

Provision of Water and Sanitation in Kenyan Urban Areas: An Evaluation of Existing and Alternative Models

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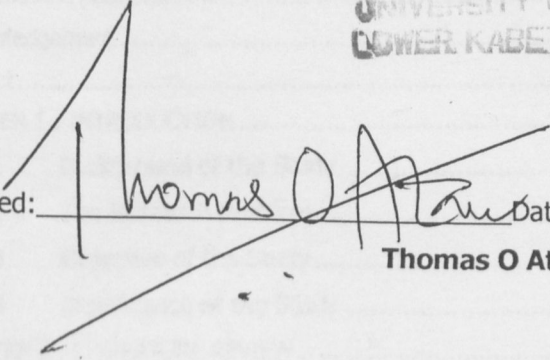
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DECLARATION

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

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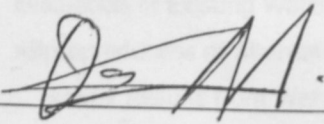
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ACRONYMS AND ABBREVIATIONS

A1	Water Services Department Water Provision model where the public owns the infrastructure and the operations carried out by a department of the Local Authority
A2	Water Services Company Water Provision model where the public owns the infrastructure and the operations carried out by a private company wholly owned by the Local Authority
B1	Service Contract Water Provision model where the public owns the infrastructure and certain functions of the operations carried out by a private company
B2	Management Contract Water Provision model where the public owns the infrastructure and operations are by a private company not owned by the Local Authority
GTZ	Deutsche Gesellschaft für Technische Zusammenarbeit The German society for technical co-operation (GTZ) is a worldwide enterprise of international co-operation for sustainable development. GTZ is involved in approximately 2,700 development projects and programs in more than 130 countries of the South and the East, primarily on behalf of the German Federal Government.
KfW	Kreditanstalt für Wiederaufbau. The KfW development bank promotes projects and programs on behalf of the German Government in developing countries.
LAs	Local Authorities
MENR	Ministry of Environment and Natural Resources
MLG	Ministry of Local Government
MWR	Ministry of Water Resources For the purposes of this study, the Ministry in charge of water matters is referred to as the Ministry of Water Resources. It has been variously referred to as the Ministry of Lands Reclamation, Regional and Water Development and the Ministry of Water Resources in the literature review.
O&M	Operations and Maintenance
UfW	Unaccounted For Water
W&S	Water and Sewerage/Sanitation
WSC	Water and Sewerage/Sanitation Company
WSD	Water and Sewerage/Sanitation Department

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ABSTRACT

That water is essential for both consumption and for sanitation is not in doubt. Its management determines how people relate to their health, socio-cultural, economic development and their environment.

Poor performance of urban water provision and public utilities in developing countries have led to calls for a reduction in the role of the state and the increased role of the private sector in what has traditionally been the domain of the public service. The challenges faced by water providers in urban areas are wide and varied. They include the rapid population growth due to rural-urban migration and the changing profile of these populations, with an increasing percentage being poor.

Globally, governments have responded by implementing various water provision models, including fully-fledged privatisation, commercialisation, concessions and management contracts.

In Kenya, the Government initiated interventions in 1986 with the production of a Sessional Paper that stipulated the necessary measures to achieve commercialisation. Nine municipalities namely Eldoret, Kericho, Kisumu, Kitale, Nakuru, Nanyuki, Nyahururu, and Nyeri were identified as pilot towns for commercialisation.

The primary objective of this research project was to identify whether the commercialisation so far undertaken in Kenya have successfully responded to the challenges. The other objective was to give recommendations on whether other water provision models might produce better results.

In chapter one of this report, the introduction and the background of the study have been outlined. The research problem, objectives of the study and its significance has also been stated. Chapter two which comprises the literature review, has presented the key issues in Water and Sanitation utilities, and explained the different models. Chapter three has covered the research methodology, the population, methods of data collection and analysis. Chapter four has the data analysis and findings while chapter five contains conclusions and recommendations. Further topics of research related to this area of study are also suggested here.

CHAPTER 1 : INTRODUCTION

1.1 Background of the Study

Water is essential for life, both for consumption and for sanitation. How it is managed determines how people relate to their health, socio-cultural, economic development and their environment. Access to clean water means that a community's health status is not compromised by "water borne" and related diseases. Availability of water also ensures that a community is culturally and economically sustainable.

Demand for fresh water has tripled in the past 50 years, and continues to rise as a result of population growth and economic development. Water mismanagement has become a crisis of governance that will impact heavily on public health and the environment, while heightening tensions and conflicts over declining resources. Worldwide, the greatest impacts will be on the poor, who are most vulnerable to water-borne illness - which further perpetuates their poverty (Sawin, 2003).

Out of an estimated 784 million people living in Africa in 2000, only 62 percent were served by an "improved" water supply. By the year 2015, urban population in Africa is projected to increase by 68%, to 501 million. Since most of the urban migrants are low-income earners, this will lead to the proliferation of low-income settlements in the urban centres (Kayaga, 2002). In Kenya, the number of people living in poverty is estimated to have risen from 11 million or 48% of the population in 1990 to 17 million or 56% of the population in 2001 (GoK, 2003). Per capita income in constant 1982 prices has also declined from US\$ 271 in 1990 to US\$ 239 in 2002 (GoK, 2003). Kenya has identified a strong link between poverty and lack of access to improved water supply and sanitation (GoK 2003).

Being a social commodity, it has been incumbent upon the Government provided water, either directly or through quasi-government organizations like LAs and parastatals. This has largely been due to the amount of capital required for infrastructure maintenance with no guarantee of returns. For instance, the first phase of the Dar es Salaam, Tanzania project covering infrastructure rehabilitation and improvement was expected to cost the government \$145 million (Mason and Talbot, 2002).

Parastatals operate under delegated public management but lack the Public Limited Status. Consumers therefore have no power over these organizations through

representation on the board or as shareholders. Parastatals have no mechanism for feeding back the consumers' interests, wishes and complaints. Their boards are usually composed of top civil servants and lack consumer representation (Sibanda, 2002).

The poor performance of urban water provision and public utilities in developing countries, increasing economic difficulties and changes in prevailing ideologies have led to calls for a reduction in the role of the state and the increased role of the private sector in what has traditionally been the domain of the public service. Public water providers have embraced different models as the best institutional means to escape from public service decay (Onjala, 2002).

The Government has water projects in both urban and rural areas. This study will confine itself to the provision of water in urban areas. For the purposes of this study, an urban area will take the World Health Organisation definition: urban centers according to national criteria. Rural areas are those outside urban centers according to national criteria (WHO, 2000).

All organizations lend themselves to the external environment. The environment is highly dynamic and continually presents opportunities and challenges (Pearce and Robinson, 1999). Water service providers are not an exception. The challenges faced by water providers in urban areas are wide and varied and include the rapid population growth due to rural-urban migration and the changing profile of these populations, with an increasing percentage being poor.

Governments have added to the challenges by under-investing in water infrastructure. Revenues from water provision have also not been adequate to meet costs. Low or non-collection of revenue has exacerbated the problem (Briscoe, 1998). Inefficient metering and billing too have contributed to large proportions of supplied water being unaccounted for (Kanyuiro, 1988).

Large-scale civil projects and specifically water infrastructure developments like dam construction have not been immune to dishonest practises, and cases of corruption have been documented. Musa (1999) found that a major cause of time delays and cost overruns in Kenya's government funded water projects was corruption. This has increased the cost of supplying water.

Further turbulence in the environment has been presented by the international development partners like the International Monetary Fund who have pressured

developing countries into opening up provision of water to private companies as a condition for receiving assistance. According to Mason and Talbot (2002) African countries were required to open up water supply to private companies as a condition for receiving IMF loans. In many of these cases the IMF loans were negotiated under the Poverty Reduction and Growth Facility (PRGF) introduced in 1999.

There are several reasons for the generally poor performance of public water utilities. Alfaro et al (1997) found that Water and sewerage service is a natural monopoly, and as a result customers cannot easily impose discipline on a utility that offers an inferior price/service combination by abandoning it for another provider who offers a superior one. For the same reason, performance comparisons for the purpose of encouraging efficient operation are difficult. Thus, both market and bureaucratic constraints on management inefficiency are weak.

Government, as "owner" and operator of water utilities, has multiple objectives and no explicit approaches for making the appropriate tradeoffs between them. Even in the best of circumstances, this greatly complicates the tasks of managers and, also the task of evaluating managerial performance (Alfaro et al 1997).

Alfaro et al (1997) also established that in public-owned firms, there is no person or group who gets the profits, no "residual claimant" whose overriding goal, subject to socially determined constraints, is maximizing the difference between revenues and costs. Therefore, with the absence of a performance-based incentive system, there is no manager of the water utility whose wealth will be significantly increased through superior performance of the utility. The consequence of this is operational inefficiency. Many utilities are overstaffed, often with unqualified personnel, with between 10 and 20 employees per 1000 water connections in 1991 in most Latin American utilities compared to about 3 in Santiago and between 2 and 3 in Europe. Levels of unaccounted for water are also high, in some cases close to half the total water production. These losses are a consequence of leaks due to inadequate maintenance of infrastructure and "commercial losses" resulting from illegal connections, under-registering meters and inadequate billing and collection practices. With the lack of performance-determined pay for managers there is little incentive to resist political plunder of the utility, which can take place through patronage employment, appeasement pricing, or through corrupt procurement and billing practices.

Globally, governments have responded to these challenges by implementing various water provision models. These have varied from fully-fledged privatisation,

commercialisation, concessions to management contracts. Public water companies were created as agents to LAs give consumers a direct say in strategic decisions like approval of budgets, investment plans, proposed changes to tariffs etc. However, these companies continued to suffer from the continuance of "government mentality" and the desired improvements in cost recovery, consumer orientation and operational efficiency were not realised although service improved (Sibanda, 2002).

The public sector will continue to play a primary role in terms of regulation and financing. According to Briscoe (1998), where the private sector has been engaged, the results have generally been encouraging - accountability, efficiency, quality and coverage have improved markedly. But as currently structured in most developing countries, the water supply sector will attract little private capital. There is a long history of underpricing, politicised debate about "basic needs" and the moral imperative of subsidies that do not augur well for high capital intensity, long payback periods and the associated risks. Mukundi (1999) agreed with Briscoe (1998) that most government ministries, departments and state owned public utilities suffer from multiple and conflicting objectives and inadequate accounting for costs or financial risk, which put little emphasis on revenue collected and the quality of services delivered.

The ingredients for any W&S utility in developing countries to be successful include the paying of attention to both long-term vision and the transition processes to that vision. According to Briscoe (1998), utilities must also ensure efficiency in production and delivery as well as acceptable quality of services. They by necessity must also have a wide coverage while at the same time paying attention to environmental impact of their actions.

Briscoe (1998) reported that W&S services must be accessible to the poor, as this group forms an increasing part of the urban population. Subsidies are an option, and until the late 1980s water utilities in most developing countries used cross-subsidies to address the needs of the poor. The universally stated rationale for subsidizing services is that "water is a basic human need, for which the poor cannot afford to pay". However in virtually every situation, when services are rationed, it is those with access to political power (the rich and middle classes) who get served, and it is the poor who do not get services and have to rely on the "black market". The consequence of "social tariffs" is that the rich are heavily subsidized, while the poor pay high prices for "black market" water. The "hydraulic law of subsidies" always pertains - water flows towards influence and power. The poorer the country, the greater the rationing and the greater the negative impact of "social subsidies" on the poor.

While subsidies help the poor to mitigate the effects of the increased costs of water, they introduce several distortions. First, it means that each poor person served means a financial loss for the utility, which, consequently, creates disincentives to serve the poor. Second, it means that utility managers are diverted from their primary focus, which is running their company efficiently (Briscoe, 1998). Chile introduced a new approach that separated the welfare and business functions, by introducing "water stamps" that were provided by the government to the poor, and used by the recipients to pay part of their water bills (Alfaro et al, 1997). This worked very well and meant that utility managers were now out of the welfare business.

Cross-subsidy schemes, by their nature, generally result in inefficient pricing from a resource allocation perspective. They may encourage socially costly efforts to avoid the price-discrimination upon which such schemes depend, including both illicit behavior such as corrupting meter readers or diverting water before it is metered, and legal, but costly, behavior such as developing private wells and other independent sources of water supply (Alfaro et al, 1997).

W&S services must also be capable of transiting out of a "low-level equilibrium trap". According to Briscoe (1998), another key issue for water utilities in developing countries is making a transition out of a "low-level equilibrium trap", in which the quantity and quality of services are poor, willingness to pay is low, revenues are low, services are poor. An innovative approach in Conakry, Guinea showed that creative financing could help break out of this vicious cycle. In 1987, the government water utility functioned very poorly, and the quality of services in Conakry was abysmal. The government of Guinea decided that they wanted to attract the private sector. However no private company was interested in a contract when revenues were only a fraction of the costs. The private operator was then assured of efficient revenues by a combination of (initially low, but rising) revenues from users and (initially high, but declining) subsidies from the government (largely paid out of a World Bank credit). A time-bound, transparent "transition subsidy" was used to improve services, and then raising tariffs for the improved service. The vicious cycle was replaced by a virtuous cycle of good service and reliable revenues.

Another key issue in W&S services is its ability to manage and reduce Unaccounted for Water (UFW). In many cities in developing countries, more than half the water supply is unaccounted for. This loss is normally attributed to leakage, metering error or non-recoverable uses of water (WHO 1994). Rates of Unaccounted for Water (UFW) vary from

system to system, but evaluation findings confirm that in most water supply entities they are unduly high. In 1989, Singapore's UfW of about 10 percent ranked the lowest in the world. Manila, Philippines, has consistently had UfW rates around 60 percent, and Amman, Jordan, around 58 percent (World Bank, 1994B). Specifically, UfW is attributed to leakage arising from spillage of water from overflow devices of the service reservoirs, from pipes or other parts of the distribution system. It can also be attributed to metering errors and this accounts for a substantial part of total losses and is 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 errors in the metered quantities of water rather than with actual loss of water. Metering error also lead to inflated billing, with high default rates being a consequence. Non-recoverable water supply is also a cause of ufW. This represents losses from quantities of water that are not accounted for in the supplier's invoices. This category includes operational consumption (washing and disinfecting pipes and service reservoirs) and illegal connections.

Under-investment due to other governmental priorities also affects performance in W&S utilities. Revenues from water are usually not ploughed back while huge investments are required for major capital works, both to maintain existing and to expand infrastructure. Structural adjustments led to reduction of funding (Mwongera, 1994) and also to high deterioration of the infrastructure of these services, which compromised the health of the people. Funds generated through water revenue are also diverted to other uses such as payment of councillors' salaries and allowances other than to support the water system (Onjala, 2002).

Revenues collected are usually not enough to meet costs. Kanyuiro (1988) in his study entitled "Application of Trend Analysis to model Domestic Water Consumption Patterns for selected residential areas of Nairobi" acknowledged that that the provision of water in Nairobi is only possible if adequate revenue is generated from water sales to cover capital, O&M costs. He attributed poor collection of revenue to delay in reading the meters, and subsequently delay in prompt billing. His study determined that by reading meters less frequently, NCC could reduce some problems experienced by Nairobi WSD, like transport required to get to the meter readers in the field. This would translate into accurate readings and release meter readers to attend to other tasks like reporting of any repair and maintenance requirements. However, Kanyuiro's proposal looked at a single factor that contributed to inefficient billing. He did not address the other challenges faced by water providers, so it would be correct to assume that even if the NCC adopted his proposal, the city's water challenges would still have persisted.

Paradoxically, it is frequently and incorrectly asserted that spending on the sector has declined in recent decades. A World Bank review of public expenditures in developing countries shows that public investment in the W&S sector increased from under 0.3% of GDP in the 1960s and 1970s, to over 0.4% of GDP in the 1980s (Briscoe, 1998). There is a lot of private financing in the informal water economy. Where there are deficits in formal supplies, households devise other ways of meeting these needs, generally at very high costs. Water vendors are ubiquitous in developing countries, and typically charge around \$3 per cubic meter of water, which is ten or more times the cost of water through the formal system (Briscoe, 1998). The magnitude of this "black economy" is huge. In the city of Onitsha, Nigeria, for example, aggregate annual payments to water vendors are 10 times the annual revenues of the water utility.

Corruption in large projects also affect the performance of W&S utilities. The Lesotho High lands Water Project (LHWP) is the largest civil engineering project in Africa and is the world's second largest water-transfer scheme in the world, after China's Three Gorges Dam. Upon completion in 2027, it will divert about 40% of the Senqu/Orange River's water through five large-scale dams. Nine companies and three international consortiums were charged in Lesotho in February 2000 with bribing the head of the Lesotho Highlands Development Authority (LHDA), the implementing agency of the LHWP with around US \$2 million dollars (Tricarico, 2000). In August 2003 Lesotho's High Court fined a German company, Lahmeyer International, more than US \$1 million dollars for bribing its way into the dams project (BBC, 2003).

Water Tariffs and Quality control can affect performance. The MLG has the full control over the pricing of water within the LAs, which undermines the latter's ability to become financially autonomous. On the other hand, the MENR controls regulation of water quality and wastewater standards that the LAs were expected to enforce. Moreover, regulatory functions of MLG and MENR are so disparate that overall enforcement and monitoring of LAs activities are often uncoordinated and inadequate (Onjala, 2002). Unenforceable Regulations also often compromises performance. Although LAs have powers to prosecute consumers who contravene W&S regulations, the penalties have not kept-up with inflation. The effort involved in going to court is not justified, as the fines are low, so the LAs main interest is to rectify the situation without recourse to the law. Consequently physical harassment; bribery and other forms of arbitrary action are common. If fines were higher, the LAs would find it justifiable to pursue legal action (Onjala (2002).

Onjala (2002) observed that political interference including internal problems brought by meddling by different interests groups. In councils, there is a preoccupation with day-to-

day affairs at the expense of longer-term considerations. The problems associated with keeping the council running on a daily basis seem to be sufficiently taxing that little time or energy is left for dealing with the growing and future water crisis (Onjala (2002). Higher echelons of Government also interfere when national level players direct their efforts to protecting vested interests over tendering, project financing and manpower recruitment in LAs. Closely linked to political interference is questionable staff discipline and morale. While LAs select, recruit and promote non-skilled, semi-skilled and technician level manpower, it cannot take disciplinary action against any of them. The Public Service Commission instead carries out disciplinary action. The MLG also supervises deployment of the most senior officers of LAs and this has led to an irregular pattern of employment and poor work ethics. The chief officers are also preoccupied with opportunistic behaviour that is detrimental to the central function of the LAs like illegal clean water supply by tankers.

It then emerges that the main problem with W&S in developing countries is the financing of the sector, which if adequate should lead to more reliable supplies, better billing systems and subsequently more likelihood of efficiency gains and payments by consumers. Any model adopted for W&S must of necessity be able to attract the financing required. As currently constituted, government is the biggest financier, consequently, utility managers correctly see government as their most important stakeholder - there is little accountability to the users of the services. But then again, because government is a fickle client, there is seldom sufficient reliable financing to cover the costs of maintenance and to extend coverage. For this reason, the result is no services at all, for others the services are of poor quality.

Lotz (1995) noted that in Kenyan towns the proportion of the population with drinking water connection supply is around 78%. In some towns however, supplies are often interrupted for days or even months, with the result that cannot be attributed to inadequate water supply sources. 34.5% of the urban population have access to appropriate centralised sewerage facilities though their conditions have been getting worse due to poor maintenance.

Until 2002, operations of WSDs within urban areas in Kenya were guided by the Water Act (Cap 372) that delineated the powers and responsibilities of a water undertaker. The WSDs are also subject to the Local Government Act (Cap 265) especially in areas of procurement of stores, appointments of staff and general organization of functions. The General Manager presents all functional matters in water as motions to the Water and Sewerage Committee for consideration by the elected councillors. These motions are then

forwarded to the Finance Committee and then adopted by the full council, which meets once a month. The WSDs are also subject to the guidelines and regulations provided by the Water by-laws. Currently many decisions go wrong at this level.

For the LAs to function as Water Undertakers, the Municipalities act in liaison with the Urban Development Department (UDD) of the MLG that also handles matters requiring the involvement of the Ministry of Water. The municipalities are empowered to issue by-laws related to the provision of water and sewerage services in their own jurisdiction. By 1997 there were 147 gazetted urban areas with 30% of them under LA appointed water undertakers. The MLG plays a facilitative and regulatory role, arranging necessary technical interventions with the MWR and financing. Some LAs run and maintain their W&S facilities (e.g. Nairobi, Eldoret, Kericho, Nyeri). Others receive water in bulk from National Water Conservation and Pipeline Corporation and run sewerage services. Others are dependent on the National Water Conservation and Pipeline Corporation for provision of water and revenue collection for water and sewerage services.

Commercialisation of water supplies and sanitation services was initiated by the Kenya Government in 1986 with the production of a Sessional Paper that stipulated the necessary measures to achieve commercialisation. In 1987, the required institutional set-up was established through the assistance of donor agencies like GTZ. Until 1997, none of the urban areas in Kenya ran W&S services on a full commercial basis, despite the initial framework being set forth by the Sessional Paper of 1986. The process of commercialisation of W&S in Kenya has been done in various ways. In general it begins with the government decentralising or relinquishing the supply and provision of these services to the LAs which are in turn, expected to operate the facilities like any service industry to earn revenue and self sustain the services. At its worst, the LA should break-even but the main objective is to make profits.

Nine municipalities namely Eldoret, Kericho, Kisumu, Kitale, Nakuru, Nanyuki, Nyahururu, and Nyeri were identified as pilot towns for commercialisation. These councils were granted water undertakership meaning that they were given the right to run water supply system independently (Lotz 1995). It was realised that despite these intervention measures W&S provision by LAs was far from being self-sustaining. The physical infrastructure in water and sewerage had already deteriorated, maintenance activities was neglected, management of both systems and services to the public was poor, water losses had reached unacceptable levels, tariffs were not cost recovering and revenue collection efficiency was below standards.

In workshops held in 1995 between the pilot towns, MWR and GTZ it was resolved to form of WSCs (Model A2) as the next step in commercialisation. Between September and October 1997 three WSCs (Kericho, Nyeri and Eldoret) were registered in the Registrar of Companies office. In deciding on model A2, a key aspect taken into account was the then LA responsibility for, and ownership of the water supply and sanitation systems. It was strongly felt that ownership of the fixed assets should remain wholly with the LAs. In order to adopt a conservative approach it was recommended that, as first stage, private sector involvement be limited to Service Contracts (model B1). In order to remove these services from the local government system, it was further felt that WSDs should be transformed into WSCs (model A2) in the Municipal Councils. Overall, there was a decision that service contract (model B1) combined with a WSC (model A2) was the model that would be compatible with the then institutional capacity in the Local Government sector. (Onjala 2002).

The experience of model B1 in Kenya has not been good as experienced with debt collection at the Nairobi City Council. This is so because open procurement processes that allow for the most competitive bids to emerge have not been practised. Debts collected through service contracts have also usually not been passed on to the council. In May 2004, Nairobi City Council awarded a multi-billion shilling garbage collection contract to an Italian company Jacarossi Imprese SPA. Kisero (2004) questioned the manner in which City Hall negotiated such a massive contract secretly, and why it was not subjected to competitive bidding. He also asked the grounds upon which the Italian company was chosen, and if due diligence was carried out to determine the company's capacity to undertake a deal of the magnitude.

Model B2 examples in place include the contracts between LA and private companies in the management of game parks. The LAs, Narok, Trans Mara, Samburu, Isiolo and Olkejuado have management contracts for the maintenance of parks falling within their jurisdictions.

In a recent development, a Water Resources Management Board has been established under the Water Act 2002 and will manage water resources in the country. This has been done in recognition of the fact that new approaches must be explored in order to develop catchment areas, enhance management and attract investment in rehabilitation/expansion of water resources management infrastructure. The Water Act 2002 (GoK, 2002) aims to create structures that will regulate water activities by separating water resources management functions from water supply delivery functions. The Act empowers the Minister to develop, review and revise a National Water Services

strategy that consists of plans for extension of water services to underserved areas, time frame for the plan and an investment programme.

1.2 The Research Problem

The Government has not been very successful in responding to the challenges posed by the environment. The use of three models in Kenyan urban areas – A1, A2 and B1 suggests that Kenyan urban areas are still experimenting to establish what the appropriate model is. If a single appropriate model is identified and adopted for use in Kenyan urban areas, provision of water to urban areas will be greatly improved, as it will directly address the challenges identified above. A key issue in the Water Act 2002, that of developing an appropriate model for the distribution of water and sanitation services in urban areas will also have been achieved.

Few studies have been carried out to determine how best W&S services can be delivered in Kenya's urban areas. Mukundi (1999) looked at reasons and modalities for the A2 model at the Nyeri Municipal Council. Kanyuiro (1988) looked at metering and billing inefficiencies with a view to addressing but an aspect contributing to water provision problems at the Nairobi City Council.

1.3 Objective of the Study

The study sought to:

1. Evaluate existing water provision models.
2. Determine if alternative models of water provision are more appropriate.

1.4 Significance of the Study

This study could assist LAs licensed to provide water in urban areas to evaluate their performance and could form the basis of future strategic direction. LAs yet to embark on improving water provision could use the study to avoid pitfalls encountered by the pioneers of various models.

The study could also assist the Water Management Regulatory Board provide direction on the most appropriate model for Kenya's urban areas.

Finally the study will contribute to the existing literature in the area of water provision in urban areas and also form the basis for further research.

CHAPTER 2 : LITERATURE REVIEW

2.1 Alternative Models for Water and Sewerage Services

The primary argument for other models is the efficiency gains that can be derived from moving from public to private provision of a service. Public provision is viewed as inherently inefficient, bureaucratic, and lacking in innovation. Private provision is viewed as inherently efficient, dynamic and effective in developing and implementing productivity and efficiency enhancing technology. Proponents of privatisation also argue that private sector involvement in delivery of urban infrastructure and services will harness private capital.

According to the World Bank Report (1994A), commercialisation of W&S services, implies running the utilities along business lines characterised by the following: clear and coherent goals focussed on delivering services, autonomous management, and accountability for results for both managers and employees on top of the enjoyment of financial independence.

Privatisation can take many forms. The institutional models available for Urban W&S Services can be broadly categorised as follows: model A: Public ownership and public operation; model B: Public ownership but private operation; model C: Private ownership and private operation (World Bank 1994).

Table 2-1: Water Provision Models

	Public Ownership	Private Ownership
Public Operations	A1 Water Services Department	D
	A2 Water Services Company	
Private Operations	B1 Service Contract	C1 Build Own Operate Transfer (BOOT)
	B2 Management Contract	C2 Reverse BOOT
	B3 Lease Contract	C3 Joint Ownership/Mixed Company
	B4 Concession	C4 Outright Sale

Source: (World Bank 1994)

The models as proposed by the World Bank have not envisaged a situation where there is private ownership with public operations, Model D.

Model A: Public Ownership, Public Operations

Model A establishes quasi independence of public entities and insulates infrastructure enterprises from non-commercial pressures and constraints. It can take two forms, operation by A1; public department, or A2 public enterprise. The effectiveness of Water Services Departments (WSDs) – A1 is severely restricted by their having to operate within the Local Government structure without any autonomy, and their impact over time has been very limited. Under model A2 the departments are given a more autonomous structure by the formation of Water and Sanitation Companies (WSCs). The WSCs are legally and financially independent, and operate under the Companies Act. This model gives the provider independent status and subjects it to the same legal requirement as private firm like standard commercial law, accounting criteria, compensation rules, labour laws and is less susceptible to government interference. Explicit contracts between and (public or private) managers or private entities involved in infrastructure services, which increases autonomy and accountability by specifying performance objectives that embody government-defined goals. The WSCs have relatively independent operations with modest incentives for efficiency and are under public control.

Performance agreements in the A-series models retain all decision-making 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 expectations and the roles, responsibilities and reward of all the public entity. In performance agreements, the LA has to promise an increased managerial autonomy for the enterprise as well as rewards for workers in exchange for fulfilling agreed performance. The duration of the agreement should be short. One year is more effective because they allow more frequent assessment. The common incentive is the weight attached to various performance indicators after careful negotiation between managers and the LA. The weights will give a sense of priorities so that the managers can concentrate on what matters most and not what might be easier to achieve.

Mukundi (1999) in his study looked at model A2 adopted by the Nyeri Municipal Council, and attempted to determine what problems, if any, were encountered. He hoped this would provide useful information to the government and other implementing agents like LAs, on the key factors that limits the implementation of this model.

Mukundi (1999) also acknowledged that W&S services provision by LAs has not been self-sustaining. The physical infrastructure has deteriorated, maintenance activities have been neglected, management of both systems and services to the public has been poor, water

losses have been unacceptable, tariffs have not been cost recovering and revenue collection efficiency has been below standards.

In his findings, Mukundi (1999) concluded that modification of the Nyeri Municipal Council adopted model is required. He established that the crucial factor for a successful institutional arrangement was not generally the maximum degree of commercialisation, but a mixture of economic incentive mechanisms, technical capabilities of the target town and a regulatory system that is appropriate to local conditions.

Significant in Mukundi's (1999) conclusions was that model A2 had not reduced unaccounted for water (UFW), which is a key measure of O&M efficiency. He then recommended that competition should be encouraged, and managed through contractual agreements (simple contracts for specific services like revenue collection to long term concessions that require operations, maintenance and facility expenditure). He also recommended that agency agreements between water providers and companies should be 3 – 5 years. He also proposed the establishment of Independent Regulatory Board to protect consumers from exploitation where direct competition is not possible and to ensure service, quality, environmental protection and service obligation.

Model B: Public Ownership, Private Operations

Model B has four possible sub-models categorized as follows: B1: Service Contracts; B2: Management Contracts; B3: Lease Contracts; and B4: Concessions. LAs still maintain ownership of the water facilities and assets but enter into agreement contracts with the private sector.

Service Contracts (B1) are the simplest form of private sector participation, under which the LA retains overall responsibility for operation and maintenance of the system, except for the specific services contracted out. Examples of such services could include Meter Reading; Billing and Collection; Equipment Rental; Construction of New Facilities. They have the advantages of being of short duration (1-2 years), and payments are directly linked to the work performed. Service contracts transfer to private providers the responsibility for delivering a specific service at lower cost of obtaining specific skills or expertise lacking in the LA – such a 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 (LA) payroll. This model permits competition amongst multiple service providers for service contracts.

There are high incentives for efficiency; commercial orientation in management; autonomy in personnel management.

Management Contracts (B2) involve a more comprehensive arrangement, whereby the LA transfers to the private contractor responsibility for the entire operation and maintenance of the system. This means that the private contractor is free to make day-to-day management decisions, without assuming any commercial risk. Contracts are renewed every 1-3 years and remuneration based on performance. Management contracts bring commercial experience to the utility. The parties involved define or negotiate service standards and there is reasonable degree of management autonomy, high incentives for efficiency and relative financial management autonomy.

Management contracts increase autonomy and reduce political interference in the day-to-day operations of service provision. However, when LAs prevent private contractors from controlling key functions affecting productivity and service quality – such as staffing, procurement – the contractor cannot be held accountable for overall performance. (Dominique, 1995)

Lease Contracts (B3) are arrangements whereby the LA supplies the major investment for production facilities, and a private contractor then pays for the right to use the public facilities providing services. The lease generally awards the contractor exclusive right to the streams of revenue for a period of 6 – 10 years. The contractor bears most of the commercial risks, but not the financial risks associated with large investment. Leases allow a mix of ownership where the LA owns the land and infrastructure facilities – water and sewerage utilities- while a private firm owns and operates the superstructure.

Concessions (B4) incorporate all the features of the lease but give the contractor the added responsibility of investment – such as for specified extension or expansion of capacity or for replacement of fixed assets. In them, the private contractor has overall responsibility for the services, including capital investment. The fixed assets, however, remain the property of the LA, but they are entrusted to the contractor for the duration of the concession period (normally 20-30 years). The provider assumes operational and investment risk. Specific performance targets are set; the provider has direct legal relationship with consumers and provides performance indemnity guarantees.

Model C: Private Ownership, Private Operations

The third group of models, model C, there is at least partial private ownership. The sale and private ownership may be prompted by the desire to separate completely ownership of W&S systems and O&M. The attractiveness to buyers however depends mainly on the rates they will be permitted to charge, because installation themselves have no alternative value. Model C includes BOOT (Build-Operate-Own-Transfer) and its variations; Reverse BOOT, in which ownership is transferred from the LA to the private sector; Joint Ownership or Mixed Companies; and outright Sale.

Build Operate Own Transfer (BOOT)(C1). Under a BOOT contract, a firm or a consortium of firms finances, builds, operates and owns a specific new facility or system. After a predetermined period of time, ownership of the facility transfers to the public authority. BOOT contracts have not been used until recently in the W&S sector, but have been extensively employed in the power and transportation sectors.

A slight variation of the BOOT system is known as BOT (Build-Operate-Transfer), whereby ownership is transferred to the LA as soon as the facility is completed, and the function of the private firm is only to build and operate it. A BOT arrangement is a good way of getting efficient delivery of bulk services, with private investment. It is however not a good solution if distribution systems are in bad shape and operating companies perform poorly. Another variation is BOO (Build-Operate-Own), whereby ownership is not transferred to the LA but remains with the private firm that builds and operates the facility. Other variations of the BOOT arrangement include: BTO (Build-Transfer-Operate) and ROT (Rehabilitate-Operate-Transfer).

Reverse BOOT (C2). In this model, ownership is transferred from the LA to the private sector. As a BOOT arrangement in itself involves a substantial risk for the private sector, and in countries where economic or political risks are high, private sector firms may not be interested in BOOT contracts. In such circumstances a reverse BOOT may be a preferable arrangement. The public sector itself finances and builds the plant, and then contracts a private firm to operate it over a long period of time. To acquire the plant gradually, the private firm pays an annual fee to the LA, which usually covers the full debt service of the entire investment cost. A reverse BOOT contract offers the advantages of lower risk that may stimulate participation of more private firms, and efficient private sector operations. It encourages the private operator to maintain the facility well, because it expects to become the owner at some point in the future.

BOOT arrangements are attractive mostly for new plants that require large amounts of financing like large water treatment plant or wastewater treatment plant. They are not suitable for water distribution or wastewater collection systems. Under a BOOT contract, the LA is often responsible for determining the demand for the service being contracted and, therefore, for the size of the facility. The duration of the contracts is almost always the period of time needed to retire the debt incurred and to provide a return to equity investors. Experience with BOOTs has shown that the legal basis for private sector involvement has to be clearly established. The effect on financing caused by the size and length of time of these contracts is also a factor, so are the pricing (level of tariffs) and contractual arrangements.

Joint Ownership, or Mixed Companies (C3), with part council and part private ownership. In some cases, such as when the country environment is risky, it may not be feasible to pass on full responsibility to the private sector. A suitable model may be the joint ownership (or mixed companies or joint ventures) whereby a private sector firm and the public authority incorporate a firm under the normal commercial code.

Outright sale to the private sector (C4) through the stock exchange transfers assets out of the public sector to private companies or individuals.

Of the models suggested by the World Bank (World Bank Report, 1994), The Water Act 2002 appears to have eliminated model C that provides for Private Ownership/Private Operations. This is because The Water Act states that the cost of construction and maintenance of any water works shall be paid out of moneys to be provided by Parliament.

According to Onjala (2002), the motivation for the privatisation of public water utilities is usually premised on the assertion that privatisation will result in significantly improved efficiencies. The evidence of the benefits of privatisation is, at best, mixed. He also acknowledges that failures of both private and public management can be found, at least in part, and blamed on an inadequate regulatory environment.

Briscoe (1995) however acknowledges that in all countries the water sector is a product of a long and complex history, and deeply embedded in the particular cultural, political and social fabric of the society. This presupposes that there is no one model that will fit all countries.

CHAPTER 3 : RESEARCH METHODOLOGY

3.1 Research Design

Survey research design was selected for this study. This design was appropriate because other models of W&S provision have not been employed in Kenya and limited research has been done in this area. The survey research design methodology has been used in Kenya when undertaking research that investigates fairly new phenomena like Information Technology. Ncube (2001) used the method in the research on "E-Business Practises by Small and Medium Scale Enterprises (SMEs) in the Craft Industry: The Case of Members of AMECA in Nairobi."

3.2 Population

The population of interest comprised all LAs in Kenya have implemented some form of private sector participation. Eldoret, Kericho, Kisumu, Kitale, Malindi, Meru, Nakuru, Nyeri and Thika use the A2 model. At the time of study, Nairobi was transiting from the A1 to the A2 model.

In evaluating existing water provision models, and determining if alternative models are more appropriate, the responses of stakeholders was considered. Based on the literature review, these were identified as WSCs, LAs, Donor Agencies in the Water Sector in Kenya and the Regulatory Authority.

From the WSCs, the chief executives of the WSCs in the ten towns above were contacted. From the LAs, the town clerks were contacted. Of the donor agencies, the officers in charge of the Water and Sanitation departments of both the World Bank and GTZ were contacted. At the time of the study, the Regulatory Authority had just been formed, but nevertheless, the Chairman was contacted. The survey was hence conducted on a total of 23 respondents.

3.3 Data collection

Primary data was collected through questionnaire and interviews. The questionnaires were mailed to the respondents together with stamped self-addressed envelopes. After confirmation of receipt, telephone follow-up was used to ensure that the questionnaires were mailed back. This method of data collection was used due to the wide geographical

area the study covered. The questionnaire was structured so as to have ease of administration, comprehension by the respondent and objectively measurable reliability.

3.1 Introduction

3.4 Data Analysis

A 3-point rating scale was adopted for all responses to the questionnaires. The data was coded and averages and percentages used to analyse the data. The Statistical Package for Social Science (SPSS) was used to uncover relationships among the factors determining a water provision model and the variables for measuring success of W&S utilities.

Kenya City Council and Chief Executive – Water Services Regulatory Board, were

being stopped and the population reduced from 23 to 20.

A total of 9 responses were received. Of the responses, 4 were from W&C out of 9, namely 44% (4/9) while 5 were from other stakeholders out of 11 initially sent (45.5%). The aggregate response rate was therefore 9 out of 20 (45%) and this was deemed adequate enough to allow the completion of the study. This response rate is a good one given as most researchers done in the public sector yield low rates of response (Muganyizi, 1999).

The analysis is divided into two parts. The first part evaluated existing water provision models. The second part attempts to determine if alternative models of water provision are more appropriate.

4.1 Evaluation of Existing Water Provision Models

The respondents were asked how well they thought W&S had achieved the water provision targets for W&S.

The chief executives of W&S were of the opinion that the transition from poor quantity and quality to good service and reliable systems had gone on very well with W&S response – Table 4-1 below. Some of them thought that any of the alternative models is not really good.

There were also those who indicated that the transition from poor quantity and quality to good service and reliable systems had gone on very well – Table 4-2. Only a few respondents thought that the model of the past has been changed for very well. They were of the opinion that the delivery of water has gone on very well. However, the views of W&S were that any of the alternative factors

CHAPTER 4 : ANALYSIS AND FINDINGS

4.1 Introduction

A total of 23 questionnaires were sent out. During the period of the study, Nairobi City Council had just formed their Water and Sewerage Company and could therefore not provide any meaningful data in the context of the study. Likewise, the Water Services Regulatory Board had also just been constituted, and could not provide any information. Three respondents (Chief Executive – Nairobi Water Company, Town Clerk – Nairobi City Council and Chief Executive – Water Services Regulatory Board) were hence dropped and the population reduced from 23 to 20.

A total of 9 responses were received. Of the responses, 4 were from WSC out of 9 initially sent (44.5%) while 5 were from other stakeholders, out of 11 initially sent (45.5%). The aggregate response rate was therefore 9 out of 20 (45%) and this was considered adequate enough to allow the completion of the study. This response rate is a good one given as most researches done in the public sector yield low rates of response (Musa, 1999).

The analysis is divided into two parts. The first part evaluates existing water provision models. The second part attempts to determine if alternative models of water provision are more appropriate.

4.2 Evaluation of Existing Water Provision Models

The respondents were asked how well they thought WSCs had addressed the measurement factors for WSC.

The chief executives of WSC were of the opinion that the transition from poor quantity and quality to good service and reliable revenue had gone on very well with 80% agreeing – Table 4-1 below. None of them thought that any of the measurement factors was badly rated.

Town clerks and donors were unanimous that the transition from poor quantity and quality to good service and reliable revenue had gone on very well – Table 4-2. Only 25% of them however thought that the needs of the poor had been catered for very well. The same number also thought that the recovery of costs had done on very well. Like chief executives of WSC, none thought that any of the measurement factors had come out badly.

Table 4-1: Evaluation of existing models by Chief Executives of WSC.

	Badly	Well	Very Well
Transit from poor quantity and quality to good service and reliable revenue		40%	60%
Address the needs of the poor		40%	
Attract investment		40%	20%
Recover costs		80%	20%
Eliminate corruption		60%	40%
Enhance efficiency (Quality/Unaccounted for water/coverage)		20%	

Table 4-2: Evaluation of existing models by Town Clerks and Donors.

	Badly	Well	Very Well
Transit from poor quantity and quality to good service and reliable revenue			100%
Address the needs of the poor		75%	25%
Attract investment		25%	75%
Recover costs		75%	25%
Eliminate corruption		50%	50%
Enhance efficiency (Quality/Unaccounted for water/coverage)		25%	75%

When the responses to the evaluation of existing models were put together – Table 4-3, the picture that emerged was of generally good evaluations, with areas requiring improvement being in the addressing of the needs of the poor, the recovery of costs and the enhancement of efficiency in that order.

Table 4-3: Evaluation of existing models by all respondents.

	Badly	Well	Very Well
Transit from poor quantity and quality to good service and reliable revenue		22%	78%
Address the needs of the poor		88%	13%
Attract investment		43%	57%
Recover costs		78%	22%
Eliminate corruption		56%	44%
Enhance efficiency (Quality/Unaccounted for water/coverage)		57%	43%

4.3 Appropriateness of Alternative Models for Water Provision

In order to determine whether alternative models of water provision would be more appropriate, respondents were asked for their opinion on how measurement factors would be affected when key components of models were varied. The seven key model components are:

1. Ownership of Distribution Systems and Water and Sewerage Plants. The physical infrastructure can be owned either by the WSC itself or by the LA. Models C and D prescribes that ownership is by the WSC, while Models A and B vest ownership on LAs.
2. Ownership of Water and Sewerage Companies. WSCs can be owned by private investors, or by the LA. Model C and D prescribe ownership by private investors, while models A and B prescribe ownership by the LAs.
3. Duration of Agreements. Short durations of agreements between the owner of the infrastructure and the WSC tend to prevalent in Model B1, while lease agreements (Model B3) and concessions (Model B4) requires longer periods of agreement since they make investments and require longer periods to recoup their capital.
4. Commercial Orientation. This factor differentiates between model A1 and the rest. In Model A1, the LA has a department that manages water supplies, and is bound by the local authority statutes. All other models inject some measure of commercialism in their operations.
5. Contracts for Services. Within the model A and B series, the WSC can contract out some of its services for which it has no internal capacity to other parties. In models C and D, the presumption is that the WSC has the internal capacity to carry out all services.
6. Compensation of Services. Compensation for services rendered can either be a fixed amount, or based on income generated or collections. Models up to B1 will generally compensate based on a fixed fee, while the others tend to be based on variable factors. This can determine motivation of management.
7. Responsibility for investments. LAs make capital investments in all models up to B3, while in Models B4 and C, that responsibility rests on the WSC.

The perception of stakeholders to each of these determined what models they preferred.

4.3.1 Survey Results from Water and Sewerage Companies

Survey questionnaires were sent to the Chief Executives of the Water and Sewerage Companies selected for the study. They were asked to give responses to whether they thought if the six measurement factors would yield better or worse results when models determinants were varied.

A. OWNERSHIP OF DISTRIBUTION SYSTEMS AND WATER & SEWERAGE PLANTS

The distribution systems, water production and sewerage treatment plants can be owned by either the Water and Sewerage Company or Local Authority. The respondents were asked whether they thought measurement factors would be affected by ownership of Distribution System And Water & Sewerage Plants.

20% Chief executives of WSC said that where the WSC owned the distribution plants, the needs of the poor would be negatively affected while a further 20% did not think the needs of the poor would be affected – Table 4-4. They were unanimous that the transition from poor quantity and quality to good service and reliable revenue, the attraction of investment and the recovery of costs would be positively affected.

Table 4-4: WSC Chief Executives’ perception of effect on ownership of Distribution Systems by WSC

	Negatively Affected	Not Affected	Positively Affected
Transit from poor quantity and quality to good service and reliable revenue			100%
Address the needs of the poor	20%	20%	60%
Attract investment			100%
Recover costs			100%
Eliminate corruption		20%	80%
Enhance efficiency (Quality /Unaccounted for water /coverage)		20%	80%

If ownership of the distribution plants were vested on LAs, the chief executives of WSC were fairly consistent in stating most of the measurement factors would be negatively affected. 40% of them however said that the needs of the poor would not be affected, while 60% thought that the needs of the poor would be positively affected Table 4-5.

The above results showed that ownership of distribution systems and water & sewerage plants by WSCs would impact more positively than ownership by local authorities. The mean for WSC=0.8667 LA=0.3 and the t-stat=5.9367 while the critical region=2.2281, p-value=0.0001 hence the result was significant and we rejected the null hypothesis that there would not be any positive effect.

Table 4-5: WSC Chief Executives’ perception of effect on ownership of Distribution Systems by LA

	Negatively Affected	Not Affected	Positively Affected
Transit from poor quantity and quality to good service and reliable revenue	60%		40%
Address the needs of the poor		40%	60%
Attract investment	60%	20%	20%
Recover costs	80%		20%
Eliminate corruption	60%	20%	20%
Enhance efficiency (Quality /Unaccounted for water /coverage)	60%	20%	20%

Table 4-6: Analysis of WSC Chief Executives’ perception of effect on owning of Distribution Systems

Ownership Of Distribution System And Water & Sewerage Plants Is Positively Affected	By Water And Sewerage Company	By Local Authority
Mean	0.8667	0.3
Variance	0.0267	0.028
Observations	6	6

Hypothesized Mean Difference	0
Degrees of freedom	10
t Stat	5.9367
P(T<=t) two-tail	0.0001
t Critical two-tail	2.2281

B. OWNERSHIP OF THE WATER AND SEWERAGE COMPANY

The Water and Sewerage Company can be owned either by the Local Authority or Private Investors. Chief executives of WSCs were asked how the measurement factors would be affected by either ownership.

Chief executives of WSC were fairly evenly split on whether ownership of WSC by LAs would positively affect or not affect at all the measurement factors – Table 4-7.

The chief executives were unanimous that attraction of investments, recovery of costs, elimination of corruption and enhancement of efficiency would be positively affected if private investors owned WSCs. 80% however thought that the needs of the poor would be negatively affected - Table 4-8.

Table 4-7: WSC Chief Executives' perception of ownership of WSC by LAs

	Negatively Affected	Not Affected	Positively Affected
Transit from poor quantity and quality to good service and reliable revenue		60%	40%
Address the needs of the poor	20%		80%
Attract investment		40%	60%
Recover costs		40%	60%
Eliminate corruption		40%	60%
Enhance efficiency (Quality /Unaccounted for water /coverage)		40%	60%

Table 4-8: WSC Chief Executives' perception of ownership of WSC by private investors

	Negatively Affected	Not Affected	Positively Affected
Transit from poor quantity and quality to good service and reliable revenue	20%	20%	60%
Address the needs of the poor	80%		20%
Attract investment			100%
Recover costs			100%
Eliminate corruption			100%
Enhance efficiency (Quality /Unaccounted for water /coverage)			100%

The above results were not significant at 5% level of significance and hence we adopted the alternative that ownership by private investors would generate more positive effects than ownership by local authorities.

Table 4-9: Analysis of WSC Chief Executives' perception of effect on ownership of WSC

Ownership Of The Water And Sewerage Company is Positively Affected	By LA	By Private Investors
Mean	0.6	0.8
Variance	0.016	0.112
Observations	6	6

Hypothesized Mean Difference	0
Degrees of freedom	6
t Stat	-1.3693
P(T<=t) two-tail	0.2199
t Critical two-tail	2.4469

C. DURATION OF AGREEMENT

Chief executives of WSCs were asked how they thought measurement factors would be affected if the duration of the agreement between the Water and Sewerage Company and the Local Authority were 1 – 3 years, 4 – 10 years or 10 – 30 years.

Chief executives of WSCs were fairly consistent in saying that shorter durations would negatively impact nearly all measurement factors. Interestingly, 20% thought that shorter durations would positively affect the transition from poor quantity and quality to good service and reliable revenue.

Table 4-10: WSC Chief Executives’ perception of agreements of 1 – 3 years

	Negatively Affected	Not Affected	Positively Affected
Transit from poor quantity and quality to good service and reliable revenue	40%		20%
Address the needs of the poor	60%		
Attract investment	40%	20%	
Recover costs	60%		
Eliminate corruption	40%	20%	
Enhance efficiency (Quality /Unaccounted for water /coverage)	40%		
Average	47%	20%	20%

When asked what effects a 4 – 10 years agreement would have on the measurement factors, they seemed fairly indifferent with most responses falling under the “not Affected” column Table 4-11.

Table 4-11: WSC Chief Executives’ perception of agreements of 4 - 10 years

	Negatively Affected	Not Affected	Positively Affected
Transit from poor quantity and quality to good service and reliable revenue		40%	20%
Address the needs of the poor	20%	20%	20%
Attract investment	20%	40%	
Recover costs	20%	40%	
Eliminate corruption		40%	20%
Enhance efficiency (Quality /Unaccounted for water /coverage)		20%	40%
Average	20%	33%	25%

All chief executives were unanimous that all measurement factors would be positively affected when the duration of agreements were 10 – 30 years – Table 4-12.

Table 4-12: WSC Chief Executives' perception of agreements of 10 – 30 years

	Negatively Affected	Not Affected	Positively Affected
Transit from poor quantity and quality to good service and reliable revenue			100%
Address the needs of the poor			100%
Attract investment			100%
Recover costs			100%
Eliminate corruption			100%
Enhance efficiency (Quality /Unaccounted for water /coverage)			100%
Average			100%

It was quite clear that WSCs are certain that with an agreement lasting between 10 – 30 years in place, they would be in a position to deliver positively on all the key factors for measuring success of WSCs.

D: COMMERCIAL ORIENTATION

The Water and Sewerage Company can be run purely under commercial lines. Chief executives of WSCs were asked how the measurement factors would be affected if the company were run or not run under purely commercial lines.

Chief executives of WSCs all agreed that the measurement factors would all be positively affected when there was an element of commercial orientation in operations. The exception was 20% who thought that the needs of the poor would not be affected.

Where there was no commercial orientation, all chief executives thought that the measurement factors would be negatively affected, the exception being the addressing of the needs of the poor where 80% thought there would be no effect while 20% thought that the needs of the poor would be positively affected Table 4-14 below.

Table 4-13: WSC Chief Executives’ perception of commercial orientation in operations

	Negatively Affected	Not Affected	Positively Affected
Transit from poor quantity and quality to good service and reliable revenue			100%
Address the needs of the poor		20%	80%
Attract investment			100%
Recover costs			100%
Eliminate corruption			100%
Enhance efficiency (Quality /Unaccounted for water /coverage)			100%

Table 4-14: WSC Chief Executives’ perception of non-commercial orientation in operations

	Negatively Affected	Not Affected	Positively Affected
Transit from poor quantity and quality to good service and reliable revenue	100%		
Address the needs of the poor		80%	20%
Attract investment	100%		
Recover costs	100%		
Eliminate corruption	100%		
Enhance efficiency (Quality /Unaccounted for water /coverage)	100%		

The analysis – Table 4-15 below showed that WSCs being run under purely commercial lines would yield positive results. The t-statistics fell in the rejection region of the critical region and the results were significant at 5% level of significance. The mean for the commercial orientation=0.9667.

Table 4-15: Analysis of WSC Chief Executives’ perception of commercial orientation

Services are Positively affected by	Commercial Orientation	No Commercial Orientation
Mean	0.9667	0.0333
Variance	0.0067	0.0067
Observations	6	6

Hypothesized Mean Difference	0
Degrees of freedom	10
t Stat	19.7990
P(T<=t) two-tail	0.0000
t Critical two-tail	2.2281

E. CONTRACT FOR SERVICES

The Water and Sewerage Company can contract out some services like Meter Reading, billing and collection. Chief executives of WSCs were asked how they thought the measurement following factors would be affected if some services were contracted out.

All Chief executives were of the opinion that corruption could be eliminated if some services were contracted out. 20% thought that the needs of the poor would be negatively affected.

Table 4-16: WSC Chief Executives’ perception of contracting for services

	Negatively Affected	Not Affected	Positively Affected
Transit from poor quantity and quality to good service and reliable revenue		40%	60%
Address the needs of the poor	20%	60%	20%
Attract investment		40%	60%
Recover costs		40%	60%
Eliminate corruption			100%
Enhance efficiency (Quality /Unaccounted for water /coverage)		40%	60%

Most chief executives were indifferent where services were not contracted out. 40% thought that cost recovery, elimination of corruption and the enhancing of efficiency would be negatively affected –Table 4-17.

Table 4-17: WSC Chief Executives’ perception of not contracting for services

	Negatively Affected	Not Affected	Positively Affected
Transit from poor quantity and quality to good service and reliable revenue		100%	
Address the needs of the poor		80%	20%
Attract investment		100%	
Recover costs	40%	60%	
Eliminate corruption	40%	60%	
Enhance efficiency (Quality /Unaccounted for water /coverage)	40%	60%	

If WSCs contracted out some services like meter reading, billing, and collection as analysed in the t-test below, there would be positive effects. The results below showed that the t-statistics falls in the rejection region and the results were significant at 5% level of significance. The mean for contracting out was 0.600 while the mean for not contracting out was 0.0333.

Table 4-18: Analysis of WSC Chief Executives' perception of contracting for services

Contract For Services Is Positively Affected when	Some Services Are Contracted Out	No Services Are contracted Out
Mean	0.6000	0.0333
Variance	0.0640	0.0067
Observations	6	6

Hypothesized Mean Difference	0
Degrees of freedom	6
t Stat	5.2215
P(T<=t) two-tail	0.0020
t Critical two-tail	2.4469

F. COMPENSATION FOR SERVICES

The Water and Sewerage Company can be compensated by a fixed amount, or a variable amount depending on performance. Chief executives of WSCs were asked how the measurement factors be affected if compensation to the WSCs were either fixed or variable.

Chief executives of WSCs mostly thought that with fixed compensation, measurement factors would either be negatively affected or not affected – Table 4-19. They all however thought that the needs of the poor would be negatively affected.

With variable compensation, with the exception of the needs of the poor and attraction of investment, all chief executives thought that the measurement factors would be positively affected – Table 4-20.

Table 4-19: WSC Chief Executives’ perception of fixed compensation for services

	Negatively Affected	Not Affected	Positively Affected
Transit from poor quantity and quality to good service and reliable revenue	40%	40%	20%
Address the needs of the poor	100%		
Attract investment		80%	20%
Recover costs	80%		20%
Eliminate corruption	40%	40%	20%
Enhance efficiency (Quality /Unaccounted for water /coverage)	60%	20%	20%

Table 4-20: WSC Chief Executives’ perception of variable compensation for services

	Negatively Affected	Not Affected	Positively Affected
Transit from poor quantity and quality to good service and reliable revenue			100%
Address the needs of the poor	40%	40%	20%
Attract investment		40%	60%
Recover costs			100%
Eliminate corruption			100%
Enhance efficiency (Quality /Unaccounted for water /coverage)			100%

Compensating WSCs by variable amount as shown in the results above would have a positive effect. The mean for fixed compensation=0.2 while the mean for variable compensation=0.8 and the t-statistics fell in the rejection region hence we rejected the null hypothesis that both fixed and variable compensation would generate similar effect. The results were significant at 5% level of significance (p-value<0.05).

Table 4-21: Analysis of WSC Chief Executives’ perception of compensation

Services are positively affected if Compensation is	Fixed	Variable
Mean	0.2000	0.8000
Variance	0.0000	0.1120
Observations	6	6

Hypothesized Mean Difference	0
Degrees of freedom	5
t Stat	-4.3916
P(T<=t) two-tail	0.0071
t Critical two-tail	2.5706

G. RESPONSIBILITY FOR INVESTMENT

Investment can be carried out either by the Local Authority or the Water and Sewerage Company. Chief executives of WSCs were asked how the measurement factors would be affected if capital investments were carried out by the LA or the WSC.

There seemed to be no discernible pattern on chief executives preferences where LAs made capital investments Table 4-22. The responses were distributed across the scale, but the general perception is that the measurement factors would be negatively affected.

Table 4-22: WSC Chief Executives’ perception Capital Investments By LAs

	Negatively Affected	Not Affected	Positively Affected
Transit from poor quantity and quality to good service and reliable revenue	60%		40%
Address the needs of the poor		80%	20%
Attract investment	40%	20%	40%
Recover costs	60%	20%	20%
Eliminate corruption	80%		20%
Enhance efficiency (Quality /Unaccounted for water /coverage)	60%	40%	

However, if the capital investments were made by WSCs, the chief executives mostly seemed to think that the measurement factors would be positively affected. 40% thought that the needs of the poor would not be affected – Table 4-23.

Table 4-23: WSC Chief Executives’ perception Capital Investments By WSCs

	Negatively Affected	Not Affected	Positively Affected
Transit from poor quantity and quality to good service and reliable revenue			100%
Address the needs of the poor		40%	60%
Attract investment			100%
Recover costs			100%
Eliminate corruption		20%	80%
Enhance efficiency (Quality /Unaccounted for water /coverage)			100%

Capital investment by WSCs was much better than by LAs because it yielded more positive effect as shown by the above results. Based on the means and the t-statistics, which fell in the rejection region, we rejected the null hypothesis that the two would generate equal positive results.

Table 4-24: Analysis of WSC Chief Executives’ perception on Capital Investments

Responsibility For investment Is Positively Affected If	Made By LA	Made By WSC
Mean	0.2800	0.9000
Variance	0.0120	0.0280
Observations	6	6

Hypothesized Mean Difference	0
Degrees of freedom	9
t Stat	-7.3754
P(T<=t) two-tail	0.0000
t Critical two-tail	2.2622

4.3.2 Survey Results from Other Stakeholders

Survey questionnaires were sent to the town clerks of the towns selected for the study. They were asked to give responses to whether they thought the six measurement factors would yield better or worse results when models determinants were varied.

A. OWNERSHIP OF DISTRIBUTION SYSTEM AND WATER & SEWERAGE PLANTS

The distribution systems, water production and sewerage treatment plants can be owned by either the Water and Sewerage Company or Local Authority. The town clerks of the respondent towns were asked whether they thought the measurement factors would be affected by ownership of Distribution System And Water & Sewerage Plants.

Were the distribution systems owned by WSCs, the town clerks mostly thought that the measurement factors would either not be affected or be negatively affected. 50% thought that the needs of the poor would be negatively affected.

Table 4-25: Town clerks’ perception of effect on ownership of Distribution Systems by WSC

	Negatively Affected	Not Affected	Positively Affected
Transit from poor quantity and quality to good service and reliable revenue		25%	50%
Address the needs of the poor	50%	25%	0%
Attract investment		25%	50%
Recover costs		25%	50%
Eliminate corruption		75%	0%
Enhance efficiency (Quality /Unaccounted for water /coverage)		50%	25%

Were the distribution systems owned by LAs, town clerks generally thought that the measurement factors would be negatively affected. Interestingly, 50% thought that the needs of the poor would be better addressed Table 4-26.

Table 4-26: Town clerks’ perception of effect on ownership of Distribution Systems by LAs

	Negatively Affected	Not Affected	Positively Affected
Transit from poor quantity and quality to good service and reliable revenue	50%	25%	25%
Address the needs of the poor	25%	25%	50%
Attract investment	75%	25%	0%
Recover costs	75%	25%	0%
Eliminate corruption	25%	50%	0%
Enhance efficiency (Quality /Unaccounted for water /coverage)	50%	50%	0%

The null hypothesis for the analysis was that there would be equal positive effect when ownership of the distribution system and water & sewerage plant is either by WSC or LAs. From the analysis in Table 4-26 below, the t-statistics=1.2649 and the critical region=2.2281, the t-statistics fell in the acceptance region hence we accepted the null hypothesis that there was likely to be equal positive effect when the ownership was by WSC or LAs. From the above tables, we saw that most respondents were of the opinion that there would not be much difference.

Table 4-27: Analysis of Town clerks’ perception of effect on ownership of Distribution Systems

Ownership Of Distribution System And Water & Sewerage Plants Is Positively Affected	By Water And Sewerage Company	By Local Authority
Mean	0.2917	0.1250
Variance	0.0604	0.0438
Observations	6	6

Hypothesized Mean Difference	0
Degrees of freedom	10
t Stat	1.2649
P(T<=t) two-tail	0.2346
t Critical two-tail	2.2281

B. OWNERSHIP OF THE WATER AND SEWERAGE COMPANY

The Water and Sewerage Company can be owned either by the Local Authority or Private Investors. Town clerks of the respondent towns were asked how the measurement factors would be affected by this ownership.

The town clerks were fairly distributed on the effect of ownership of the WSC by the LA on the measurement factors.

Table 4-28: Town clerks’ perception of effect on ownership of WSCs by LAs

	Negatively Affected	Not Affected	Positively Affected
Transit from poor quantity and quality to good service and reliable revenue	25%	50%	25%
Address the needs of the poor	25%	25%	50%
Attract investment	25%	50%	25%
Recover costs	50%	25%	25%
Eliminate corruption	50%	25%	25%
Enhance efficiency (Quality /Unaccounted for water /coverage)	25%	50%	25%

With the exception of the needs of the poor, all town clerks thought that the measurement factors would be positively affected. Half of them thought that the needs of the poor would be negatively affected while the other half thought that these needs would be positively affected.

Table 4-29: Town clerks’ perception of effect on ownership of WSCs by private investors

	Negatively Affected	Not Affected	Positively Affected
Transit from poor quantity and quality to good service and reliable revenue			100%
Address the needs of the poor	50%		50%
Attract investment			100%
Recover costs			100%
Eliminate corruption			100%
Enhance efficiency (Quality /Unaccounted for water /coverage)			100%

The results below – Table 4-30 were based on the null hypothesis that there would be no positive effect when ownership was either by LAs or private investors. From the analysis results, the t-statistics =-6.7082 while the critical region=2.3646 hence the t-statistics fell in the rejection region and significant i.e.=0.0003(p-value <0.05 at 95% confidence interval). We rejected the null hypothesis and adopted the likelihood that there was a more positive effect when ownership was by private investors.

Table 4-30: Analysis of Town clerks’ perception of effect on ownership of WSC

Ownership Of The Water And Sewerage Company is Positively Affected	By LA	By Private Investors
Mean	0.2917	0.9167
Variance	0.0104	0.0417
Observations	6	6

Hypothesized Mean Difference	0
Degrees of freedom	7
t Stat	-6.7082
P(T<=t) two-tail	0.0003
t Critical two-tail	2.3646

C. DURATION OF AGREEMENT

Town clerks of respondent towns were asked how they thought measurement factors would be affected if the duration of the agreement between the Water and Sewerage Company and the Local Authority were 1 – 3 years, 4 – 10 years or 10 – 30 years.

Where the duration of agreement was short, 75% of the town clerks thought that all measurement factors would be negatively affected.

Table 4-31: Town clerks' perception of agreements of 1 – 3 years

	Negatively Affected	Not Affected	Positively Affected
Transit from poor quantity and quality to good service and reliable revenue	75%	25%	
Address the needs of the poor	75%	25%	
Attract investment	75%	25%	
Recover costs	75%	25%	
Eliminate corruption	75%		25%
Enhance efficiency (Quality /Unaccounted for water /coverage)	75%	25%	
Average	75%	25%	25%

Where the duration of agreement was between 4 – 10 years, nearly half of the town clerks thought that there would be no effect on the measurement factors. 25% thought that all measurement factors would be positively affected.

Table 4-32: Town clerks' perception of agreements of 3 – 10 years

	Negatively Affected	Not Affected	Positively Affected
Transit from poor quantity and quality to good service and reliable revenue		50%	25%
Address the needs of the poor		50%	25%
Attract investment	25%	25%	25%
Recover costs	25%	25%	25%
Eliminate corruption		50%	25%
Enhance efficiency (Quality /Unaccounted for water /coverage)		50%	25%
Average	25%	42%	25%

Unlike chief executives who unanimously agreed that a longer agreement would positively affect the measurement factors, only 75% of the town clerks shared this belief – Table 4-33. The rest thought that the measurement factors would be negatively affected.

Other stakeholders seemed to agree that with an agreement lasting between 10 – 30 years in place – Table 4-33 below, WSCs would be in a position to deliver positively on all the measurement factors. A small minority however were concerned that duration of this length might negatively impact on the transition poor quantity and quality, catering for the poor, attracting investment, and recovering costs.

Table 4-33: Town clerks' perception of agreements of 10 – 30 years

	Negatively Affected	Not Affected	Positively Affected
Transit from poor quantity and quality to good service and reliable revenue	25%		75%
Address the needs of the poor	25%		75%
Attract investment	25%		75%
Recover costs	25%		75%
Eliminate corruption		25%	75%
Enhance efficiency (Quality /Unaccounted for water /coverage)		25%	75%
Average	25%	25%	75%

D: COMMERCIAL ORIENTATION

The Water and Sewerage Company can be run purely under commercial lines. Town clerks of the respondent towns were asked how the measurement factors would be affected if the company were run or not run under purely commercial lines.

Town clerks thought that with commercial orientation, the measurement factors would all be positively affected except the needs of the poor where 75% thought that these needs would be negatively affected.

Table 4-34: Town clerks' perception of commercial orientation in operations

	Negatively Affected	Not Affected	Positively Affected
Transit from poor quantity and quality to good service and reliable revenue			100%
Address the needs of the poor	75%		25%
Attract investment			100%
Recover costs			100%
Eliminate corruption			100%
Enhance efficiency (Quality /Unaccounted for water /coverage)			100%

Town clerks were quite consistent in stating that where there were no commercial operations, measurement factors would be negatively affected. Half of them however thought that with no commercial orientation, the needs of the poor would be positively affected.

Table 4-35: Town clerks’ perception of non-commercial orientation in operations

	Negatively Affected	Not Affected	Positively Affected
Transit from poor quantity and quality to good service and reliable revenue	100%		0%
Address the needs of the poor	25%	25%	50%
Attract investment	100%		0%
Recover costs	100%		0%
Eliminate corruption	100%		0%
Enhance efficiency (Quality /Unaccounted for water /coverage)	100%		0%

The above results were based on the null hypothesis there would not be any positive effect whether WSCs were run either commercial or non-commercial orientation. From the results, the t-statistics=5.2697 and the critical region=2.2622 hence the t-statistics fell in the rejection region and significant i.e. p-value=0.0005<0.05 at 5% significance level. We rejected the null hypothesis and adopted the alternative, which showed from the means that there would be quite a difference when WSCs are run under commercial orientation.

Table 4-36: Analysis of Town clerks’ perception of commercial orientation in operations

Services are Positively affected by	Commercial Orientation	No Commercial Orientation
Mean	0.8750	0.0833
Variance	0.0938	0.0417
Observations	6	6

Hypothesized Mean Difference	0
Degrees of freedom	9
t Stat	5.2697
P(T<=t) two-tail	0.0005
t Critical two-tail	2.2622

E. CONTRACT FOR SERVICES

The Water and Sewerage Company can contract out some services like Meter Reading, billing and collection. Town clerks of respondent towns were asked how they thought the measurement following factors would be affected if some services were contracted out.

With the contracting of services, all town clerks thought that corruption would be eliminated. Only 25% thought the needs of the poor would be negatively affected.

Table 4-37: Town clerks' perception of contracting for some services

	Negatively Affected	Not Affected	Positively Affected
Transit from poor quantity and quality to good service and reliable revenue		25%	75%
Address the needs of the poor	25%	25%	50%
Attract investment		25%	75%
Recover costs		25%	75%
Eliminate corruption			100%
Enhance efficiency (Quality /Unaccounted for water /coverage)		25%	75%

Where services were not contracted out, town clerks were of the opinion that the measurement factors would either not be affected or be negatively affected. 25% - Table 4-38 thought that the needs of the poor and elimination of corruption would be positively affected.

Table 4-38: Town clerks' perception of not contracting for some services

	Negatively Affected	Not Affected	Positively Affected
Transit from poor quantity and quality to good service and reliable revenue	75%	25%	
Address the needs of the poor	25%	50%	25%
Attract investment	25%	75%	
Recover costs	50%	50%	
Eliminate corruption	50%	25%	25%
Enhance efficiency (Quality /Unaccounted for water /coverage)	75%	25%	

The results below showed that there would be a positive improvement when WSCs contract out some services like meter reading, billing, and collection. The t-stat=8 and the critical region=2.2281 hence the t-stat fell in the rejection region of the null hypothesis and significant at 5% level of significance i.e. p-value=0.0000<0.05 and the mean for contracting out =0.75

Table 4-39: Analysis of Town clerks’ perception of contracting for some services

Contract For Services Is Positively Affected when	Some Services Are Contracted Out	No Services Are contracted Out
Mean	0.75	0.0833
Variance	0.025	0.0167
Observations	6	6

Hypothesized Mean Difference	0
Degrees of freedom	10
t Stat	8
P(T<=t) two-tail	0.0000
t Critical two-tail	2.2281

F. COMPENSATION FOR SERVICES

The Water and Sewerage Company can be compensated by a fixed amount, or a variable amount depending on performance. Town clerks of respondent towns were asked how the measurement factors be affected if compensation to the company were either fixed or variable.

With fixed compensation, the town clerks thought that the measurement factors would be negatively affected. A minority 25% thought that the needs of the poor would be positively affected.

Table 4-40: Town clerks’ perception of fixed compensation for services

	Negatively Affected	Not Affected	Positively Affected
Transit from poor quantity and quality to good service and reliable revenue	75%	25%	
Address the needs of the poor	75%		25%
Attract investment	75%	25%	
Recover costs	100%		
Eliminate corruption	75%	25%	
Enhance efficiency (Quality /Unaccounted for water /coverage)	75%	25%	

With variable compensation, the town clerks thought that the measurement factors would be positively affected, save for the needs of the poor and the elimination of corruption where only 75% thought that the measurement factors would be positively affected.

Table 4-41: Town clerks’ perception of variable compensation for services

	Negatively Affected	Not Affected	Positively Affected
Transit from poor quantity and quality to good service and reliable revenue			100%
Address the needs of the poor	25%		75%
Attract investment			100%
Recover costs			100%
Eliminate corruption		25%	75%
Enhance efficiency (Quality /Unaccounted for water /coverage)			100%

The above result showed that there would be a positive effect when WSCs were compensated by a variable amount depending on the performance. The results were significant at 5% level of significance i.e. p-value=0.0000 and the t-stat fell in the rejection region and the mean for variable compensation=0.9167.

Table 4-42: Analysis of Town clerks’ perception of compensation for services

Table 4-42: Analysis of Town clerks’ perception of compensation for services

Services are positively affected if Compensation is	Fixed	Variable
Mean	0.0417	0.9167
Variance	0.0104	0.0167
Observations	6	6

Hypothesized Mean Difference	0
Degrees of freedom	9
t Stat	-13.0236
P(T<=t) two-tail	0.0000
t Critical two-tail	2.2622

G. RESPONSIBILITY FOR INVESTMENT

Investment can be carried out either by the Local Authority or the Water and Sewerage Company. Town clerks of the respondent towns were asked how the measurement factors would be affected if capital investments were carried out by the Local Authority or the Water and Sewerage.

Where the LAs made capital investments, town clerks thought that the measurement factors would be negatively affected Table 4-43.

Table 4-43: Town Clerks’ Perception of Capital Investments By LAs

	Negatively Affected	Not Affected	Positively Affected
Transit from poor quantity and quality to good service and reliable revenue	75%		25%
Address the needs of the poor	75%		25%
Attract investment	75%		25%
Recover costs	75%	25%	0%
Eliminate corruption	100%		0%
Enhance efficiency (Quality /Unaccounted for water /coverage)	75%	25%	0%

Where the capital investments were made by WSCs, town clerks thought that there would be positive effects on the measurement factors. Only 25% thought that the needs of the poor would be negatively affected.

Table 4-44: Town Clerks’ Perception of Capital Investments By WSCs

	Negatively Affected	Not Affected	Positively Affected
Transit from poor quantity and quality to good service and reliable revenue			100%
Address the needs of the poor	25%	25%	50%
Attract investment			100%
Recover costs			100%
Eliminate corruption		25%	75%
Enhance efficiency (Quality /Unaccounted for water /coverage)			100%

The above results showed that capital investment by WSCs is much better than by LAs. The t-stat=-7.3485 and the critical region=2.2622, the significance level=0.0000<0.05. The mean for the capital investment by WSCs=0.875.

Table 4-45: Analysis of Town Clerks’ Perception of Capital Investments

Responsibility For investment Is Positively Affected If	Made By LA	Made By WSC
Mean	0.1250	0.8750
Variance	0.0188	0.0438
Observations	6	6

Table continued next page

Hypothesized Mean Difference	0
Degrees of freedom	9
t Stat	-7.3485
P(T<=t) two-tail	0.0000
t Critical two-tail	2.2622

A summary of the analysis described above revealed the picture shown in Table 4-46 below. All stakeholders were in agreement that the models currently in place, while making positive contributions to the supply of water and sewerage services, do not adequately address the challenges currently presented by the environment. Significantly, both chief executives and town clerks were in agreement on all issues except the ownership of distribution systems And water & sewerage plants where town clerks were indifferent on whether these were owned by themselves or WSCs - Table 4-46 below.

Table 4-46: Summary of stakeholders preferred Models

Factor	WSCs Response	Ideal Model	Other Stakeholders Response	Ideal Model
A: Ownership Of Distribution System And Water And Sewerage Plants	Positive if owned by WSC	C	Indifferent	N/A
B: Ownership Of WSC	Positive if owned by Private Investors	C3/C4	Positive if owned by Private Investors	C3/C4
C: Duration Of Agreement	Positive if 10 – 30 Years	B4	Positive if 10 – 30 Years	B4
D: Commercial Orientation	Positive if WSC is commercially run	B/C	Positive if WSC is commercially run	B/C
E: Contract For Services	Positive if some services are contracted out	B1	Positive if some services are contracted out	B1
F: Compensation For Services	Positive if Variable	B/C	Positive if Variable	B/C
G: Responsibility For Investment	Positive if done by WSC	B4/C	Positive if done by WSC	B4/C

CHAPTER 5 : CONCLUSION

This is the final chapter. It summarises and draws conclusions on the findings of the study. The chapter also highlights limitations of the study; makes recommendations on areas for further research and also recommendations for policy and practise.

5.1 Summary, Discussions and Conclusion

The study had two major objectives, namely:

1. Evaluate existing water provision models.
2. Determine if alternative models of water provision are more appropriate.

For the first objective of the study, the findings showed that there was consensus that the adopting the A2 model had significant success. However, all stakeholders seemed to agree that provision of water and sewerage services in urban areas could be better. There was a feeling that players are somewhat restricted, especially in the area of capital investment. The chief executives of WSCs believed that the present model would not attract as much investment as required. They also felt that if that investment capital were available, they should be given the leeway to put it into use, and not let LAs to carry out the task. Quite oddly, town clerks were also of the same opinion, as it had been expected that they would jealously guard their role of presiding of capital investments. Under normal circumstances, the conflict between the owners of capital and the managers would have been manifested by the misalignment of expectations by both parties. In the study, this conflict between town clerks as infrastructure owners and chief executives of WSCs as managers was not apparent. It should however be noted that in most cases, the managers were former employees of LAs.

There was also concern that the poor were not adequately taken care of, water being the social commodity that it is. It appeared that there was an inverse relationship between taking care of the needs of the poor and the recovery of costs. The respondents all believed that if they were to ensure cost recovery, they had to sacrifice the poor. According to Briscoe (1998) this need not be so as the poor will pay the going rate if they are assured of regular supply of potable water. He cited an innovative approach in Conakry, Guinea where the private operator was assured of efficient revenues by a combination of (initially low, but rising) revenues from users and (initially high, but declining) subsidies from the government (largely paid out of a World Bank credit).

While agreeing that other models could have produced the desirable results, the path taken by LAs of first creating a wholly owned company to manage water provision had the double effect of removing water management from the bureaucracies and inefficiencies associated with the public sector, and more importantly allowing the new company to build internal capacity to manage water provision. Alternatively, the LAs could as well have contracted the provision of water to competent third parties, but they had to be cognisant of the political and social ramifications of rendering their water departments redundant. The path taken of creating a commercially oriented and wholly owned company lessened the impact.

With the adoption of the A1 Model, most LAs faced the loss of significant amounts of revenue from water provision, and cash crisis within LAs became a common occurrence. The LAs are having to consider carrying out painful rationalisation or looking for alternative sources of income. However, a positive outcome is that there is more scrutiny on the use of funds presently collected by LAs.

For the second objective, the study sought to establish if in the opinion of stakeholders, other models of water provision were more appropriate. The respondents were asked for their opinion on how the measurement factors would be affected when key components of models were varied. The seven key model components were:

1. Ownership of Distribution Systems and Water and Sewerage Plants. The physical infrastructure can be owned either by the WSC itself or by the LA. Models C and D prescribe that ownership is by the WSC, while Models A and B vest ownership on LAs.
2. Ownership of Water and Sewerage Companies. WSCs can be owned by private investors, or by the LA. Model C and D prescribe ownership by private investors, while models A and B prescribe ownership by the LAs.
3. Duration of Agreements. Short durations of agreements between the owner of the infrastructure and the WSC tend to be prevalent in Model B1, while lease agreements (Model B3) and concessions (Model B4) require longer periods of agreement since they make investments and require longer periods to recoup their capital.
4. Commercial Orientation. This factor differentiates between model A1 and the rest. In Model A1, the LA has a department that manages water supplies, and is bound by the local authority statutes. All other models inject some measure of commercialism in their operations.

5. Contracts for Services. Within the model A and B series, the WSC can contract out some of its services for which it has no internal capacity to other parties. In models C and D, the presumption is that the WSC has the internal capacity to carry out all services.
6. Compensation of Services. Compensation for services rendered can either be a fixed amount, or based on income generated or collections. Models up to B1 will generally compensate based on a fixed fee, while the others tend to be based on variable factors. This can determine motivation of management.
7. Responsibility for investments. LAs make capital investments in all models up to B3, while in Models B4 and C, that responsibility rests on the WSC.

The perception of stakeholders to each of these determined what models they preferred.

A summary of the analysis described in the Analysis and Findings chapter revealed the picture shown in Table 4-46 on page 44. All stakeholders were in agreement that the models currently in place, while making positive contributions to the supply of water and sewerage services, do not adequately address the challenges currently presented by the environment. Significantly, both chief executives and town clerks were in agreement on all issues except the ownership of distribution systems And water & sewerage plants where town clerks were indifferent on whether these were owned by themselves or WSCs.

From the foregoing findings and discussions, the following conclusions can be drawn:

- The models presently in place do not adequately address the challenges of water provision in urban areas. Key issues like the recovery of costs that guarantee sustainable operations are not being presently addressed. The attraction of investment is also not possible with the present model.
- Model B1 could increase efficiency and reduce corruption, but the literature review suggests that experiences with it have not been good due to the influence still exerted on the WSCs by LAs. Kiser (2004) highlighted this when reporting on the manner in which Nairobi City Council negotiated a contract for garbage collection secretly, exposing the obliqueness of the process.
- Model C3 and C4, while ideal for the purposes of attracting investment would not be politically palatable. These models call for the transfer of ownership to private investors who would run them on purely commercial lines. The dangers of this is that with a weak regulatory framework, monopoly of supply of an inelastic commodity would be very harmful not only to the disadvantaged poor, but also other more affluent sectors of urban dwellers.

- Model B4 seems to be favoured among the respondents of the study. It would appear to be a compromise between the extreme (Model C series) and the present situation.

Judging from the findings, the ideal models would be B4 (Concession), C3 (Joint Ownership/mixed Ownership) or C4 (Outright Sale). However, the political, legal, social and economic consequences of the C series models must be considered, and have not been the subject of this study. The effects of the recommended models on the poor and cost recovery have also not been the subjects of this study. Consideration should therefore be given to adopting the B4 model, as this would allow the companies to make investments in plant and equipment without having to rely on the present owners. The B4 model allows the present owners to retain their investments, hence taking care of the potential fall out from having to sell off water supply systems.

The adoption of any of the favoured models will effectively subject water provision to market forces. Without a strong, fair, impartial and effective regulatory regime, there is the real fear that the poor will be worse off. The Government should be ready to mitigate these outcomes, possibly by prudent use of subsidies as was done in Conakry (Briscoe 1998). Safe drinking water impacts heavily on public health and the greatest impacts are on the poor, who are most vulnerable to water-borne illness - which further perpetuates their poverty (Sawin, 2003). In order to reduce spending on primary health care, the Government could subsidize provision of water to the poor by redirecting Health allocations towards water subsidies.

5.2 Limitations of the Study

The ideal data collection method for this study would have been the personal interview method, where the questionnaire would have formed the basis for the interview. This mode was carried out on one respondent and the results included points of view that had not previously been anticipated. However, due to time and budget constraints, the researcher was unable to either travel to other towns or send a representative.

The general response rate of 45% was quite poor. This was probably due to the refusal of some respondents to commit themselves given the level of officialdom in the government and their fear of victimisation, despite assurances given by the researcher. It was also felt that if all respondents were physically contacted, the response rate might have been higher as some respondents are usually willing to talk but not commit their thoughts to paper.

The Nairobi City Council formed a wholly owned company to manage its water and sewerage services during the period of the study. The Water Services Regulatory Board was also formed during the period of the study. It would have been significant if these two had provided input, as the former is now the largest water company in the country.

A stakeholder left out of the study altogether was the consumer. This was so because of the number of potential respondents and the attendant cost/time implications, and the assumption that with water provision being an emotive subject, their responses would have generated more heat than light. However, it would have been a valuable addition to the study if it were established whether consumers would be willing to pay market rates for reliable supply of quality water.

5.3 Recommendation for Further Research

The following areas are recommended for further study:

- Catering for the water and sewerage needs of the urban poor without compromising on service delivery.
- The political, legal, social and economic consequences of adopting the models recommended by this study.

5.4 Recommendations for Policy and Practice

That the changing profile of urban areas has wreaked havoc on water provision is not in doubt. There has been mass migration of job seekers from rural to urban areas, and this has put massive pressure on water provision systems (Kayaga, 2002). Unfortunately, corruption has ensured that funds set aside for operations, maintenance and infrastructure expansion have not been put to effective use due to corruption (BBC, 2003). The challenge for policy makers is how to ensure that investment for water provision is put to the uses it is intended for, while at the same time ensuring that the supply of water is sustainable in the long run. At a higher level, policy makers need to address reasons for rural-urban migration and put in place systems that will eliminate or reduce this migration.

In the short run, there is need for investment in water infrastructure. Coupled with the regular supply of water are the attendant issues like customer services and accurate metering and billing. Consumers pay willingly when they have confidence in the accounting used to bill them (Kanyuiro, 1988).

In the longer run, different models of water provision in urban must be addressed as it will soon be realised that the present models, while ensuring that there is less pilferage of water income, still does not generate adequate funds to ensure sustainable operations. The present environment is heavily subsidized by government and donor funds.

The role of donors in sensitising and providing funds for the transition from the previous models employed to today's situation must be lauded and encouraged. The donors enabled the Government and local authorities to appreciate the importance of water and the need to respond to the changing environment.

Given the above, there is a role for each of the stakeholders to play to ensure success in the provision of water and sewerage services in urban areas.

The government must put in place an environment that allows for investment in water and sewerage services in urban areas. This includes setting up a strong and independent regulatory authority comprising all stakeholders that would be able to police and arbitrate the water sector. Such a body should have the capacity to enact

rules and regulations dynamically as the environment is constantly changing and the present legislative arm does not have the capacity to quickly react to the environment.

The government should also establish the reasons for the rapid rural-urban migration and address them. If this migration were stemmed, there would be less pressure on urban water provision systems. This could include the development/upgrading of smaller urban areas, provision of basic services to the rural areas and the creation of employment.

The health provision strategy should be geared towards preventative care, and not curative care. The former will include the provision of safe water and sanitation services. The health ministry should be able and willing to contribute to the provision of safe water by subsidizing the marginalized.

It is vital that LAs are completely weaned off the income generated from water provision. As infrastructure owners, they should only collect rent and not play a role in the running of WSCs. Much as we have "independent" WSCs, LAs still play a major role as most of the employees of WSCs are either former employees of LAs or are seconded there by LAs. LAs also sit on the boards of WSCs. While this approach is good during the transition, LAs must now be encouraged to let WSCs be totally independent and allowed to formulate and execute their own strategies. LAs role should be restricted to that of infrastructure owners seeking a good return for the use of their investments.

The WSCs must now be given the leeway and independence to recruit competent staff and place them in the right positions. Competent personnel for today's changing environment is essential to ensuring service delivery.

The WSCs should also be allowed to look for capital for investment and without necessarily seeking the authority of LAs. They should be able to raise local capital for investments by issuing bonds and similar instruments.

Until now, the donor community have been the main drivers for change in the water sector. They should be lauded for their efforts, but it is important that change agents now be locals, as this will both ensure that there is ownership of the water sector and that home grown solutions are employed.

Consumers on their part need to be sensitised on demanding for competent services by WSCs. WSCs companies as presently constituted have consumers represented on their boards. These representatives must push the agenda forcefully. Consumer watch groups should also be more forceful in their articulation of the needs of consumers.

APPENDICES

1. References

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2. Letter of Introduction To The Respondents

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2. Letter Of Introduction To The Respondents

JULY 2004

To Whom It May Concern,

Dear Sir/Madam

MBA RESEARCH PROJECT

I am a student in the Faculty of Commerce of the University of Nairobi. In partial fulfilment of the requirements of the Master of Business Administration (MBA), I am conducting a study entitled "Provision of Water and Sanitation in Kenyan Urban Areas: An Evaluation of Existing and Alternative Models".

I kindly request your assistance in being interviewed based on the attached outline. I will be most appreciative of any information you may feel necessary for this study. This information is purely for the purpose of my project work and pledge to you that it will be treated with strict confidentiality. A copy of the final research report will be availed to you upon request.

Your responses will be treated as strictly confidential and your cooperation will be most appreciated.

Yours Sincerely,

THOMAS O ATAOK

STUDENT

DR. MARTIN OGUTU

SUPERVISOR

3. Questionnaire

Part I (Evaluation of Existing Models)

If respondent is NOT a Water and Sewerage Company, what is your stake in Water and Sanitation?

If respondent is a Water and Sewerage Company, answer the following:

1. When did the Water and Sewerage Company take over provision of W&S services?
2. What is the duration of the Water and Sewerage Company agreement with the Local Authority in years? _____
3. How many active water accounts do you have? _____
4. Circle the most appropriate responses in the following table:

1. Is the Water and Sewerage Company run under purely commercial lines i.e. adherence to the Company Act, AGMs etc?	Yes	No	Other
2. Who owns the Distribution System and Water and Sewerage Plants?	Local Authority	Private Investors	Other
3. Who owns the Water and Sewerage Company?	Local Authority	Private Investors	Other
4. Does the Water and Sewerage Company contract out services i.e. Meter Reading, billing, collection?	None	Some	
5. Is the Water and Sewerage Company compensated with a fixed amount or variable amount based on other factors?	Fixed	Variable	Other
6. Who is responsible for Capital Investments?	Local Authority	Water and Sewerage Company	Other

All respondents to circle the most appropriate responses in the following table:

How well has the Water and Sewerage Company been able to address the following factors:

	Badly	Well	Very well
1. Transit from poor quantity and quality to good service and reliable revenue	1	2	3
2. Address needs of the poor	1	2	3
3. Attract Investment	1	2	3
4. Recover costs	1	2	3
5. Eliminate corruption	1	2	3
6. Enhance Efficiency (Quality/Unaccounted for Water/Coverage)	1	2	3

Part II (Survey of alternative models of water provision)

Ownership of Distribution System and Water and Sewerage Plants

If the distribution system and water and sewerage plants were owned by the Water and Sewerage Company/Local Authority, how would the following factors be affected?

	Ownership by Water and Sewerage Company			Ownership by Local Authority		
	Negatively affected	Not affected	Positively affected	Negatively affected	Not affected	Positively affected
Transit from poor quantity and quality to good service and reliable revenue						
Address needs of the poor						
Attract Investment						
Recover costs						
Eliminate corruption						
Enhance Efficiency (Quality/ Unaccounted for Water/Coverage)						

Ownership of the Water and Sewerage Company

If the Water and Sewerage Company were owned by Local Authority/Private Investors, how would the following factors be affected?

	Ownership by Local Authority			Ownership by Private Investors		
	Negatively affected	Not affected	Positively affected	Negatively affected	Not affected	Positively affected
Transit from poor quantity and quality to good service and reliable revenue						
Address needs of the poor						
Attract Investment						
Recover costs						
Eliminate corruption						
Enhance Efficiency (Quality/ Unaccounted for Water/Coverage)						

Duration of Agreement

If the duration were 1 – 3 / 4 – 10 / 10 – 30 years, how would the following factors be affected?

	1 – 3 Years			4 – 10 Years			10 – 30 Years		
	Negatively affected	Not affected	Positively affected	Negatively affected	Not affected	Positively affected	Negatively affected	Not affected	Positively affected
Transit from poor quantity and quality									

to good service and reliable revenue									
Address needs of the poor									
Attract Investment									
Recover costs									
Eliminate corruption									
Enhance Efficiency (Quality/ Unaccounted for Water/Coverage)									

Commercial Orientation

If the Water and Sewerage Company were/were not run under purely commercial lines, how would the following factors be affected?

	Commercial Orientation			No Commercial Orientation		
	Negatively affected	Not affected	Positively affected	Negatively affected	Not affected	Positively affected
Transit from poor quantity and quality to good service and reliable revenue						
Address needs of the poor						
Attract Investment						
Recover costs						
Eliminate corruption						
Enhance Efficiency (Quality/ Unaccounted for Water/Coverage)						

Contracts for Services

If some/none/all services like Meter Reading, billing and collection were contracted out, how would the following factors be affected?

	Contract Out Some Services			Contract Out All Services		
	Negatively affected	Not affected	Positively affected	Negatively affected	Not affected	Positively affected
Transit from poor quantity and quality to good service and reliable revenue						
Address needs of the poor						
Attract Investment						
Recover costs						
Eliminate corruption						
Enhance Efficiency (Quality/ Unaccounted for Water/Coverage)						

Compensation for Services

If the Water and Sewerage Company were compensated by a fixed/variable amount, how would the following factors be affected?

	Fixed Compensation	Variable Compensation
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	Negatively affected	Not affected	Positively affected	Negatively affected	Not affected	Positively affected
Transit from poor quantity and quality to good service and reliable revenue						
Address needs of the poor						
Attract Investment						
Recover costs						
Eliminate corruption						
Enhance Efficiency (Quality/ Unaccounted for Water/Coverage)						

Responsibility for Investment

If the Local Authority/Water and Sewerage Company were responsible for capital investments, how would the following factors be affected?

	Capital Investments By Local Authority			Capital Investments By Water and Sewerage Company		
	Negatively affected	Not affected	Positively affected	Negatively affected	Not affected	Positively affected
Transit from poor quantity and quality to good service and reliable revenue						
Address needs of the poor						
Attract Investment						
Recover costs						
Eliminate corruption						
Enhance Efficiency (Quality/ Unaccounted for Water/Coverage)						

Are there any other comments you may wish to add?

Thank you for your cooperation.