</td>
</tr>
<tr>
<td>Research Assistants</td>
<td>6x 10 days</td>
<td>2000</td>
<td>120,000</td>
</tr>
<tr>
<td>Report</td>
<td>1</td>
<td>800</td>
<td>800</td>
</tr>
<tr>
<td>Computer Time (Internet Time &amp; analysis)</td>
<td>150 hrs</td>
<td>120</td>
<td>18000</td>
</tr>
<tr>
<td>Report duplicates</td>
<td>4 copies</td>
<td>150</td>
<td>600</td>
</tr>
<tr>
<td>Contingency</td>
<td>-</td>
<td>-</td>
<td>3210</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td>-</td>
<td>-</td>
<td><strong>156,230</strong></td>
</tr>
</tbody>
</table>
APPENDIX III: QUESTIONNAIRE

(FOR THE RESIDENTS/CUSTOMERS)

SECTION A: SOCIO-DEMOGRAPHIC DETAILS OF THE RESPONDENTS

A1: Name of the Respondents (Optional) .................................................................

Socio-demographic details of the respondents:

<table>
<thead>
<tr>
<th>A2: Gender</th>
<th>A3: Age</th>
<th>A4: Occupation</th>
<th>A5: Educational level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>□ Less than 18yrs</td>
<td>□ Unemployed</td>
<td>□ None</td>
</tr>
<tr>
<td>Female</td>
<td>□ 19yr-25yrs</td>
<td>□ Self-employed</td>
<td>□ Primary</td>
</tr>
<tr>
<td></td>
<td>□ 26yrs-32yrs</td>
<td>□ Employed</td>
<td>□ Secondary</td>
</tr>
<tr>
<td></td>
<td>□ 33yrs-39yrs</td>
<td>□ Businessperson</td>
<td>□ College/University</td>
</tr>
</tbody>
</table>
|           | □ 40yrs-46yrs | □ Others (Specify)...
|           | □ 47yrs-53yrs |                      |                       |
|           | □ 54yrs and above |                    |                       |
SECTION B

Please tick (√) where necessary.

1. For how long have you been resident/customer of Mavoko Municipality?
   - Less than one year ( )
   - 1-5 years ( )
   - 6-10 years ( )
   - 16 years and above ( )

2. What is your main source of water?

<table>
<thead>
<tr>
<th>Source of water</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water purchased from the council</td>
<td>( )</td>
</tr>
<tr>
<td>Water purchased from private suppliers of water (e.g. borehole operators)</td>
<td>( )</td>
</tr>
<tr>
<td>Water sourced from own well(s)</td>
<td>( )</td>
</tr>
<tr>
<td>Water sourced from spring, rivers, lakes or pond for free</td>
<td>( )</td>
</tr>
</tbody>
</table>

3. What is your degree of satisfaction with these sources of water?

   Use: 1=Satisfied; 2=Neutral(neither dissatisfied nor satisfied); 3=Dissatisfied

<table>
<thead>
<tr>
<th>Source of water</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water purchased from the public utility company (municipality owned company)</td>
<td>( )</td>
</tr>
<tr>
<td>Water purchased from private suppliers of water (e.g. borehole operators)</td>
<td>( )</td>
</tr>
</tbody>
</table>

4. In case you are dissatisfied with the above sources of water, please indicate the reasons:

<table>
<thead>
<tr>
<th>Source of water</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water purchased from the municipal council</td>
<td></td>
</tr>
<tr>
<td>Water purchased from private suppliers of water (e.g. borehole operators)</td>
<td></td>
</tr>
</tbody>
</table>

5. (a) Do you ever experience water shortages

   Yes ( )
   No ( )

   (b) If yes, how often do you experience water shortages?
   - Daily
   - Weekly
   - Monthly
   - Every two or three months
   - Never or almost never

6. Have you ever suffered from any illness caused by drinking water supplied by your council?
7. Are you aware of the commercialization of water and sanitation services at Mavoko Municipality?

<table>
<thead>
<tr>
<th>Aware</th>
<th>()</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not Aware</td>
<td>()</td>
</tr>
<tr>
<td>Not Sure</td>
<td>()</td>
</tr>
</tbody>
</table>

8. Do you think that the revenue collected for the water and sanitation services is consumerate with the services rendered?

<table>
<thead>
<tr>
<th>Yes</th>
<th>()</th>
</tr>
</thead>
<tbody>
<tr>
<td>No</td>
<td>()</td>
</tr>
<tr>
<td>Do not know</td>
<td>()</td>
</tr>
</tbody>
</table>

9. How would you rate the effectiveness of the water and sewerage company in terms of service delivery?

| Excellent | () |
| Very Good | () |
| Good | () |
| Fair | () |
| Poor | () |

10. As a resident/customer of Mavoko Municipality which problems have you encountered in the last five years as far as water supply and sanitation services are concerned. (Please list five).

- ...........................................................
- ...........................................................
- ...........................................................
- ...........................................................
- ...........................................................

11. In your own wards, what do you think the Municipal Council of Mavoko and water and Sewerage Company can do to solve the above problems?

- ...........................................................
- ...........................................................
- ...........................................................
- ...........................................................
12. Please indicate your level of satisfaction to the following factors by ticking in the appropriate box:

<table>
<thead>
<tr>
<th>Factor</th>
<th>Fully dissatisfied</th>
<th>Fairly dissatisfied</th>
<th>Satisfied</th>
<th>Fairly Satisfied</th>
<th>Highly Satisfied</th>
</tr>
</thead>
<tbody>
<tr>
<td>(i) Prompt response to customer complaints</td>
<td>()</td>
<td>()</td>
<td>()</td>
<td>()</td>
<td>()</td>
</tr>
<tr>
<td>(ii) Revenue Collection and billing system</td>
<td>()</td>
<td>()</td>
<td>()</td>
<td>()</td>
<td>()</td>
</tr>
<tr>
<td>(iii) Cost of Services</td>
<td>()</td>
<td>()</td>
<td>()</td>
<td>()</td>
<td>()</td>
</tr>
<tr>
<td>(iv) Public Awareness and information flow</td>
<td>()</td>
<td>()</td>
<td>()</td>
<td>()</td>
<td>()</td>
</tr>
<tr>
<td>(v) A motivated staff (efficient and effective)</td>
<td>()</td>
<td>()</td>
<td>()</td>
<td>()</td>
<td>()</td>
</tr>
<tr>
<td>(vi) Speedy reconnections after payments</td>
<td>()</td>
<td>()</td>
<td>()</td>
<td>()</td>
<td>()</td>
</tr>
<tr>
<td>(vii) Levels of corruption by the Council Officers and the Water &amp; Sewerage Company Staff</td>
<td>()</td>
<td>()</td>
<td>()</td>
<td>()</td>
<td>()</td>
</tr>
<tr>
<td>(viii) Public Relations</td>
<td>()</td>
<td>()</td>
<td>()</td>
<td>()</td>
<td>()</td>
</tr>
</tbody>
</table>

13. Do you have any comments on the commercialization and management of water supply and sanitation services by the Mavoko Municipal Council?

____________________________________________________________________
____________________________________________________________________
____________________________________________________________________
____________________________________________________________________

THANK YOU FOR YOUR TIME.
QUESTIONNAIRE II
(FOR MUNICIPAL EMPLOYEES)

PART ONE

Please indicate your choice by ticking inside the bracket.

1. In which year did your town begin commercialization of W&S services? 19

2. What is percentage of unaccounted for water?
   A) Less than 20% ()
   B) Between 20% and 50% ()
   C) Over 50% ()

4. What is the optimum representation of council in the Board of Director of W&S Company?
   Less than 50% ()
   More than 50% ()

5. Who will have the borrowing power to finance capital investment?
   Company () Local Authority ()

6. Does the company contract private companies to carry out some of its operations?
   Yes () No ()

8. If yes in 6 above, what is the percentage?
   Less than 25% ()
   Between 25-50% ()
   Above 50% ()

7. Is the public informed about commercialization of the W&S utilities?
   Yes ()
   No ()

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9. What is the percentage of revenue collection efficiency?
   Less than 50% ()
   Between 50-80 %() 
   Above 80% ()

10. Does the revenue collected form W& S Company used for other purpose other than the operation of the Company.
   Yes ()
   No ()

11. Does the W&S tariffs cover full cost of provision of the service?
   Yes ()
   No ()

12. If Not, what percentage of the cost do they cover._______________

PART TWO
Several factors have been identified that affects implementation of full commercialization of water supply and sanitation services in your town. Please indicate to what extent you consider each of the following factors to have contributed to limiting implementation of the commercialization process. A score of (1) will imply least influence while a score of (5) will imply most influence.

1. Formation of water and sanitation (W&S) service.
   1 2 3 4 5

2. High influence by Central Government
   1 2 3 4 5

3. Lack of clear policy guidelines
   1 2 3 4 5

4. Changes of Civic leaders due to General Election
   1 2 3 4 5

5. Lack of motivation of employees
   1 2 3 4 5

6. Lack of commitment of both chief officers and company management
   1 2 3 4 5

7. Lack of adequate organization structure to effectively carry out the activities of W&S
   1 2 3 4 5

8. Lack of community awareness and participation
   1 2 3 4 5

9. Interference by civic leaders
   1 2 3 4 5

10. Poor team work between relevant government ministries, Local authority and community
   1 2 3 4 5

11. Personal interest of the chief officers for example job security.
   1 2 3 4 5

61
12. Contradiction of both Company and Local Authority Acts affecting the registration of W&S companies.

13. Unfilled vacancies at top management posts.

14. Lack of trained personnel.

15. Transfer of Chief Officer of the town.


17. Lack of management information to middle and lower cadre management.

18. Tariffs that don't cover full cost of W&S services.

19. High levels of unaccounted for water.

20. The old manual billing process.

21. Lack of enough drinking water sources.

22. Poor revenue collection process.

23. Misappropriation of revenue collected from W&S services.

24. Lack of enough investment funds.

25. Poor methods of acquiring materials and issuing Supplies.

26. Lack of computerizing information system.

27. Insufficient flexibility in bill payments offered.

28. Lack of strategic planning in all levels of Management.

29. Lack of adequate knowledge of the exact value of the assets the Company has.

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| 30. Poor public relation | 1 | 2 | 3 | 4 | 5 |