PRIVATE SECTOR PARTICIPATION IN WATER MANAGEMENT: MALINDI WATER SUPPLY CASE STUDY

BY

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Declaration

I, hereby, declare that this thesis is my original work and it has not been submitted for a degree in any other University.

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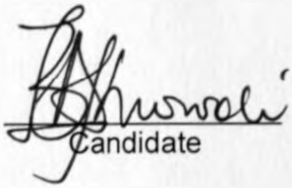

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This thesis has been submitted for examination with my approval as University supervisor.

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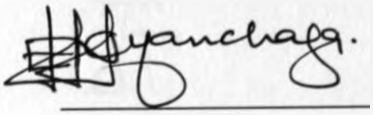

Supervisor

11th August 2006

Date

Dedication

This thesis is dedicated to my dear mother Mrs Alubinah Nabwire Nyegenye who ensured that inspite of the poverty in which we lived we got educated through her unwavering struggle and especially her encouragement at the start of the masters programme.

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ABSTRACT

Most of the existing water supplies in the urban areas in Kenya are generally poor in terms of technical and financial performance. Service coverage is inadequate, levels of service are low, and in many cases the situation has been deteriorating. The main reasons for the poor water service delivery are considered to be rooted in the past and current institutional and organisational arrangements. The Government has since the early 1970s been introducing measures to deal with these problems. These changes include use of different management options in the provision of water supply and sewerage services especially in urban water utilities.

The primary objective of this study was to evaluate the performance of the management contract which is the Private Sector Participation (PSP) option in use in Malindi water supply with a view of determining reasons for its adoption and the extent to which it has improved service delivery. The secondary objective was establishing the critical factors that have made the PSP operator to succeed in order to come up with lessons that can be replicated in other urban water utilities. Questionnaires and interviews both in the field and in Nairobi were used in the study. In addition, various reports were synthesised to identify the prior problems in the water supply and achievements of the PSP operator in accordance with the contract performance targets.

The study revealed that the management contract entered into between the operator and the client was strong in financial provisions, however, the incentives and penalties were based on poor performance standards. The findings also indicate that the introduction of PSP in the utility was as a result of desire to improve operational and strategic management in the utility; enhance technical capacity; excessive donor pressure; demand for professional management; need to increase tariffs and need to introduce new technology and efficiency in the scheme. The study findings shows that the PSP operator has improved the financial performance of the scheme, through substantial increase in collection efficiency; the fear that PSP leads to staff reductions has been proved wrong as the PSP operator increased staff numbers from 20 to 61persons; the PSP

operator has introduced professional management in the utility operations. Furthermore, the PSP operator allocates adequate funds to operation and maintenance (O&M) and has improved customer relations and introduced use of information technology on the scheme. Indeed 51% of the respondents are of the view that the supply is more reliable than before PSP. However, the research also revealed that 55% of the respondents are not satisfied with the water quality; customers who buy water from kiosks or vendors pay a higher price than customers with a water connection. There were complaints that the PSP operator unnecessarily delays approval for establishment of additional water kiosks and does not adequately address complaints. Views were also expressed that the PSP operator is too strict therefore his contract should be terminated.

The lessons learnt are that professional management of a water utility, sufficient funding for operation and maintenance, good customer care and realistic tariffs will lead to efficient sustainable and reliable water supply. Training and proper remuneration were identified as important aspect of motivation for staff in any water utility. It was also recognised that for PSP to succeed, it should be preceded by commercial development of a water utility which includes reducing UFW, introducing computerised billing, developing comprehensive O&M management based on preventive maintenance and prompt completion of repairs and improving customer services.

The lessons learnt are that professional management of a water utility, sufficient funding for operation and maintenance, good customer care, proper information to customers and realistic tariffs will lead to efficient sustainable and reliable water supply. Training, focused work assignment and proper remuneration were identified as important aspect of motivation for staff in any water utility. It was also recognised that for PSP to succeed, it should be preceded by commercial development of a water utility which includes reducing UFW, introducing computerised billing, developing comprehensive O&M management based on preventive maintenance and prompt completion of repairs and improving customer services.

List of Abbreviations

AIE	-	Authority to Incur Expenditure
AFD	-	French Development Agency
ALDEV	-	African Land Development Organisation
BER	-	Business Economic Research Co Ltd.
BOT	-	Build Operate Transfer
CAP	-	Chapter in the Laws of Kenya
CBO's	-	Community Based Organizations
DDC	-	District Development Committee
DFRD	-	District Focus for Rural Development
DWD	-	Director of Water Development
GOK		Government of Kenya
GTZ	-	German Technical Cooperation Agency
IBRD	-	International Bank for Reconstruction and Development
JICA	-	Japanese International Cooperation Agency
KBS	-	Kenya Bureau of Standards
KFW	-	German Development Agency
LA's	-	Local Authorities
MCR	-	Mombasa and Coastal Region
MENR	-	Ministry of Environment and Natural Resources
MoA	-	Ministry of Agriculture
MoLG	-	Ministry of Local Government
MoNR	-	Ministry of Natural Resources
MoP&ND	-	Ministry of Planning and National Development
MoW	-	Ministry of Works
MOWD	-	Ministry of Water Development
MUWSP	-	Minor Urban Water Supply Programme
MWI	-	Ministry of Water and Irrigation
NGOs	-	Non Governmental Organization
Norad	-	Norwegian Development Agency
NWP	-	National Water Policy
NWCPC	-	National Water Conservation and Pipeline Corporation
NWMP	-	National Water Master Plan
OCEF	-	Japanese Overseas Development Agency
O & M	-	Operation and Maintenance
PPP	-	Public Private Partnership
PPIAF	-	Public Private Infrastructure Advisory Facility
PSP	-	Private Sector Participation
RoK	-	Republic of Kenya
SIDA(Sida)	-	Swedish International Development Agency
SSiPs	-	Small Scale Independent Providers
ToR	-	Terms of Reference
UFW	-	Unaccounted for Water
UNICEF	-	United Nations Children Educational Fund
UNCHS	-	United Nations Centre for Human Settlement (Habitat)
UNIDO	-	United Nations Industrial Development Organization
WA	-	Water Act
WB	-	World Bank
Watsan	-	Water and Sanitation
WDD	-	Water Development Director
WHO	-	World Health Organization
WRMA	-	Water Resources Management Authority
WSB		Water Service Board
WSC	-	Water and Sewerage Company
WSD	-	Water and Sewerage Department
WSPs	-	Water Services Providers
WSS	-	Water Supply and Sanitation
WRA	-	Water Resources Authority

1 INTRODUCTION

1.1 Background to the Research

Despite considerable investment in water and sewerage development, only about half of the estimated Kenyan Population of 33 million have access to potable water, at reasonable distances. Suitable sanitation, especially disposal of human waste, is available to even less people (MoP&ND, 2003 p14, 57, 58). The urban areas fare better; however, the existing provision of water supply and sanitation (WSS) services within the urban areas suffers from some major shortcomings (KFW/Katalyst21 2001 p1).

(i) Water supply is unreliable, inadequate and, often delivered at insufficient pressure. In addition not more than 60% of all consumers are supplied with water for 24 hours per day;
(ii) Water coverage in most of the urban areas is low;
(iii) Poor Financial and commercial performance;
(iv) Inadequate and inappropriate management;
(v) Unsatisfactory skills for managerial and support staff;
(vi) Deteriorating infrastructure, dilapidated facilities, and outdated plant and equipment are a common sight in some water supply systems; and
(vii) Insufficient production of water worsened by excessive levels of physical and commercial water losses.

These problems were attributed to weak institutional arrangements in service delivery. Some of these problems are also identified by the World Health Organisation (WHO, 1994 p3) as afflicting water supplies in developing countries. The shortcomings in the Kenyan water sector have long been identified. But the Local Authorities (LAs) and the Government had no common strategy of addressing them until 1999 when the government issued Sessional paper No.1 on National Policy on Water Resources Management and Development (National Water Policy (NWP) (MoWR 1999) defining reform approaches. The new approaches were codified into law through Water Act 2002 (BER 2003).

Various structures for delivery of water services exist in urban areas that include (UWASAM 2001, p5):

(a) Delivery through autonomous companies formed by local authorities;
(b) Delivery through contracting out (PSP) ;
(c) Delivery through water departments within the local authorities;
(d) Delivery through trustee companies and
(e) Delivery directly through Ministry of Water resources Management and Development(MWRMD)/National Water Conservation and Pipeline Corporation(NWCPC).

In rural areas MWRMD/NWCPC are prominent in service delivery, however, service delivery through Self help groups, communities and Non Governmental Organisations (NGOs) play an important role.

All the above modes of delivery of services were sanctioned through the provisions of the now repealed Water Act Cap 372. In July 2002, CAP 372 was repealed therefore most of the above existing delivery modes are interim, until the Water Service Boards engage new water service providers in both urban and rural water utilities in accordance with the new Water Act 2002. The Act proposes several delivery mechanisms to ensure water delivery to all.

For sustainability to be achieved in the water service delivery, it is has become clear that business principles have to be applied. The residents in Kenyan urban areas are crying for a reliable water service, which is one that offers the water users access to an essentially uninterrupted supply of water. The only limiting factor should be what the user is prepared to pay for the desired degree of access and volume consumed.

This level of service excellence in the provision of potable water to customers involves production and treatment of adequate water and its transmission to the consumers. These two activities require infrastructure of plant and equipment, organisation structure capable of operating the plant and ensuring that potable and adequate water is, indeed produced and transmitted to the customer. Such an organisation includes staff, systems of management, office equipment,

transport, communication facilities etc. However, there has to be sufficient operating resources such as chemicals, power, fuel, salaries. Without any of these it is not possible to provide water services efficiently. Investments must be made to acquire and install plant, equipment and train staff in the first place. Secondly, such plant, equipment and staff require resources for operation. Thirdly plant and equipment require continuous maintenance, replacement when necessary and renewal when worn out.

The provision of water services, therefore, incurs three types of costs as follows:

(I) Investment costs (acquisition and installation of facilities)

(II) Operating costs (acquisition of inputs and labour)

(III) Maintenance costs (servicing and repairing facilities)

Adequate resources must be available to undertake the required investments, operate and maintain the facilities to provide water services. Schalkwyk (2001 p2) notes that crucial to the success of any business is its management i.e. the skills and capacity of the water service provider which delivers the water services. He further notes that in the water business, the organisation finds itself operating in an environment governed by political and cultural influences and monitored and regulated by different stakeholders. Thus the institutional structures appropriate to the condition which occur in the various water utilities are crucial to sustainable water service delivery.

The National Water Policy (NWP) and Water Act 2002 have defined the required institutional changes in the management of the water services in Kenya as follows:

(a) Decentralisation of provision WSS services

(b) Creation of institutions for localised provision of WSS services

(c) Development of Water Services Strategies

(d) Development of guidelines for the provision of WSS services

(e) Opening up of the space of the provision of WSS services to providers who may now include Non Governmental Organisations (NGOs), Community Based Organisations (CBOs), Individuals, Public and Private companies, LAs etc

(f) Requiring effective and efficient provision of WSS services, and,

(g) Setting up of a Water Services Regulatory Board (WSRB) and mechanism for regulating provision of WSS services and monitoring performance.

Adequate and appropriate management of O&M, Customers and finances as well as suitable development of facilities to reach all are among the key issues addressed by the reforms in the WSS services. The hallmark of the reforms is provision of adequate WSS services to all at affordable prices and at sustainable costs.

Urban areas in Kenya have very high population growth rate of about 7%, whereas the average annual growth for the country is estimated at 2.8% (JICA/Nippon Koei, 1998 p 6-4). This growth rate, therefore, puts tremendous pressure on already malfunctioning urban water supplies.

Until recently the government still regarded water as a social good, and was therefore reluctant to accept the introduction of commercial concepts in its management. On the other hand Local Authorities regard water as a source of cheap revenue that can be used for other purposes not related to water; including salaries and allowance to councillors.

As the water supply sector especially in urban areas has continued to show signs of falling apart, the Government and its development partners have realized that there is need to change the approach to management in the Sector. In other words, there is need to redefine the management of the sector. Various modes to improve performance of the sector in urban areas have been tried, since the late 1980s. These include formation of autonomous water departments in Local Authorities, separating water accounts from the general account of the local authority, formation of a Government Corporation to operate water services on a commercial basis, Commercialisation of urban water utilities through formation of autonomous water companies, and more recently contracting out to the private sector and running water supplies in urban areas through trustees.

However, more and more experts in the sector point out that public owned and operated water utilities have a proven record of poor performance and mismanagement. They however accept that there are few well managed public utilities, but they seem to be the exception that confirms the rule. These experts further point out that there is the insufficiency of public funds alone to meet the increasing investment needs of the water sector. Janssens (1996 p1) points out two objectives of PSP as ensuring improved management, higher efficiency and acquiring capital needed for investment. Thus, there seems to be a general agreement that there is a relationship between PSP and sustainable improved performance and efficiency in delivery of water services. In particular, it has been reported that PSP if well designed can bring big improvements in quality, availability and cost effectiveness of the service.

Critics to PSP arrangements site concerns such as consequences for water supply employees, loss of control of a strategic sector and tariff increase that may result and especially their impact to the poor (World Bank 1997). Consequently the policy makers, in the water sector in Kenya, have not embraced PSP with open arms as would have been expected.

Indeed in the past three years, the Government of Kenya with support of the World Bank affiliate; the Public-Private Infrastructure Advisory Facility (PPIAF) has conducted studies for PSP for three cities of Nairobi, Mombasa and Kisumu (Halcrow,2002/2003,PricewaterHouseCoopers,2002) . However, after grappling with the decision on which PSP options to adopt , since the finalisation of the studies, in late 2003 the Government decided that the time was not ripe for any of the PSP options to be adopted in the water sector.

The policy makers in the water sector have however made it clear that for now the preferred option is corporatisation of the water utilities. The words ***"The Governments preferred option"*** (MOWRMD 2004, p4), which are usually used, do not rule out other options but it seems now, they are unprepared to discuss *"those"* other options. On the other hand the development partners are not unanimous in which direction the water sector should move. With the ongoing reforms in the sector, most would not like to be seen pushing the government in a

direction it is not prepared to take. They are content to support the ongoing institutional changes and review the situation a few years downstream. Thus, the World Bank is supporting institutional restructuring within the Nairobi Water Service Board, and down playing the PSP options it was promoting. The French development agency AFD, and the German financing Agency, KFW, who were supporters of the World Bank's approach have also adopted the same views. But, KFW has underwritten the PSP contract in Malindi water supply while AFD has even as late as early 2003 tried to support contracting out certain functions in Nairobi City. On the other hand the German technical support agency GTZ, continues to promote commercialization as the way forward in management of urban water supplies. The Japanese Development agency, JICA on the other side is promoting the formation of trustees to manage autonomous water supplies in urban areas. Meru water supply, which is JICA's pilot scheme, started operating in July, 2002.

Therefore, it is no wonder that the water sector policy maker's decision on PSP options is still hazy. There is a general agreement with the good side of PSP management but no one wants to fully embrace it in the Water Sector in Kenya.

Presently, private sector participation in the public Water sector in Kenya is limited to a full cost covering pilot project management contract for the Malindi Water Supply area of NWCPC. This area covers the Municipality of Malindi and a rural corridor approximately 22 Km long. The management contract is for 4½ years duration and commenced in March 2000. The current contract was preceded by a service contract between 1995 and 1998. The service contract and management contract in Malindi water supply area have valuable lessons for the future of PSP in Kenya. Therefore the performance of Malindi Water supply if properly documented may be what is required to present findings that may be used by decision makers in Government to look at PSP from a new angle. ***The important issue in this study therefore is to interpret the data that will be collected concerning the operations of the PSP operator, in Malindi Water Supply, with the aim of determining good practices that can be replicated in other urban water supplies.***

1.2 Statement of the Problem

The Private sector is operating water supplies on a small scale in many places. However, in Malindi water supply, the private sector is in charge of a relatively large Public water supply. This study, therefore proposes to identify factors that contributed to the contracting of the private sector operator to manage the water supply and also evaluate the performance gains that have occurred through the introduction of PSP option in the management of the water supply as a means of developing the critical factors necessary if the Private Sector is to be an option in the management of urban water supplies in Kenya.

1.3 The Study Objectives

The objectives to this study include the following:

1. To analyse and provide information on the issues that contributed to the adoption of PSP arrangements in Malindi Water Supply.
2. To study and diagnose the agreements entered into and the performance targets set and how successfully they have been implemented.
3. To study the strategies that the PSP operator has adopted to overcome the problems that were affecting the efficient performance in the water supply.
4. To analyse effectiveness of the service delivery to the consumers by the PSP arrangements.
5. To analyse and interpret the data obtained with the aim of determining good practices that can be replicated in other urban water supplies.

1.4 The importance of the study

The existing water supply systems in urban areas are not operating optimally in delivery of the service. There is therefore a recognised need to improve performance and efficiency in water provision in urban areas. This requires utilization of alternative management arrangements, from those that have hitherto been in use. This is in recognition of the fact that the major problem affecting water supplies in Kenya is the institutional and management arrangements that

are in use. Private sector participation has been identified in recent studies as the way forward.

Between 1997 and 2001 attempts, with various degrees of success, have been made towards commercialisation of urban water supplies. By end of March 2004 the water utilities in Nyeri, Kericho, Eldoret, Kitale, Nakuru, Kisumu Nyahururu and Nairobi had, managed to register and were operating water and sewerage in their areas of jurisdiction through Water and Sewerage Companies (WSCs). These companies had taken over from the water sewerage departments (WSD's) in those municipalities with the aim of providing water and sewerage services to their residents on commercial basis. However, only Nyeri and Eldoret have water companies that have been operational for over five years. The rest have been in operation for about a year and Nairobi for less than a year. The WSC in Kericho, which commenced at the same time as those of Nyeri and Eldoret, in July 1998, had, after an initial failure, again started operating in August 2002. The WSC in Kisumu and Nyahururu started operating in July 2002. Thika and Nanyuki have also made significant progress towards commercialisation but through restructuring their water departments without forming water companies. On the other hand the Management Board of Kitale and Nakuru were disbanded in 2001, and the water utilities taken over by the then Ministry of Environment and Natural Resources. Therefore the performance of water and sewerage companies can be said to have been chequered.

It is however important to note that the World Bank experts in Water supply services did not consider operations of WSC in Eldoret as a form of PSP in the Water Services in the definition of PSP apart from the WSC in Nyeri in their analysis of the water sector situation in Kenya (World Bank, 2000). Indeed Ng'ang'a (1999) in his research on commercialisation of water services and sanitation in Kenya, recommended that Nyeri Water and Sewerage Company should increase PSP in its operations. Nganga could have recognised that the water company in Nyeri does not meet the criteria for PSP.

Therefore the only formal PSP experience in WSS in Kenya is the Management Contract, which the National Water Conservation and Pipeline Corporation

(NWCPC) signed with a consulting firm to operate and maintain Malindi Water Supply in Malindi Municipality.

It is generally accepted that private sector participation of infrastructure promises increased efficiency in investment, management and operation as well as access to private finance for investment. It can reduce Government over stretch; generate government revenues; develop local capital markets; and stimulate foreign investment. It can also signal to international investors, capital markets, and local population that a Government is committed to sound fiscal management, efficiency, and a substantial role for the private sector (World Bank, 1997). The study therefore sets out to find out if some of these claimed benefits of PSP have been realised in Malindi water supply as a result of involving a PSP operator. Since it is the strategy of the government to encourage PSP involvement in the service provision including the Water Sector (Narc, 2002 p 35, 43), the evaluation of the PSP gains in Malindi Water Supply can:

- Point out the issues both the Government and local authorities have to consider before adopting PSP in the Management of urban Water supplies;
- Identify problems, which other urban areas wishing to adopt PSP options can avoid;
- Help the urban water utility managers adopting PSP options to focus on the Performance targets that need to be included in the contracts/agreements.

2 DEVELOPMENT OF THE WATER SECTOR

2.1 Evolution of the Water Sector in Kenya

The responsibility for water development shifted between three Ministries prior to the first creation of the ministry of water development. Until 1964, the Hydraulic branch of the Ministry of Works (MoW) was responsible for water and sewerage development in the urban areas. Rural water development was under the African Land Development Organisation (ALDEV) of the Ministry of Agriculture (MoA). The two organisations were amalgamated under the Ministry of Natural Resources (MoNR) in 1964 and transferred to the MoA in 1968, when the water development division was established. However, the responsibility for provincial setups of the division was divided between the Water Development Director (WDD) and the provincial Directors of Agriculture. The distribution of authority and responsibility was very vaguely defined. The seeds of weakness in management of water supplies were therefore sowed. In 1972, the water development division was upgraded to a department and the Director became directly responsible for the provincial organisations (WHO, 1973a p2).

Thus the water department was given the overall responsibility for water development in the country in 1972. However, specialised agencies remained responsible for certain sectors; the National Irrigation Board was left to continue handling all the major irrigation developments and the development of hydroelectric power was left in the hands of the Ministry of Power and Communications, until late 1972 when Tana River Development Authority was established. The only other parastatal, which then played an important part in the field of water supply, was the Mombasa Pipeline Board. The board was charged with the responsibility of administering the bulk supply of water to Mombasa and its environs. The board was in charge of constructing bulk delivery pipelines to other towns around Mombasa. For the day to day operations of its installations, the board employed the water department as the operating agent (WHO 1973a p2).

Another important player at this time was the Ministry of Local Government (MoLG) that was in charge of water supplies in eight municipalities that included Nairobi city, Kisumu, Thika, Kitale, Nakuru, and Eldoret; Nanyuki and Nyahururu county councils. The DWD was responsible for assisting the Ministry of Local Government for all technical requirements in these urban water supplies. It is important to note that the DWD was still operating four supplies within Nairobi city area, namely; Embakasi airport, Wilson Airport, Langata and Kabete areas. In addition there were thirteen private water supplies within the city boundary. The majority of rural water supplies developed then, with the help of the WHO/UNICEF programme were being operated by County Councils, which were also under the MoLG. However, concerns about the performance of the sector were growing. WHO at the request of the Government undertook a series of studies aimed at improving the management and performance of the sector and proposing a ten year development programme for the water sector. WHO prepared seventeen number separate sectoral study reports covering various developmental aspects of the water sector (WHO 1973a).

WHO in its sectoral report No.10 of 1973 on the administration and organisational structure for water supply and sewerage development made a number of recommendations some of which were implemented and appreciably changed the management of water supplies in the country. Among these recommendations were (WHO, 1973a):

(a) A ministry in charge of Water Supplies was to be established;

(b) Nairobi water and sewerage department was to be made a parastatal operating under commercial basis, independent of Nairobi City Council, but reporting to the ministry of water when created;

(c) A marketing section was to be established by the DWD to improve the economy of urban water supplies under the water department;

(d) The annual recurrent estimates, which included O&M prepared by the water department were to indicate clearly the implications of the often drastic cuts, which seemed arbitrary by the ministry of Finance;

(e) Delegation of authority and responsibility was to be increased within the water department;

(f) The quality of water supplied by the private water supplies within the City of Nairobi proved dubious, therefore, the water and sewerage department within Nairobi City Council was to take charge of them;

(g) Accounting systems used by the seven LAs operating water supplies under the MOLG were very inadequate; therefore, commercial accounting was to be introduced;

(h) The urban water supplies under the DWD were to be handed over to LAs after they had developed the necessary technical and financial resources to operate and maintain the supplies; and

(i) The DWD was to take over County Council schemes where the county councils had insufficient resources to operate and maintain the supplies.

A fully-fledged Ministry in Charge of Water Development affairs was thus created in November 1974 a year after the recommendation by the (WHO 1973a) report. One of the Ministry's first decisions was to take over the management of not only Government operated water schemes that had been under the DWD, but also the LA/county council water schemes. The Government's decision to create such a Ministry was due to the awareness that water supply and environmental sanitation were the biggest contributors to acceptable health situation. In effect, therefore, the government was in agreement with WHO that water was not receiving the attention it deserved under the MoA. Indeed within its first decade of creation, major development programmes to provide improved water supplies to the rural areas and improvement and extension of services in the urban areas were undertaken (SIDA, 1983).

The Development Plan 1984 – 88 (Republic of Kenya 1984 p36) reported that the number of rural residents reached by improved water facilities rose from 1.5million in 1976 to 3.5 million in 1983, while average distances between rural homesteads and dry season sources of water had, for most parts of the Country, been reduced from 3.4km in 1974 to 1.8km in 1983. In urban areas, the Government estimated that 75% of the total 2.6 million urban residents in 1982 were reported to have access to improved water.

Notwithstanding these achievements, the Government and the donors involved in Water supply sector had, by the beginning of 1980's, started getting concerned with the effectiveness and performance of the large number of urban schemes, maintained by the then Ministry in charge of water supplies and Local Authorities. Numerous studies undertaken for or commissioned by the Government, through the relevant department consistently concluded that the operation and maintenance, social and financial performance of the schemes were sub-optimal and were in need of major improvements (Sida1983a and Sida1983b).

The reports were unanimous that unless management reforms were carried out, and soon, the commendable gains made faced the distinct possibility of being lost as installed facilities and services would deteriorate. The most memorable of these observations was made by the operations and maintenance study report (Sida 1983 p1) which stated as follows:

> "The current situation with regard to Operation and Maintenance is unsatisfactory. These activities are currently of secondary importance in the Ministry. Resources and attention are CONCENTRATED on building new schemes with scant regard to the capacity to maintain and operate the existing schemes. As a consequence, the heavy effort of the Kenyan people to construct water supplies is for naught. The schemes deteriorate rapidly and performance is very modest. The schemes are expensive to operate, are badly or not at all maintained, and deliver to consumers an unsatisfactory volume and quality of the water produced".

2.2 Development Policies in the Sector

It is evident that the poor state of management was brought about by the Governments' policy towards the water sector as expounded in various documents between independence and 1983.

Sessional paper No.10 of 1965 on African Socialism and its application to planning in Kenya (Republic of Kenya 1965), water was seen as a social service that the Government had to provide to its citizens, either free of charge or

subsidised. A further interpretation of the paper was that commercialisation or even privatisation of some basic services, water included, would be minimised or done away with.

Therefore, effort was directed towards putting up of water supply facilities so as to reach as many people as possible in order to reduce incidences of disease. Little or no effort was directed towards sustainability of the facilities being put up.

The Government was not giving adequate resources to the water sector, especially in the periods preceding the creation of the Water Ministry. This observation is given credence by WHO Sectoral report to the Government in which the following observations were made:

(a) During the review of the budget by the ministry of agriculture, many of the programmes were cut down, often quite arbitrarily. If available financial resources were insufficient to meet the demand, it would be preferable to leave out certain programmes entirely, rather than make reductions of most programmes.

(b) The implication of not taking into account that the water department was engaged in a major development programme, and that the number of water supplies increased each year and thus the need for recurrent funds, were alarming. If the O&M funds were reduced arbitrarily, while the work volume continued to increase, the result was that the available resources were insufficient to properly maintain the supplies (WHO 1973b, p40,42).

The government took the first recommendation seriously by establishing a new plan of action aimed at injecting more resources in the sector and thus expanding the water services to as many Kenyans as possible. The result was that the Government budget allocation to water sector was not affected even though the Government embarked on the budget rationalisation programme in 1975.

The goodwill that the government enjoyed from its development partners was not put into the context of sustainable water services. Many programmes were implemented without proper coordination. Coverage seemed to be the overriding consideration, but sustainability was at the backline. This may have been due to

absence of a full fledged ministry for water. The following few examples illustrate this: (WHO, 1973b p18-31)

(i) In February 1969 an Inter-Ministerial Committee for rural water supplies was formed as a result of a cabinet decision. The terms of reference for the committee included: financial policy; water charges; rate collection; selection criteria and evaluation of rural water development. Unfortunately the committee met infrequently and generally carried out only one function that is reviewing rural water proposals put up by the water department for construction. The other important issues that the committee was expected to deliberate upon were forgotten. Therefore, the only body that could have given policy direction to the sector, at the time, lost its bearing and ended up not giving the right direction to the sector.

(ii) As early as 1963, the International Bank for Reconstruction and Development (IBRD) had started financing a water development programme in the settlement schemes under the Ministry of Lands and Settlement as part of the land distribution policy. At first, the water department seconded one hydraulic engineer to implement the programme with technical assistance from US Peace Corps volunteers. The engineer was withdrawn and the US Peace Corps also discontinued its support before the water department took over responsibility for the implementation of the programme. Furthermore, although it was the one programme where the beneficiaries were expected, to meet the full cost of water, the operators on the schemes had only received short training in maintenance of mechanical equipment on the schemes. As expected the schemes sooner than later started suffering from operational problems. It must, however be mentioned that the revenue collection of the schemes was about 50% successful. Thus, the operation and maintenance was from this experimental programme poor, while the important lessons in cost recovery at this early time after Kenya's independence were never to be replicated.

(iii) In 1962, the Ministry of Health (MoH) launched a community water supply programme. Support for the programme was obtained from WHO Win form of technical assistance and from UNICEF with material and equipment required for the implementation of the programme. For the implementation of the programme, health inspectors were given a one week crash course in design of rural water supplies. The schemes were handed over to County Councils on completion. The schemes immediately ran into problems as the Councils had very limited resources to properly maintain the supplies, which already had poor initial designs. Within the first decade, more than 50% of the schemes were not operational. The programme, however, created demand for rural water supplies, which had not been its aim.

(iv) The government policy right from independence was '*Harambee*' i.e. extending participation in the development of the country to the mass of the people. Many self help schemes were started by the population in schools, dispensaries, and other facilities in addition to water supplies. The water department had very little resources to be able to give adequate technical service to the self help water groups in the country. Indeed there were only two officers at the departments headquarters assigned the responsibility of advising all the self help groups in the country. The schemes therefore relied on health inspectors and county councils. The result was that many of the schemes were characterised by poor designs and very high financial input in relation to the service rendered from the supplies. Many of the schemes failed due to the very little knowledge on how to maintain the supplies. The efforts of the people were, therefore, not properly managed.

Therefore, by the time the Ministry of Water Development was established it already had 168 water supplies to operate and maintain and it was supporting an additional 72 that it did not require to take over additional supplies. Table 2.1 illustrates the water supplies operated by the department at the time it was elevated to a full fledged Ministry. The new Ministry should instead have concentrated in building capacity of county council and communities to manage the water supplies that were under them.

Table 2. 1: Water supplies operated by water department in early 1974 (WHO 1973a p57)

PROVINCE	TYPE OF SUPPLY			
	Urban	Rural	Institutional*	Non-Gazetted
Central	13	3	11	-
Coast	19	6	1	-
Eastern	8	10	1	5
North-Eastern	1	19	1	-
Rift Valley	25	15	19	1
Western	7	5	4	-
Nyanza	10	2	2	1
Nairobi Extra	12	6	33	-
TOTAL	95	66	72	7

*For some of the institutional supplies, the water department was only carrying out maintenance as required. The operation was by other agencies.

The entry of more donors in the water sector, in the first decade of independence, did not help matters. It is an established fact that the donor supported programmes created a big impact in the water service coverage. Unfortunately, the programmes seem to have over concentrated on service coverage at the expense of management. Sustainability does not appear to have been of major concern. Efforts were instead directed towards training of manpower at lower levels to operate the schemes and also to supervise constructions. The training seems to have mostly favoured construction rather than operation and maintenance, though most water supply operators had had only on the job training. Most higher level technicians and the few graduates who were in the field were mostly in offices carrying out administrative functions geared towards construction and rarely getting involved in operation of schemes. The operation and maintenance at senior levels was mostly in the hands of expatriates. Therefore it was not surprising that by the late 1970's there were already problems in the performance of water supplies, which had been put up only a few years earlier.

The other developmental problem was the *inconsistency* in the government policy in the water sector. Government policy in the water sector as explained in the third development plan (1974-1978) stated as follows (Republic of Kenya, 1974 p328):

> "Standard of service has been established to facilitate the design of individual schemes through standardisation of scheme components to implement a system of

user charges based on the ability to pay, cost and service. It is intended that systems for Urban Water Supply and sewerage disposal become self-supporting financially as soon as possible. Rates will be established, therefore, on the basis of full recovery of capital, operating and maintenance costs of all schemes taken together in the long run".

However, by the production of the Fourth Development Plan, the above policy which had not even been fully implemented was shifted a bit, to the detriment of the water sector as follows (Republic of Kenya 1979 p193-194): -

> "The policy of the Government is that everybody will pay for water services. But since water is a basic need, its pricing will be such that the water rates would cover direct operation and maintenance costs for the rural water supply. Moreover, new tariffs will be introduced during the plan period and will take into account ability to pay for water users in different parts of the country".

It can therefore be seen that between 1974 and 1979, a period of five years, full cost recovery in urban areas as a policy had been dropped from the official government policy in the sector. The only consistency in the official policy was that everybody had to pay for water. It is a well known fact that costs of production change over time. The implication of the above government policies was that the there would be continuous reviews of water tariffs. But this was never to be, and remains a problem even to date.

By 1981, two years into the implementation of the fourth development plan, the Government's policy on water had again changed. The change came about as a result of a Presidential directive of April 1981on rural tariffs and prices. The Ministry of Water Development, not only standardised the tariff throughout the country, but also almost abolished metered connections in rural areas. Therefore, the policy of ability to pay in different parts of the country that had been expounded in the development plan was not strictly adhered to (Republic of Kenya 1981). Whereas the Fifth development plan (Republic of Kenya,1983) reverted to theme of the third development plan, as far the policy on water was concerned; the legal notice no.194 of 1981 was not withdrawn. It is interesting to note that this legal notice was not revised till 1992, inspite of even the publication

of the Governments Sessional paper No.1 of 1986 (Republic of Kenya 1986) which introduced cost recovery in provision of social services.

2.2.1 External Influence and contribution to policy development

It is however not fully right to blame the Government's lack of consistent implementation of a coherent and clear policy in the water sector as the source of the problems. After the withdrawal of the World Bank from the water sector engagements with the Ministry of Water Development in early 1980's, bilateral donor interests seem to have taken over and guided the direction of the sector. The authors experience in the sector, as outlined by the following examples of bilateral policy of the prominent donors, illustrates this.

(I) Swedish International Development Agency (SIDA)

This is one development agency that has been in the water sector consistently since 1970. Their concentration has been in rural areas. By the end of 1974, reports indicated that the projects they had supported were at the following stages (MOWD 1974 p3)

- Design stage 7 projects
- Construction 36 projects
- Operations 57 projects (MOWD 1974 pg 3)

By late 1970s, SIDA realised that the MOWD could not continue with business as usual attitude. The ministry agreed with their observation and as a result a number of studies supported by SIDA were commissioned. The water use study, 1983, argued that the MOWD should be divested of O&M responsibilities. The O&M study, (SIDA,1983a), made strong representations in favour of decentralisation. In effect therefore, the reports called for reforms revolving around the initiation of changes in the management of schemes with a view to:

a) Enabling the MOWD gain effective control over its schemes;

b) Decentralising management, operation and maintenance to appropriate levels for rapid and effective response to scheme specific happenings;

c) Increasing the level of consumer participation and responsibility in the management, operations and maintenance of schemes;

d) Increasing the level of equity in the social distribution of scheme waters and

e) Generating resources needed for O&M from the beneficiary consumer population.

These reports, however, warned that without these reforms the water sector shall increasingly find it difficult to operate and maintain the schemes and to generate the resources required for the much needed expansion of its investments to reach the majority of population.

The MOWD was slow to implement the required changes, especially after the handing over of urban water supplies to LAs in early 1980s became a fiasco due to failures in service delivery, which forced the MOWD to take most of them back. Though SIDA continued engagement with the ministry, they tried to implement the recommendation in the reports in parts of the country, with hope that the ministry would widen the scope of implementation of the recommendations to cover other parts of the country. It never happened, the ministry continued with the business as usual attitude.

SIDA as a result started advocating for community management of water supplies and indeed found a way of doing this with the acceptance of the ministry. This was a fad, especially during the water decade, throughout the world. The communities were unprepared for the new role; they did not have the required capacity; neither was the Government, which had to support the communities, prepared for community management in the water sector at the time. The other problem is that there was no experience in or of community management in piped water supplies. Community management of water supplies was therefore introduced without adequate preparation. It took more than a decade for community management to be appreciated by government, inspite of the fact that there were self help water projects being implemented at the same time. Therefore, the Swedish support policy, of trying to solve the problems of poor services in the sector through empowering the community was not fully right. The policy as such distracted attention from more serious sustainability problems in Government schemes, which were supplying the majority of the population. However, credit must go to SIDA who continued to engage the ministry in

discussions aimed at reversing the deteriorating situation. Indeed, it is due to them that the Water Policy and new Water Act 2002 were put in place, hence leading to implementation of recommendations that had been made two decades earlier.

(II) The Norwegian Agency for development (Norad).

This was the moving force behind supply of water to the small towns in Kenya. The activities of Norad, which started in 1980 stopped in this country in 1991. Their last programme in Kenya was the Minor Urban Water Supply Programme (MUWSP), 1988-92. The appraisal mission for this phase of the programme noted the following in their report on the issue of sustainability (Hifab AS 1987 p11).

> "In the missions opinion the sustainability of MUWSP proposals is threatened by shortfalls in recurrent funds. Until a more efficient cost recovery policy has been implemented it is not advisable to continue with the same emphasis on new constructions as in the past"

This was an opinion being given during the lifetime of the fifth development plan and after the publication of the Government Sessional paper No.1 of 1986. The implication was that the efficiency and performance of water supplies in urban areas was worrying everyone, but nothing concrete was being done.

Unfortunately, Norad, during this phase embarked on rehabilitation of minor urban water supplies. The only sustainability activity that they included in the programme was metering and improving coverage to the poor in the minor urban areas. No attempt was made to address the issue of management of the rehabilitated water supplies, though this was being piloted by SIDA for communities in eastern province of the country.

(III) German Technical Development Agency (GTZ)

The German Government development agency has been supporting urban water supplies right from the early seventies. It was the first bilateral organisation to take seriously the need to improve management of water supplies in urban areas.

However, after the programme moved from MOWD to MoLG in mid 1980's, it stopped fully involving the Ministry in charge of water affairs in its plans. This implied that the issues they advocated were not incorporated in the policies for urban water supplies by the department which was in charge of the water policy and which was in charge of most of the urban water supplies.

If GTZ had included the Ministry in charge of water affairs in their programmes especially from 1990, the pace of change in management of urban water supplies would have been faster. It should be noted that at this time, Norad's approach to sustainability was completely different from that of GTZ. This was simply due to the fact that the two agencies were working under different Ministries, that is Norad under Ministry of Water Development and GTZ under Ministry of Local Government. Credit must also be given to GTZ as their consistency in seeking for a solution in the management of urban water supplies led to the changes that finally culminated in Commercialisation that has now gained acceptance by most LA's. Similarly the Ministry in charge of water now fully advocates commercialisation as part of reforms.

(IV) German Development Agency (KFW)

This is a German Government Agency that provides credit for large-scale developments. Its funding to the urban water supplies in Kenya started in mid 1970s. A substantial number of urban water supplies in this country have been built through the support of KFW. These include water supplies in Eldoret, Kitale, Malindi, and Kericho. Unlike GTZ, sustainability was not an issue in its loans/grants until mid 1990s. This may have been due to the fact that GTZ was handling the sustainability aspects in urban water supplies. If these two German financed organisations had worked jointly, the situation in urban water supplies would most probably be different today.

This uncoordinated approach at the central level was therefore a disaster for the improvement of management of water supplies in urban areas.

(V) Japanese International Cooperation Agency / Japanese Overseas Development Agency (JICA/OCEF)

These are Japanese Development Agencies. Japan did not want generally to tie conditions to its support to Kenya. Therefore, some of their projects like Taveta-Lumi and Greater Nakuru constructed in the late1980s, did not have a component of management training. Sustainability was assumed provided by either the Ministry of Water Development or NWCPC. Specifically, JICA assumed that with its annual training in management of a small number of local technical staff in Japan, the benefits would be passed over to the water supplies. Unfortunately this was never the case. Most of the People trained were not from water supplies as most were picked because they had not attended a course outside Kenya but not because they could utilise the knowledge gained in improving the water supplies.

It was only after JICA supported the preparation of the National Water Master Plan in 1992 (Jica,1992) that Japan realised that the issue of sustainability was serious and required addressing. Indeed their current supported water project in Meru is piloting a management arrangement, which is a public-public-partnership through a trustee that puts commercial aspects first. The success of this Japanese sponsored project may be another mode of management of urban water supplies that may be adopted for ministry managed urban water supplies in post reform period.

However, while carrying out the AfterCare Study (JICA/Nippon Koei, 1998), on the National Water Masterplan, in 1998, JICA, recommended institutional changes in the management of water supplies especially in urban water supplies. Though, in the AfterCare Study they did not specify a management system that could be utilised, they recommended commercialisation of urban water supplies. It is on basis of this that the Meru management approach was adopted. Jica does not believe in supporting privatisation in urban water supplies and that is the reason they adopted public-public-partnership.

The fact that it took Japan close to a decade to realise that there was need to change the management mode of water supplies, goes to show how different

donor approach to the management in the sector has been and the effect it has had on the reform in the water sector.

(VI) The World Bank

The failure of World Bank to have any project in the Ministry of Water Development between 1983 and 1994, implied that they could not influence any policy change in a ministry in charge of water affairs. Indeed, the two water projects that the Bank was involved in i.e. 3rd Nairobi and Mombasa and Coastal water supplies since their withdrawal from the Ministry did not improve the management of the water utilities in which the projects were implemented.

In 1991 the World Bank and African Development Bank threatened to stop funding to the third Nairobi water supply project unless tariffs were revised. This prompted the MOWD to revise the tariffs that had stayed the same for a decade. Thus the World Bank and African Development Bank must be credited with having made the Ministry revise Legal Notice No.194 of 1981. Other tariff revisions followed in 1993, 1995 and later in 1997. The World Bank was also instrumental in getting the NWCPC to start the service contracts in Malindi water supply in 1995 as a way of trying out PSP options in the water sector, as a means of improving service delivery.

It is therefore clear that if the World Bank had been engaged with the Ministry in charge of water affairs, many changes could have been realised. Their absence for a decade implied that the one donor with ability to influence all other donors and make them follow one path was nowhere when most required to give the direction to other donors in the sector.

(VII) Finnish Development Agency (FINNIDA)

This agency was involved in the water sector in Western Kenya from 1981 up to 2003. In the initial years the agency's project concentrated on community projects where the communities were never prepared adequately before the facilities were left to them to operate. Thus most of the supplies collapsed due to absence of small items. The problem was that individuals within the communities would contribute whatever was required and this would be mistaken for community contribution. In the end, the communities demand for the service was not actually

present. This however, changed in the subsequent programmes especially from the late1980s in which the capacity building for the communities and ministry staff was carried out to a high extent than anywhere in the country. Unfortunately, most of the ministry staff were transferred and replaced by those with no training in community support. This programme was therefore trying to convert people without adequately preparing them. This would seem to have been its biggest weakness. The other problem that the programme faced especially in the last years was that, it revolved around personalities, who were convinced that the ministry was not required in whatever they were doing. Unfortunately they had the support of the donor. The result was that inspite of the regular, technical and steering committee meetings, the programme were never part of the Ministry. As a matter of fact the programme stopped being part of the ministry from the time the last Finnish Technical Advisor left the Ministry. Therefore, its experiences never went outside the project area. The failure to get the policy leaders in the Ministry to appreciate the immense changes that the donor had introduced in the sector in western Kenya meant that when the programme stopped, the experiences also disappeared even from most of the local ministry staff.

2.2.2 Towards a water policy

For a long time after independence water policy was contained in various documents and circulars that were released by the Government in general and the ministry in charge of water supplies from time to time. Major among these was the Governments National development plans released every five years by the ministry in charge of economic development.

The National Development Plans generally contains the country's priorities, goals and objectives and describes the general conditions necessary for the attainment of these aspirations. However, the main preoccupation of the ministry of planning is the Country's economic issues and policies, therefore in discharge of its functions, the ministry in charge of water development, like other ministries is faced with economic policy issues, which it has to analyse directly. The ministry is therefore expected to identify these issues and be guided in formulation of solutions by the ministry of planning. Due to the sheer volume of information

emanating from districts, the Ministry of planning did not have enough personnel at any given time to concretise the water ministries issues into proper solutions for the sector. As a result there were inadequacies in the planning process as far as the water sector was concerned (Sida 1992 p14).

Apart from the National Development Plans, there have been other policy documents issued by government that have had profound effect on the way the sector has developed. Major among these was the Sessional Paper No.10 of 1965 on African Socialism and its Application to planning in Kenya. This document while espousing nationalisation also indicated that the strategy was driven more by pragmatic social, economic and political objectives. To this end the policy document meant that major basic services were going to be either provided free or subsidised by the government. As such the Sessional paper meant that significant involvement of other actors such as the private sector was very minimal. Aseto and Okello (1997) noted that as a result of this policy document, the Government increased its involvement in direct economic activities by nationalising, as well as establishing, many new state enterprises in a variety of sectors and locations. They further noted that no steps were taken to encourage the growth of or strengthening of the private sector commensurately. This policy therefore dictated the tariffs revisions in the country. The tariffs set between 1970 and 1981 took the subsidy implication of the Sessional paper into account. The Water use study of 1983 and Tariff Study of 1984 estimated a direct cost recovery minimum of Kshs 6/m^3, while the average water tariff at the time and for the next eight years was Kshs 2/m^3 (ICS interconsult 1984 p50).

Another very important policy directive, which had effect on the water sector was the Presidential directive of April, 1981 that revised the then existing rural tariffs on account of (a) abolishing, temporary, metered, rural tariffs, and (b) unified official rural tariffs throughout the country in place of the then existing geographically different tariffs. This directive started off the direct involvement of politicians in dictating the policy in the water sector. Indeed the bureaucrats then got scared of revising even the urban tariffs such that the tariff revision vide legal notice no.94 of 1975 (Republic of Kenya, 1975) for urban water schemes remained unchanged for sixteen years. Thus, the sustainability of urban water

supplies was affected directly. The overall long-term objective of achieving self-financing for the water sector; through the policy of full cost recovery for urban schemes was thus defeated. In the same breadth, the policy of recovery of the direct O&M costs for rural water supplies was also jeopardised.

One of the most important Government policy initiatives in provision of services to the people was the introduction of the policy of "District Focus for Rural Development (DFRD)" in 1983 (Republic of Kenya 1983). This policy transferred the responsibility for planning and implementation from the headquarters of various ministries to the districts. The DFRD was supposed to increase popular participation of communities in development in their areas. However, by the end of the first decade, there was no sub-committee in place dealing with water within the DDC unlike other development activities. Worse still, there was insufficient interaction between the MoWD headquarters and their officials at the district level, particularly as far as planning and implementation of the projects were concerned. Projects continued being planned and implemented from the ministry headquarters. In effect, therefore, the policy of involving the beneficiaries in planning their developmental needs was not operational at official level in the water sector. It can safely be stated that the implementation of the DFRD policy in the sector started off on a wrong note. More important, as noted in the delineation report (MENR/Sida 1992) was the fact that for the DFRD to take effect in the water sector, it would have been essential to decentralise programme planning and implementation to a level more accessible to the intended beneficiaries. However, this started happening a decade after introduction of the DFRD policy with the establishment of District Water Committees.

In 1986, the Government launched **Sessional Paper No.1 of 1986** on **Economic Management for Renewed Growth** (Republic of Kenya, 1986). According to the Water Services Strategy (MENR, 2001) through this new policy the government was to identify several strategies to reach several goals among them the provision of basic services, which would accelerate economic growth, and reduce inflation to manageable level. Accordingly, the government began contemplating cutting back on direct involvement in the development and management of water supplies. Aseto and Okello (1997), noted that this sessional paper, specified the

conditions for sustainable growth trajectory through to the end of the century. Basically, the policy meant that resources, other than the state budget had to be mobilised through cost sharing in order to increase the degree of cost recovery in most sectors. Certainly this was important especially for sectors like water where by the beginning of the 1990s personnel costs had almost reached 80% , according to TARM Consultants (1991) leaving inadequate funds for O&M. Therefore for the first time since the presidential directive of five years earlier cost recovery was an official policy in the entire water sector.

On June 24th1988, through Legal Notice No.270 (Republic of Kenya 1988), the President ordered that a National Water Conservation and Pipeline Corporation be established, under the State Corporations Act Cap 446 of the laws of Kenya. The NWCPC was to operate those water supplies placed under its care on commercial basis. However during its first years of operation, the duties and responsibilities of NWCPC were very similar to those that were being performed by the department of Water Development. The delineation report (SIDA 1992) observed that the only difference was the fluidity with which the NWCPC could operate, since it was not subject to all the government bureaucratic procedures.

In 1992, the Ministry of Water Development released two important documents that continued to guide the sector up to the end of the decade. One was the Delineation Study of the Water Sector in Kenya (SIDA, 1992), and the National Water Master Plan (Jica 1992). The main outcome of the delineation report was a defined and improved delineation of roles, functions and responsibilities of the principal actors in the sector, with special focus on those roles, functions and responsibilities which best suited the MOWD and NWCPC. On the other hand, the national water master plan set out long-term plans for the much needed reforms in the management and development of the water sector. One of the most important recommendations to come from the two reports was that the Ministry should develop a water policy.

Subsequently, between 1995 and 1999, the ministry was involved in a policy development process for the sector. This was published as Sessional Paper No.1 of 1999 under the title **National Policy on Water Resources Management and Development** (Republic of Kenya 1999). This document is the blue print which

has since then guided legal, administrative and investment reforms in the water sector. The document, also proposed the necessary framework and provided a mechanism for mobilising resources to safe guard and develop the Country's water sector.

The Policy document was ready in its current state as early as 1996. The delay in publishing the document implied that the policy did not capture the emerging trends in the water sector that were fast gaining pace such as commercialisation. The policy spelt out the need to decentralise the decision making in the water sector, but failed to clearly explain where and how the services would be decentralised. Though the policy states that urban water supplies would be handed over to local authorities with adequate capacity, no specific moves were made to build the capacity in the local authorities. In the end, five years after the release of the policy document, the number of local authorities providing water services reduced from eleven to eight. The reduction in the number of local authorities in charge of their own water supplies was due to gross mismanagement of the water supplies forcing the Ministry in charge of water affairs to takeover the management of water supplies in those local authorities. Therefore as proposed in the policy document a new legal framework to back up the new policy directions had to be developed.

2.3 The Water Act 2002

The Water policy document noted that the Water Act Cap 372 would be revised. Indeed a Water Act 2002 (Republic of Kenya, 2002) was enacted in which new institutions were specified and roles of current prominent actors redefined.

The Water Act 2002 spells out the role and responsibilities of the Minister for Water in the new decentralised setting. The legal language used in the act generally refers to policy-making, monitoring and coordination as the responsibilities of the Minister. Indeed, within the Act, the Minister's statutory and discretionary powers are mentioned frequently touching on all areas of water resources management and water services. However, the decentralisation aiming at accountability and efficiency that is the cornerstone of the Water Act 2002 calls

for a clear separation of functions within the sector. The end result in the implementation of the act is the Ministry in charge of water affairs retaining only the policy making, coordinating and monitoring functions while the new institutions created take over the regulatory and operational responsibility. A Water Services Regulatory Board is established to regulate all matters of water supply and sanitation service provision through direct supervision of new bodies that have been established known as Water Service Boards. The legal responsibility for provision of water services will be vested in the water service boards and existing assets held by Central Government through the MWRMD, parastatals, Local Authorities and communities will be transferred or availed for the use of the WSB's. WSB's will provide water services through Water Service Providers who shall be private companies, NGOs, or companies formed by LA.'s.

2.4 Institutional Framework

In 1951, a Water Act Cap 372 (Cap 372) was enacted repealing the Water Ordinance of 1929 (Kenya colony, 1929). Among the institutions established under this Act was the Water Resources Authority (WRA). The authority had wide advisory duties on all aspects of water management. The WRA had one executive function in that certain decisions of the Water Apportionment Board were subject to the appeal of the Authority. In 1972, the Water Department took over the functions of the Authority. The water department continued with advisory powers in water management including water management in urban areas.

Another important institution established under Cap 372 was the Water Apportionment Board (WAB). While the powers and duties as set out in Cap 372 did not so provide, the WAB in effect exercised the Ministers powers to control the right to use water in the Country. The main functions of the Board were the issuance, variation, revocation, etc of water permits. The DWD was the technical advisor to the board and also provided its secretariat. The mandate of the last board, of the institution that had been in existence since 1951 expired in June 2003, the board then formally ceased to exist.

In March 2003, the Minister operationalised the Water Act 2002, thereby repealing Cap 372. However, Section 114 of the Water Act 2002 allows local authorities or other persons to continue operating water services within the meaning of the water act until the minister publishes a plan for transfer of management and operations of the water services to Water Service Boards as required by the Act. As a result water supply operations within urban areas shall continue to be guided by Cap.372, which spells out the powers and responsibilities of the water undertaker. However, the Local Government Act Cap.265 shall also continue to guide the operations of water and sanitation services in as far as establishment and maintenance of sewerage and drainage works are concerned, fixing and collecting tariffs, regulation of private sewer and water connections and maintenance of water fund accounts.

Another important institution on the statute books is the Mombasa Pipeline Board Cap.373 (Kenya Colony, 1958). This Act which came into effect in 1957, created the Mombasa Pipeline Board, which functioned till the mid1970s. The Board was charged with the responsibility of administering the bulk supply of water to Mombasa and its environs. For the day to day operations of its installations, the board employed the Water department on agency basis. The important issue about this Act was that the management of coastal water services were to be on commercial terms. This was to enable the Government to repay the loan used to construct the Mzima pipeline.

There is also the Legal Notice No.270 of 1988 (Republic of Kenya, 1988), which established the NWCPC. Among its intended objectives as stated by the delineation report (SIDA, 1992) were to commercialise water sector operations, to achieve financial autonomy in water operations, to improve performances and efficiency of water schemes, to reduce dependence on public funding of independent water schemes

According to the Delineation report (SIDA, 1992), none of these objectives of the establishment of NWCPC were ever listed by anyone and hence it took long before the successive boards of Directors and the management of the Corporation realised that these were the objectives, which had to be fulfilled.

Therefore under CAP 372, many organisations were involved in the urban water supply development and management. The key organisations included Ministry of Water Resources Management and Development (MWRMD), as lead agency, NWCPC, MoLG and LA's and MoH. Some were concerned with policies, others with implementation, operations and maintenance and others had multiple roles, which led to conflicts in the sector. The main functions performed by the various institutions are summarised in Table 2.2.

Until the transfer plan in accordance with Water Act 2002 is gazetted, the MWRMD, remains the custodian of all the water resources. In this capacity, the following functions are undertaken: general administration and planning, technical advice to other ministries, including the ministry of local government, training of junior and medium level water staff, operation and maintenance of rural and urban water supplies, sewerage and special water programmes.

Therefore, the main problems in the sector have all been blamed on the institutional weaknesses and lack of clear defined framework apportioning roles and responsibilities. In particular the role of MWRMD as a primary service provider and principal regulator has undermined the performance of the sector.

Table 2. 2: Functions of Various Institutions under WA Cap 372 (MENR, 2001 p7)

Actor	Roles
MWRMD	• Lead Agency in Water affairs through Cap 372 • Appointment of Water Undertakers • Water Conservation • Development of Water Supply systems • Setting and Approval of Standards • Regulation • O&M • Policy Formulation • Water Quality/Pollution Control • Research • Registration of Professionals • Water Apportionment • Sharing of International Waters • Sector Coordination • Approval of Water Tariffs, levies, rates & charges • Manpower Training for the Sector
NWCPC	• Manage & Develop Water Supplies as specified by the Minister • Supply Water In Bulk to Such Water undertakers as the Minister may Designate by Legal Notice • Retail Water • Setting Tariffs for the Ministers Approval • Assisting Government in Policy Formulation and Execution
MoLG	• Lead Agency in Relation to Sewerage, Under Cap 265 • Policy Formulation • Monitor Performance of Local Authorities • Implementation of Local Government Act • Approval, Coordination of Local Government Planning and Budgets • Providing Technical Assistance in Tendering, ToRs, and Supervision of Contracts • Initiate Financing Proposals-Development • Monitor Service Quality • Obtain Funds, Annual/Supplementary Budget; and Liaison with Development Partners.
Las	• Provide Sewerage Services • Discretionary Powers to Provide Water Services • Monitor Service Quality • Set Tariffs, Rates • Set Bye-laws and Regulations • Enforce Regulations and Bye-laws • Plan and Develop Infrastructure • Financing • Acquisition of Land for Easement, Way leaves for Service Provision
Private Operators	• Service Provision • Financing • Own Facilities
MOH	• Service Provision • Monitor Water Quality under cap 242 • Maintenance of Water Quality Standards

Adopted from water strategy Sept 2001 pg 7

The institutional framework under the Water Act 2002 involves the following agencies: the MWRMD, the Water Services Regulatory Board (WSRB), Water Service Boards (WSBs), Water Services Providers (WSPs) who may be LA's,

Private Sector, and Independent Providers, Water Appeal Board (WAB) and MOH. Table 2.3 provides the roles of the various actors in the institutional framework. From the table it is clear that the act has therefore defined the roles of the various actors in addition to devolving responsibilities for service provision.

Table 2. 3: Institutional Arrangements Water Act 2002 (MENR, 2001 p11)

Actor	Roles
MWRMD	• Policy Formulation/Strategy Development • Sector Coordination • Monitoring
WSRB	• Regulate WSBs • Issue Licences to WSBs • Approve Agreements between WSBs & WSPs • Approve Operational Plans, Tariffs, rates and Levies • Monitor Performance and Quality • Setting and Enforcing Performance Standards and codes of Practice • Promote Fair Competition Between WSPs • Conduct Viability Studies • Maintain Register of WSPs • Disseminate Information to Consumers • Advise WSBs on Handling Consumer complaints • Promote Water Conservation and Demand Management • Report to Parliament through Minister responsible for Water
WSBs	• Licence holders for Provision of Water in a Designated Area • Hold abstraction licences • Enter Agreements with WSPs • Hold/Obtain Use of Water Assets • Prepare Business Plans for the Designated Areas • Tariff setting • Expansion of Coverage • Submit Quarterly Reports on Performance to WSRB
WSPs	• Bid for Scheme Operations • Enter Agreements with WSBs • Operate Schemes on a Cost Recovery Basis • Comply with Quality and Service Levels
MOH	• Water Quality /Public Health Act Cap 242
Water Appeals Board (WAB)	• Receive and Deal with Complaints

2.5 Performance of the Urban Water Utilities

2.5.1 Introduction

According to the aftercare study (JICA/Nippon Koei, 1998), the urban population is projected to reach 11.5 million by the year 2010. This growth shall put tremendous pressure on existing utilities especially water and sanitation services, whose performance has been dismal since the mid 1980's. As part of the implementation of the District focus for rural development policy, the then Ministry

of Water Development with the agreement of the Ministry of Local Government set out purposely to appoint Local Authorities as water undertakers in their area of jurisdiction. Due to the poor performance in service delivery, most of the local authorities appointed as water undertakers, failed within the initial two years of taking over. The Ministry of Local Government then issued an official circular in January 1986, barring further appointment of Local Authorities as water undertakers. This circular has never been lifted, and since that time no local authority has been appointed a water undertaker (MOLG 1996 p5). The following are the main water undertakers in urban areas (World Bank 2000):

(a) Ministry of Water Resources Management and Development (MWRMD), which operates 75 piped urban water supplies serving a population of 1.4 million people. The water undertaker for these water supplies is the Director of Water Development who runs these water supplies through the Provincial and District Water offices. The policy matters and most technical issues involving the schemes are handled by the Head Office in Nairobi.

(b) The National Water Conservation and Pipeline Corporation (NWCPC) operates 21 water supplies in urban areas, serving a population of 2.2 million. Though the head office in Nairobi makes the policy and financial decisions, most technical and managerial decisions have been decentralised to the regions.

(c) Local Authorities. Currently there are eight local authorities that operate their own water supply and sanitation systems. They serve a combined population of 3.9 million. Apart from Thika and Nanyuki, the rest provide the service through autonomous water companies. Before the coming into force of the Water Act 2002, Ministry of Local Government used to play a facilitative and regulatory role, arranging necessary technical interventions with MENR and financing.

Irrespective of the water supply operator be it MWRMD, NWCPC or LA's, one cannot say that there is any institution that has performed better. This may be due to the political, economic and financial management factors under which the

sector has operated being the same. Water shortages still persist in many urban areas irrespective of the water undertaker.

As noted, the performance of urban water supplies has been dismal. Revenue collection is poor, and does not exceed an average of 50% to 70% of billed revenue. In most cases, collections tend to lag behind billing by several months leading to mismanagement of earned revenue and unnecessarily high operational costs. Staffing levels and patterns are often inappropriate, and personnel related costs consume between 50% and 75% of recurrent expenditure. Leakage rates are high and as much as between 40% and 60% of the piped water is 'unaccounted for' due to illegal connections, burst pipes and inefficient operations (MENR 2001).

The table 2.4 summarises the most common indicators to determine the performance of water utilities in urban areas (JICA, 1992 and Onjala, 2002a).

Table 2. 4: Summary of performance indicators by water authorities in Kenya

Indicator	Nairobi	Eldoret	Kisumu	Nakuru	Thika	NWCPC	MENR
Urban Centres (no)	1	1	1	1	1	32	71
Urban Population (000)	2100	300	400	500	149.4	1170	3400
Urban Pop. Served (000)	1853	175	209	300	120	950	1340
Service Ratio (%)	88	58	52	60	80	81	39
No. of Connections (000)	158	9	14	17	4	54	12
Staff Employed	1870	202	302	599	146	1617	7600
Staff per 1000 connections	12	23	22	35	34	30	61
Water Produced (000 m^3/d)	347	30	18	28	24	80	1700
Water Sold (000 m^3/d)	170	16	4	2	13	51	436
UFW (%)	48	52	82	45	47	36	74
Collection Efficiency (%)	39	51	39	62	76	50	41
Metering (%)	25	90	76	85	84	65	28

2.5.2 Performance indicators

Service ratio, the percentage of demand for service satisfied by the water supply system in its area of jurisdiction is very poor as far as urban water services are concerned. This ranges between 36-88%. Nairobi has the highest service coverage in the country at 88% and municipalities under the MENR having the lowest at 39% (JICA,1992). These figures are collaborated by the Multiple Indicator Cluster Survey Report, which was released by the Ministry of Planning in

March 2003, which puts the percentage of people using improved water source in Nairobi Province at 93.9%. However, of this percentage, 6% use water from boreholes; ponds, streams, rivers; and water vendors. In effect, therefore, according to the survey the water supply in Nairobi meets only 87.9% of the water requirement which was the figure a decade earlier (MoP&ND, 2003 p57). The implication is that the figures given in the NWMP of 1992 have not been exceeded a decade later. In effect, therefore, no urban water supply fully meets the water demand in its area of jurisdiction.

This state of affairs has been brought about by among other reasons the high levels of unaccounted for water (UFW), which range between 50-80% (NWCPC, 1993 and Onjala, 2002). Due to poor metering and the high number of non-working meters, the level of UFW is not easy to determine. For example, in 1997 JICA observed through field measurements that the UFW in Meru was over 70% while the Ministry of Water Development had been estimating it at about 40% (JICA, 1997). Another example again is Kisumu City, out of a total of 11,240 water meters only 32% are thought to be working, 26% are not working and therefore consumption is normally estimated, and almost 40% are "disconnected" (JICA, 1998). A field visit to Kisumu by Onjala (2002a) revealed that not all working meters are read on a regular basis, few as they are.

The quality of water produced is also not entirely satisfactory in most urban areas. Most treatment plants have inadequate capacity, and are therefore not fully effective particularly in removal of bacteriological contamination. The quality of raw water is very poor today when compared to the time most of the plants were built. This poor quality of raw water demands for enhanced treatment than is currently in use to achieve the standards set by the Kenya Bureau of Standards (KBS), which are used as the standard by MWRMD. Old and poor technology is not the only problem; most of the equipment has broken down and has not been replaced. Spare parts are not stocked, and most times those in management do not even know what has broken down as they lack transport to visit the water supplies. The situation is made worse by the near centralisation of purchases for the major O&M supplies such as chemicals, meters and pumps.

The above situation is made worse by the poor process control at the works and poor records kept by water undertakers. An examination of operational charts at the MWRMD easily shows that test results are invented; daily records are completed to MWRMD standards, even for water supplies where it is known that testing equipment does not exist. The situation is not any different for NWCPC and LAs' operated water supplies. This has been brought about by the fact that at the scheme level, most of the staffs are not professionals or even para-professionals. Subordinate staffs have been left to operate water supplies. They at least understand some technical jobs but they are not good at financial management. As a result they are not trusted with O&M funds. In the end there is nobody at scheme level to present a strong case for adequate O& M funding (NWCPC 1993).

The Government policy in the Third National Development Plan (Republic of Kenya 1974) indicated that water supplies and sewerage disposal systems should be self-supporting financially. Indeed the policy clearly provided that the tariffs charged had to ensure full recovery of capital, operating and maintenance costs on long term basis. Therefore, there should have been no good excuse for poor financial performance of water utilities in urban areas.

The explanation for the poor financial performance, therefore, lies in poor commercial orientation, which includes poor collection efficiency and lack of accounting of any sort at the scheme level. In many urban areas, most households who receive no water get billed for the minimum quantity. This not only inflates the apparent high consumption but also leads to default in payments by households. Many customers who refuse to pay their water bills are eventually disconnected. The most serious issue is that most water undertakers do not give the defaulting customers chance to pay in accordance with their ability until they clear the outstanding bill. Reconnection is usually on clearance of the debt. The result is the reduction in number of customers. In the end, the revenue generated is usually on the reducing trend, and hence insufficient to cover operating costs. If the issue concerning high water losses (UFW) is taken into account, then it becomes clear that little of the revenue is collected.

The situation is not made any better when most meters in the urban settings are not working. This leads to estimation of consumption and most times the minimum consumption is what is charged. With absence or non functional zonal meters, no one is sure of the quantity of water being sold or produced and distributed. Even where meters are working, they are not read regularly and hence the billing, which is also not regular, is based on estimated consumption, thus encouraging wastage. All these issues indicate that the people in charge of the urban water supplies do not have a commercial appreciation of their duties.

2.5.3 Institutional capacity and staffing

Apart from a few urban water utilities, most have inadequate institutional capacity. Most personnel now in charge of water supplies do not possess the right qualifications to put them in charge of those operations. This is especially so for urban water supplies under MWRMD and Local Authorities. Indeed on this score, the NWCPC seems to be the only organisation with some qualified technical staff down at scheme level (Richards, 2002 p1).

The other issue is that there is overstaffing at the lower cadres. The ratio of employees per 1000 connections in Kenya ranges from 12 to 50. Table 2.5 shows that Senegal and Cote d'Ivore, which have some of the most efficient water utilities in Africa; have between 3-5 employees for every 1000 connections (World Bank, 2000). Though the figure of 3-5 employees per 1000 connections is disputable, with inefficient and poorly performing utilities, it is hard enough to convince anybody that overstaffing is not a contributor to the poor performance.

Table 2. 5: Staff Comparisons for different water utilities in Africa (WB 2000)

	Kenya		Cote d'ivore	Senegal	Ghana	Uganda
	NWCPC	Nairobi WSD	SODECI	SDE	GWSC	NWSC
Type of operation	public	public	private	private	public	public
Population served(millions)	3.7	2.25	6.3	4.0	8.2	1.8
Customers('000)	242	160	420	250	251	40
Centres served	40	1	549	47	110	12
Staff	1650	2600	1400	1250	4440	1200
Staff/1000 customers	**6.8**	**16.2**	**3.3**	**5.0**	**17.7**	**30.0**

Therefore, overstaffing results in low productivity in urban water supplies.

2.5.4 Water tariffs

The urban water tariff in Kenya is not very low when compared to other African Countries like Senegal and Cote d'Ivore. However the level of the water tariff does not adequately reflect the true economic cost of collecting and treating water and wastewater. Table 2.6 gives an indication of tariffs in selected African countries.

Table 2. 6:Comparison of Tariffs in different African Utilities(Adopted from WB 2000)

	Kenya		Cote d'ivore	Senegal	Ghana	Uganda
	NWCPC	Nairobi WSD	SODECI	SDE	GWSC	NWSC
Type of operation	Public	public	private	private	public	public
Sales(million M3/Year)	65	67	113	74	87	23
Tariff(KES/m3)	**31**	**31**	**40**	**43**	**21**	**57**
Contribution to capital expenditure(%)	N/A	N/A	44	36	11	16

The other problem of Kenyan tariff system is that in an effort to reduce the cost of water consumed by low-income groups, tariff structures with large cross-subsidies are the rule. The unfortunate result has mostly been the opposite of what is intended. In a poorly metered system with under priced water, the wealthy that consume more water end up enjoying the largest subsidies. The poor, who are rarely connected as the water utilities view them as commercially unattractive at the low prevailing tariffs, end up paying dearly for the water. The World Bank (2000) carried out a rapid survey of 675 households in Nairobi, Mombasa and Kakamega. The survey confirmed that a significant proportion of the population relies on alternative water sources and that the cost of the alternatives was high. The study indicated that on average water, from kiosks, costs between Kshs 3 and Kshs 5 per 20-litre container. This works out to Kshs150-250/m^3. Water from vendors costs between Kshs10-20 per 20-litre container. This works out to Kshs500 - 1000/m^3. This means that the poor, who rely on kiosks, and have a family of six and consumes about 80 litres (4 -20l cans) of water per day (15 l/c/d)

has a monthly water budget of between Kshs360 and Kshs600. A connected household that consumes 10m³/month (16-20l cans per day) pays only Kshs250 per month. Therefore, the cross-subsidy is not helping the poor who are not connected. The survey in fact found that the poor who rely on kiosks have an average consumption of 34 l/c/d, which compares favourably with households with private connections, which have an average consumption of 39 l/c/d (World Bank, 2000).

In effect, therefore, the policy of keeping the tariff low to protect the poor is a fallacy and has no technical basis, though it sounds good politically and from civil society and NGO point of view.

2.5.5 Reasons for the poor performance

Various factors have contributed to the poor performance of urban water utilities. Although some of the factors are water undertaker specific, most factors cut across the various actors in charge of water supplies in the urban areas. Some of these are explained under the following subtopics.

(a) Conflicting roles

Under the Water Act Cap 372, many organisations were involved in the urban water supply, development and management. However, the major overlap has been the operations of MWRMD and NWCPC, where the main functions of the latter are also functions of the former.

In effect, therefore, the MWRMD has not been able to carry out the regulatory function impartially (MENR 2001, p8,9) while LA's and NWCPC working under legislations which are inferior to the Water Act Cap 372 as far as water undertaking is concerned, have been unable to implement some of their regulations as far as water supplies are concerned. This is particularly true in as far as tariff setting is concerned, as these have to be approved by the Minister in charge of water affairs. Local authorities that have tried to follow the law as put down in the Water Act Cap 372 in revising water tariffs have miserably failed.

This has been due to the impossible demands or outright rejection by the Water Department in the MWRMD due to its multiple roles.

(b) Water Tariff Legislation

As far as the water sector is concerned, the Water Act cap.372 superseded all other acts that were also dealing with water development and delivery. Accordingly, levying of water rates on water consumers had its legal foundation in Clause 143 of the Water Act Cap 372 that was intended to protect consumers against arbitrary increases in tariff that would lead to the price of water being beyond the reach of the poor and disadvantaged.

As far as urban water supplies operated by MWRMD/NWCPC are concerned, there was no change in tariff between 1975 and 1992. The tariffs and prices used during that time were those defined under Legal Notice No. 94 of 1975. While as far as other water undertakers are concerned (both private and LAs) approval of tariffs by the Minister became a nightmare, especially after 1981. Though the situation improved a bit after 1992, getting tariff approval through the MWRMD remained one of the most difficult assignments for a water undertaker who wanted to follow the law. The result was that most urban water undertakers who revised their tariffs between 1977 and 1991 simply ignored the requirement of Clause 143 of the Water Act Cap 372.

The difficulty lay in the review of the tariffs by technical department of the MWRMD, before approval by the Minister; the department was most times unwilling to recommend increases to other water undertakers when the MWRMD urban water tariffs were low. Requests for justification, even for obvious needs, to revise the tariffs have been the norm. The politicisation of water in the country instilled fear in all those who had the powers to make decisions on tariffs. Indeed even if the technical arm of the ministry was convinced that there was justification for tariff increases, some dubious reasons would be found by the decision makers to reject the increase. Nairobi City, for example, to avoid this huddle at one time had tariffs for three consecutive years approved at ago. They were taking advantage of the ultimatum by donors, to the Government, that if the tariffs were

not revised by a certain date then all funding for the Third Nairobi Water Project would be stopped and possibly cancelled.

It must however be noted that there are many incidences where this review by the MWRMD technical departments helped the water undertakers to focus properly on ways of setting up proper tariffs. The problem is that this came many months after the application was made.

The other problem of tariffs as set after 1992 was the introduction of block tariff structure. This type of tariff structure is very hard for consumers to understand. The consumers cannot readily read price signals and adjust their consumption. A return to the pre 1992 price structure of a uniform tariff may be necessary to check consumption especially by the rich.

As the Water Act 2002 comes into force, one of the recommendations that has been put forward, in the plan for the transfer of management and operations of water services to Water Service Boards, is to hold the tariffs at their current levels for the period 2004 to 2007 (MWRMD 2004). However, there has been no tariff increase in this country since 1999; the proposed period may just be too long, which may make the operations of water service providers unsustainable. The new institution in charge of approving tariff increases (i.e WSRB) may need to review this recommendation as soon as WSBs are in control of water services.

On the other hand, there is an opportunity for the WSRB to impress upon the licensees, who are the Water Service Boards, to insist that all Water Service Providers (WSPs) set realistic tariffs that meet the Government policy, failure to which no licence will be renewed. The WSBs must ensure that the requirements of section 57(5) (d) of the Water Act 2002, quoted below are strictly enforced:

"the applicant, or any WSP by whom the functions authorised by the licence are to be performed, will provide the water services authorised by the licence on a commercial basis and in accordance with sound business principles"

Equity objectives can be taken care of by setting a minimum quantity of consumption by connected low-income consumers and the disadvantaged groups

in urban areas. This should be carried out together with a policy to connect all low-income households.

(c) Unenforceable regulations

The Water Act Cap 372 and many by laws empowered water undertakers to prosecute consumers who contravened water supply regulations. Unfortunately the penalties as specified in the subsidiary legislations were generally very low, as these had not been revised since the last revision of the Act in 1972. The consequences are that offenders are not taken to court. As a matter of fact, the bribes these offenders pay to the officers who have detected the offence are bigger than the fine. Therefore, offences like illegal connections go unpunished. The length civil cases take in the courts further discourages water undertakers from enforcing regulations. The other problem is that not many prosecutors understood the water law therefore it was hard to win cases under the Act.

Under the new Water Act 2002, the relevant subsidiary legislations and rules are still in draft form, the penalties being proposed are as high as fifty thousand Kenya shillings for such offences. These draft rules and regulations are still subject to review by all stakeholders. As the WSRB, WSBs and WSPs develop further guidelines and procedures in consultation with stakeholders, they have to realistically look at the issue of unenforceable regulations so as to come up with recommendations that will work. This may involve developing incentives to WSPs to ensure that they enforce the rules.

(d) Lack of planning

All water undertakers are more pre-occupied with the day-to-day affairs at the expense of long time considerations. This problem not only faces the LA but even the MWRMD and NWCPC even at their decentralised offices. Unqualified officers who depend on wishes of their bosses man planning departments at the decentralised offices, while planning officers from the Ministry of Planning at District and Provincial levels are in charge of many departments other than water to be bothered with future needs of one department. On the other hand most LA's, which are water undertakers, have no officer specifically assigned to

planning. The head offices, which have qualified and experienced planners, do not give adequate guidance to the field offices because these are few and most times overworked. The result is that most information obtained from the field is incomplete for planning purposes.

The other problem that has affected planning among the major water utilities is the lack of consultation among the various departments or sections within their organisation. For example in local authorities water and public health are two independent departments, with each concerned with its own problems, even that, which may affect the other.

In the MWRMD during the last decade the water quality section and operation and maintenance sections operate as if they are in competition for work rather than as complimentary sections. Furthermore the consultations that used to exist between operation and maintenance, design and planning and construction ceased to function more than a decade ago. The input that O & M and construction used to give to design and planning is now missing. The result is that the designers, some of who do not have field experience, do not know what may not work in real operations. This is a very serious matter especially if it is recalled that the MWRMD is also the Technical arm in planning, design and construction for almost all the LA's water facilities.

The Water Act 2002 is expected to reverse the situation if the letter of law is followed. When applying for a licence under section 57 (2) (b), a WSB is expected to satisfy the WSRB as to the adequacy of plans for the provision of efficient, affordable and sustainable water services in its area of jurisdiction. This requirement shall ensure that WSB's have qualified planners at all times, as they may be denied a licence in the absence of realistic plans in accordance with section 57 (5) (b). A licence is subject to public consultation in accordance with section 57 (6), therefore, this section shall only work if the public scrutinises the application seriously to ensure that mediocre plans are not accepted by the WSRB.

However, there is still a fear that as both the WSRB and WSB's are public institutions, political considerations may override the public concerns. Furthermore half of the members of the Board of Directors of the WSRB are civil servants whose independence will be much in doubt in a situation, which demands that they enforce the law by denying the WSB a licence.

(e) Changes in senior positions

Although the problem of frequent changes of staff in the management and policy making levels would appear to be more of a local authority's problem, further scrutiny of these organisations easily reveals that the problem afflicts all the major water undertakers.

Frequent changes of staff at management and policy levels in local authorities are so widespread, that there is an urgent need to address this problem. The NWCPC, on the other hand, which should have been more stable has had six Managing Directors in the last ten years. The MWRMD, which is more stable with staff, is instead huddled with the problem of frequent senior staff changes in duty assignment. The effect is that there is inconsistency in implementation of measures that could address some of the problems that have been identified. Another problem is interference in decision making at lower levels by the organisations head offices. In the end, the staff in charge of water supplies cannot make decisions, as they are unsure if their head offices shall support the decisions. Unpopular decisions can lead to one losing his position. The result is that the officers directly in charge of water supplies just maintain the status quo.

The Water Act 2002 addresses this problem through devolving and decentralising decision making powers from the central place for the whole country to WSB's and WSP's. Specifically for Urban areas, it is expected that the Board of Directors of the companies being formed by local authorities shall appoint qualified and experienced personnel to be in charge of the local authority company. The implication of this is that the WSRB must enforce section 57 (5) (a) which states as follows:

"the application (for a licence) shall not be granted unless the Regulatory Board is satisfied that the applicant, or a WSP by whom the functions authorised by the licence are to be performed, has the requisite **technical** and financial competence to provide the services to which the licence relates".

Once the personnel are approved, they will not be transferable as they belong to a company, which is a legal entity. Again, the autonomy of the WSRB will really be tested to ensure that the competence of the staff is not in question. Indeed it is hoped that the situation such as arose in Nairobi water company where the council tried to reject some of the competitively recruited personnel on,excuse of very high salary should not be allowed to take root. The autonomy of the boards be they of the LA's companies or the WSBs must be guaranteed by the Ministry in charge of Water of affairs. This therefore calls for the Ministry to ensure that the various Boards are representative of the areas they are serving, and are not dominated by any single group of persons.

(f) Funds for Operations and Maintenance

Inadequate funds for O&M are the most serious problem among all water undertakers. This has been brought about by the lack of Government in general and water undertakers in particular in enforcing the policy of "Cost recovery" in urban water supplies. The problem is then made worse by diverting the little funds generated by water revenue to other uses. In LA's the money collected goes to pay for other prestige projects like health centres, repairs of roads etc. Very little is returned to water supplies to help in the required maintenance (Onjala 2002a).

The MWRMD maintains a policy of some revenue collected by field staff being returned to them. The field staff is expected to use the 60% returned revenue for all their recurrent expenditure. The result is that very little funding just like the case of LA's finds its way to the water supplies. The other problem is that the 60% revenues sent to the Districts in form of AIEs (Authority to Incur Expenditure) most times finds the District Treasuries without adequate cash floats to cover the expenditure. In such a situation, AIEs become mere papers. Indeed for a period of over a decade suppliers have insisted on being paid before honouring their

commitment to deliver goods and services. This is inspite of the standing official regulation that goods and services must be delivered before payments are made.

WS Atkins International in their interim report on Corporate Development Plan, Water Sector study for NWCPC, observed as follows "Asset maintenance is very poor..... Under funding is a major cause, but Region and Scheme Managers need to be given specific guidance in terms of maintenance of Asset States. In this area the review has found NWCPC under performing against MWRMD and LAs" (NWCPC, 1993). Ten years later the situation has not changed and will have to await the full implementation of the Water Act 2002. Therefore, all major water undertakers are under funding O & M activities.

The Water Act 2002 changes all this by ensuring that financial decisions are made at scheme level by WSPs and WSBs. However, there is only one problem that the WSBs are the asset holding company and responsible for all investments, as such must approve any investment plans if made by WSPs. Unless the agreement between the WSB and WSP is very clear on investment decisions that can be made by the WSPs, O&M investment plans conceived by WSPs, which did not form part of the licence, may be unnecessarily rejected. The WSRB will therefore have to have competent and experienced technical officers to be able to deal with conflicts that will inevitably arise.

(g) Non-viable Investments

To serve political interests, local authorities have been prevailed upon to serve areas outside their jurisdiction (i.e Nairobi serving consumers in Kiambu and consumers outside EPZ in Athi River). The result is that discriminatory water charges have to be introduced for the areas that are peri-urban. The rates in those areas are very low as they have to be close or similar to those charged by MWRMD in such areas. The other problem is that the councils do not have adequate support facilities for proper operations hence the number of illegal connections is high.

The poor performance of public water utilities in this country, therefore, seems to have followed the trend of other public enterprises in developing countries. Cook and Kirkpatrick (1988) note that, it is not in doubt that, most Public enterprises including water utilities have performed poorly. They site quotations from the two Breton Woods institutions to convey the disillusionment with public enterprises performance as follows:

(i) Unless there is a change in the operating effectiveness of public enterprises, particularly in industry, they will not take their proper place as growth points (World Bank, 1981).

(ii) In many countries the expansion of the public sector has stretched its managerial capacity to the point where serious inefficiencies result (World Bank, 1983).

(iii) Over the years, inefficiencies has flourished in many state enterprises, its over consequences marked by the ready availability of budgetary support (IMF 1986).

(iv) Actual experience with the operations of state enterprises reveals that many have not effectively served to redistribute income (IMF, 1986(a)).

Aseto and Okello (1997) quoted what may be a debatable observation from the World Bank to show the displeasure that some people have with the performance of the public institutions as follows *"The public sector lies at the core of the stagnation and decline in growth in Africa"*. This quotation could as well have been referring to the water sector in Kenya. In the period between 1989 and 1994, the access to potable water in the country actually declined from an average of 48.1% to 43% and climbed marginally to 49% by 1999 (MoP&ND 2003 p16). In effect in a decade the access to portable water did not change at all. During this period the major water undertakers were public bodies.

3 PRIVATE SECTOR INVOLVEMENT IN THE WATER SECTOR

3.1 Introduction

The subject of privatisation continues to attract a lot of attention world over and especially in the water sector where it is a more recent concept. A simple explanation of privatisation is that it involves reducing the roles of government in the national economy, while enhancing the scope of private ownership and private sector in the national economy. The growing appeal of privatisation arises from the reassessment of the role and contribution of the public enterprise sector in the process of economic growth and development. The major reasons leading to its being advocated for are the perceived weaknesses in the performance of the public enterprise sector. The case for privatisation therefore has something to do with a need of smaller government and belief in superior economic performance of private sector (Cook and Kirkpatrick, 1988).

Indeed those in favour of privatisation argue that privatisation improves efficiency, increases output and lowers costs. More importantly they argue that it curbs the growth of government expenditure, raises cash to reduce public internal and external debt and promotes individual initiatives while rewarding entrepreneurship (Aseto and Okello, 1997 p1). Some proponents of privatisation see it as a means of curbing corruption. On the same vein, those against privatisation especially in the water sector argue that many of the obstacles to improved provision have little to do with whether or not private enterprises are playing a major role in water utilities (UN-Habitat, 2003 p158).

3.2 Characteristics of the Water Sector

While considering if water and sanitation services should be provided solely by the public sector or subjected to PSP arrangements, its unique characteristics must be taken into account. Rees (1998); Hukka and Katko (2003), and World Bank (1997 p10) list the following features of WSS which are not typical with other infrastructure services:

(a) They are highly capital intensive compared to other public services. The capital costs are often 65-75% of annual operating costs. The major costs are sunk in pipe and sewer networks that are buried underground where it is costly to obtain accurate information and value about them. In most cases this information does not even exist.

(b) Water Supply and Sanitation (WSS) services infrastructure is a natural monopoly. It is feasible to construct only one system for one service area. Hence this lack of competition often leads to inefficiencies.

(c) WSS services characteristically involve the provision of so called 'public' and 'merit' goods. The former being goods and services which provide benefits to communities in general rather than to specific individual consumer i.e sewerage transportation, treatment and disposal; as compared to merit goods, which are goods that should be provided irrespective of whether individual consumers are willing or able to pay for them.

(d) The relationship between water infrastructure and urban/economic development; i.e industrial, commercial and housing developments are dependant on provision of new water infrastructure and on the maintenance of existing systems in operating order.

(e) The multi-purpose and hydrologically interconnected nature of the water resource itself. As a result, change in one part of the system tends to set up a chain reaction affecting the availability, quality and cost of supplies elsewhere within the water region. Naturally, there must be control in its withdrawal.

From the above, therefore, it is clear that that there are many factors that have to be taken into account by the government before the private sector can be contracted. True, as observed by the World Bank (WB 1997, p10), none of the special characters bars PSP, but certainly these unique characteristics require to be put in proper context before involving a PSP operator. This means that the policy framework and legal provisions have to be right. However, it has been pointed out that water is a commodity that lends itself to monopolistic tendencies.

Therefore to determine if some competition either within the water market or for the water market can be introduced, it is necessary to break down the various activities involved in its production up to the time of its provision to the consumers. Certainly, the process leading to provision of water can be divided into distinct functions. Hukka and Katko (2003) have suggested core activities to include main responsibility for required investment; ownership; strategic planning and development. They have also listed non-core activities to include design; construction; equipment supply; vehicle and machinery; repairs; inspections; operations and maintenance; meter reading; data processing; laboratory services and research. This division is important as it defines the type of operations that can be contracted out i.e. subjected to PSP arrangement in a water utility. Figure 3.1 illustrates these divisions.

3.3 Types of PSP contracts

The type of PSP option adopted will therefore depend on the type of non-core operation or a combination of non-core activities that the utility wants to be helped in. Kenya like many other countries where the water sector is dominated by the public sector can therefore be said to have involved the private sector substantially in the water sector. This involvement has been in carrying out non-core activities that include Planning and design where the majority of water supplies in the country were planned and still continue to be planned and designed by the private sector. The Ministry in charge of water had by the close of the 1980s decade stopped completely direct construction of piped water supplies in the country. It is only in drilling and small dam's construction that the public sector continued to play, but a minor role. Therefore, construction of the water facilities is another area where there is a heavy private sector involvement. From the mid 1970s, most of the public water supplies have been constructed by the private sector.

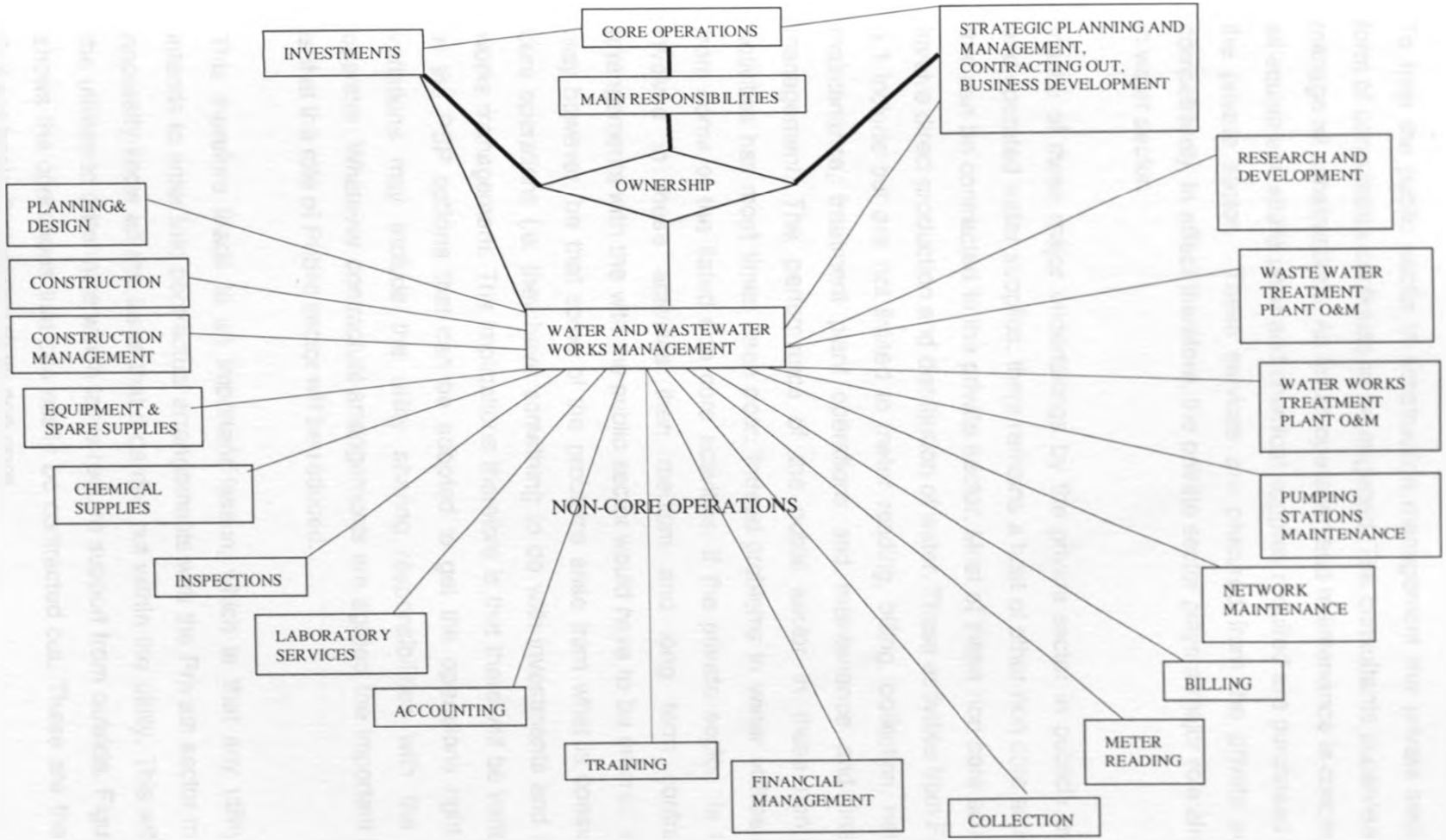


Figure 3. 1: Classifications of core and none core operations in a water utility (Hukka and Katko 2003 p 9)

To help the public sector in construction management the private sector in form of consultants continues to be engaged. The consultants supervise and manage all constructions. As far as operation and maintenance is concerned, all equipment, spare parts and chemical supplies required are purchased from the private sector. These services are procured from the private sector competitively. In effect therefore, the private sector plays a major role already in water sector.

Inspite of these major undertakings by the private sector in publicly owned and operated water supplies, there remains a host of other non core activities that can be contracted to the private sector. Most of these non core activities involve direct production and distribution of water. These activities from Figure 3.1 include but are not limited to meter reading, billing, collection, network maintenance, treatment plant operations and maintenance and financial management. The performance of the public sector in these non core activities has most times been poor. Indeed problems in water utilities arise from some of the listed non core activities. If the private sector is to be involved in these activities then medium and long term contractual arrangements with the with the public sector would have to be entered into. It may however, be that some of the problems arise from what is considered core operations i.e. they have something to do with investments and water works management. The implications therefore is that there will be variations in the PSP options that can be adopted to get the operations right. The variations may include the utility sharing responsibilities with the PSP operator. Whatever contractual arrangements are agreed the important issue is that the role of Public sector will be reduced.

This therefore leads to an important lesson, which is that any utility that intends to enter into contractual arrangements with the Private sector must of necessity know all the tasks that it carries out within the utility. This will help the utilities to determine which tasks require support from outside. Figure 3.1 shows the operations that can easily be contracted out. These are the ones that are basically referred to as non core.

Webster and Sansom (WELL STUDY, 1999)

Figure 3. 2: Types Of Management Options.

Various management options can be utilised to carryout the core and non-core functions of a utility. These range from fully public to fully private operations. In between them is a mixture of public and private operations that can also be utilised as indicated in Figure 3.2. The Private sector can therefore be brought in at any time depending on the non-core or core functions that the public sector wishes to be helped to handle more efficiently.

This therefore gives rise to the different options that can be utilised to involve the private sector in the operations of a public water utility. The options include service contracts, management contracts, lease, build operate and transfer contracts (BOT), Build own operate transfer contracts (BOOT), concessions and outright divesture. As the options move from service contract to Concession the delegation of responsibilities to the private sector increases. With Divesture the full responsibility for the water provision that is core and non-core functions are handed over to the private sector. Therefore there are various variations of PSP that are in use. Table 3.1 gives the typical PSP involvement in the water sector duration of the contracts, description of the activities and examples of where the contracts have been used.

Table 3. 1: **Types of PSP contracts** (*Webster and Sansom 1999 p 4*)

Contract Type	Description	Watsan Examples
Cooperatives	Cooperatives can position themselves to be the service providers for certain (often poorer, informal) areas of a city and manage facilities within these areas. This can take many forms.	Port-au-prince, Haiti.
Services Contracts	Public authority retains overall responsibility for O & M of the system and contracts out specific system components Service contracts typically last 1-3 years and contract out services such as meter reading, billing & maintenance	Mexico City; Santiago, Chile; Madras, India
Management contracts	Public authority transfers responsibility for the management of a full range of activities within a specific discipline such as O & M. Remuneration is based on key performance indicators. Public authority typically finances working and investment capital and determines cost recovery policy. Usually 3-5 years	Cartagena, Colombia, Gdansk, Poland; Mali; Gabon; Trinidad & Tobago
Lease Contracts (or affermage)	Private operator rents the facilities from a public authority and is responsible for O & M of the complete system and tariff collection. Lessor effectively buys the right to the revenue stream and thus shares significant commercial risk. Usually 5-15 years but can be extended.	Cote d'Ivoire; Guinea; Czech Republic
BOT (Build, Operate, Transfer) Contracts and their variations	BOT contracts are usually used to procure large, discreet items of infrastructure e.g. Water treatment plants that require significant finance. The private operator is required to finance, construct, O & M the facility for a certain period of time (usually >20 yrs) before transferring the facility back to the public authority. Variants of Bot are BOOT (Build, Own, Operate, Transfer), BOO (Build, Own, Operate)	Mendoza Argentina (BOOT); Izmit, Turkey (BOT)
Concession contracts	Private operator takes responsibility for O & M and investment; ownership of assets still rests with the public authority. Concessions are substantial in scope (Usually a whole city) and tenders are usually bid on the tariff. 25-30 years	Buenos Aires, Argentina; Manila, Philippines; Cancun, Mexico
Divestiture	Full private ownership and responsibility under a regulatory regime	England and Wales

Webster & Sansom (1999) noted two further options that also fit in these options, as follows:

(i) Corporatisation; Where public utilities are formed as autonomous commercial enterprises with a Managing Director and a Board, but remain in public ownership. In essence therefore, a public water company is formed, subject to the same rules and regulations that guide other public companies that may not be public, but run on a commercial profit making basis but whose

shares are owned by local or national governments. According to UN-Habitat (2003 p170), this model then combines operations in accordance with business principles with a degree of public control through Government shareholding.

(ii) Public -Private Joint Ventures; This involve arrangements where a company is formed jointly between the public and private sector for the sole purpose of operating agreed tasks, utilising staff and resources provided by both Government or a public water utility and the private operator. The aim of this arrangement is to share ownership and benefits.

As illustrated in Figure 3.2, these types of PSP contracts depend fully on who owns the assets and whose responsibility the management of infrastructure is. It can be seen that it is rare to have private sector also being the owner of assets, as occurs in England and Wales.

(iii) Other Types of Contracts; The other type of contract that exists and is common here in Africa is the Multi-utility contract. This is an arrangement whereby a private company runs more than one type of utility. Where this is being practised water has been bundled with electricity. The advantage of this arrangement is the easiness with which sanctions can be applied i.e cutting off electricity if water is not being paid for.

It can therefore be seen that private sector involvement in the water sector can range from service contracts to concessions. It is evident that as a utility moves from service contracts to concession the delegation of responsibility to the PSP increases. However, each of the main options has advantages and disadvantages as indicated in Table 3.2. The advantages are also used to determine the type of PSP option that a Utility may wish to utilise depending on the problems it faces.

Table 3. 2: Key features of Private Sector Participation Options (WB 2000)

PSP Arrangement	Advantages	Disadvantages
Service contracts and management contract	-Access to technology - Access to expertise and knowledge -Short term commitment	-No private sector investment in new works -Prescriptive contract as commercial incentives limited -Limited term may mean limited commitment
Leasing (affermage)	-Access to technology - Access to expertise and Knowledge - Access to some capital (limited) - Transfer of commercial risk of operations to private sector	- No private sector investment in new works but can facilitate investment from development partners
Build operate transfer (BOT) Design Build Operate (DBO) ROT	-Access to technology -Access to expertise and knowledge -Access to capital -Transfer of commercial risk of design, construction and operations to private sector -Private sector provides funding through to successful commissioning	-Not well suited to system developments comprising a number of separate projects -Water utility required to take over investment after commissioning -Does not address institutional issues
Build own operate transfer (BOOT)	-Private sector technology, expertise and knowledge -All funding of new infrastructure provided by private sector -Transfer of almost all commercial risk of infrastructure development, operation and financing to private sector -Water utility monitors only plant outputs (i.e. essentially water quality and availability) and not design, construction or operations.	-The legal and financial on-costs of contract development may be high -Does not address institutional issues
Concession	-Can cover entire system of water and wastewater plants and networks -Private sector technology -Access to expertise & knowledge -Access to capital; all funding of system improvement/expansion provided by private sector -Addresses many institutional issues -Transfer of almost all commercial risk of system development (planning, design, construction, operation and financing) to private sector/development partners -Water utility monitors only system outputs (i.e. adequacy of supply) and not means of service delivery	- It is unlikely that a private sector concessionaire will be prepared to invest significant amounts in Kenya - -Could facilitate investment from development partners - Considerable stakeholder education may be required. - The legal and financial on-costs of project development may be high
Divestiture and Joint Venture	-Can cover entire system of water and wastewater plants and networks -Private sector technology -Access to expertise & knowledge -Access to capital; all funding of system improvements/expansion provided by private sector -Transfer of all commercial risk of system development (planning, design, construction, operation and financing) to private sector (full divestiture)	-Complete divestiture essentially limited to England & Wales -Chile and Germany have chose partial divestiture and joint venture models - Requires a strong & independent regulatory system or other mechanisms (e.g. contracts) to assure outcomes - Likely to meet strong political and public opposition

Each option of PSP therefore has its unique characteristics and the option to choose depends on the problems in the service provision and the potential benefits that will be derived from it. However, the benefits also depend on what has been given to the PSP operator. This is because private sector participation is just one answer and not the full answer to the problem that may be in the sector.

Table 3.2 also indicates that all types of PSP contracts will inevitably increase technical expertise in the water sector. However, from the table, management lease and concession also lead to acquiring of management expertise. While the remaining PSP contracts also lead to increased investments and hence coverage, in addition they take up all the risks that the water utility had.

Therefore, the decision to select a PSP option should be preceded by analysis and evaluation of the water utility to determine the problems or operations that are targeted for improvement. Careful selection of the PSP option is the first step towards its success. However, Aseto and Okello (1997 p32) site the following two factors that are necessary for the success of PSP:

1. the nature of the market i.e whether the market is competitive or non-competitive; and
2. the effectiveness of the regulatory and supervisory institutions.

The World Bank (1997 p1) noted that PSP can only succeed if appropriate arrangements (options) are chosen and if the government creates the necessary enabling and regulatory environment.

In effect therefore, PSP is not the solution to all the problems that may be present in a sector, but as Osborne & Gaebler (1993 p45) observed it is one arrow in a governments quiver, depending on the problems in the sector, PSP can be the golden arrow in that quiver. This golden arrow however, can only be of use if it has adequate regulation to support it.

Water services is a monopolistic sector hence it can be argued that it will be hard to get the market forces to work as would normally be, for other products.

The issues that have to be considered in such a situation include adequacy of supply of the service; accessibility of the product or service; accessibility of information about price, quality and risks of the service. This leads to other important ingredients that make the market to work, and these are the rules and policing. This is what is described by Aseto and Okello (1997) and the World Bank (1997) as Regulatory support. However, the development of an effective regulatory system in a country like Kenya poses its own challenges as the unknown factors are too many and the personal interests, both technically and politically are still high within the water sector.

Rees (1998 p26) describes regulation as sets of commands issued by governments, which are designed to control behaviour, with accompanying 'police forces' and penalties for failure to obey. It is however observed that regulation works effectively with the consent of the regulated, being based on the acceptance that the 'commands' are reasonable. As such regulation should be seen as a referee among the PSP operator, the consumer and the relevant government bodies, in order to determine what is reasonable for each party.

UN-Habitat (2003 p174) lists the following three main functions of a regulatory system in PSP:

1. ensuring that users receive an adequate level of service at reasonable price and protecting them from abuse by firms with substantial market power;
2. ensuring that investors receive a reasonable return on capital and protecting them from arbitrary action by government; and
3. monitoring and ensuring that other conditions and standards are met, that the operator complies with the conditions and provisions of the contract, setting or regulating prices, and regulating environmental standards.

This then poses the question as to which areas of the water services sub-sector should be subjected to regulatory control. Most people are of the view that water regulation implies or should be limited to price regulation. But Seppala (2004 p90) lists some other areas in, which water services require

regulation including economic (price) regulation; environmental regulation; water quality regulation; technical regulation (standards); service quality regulation; business options; and asset management.

The job of ensuring that all the above regulatory functions are met requires information, which the regulator may find difficult to obtain from the water utilities, especially in Kenya where Operation and Maintenance information has not been taken seriously. The other question is whether the right personnel can be identified who will be able to manage the regulatory functions.

The tricky part of regulation is keeping services affordable to the poor and vulnerable in society while ensuring that the PSP operator makes a reasonable return on his investment. Indeed it is the fear of the probable increases in rates and especially the social effect to the poor that PSP arrangements are not favoured. This therefore means that if the regulator is to succeed, independence and strength to withstand pressure from both the PSP operator and the government must be ensured. Rees (1998 p29) therefore observes that unregulated water and sanitation companies are therefore not an option.

Many urban water supplies in Kenya have formed or they are in the process of forming autonomous water and sewerage companies. Therefore, autonomous companies formed by LAs will be predominant in the provision of water services. The Water Act 2002 introduces an office of a regulator in the Water Services Regulatory Board (WSRB). The Act also lists the regulatory tasks that are to be carried out, a summary of which is as follows:

1. issue licences for the provision of water services and enforcement of licence conditions;
2. determine standards for water provision to consumers;
3. establish procedures for handling complaints made by consumers against licensees and advising licensees on procedures for dealing with complaints;

4. monitor compliance with established standards including monitoring and regulating licences;
5. develop guidelines for the fixing of tariffs;
6. promotion of operating efficiency;
7. promote water use efficiency;
8. develop and monitor performance agreements;
9. monitor and re-assess the national water strategy;
10. determine fees, levies, premiums and other water service charges to be imposed for water services; and
11. maintenance of public good functions.

Commercialised water utilities are going to be the norm for some time in this country. This raises the question if there is need of one regulatory board or if alternative regulatory arrangements can be made, and the type of regulatory tasks that is important in such a situation. The other issue that arises is the required capacity of WSRB to perform its functions and especially the cost of the regulatory function to the sector. Kenya has a large population without access to water services and therefore there will be need for the WSRB to allow flexibility in prices and service standards to enable these large segments of the population to be served. Regulation design therefore should not be based on what happens in developed countries. The regulator has to work with local water utilities and other stakeholders to develop a regulatory framework that can work in the local conditions. If this is not done, then the country will quickly revert to self regulation, by use of the LAs as they are no longer party to the operations of the water utilities. Therefore, the WSRB will need to be strong to resist the now evident donor pressure to impose some prescribed imported regulatory framework by outside experts.

3.4 Reasons for PSP in the Water Sector

As noted PSP involvement in the sector is not the full answer to the problems of the sector. The reason for PSP involvement is found in the realisation that the private sector does some things better than the public sector (Osborne and Gaebler 1993 p45). The case for privatisation therefore, arises from the

reassessment of its role and contribution to the public enterprise sector in the process of economic growth and development. The major reasons leading to it being advocated for are the perceived weaknesses in the performance of the public enterprise sector. According to UNIDO (1979), Baum and Tolbert, (1985), public sector investment project have performed poorly in most developing countries, leading to widespread inefficiencies and resource misallocation.

Privatisation is, therefore, advocated as a means of improving the performance of public enterprises. Generally it is agreed that private sector is better at performing economic tasks, innovating, replicating successful experiments, adapting to rapid change, abandoning unsuccessful or obsolete activities and performing complex or technical tasks (Osborne and Gaebler 1993 p45).

According to the World Bank (1997), the public sector seeks to involve the private sector in the water management to achieve the following objectives:

(a) Bring technical and managerial expertise and new technology in the sector.
(b) Improve economic efficiency in the sector - in both operating performance and use of capital investment.
(c) Inject large-scale investment capital into the sector or gain access to private capital markets.
(d) Reduce public subsidies to the sector or redirect them from the groups now served to the poor and those not now served.
(e) Insulate the sector from short-term political intervention in utility operations and limit opportunities for intervention by powerful interest groups.
(f) Make the sector more responsive to consumers' needs and preferences.

Most water utilities in this country face some or all these problems. Therefore the obvious conclusion would be that the water sector in Kenya should include PSP options in the management of the water services. As the country

considers the inclusion of PSP partnerships in the sector there is need to know the reasons why some countries embraced PSP in their water utilities.

Westerhoff and Lane (1996) noted that privatisation in the USA targets utilities experiencing the following problems:

- Poorly and inefficiently operated and maintained and have a surplus of employees;
- Have not invested in process automation and control to reduce the labour force;
- Have labour conflicts and problems; and
- Their O&M costs are at or above the median for similar facilities.

But on a more general level, Shanker and Rodman (1996) noted that in the USA, economic and labour conditions have combined to make public works construction and expansion projects increasingly expensive and difficult to finance. They also noted that the growing cost of regulatory compliance, coupled with dwindling availability of public funds, and growing capital and O and M expenditures associated with new water treatment regulations, infrastructure improvements have combined to force introduction of PSP in American water utilities.

The UN-Habitat (2003 p171) advances the view that finance is usually of the paramount consideration in decisions to involve PSP in the water sector, this is followed by need to deliver efficient services. They also note that political shifts in countries may lead to introduction of PSP, the other reason being donor conditionality from multilateral and bilateral development agencies particularly in relationship to loans.

The general findings on why African governments involve PSP in the sector as reported by Bayliss (2000) for three African countries are summarised in Table 3.3.

Table 3. 3: Reasons for PSP Involvement in Selected African Countries

GUINEA	SENEGAL	COTE d'IVOIRE
1. Donor pressure 2. Change in Government 3. Poor management in the sector	1. Expected Financial self sufficiency 2. expected efficiency gains 3. Autonomy from government	No reasons given as this was carried out in 1960

In a paper presented in a seminar on privatisation at Greenwich University, Ugaz (2003) listed the following factors why PSP arrangements were put in place in Latin America:

1. Ineffective tariff structure charged by the public water utilities that bore no relationship with the cost of producing water;
2. Governments need to rid itself of the burden of state enterprises on the budget;
3. Political discourse, as these were newly democratically elected governments that wanted to show commitment to reform; and
4. Ideological pressure from the international water institutions and the government.

Hukka et al (1994 p35) gives two reasons why water was privatised in England and Wales as:

1) Political because the British government had set an objective of privatising public services
2) Finance required to upgrade water utilities to meet environmental requirements.

It therefore appears that developed countries enter into PSP arrangements to try and curb inefficiencies, obtain finances for new technology; for political reasons and due to poor O and M. On the other side the developing countries have also taken up PSP options for the same reasons as the developed nations. However, they also have an additional reason, in that they are also under donor pressure.

3.5 Concerns on Privatisation in the Water Sector

Inspite of the advantages of the private sector partnerships in the water utilities, decision makers still fear involving PSP in the water utilities. The fears are not limited to civil society, NGOs and politicians, but also find fertile ground in the sector personnel. Stottmann (1997) advances the following reasons for the reluctance by decision makers to accept privatisation:

1. Historical traditions
2. The notion of water as a social good;
3. Fear of loss of control by politicians; and
4. Lack of knowledge and misunderstanding about the potential role of the private sector.

This fear is mostly spread by international NGOs which seem to have a very good communication network throughout the world. For instance a lobby and litigation group the **Public Citizen** in one of its publications, which was widely circulated on the internet during the year 2003 listed the following ten reasons why water privatisation should be rejected in the water sector (Public Citizen 2001):

1. Privatisation leads to tariff increases i.e. most times whenever water is privatised, there is a corresponding increase in tariffs so that the private company can maximise profit;
2. Privatisation undermines water quality i.e. private sector shall be more concerned with profit rather than environmental standards;
3. Private sector companies are accountable to shareholders, not consumers; therefore consumer interests are easily ignored;
4. Privatisation fosters corruption i.e. water contracts are worked out behind closed doors enabling executives and government officials to make deals in their own rather than in public interest;
5. Privatisation reduces local control and public rights i.e. once water rights have been signed over very little can be done to ensure that the private company will work in the best interest of the community;

6. Private financing costs more than Government financing i.e. payments for infrastructure improvements and investments are by the public through their monthly payments. Because the investments are usually taxed, it is the consumers who have to pay for the high interest rates for the investments;
7. Privatisation leads to job losses i.e. wherever there is privatisation, there is often massive layoffs which are used to reduce costs and increase profits;
8. Privatisation is difficult to reverse i.e. withdrawing from PSP contracts is difficult due to the heavy costs that may be involved.
9. Privatisation can leave the poor with no access to clean water i.e. privatisation inevitably leads to tariff increases making the poor unable to afford water; and
10. Privatisation would open the door for bulk water exports i.e. most of the world will become water scarce by 2025. Private companies will then start exporting water from areas where it is available in large quantities leading to serious environmental consequences.

These same fears are heard from many stakeholders in Kenya whenever PSP is mentioned. Indeed during a workshop organised to brief the NGOs and the civil society about water sector reforms in mid 2003, the chairman of the National Council of NGOs stated that as the Minister in charge of water had assured them in her speech, that there will be no privatisation of water utilities, the reforms could progress without any further doubts being raised by their members. The other speakers echoed this statement.

When commercialisation of water utilities began in mid 1990s, LAs politicians and union leaders initially mistook it for privatisation. A lot of resistance was encountered from even those LA's that eventually embraced it. Onjala (2002a) pointed out the following fears local authorities had when first asked to commercialise their water supplies in the second half of 1990's:

(i) Fear of stringent financial reporting requirements e.g. preparation, approval and publication of budgets, accounts and audits.

(ii) Fear of having to deal with labour redundancies when optimal staffing plans are eventually implemented.

(iii) Fear of unfavourable public opinion that would be fuelled by the representations of those who stand to loose the subsidy that they currently enjoyed through low tariffs and sub-market rates and evasion of payments which sometimes results in accumulation of arrears.

(iv) There was inadequate understanding of the management practices that are geared towards efficient operations.

(v) Fear of other Municipal departments wishing to follow the route of commercialisation and hence the central authorities loosing control, of what they perceive as small kingdoms.

(vi) The view held by those wishing to maintain the status quo that commercialisation was a foreign concept being forced on Kenyans.

(vii) Vested interests, many a times the major suppliers of the WSD's were either the chief officers themselves, politicians of considerable influence or relatives and close friends of chief officers. The fear was therefore the loss financially that would result from commercialisation.

(viii) Lack of legal and political support to the process.

Though the LA's were not being requested to enter into the formal PSP arrangements, it can be seen that they had near similar fears as those held over PSP involvement in water sector elsewhere.

Inspite of these fears about PSP the world over, in Kenya there are out right barriers to PSP in the water sector. These barriers are found among all stakeholders the private sector included. Richards and Farid (2002 p55) lists some of these as including:

(a) Distrust of the private sector: There is a common perception that private sector companies exist only to make a profit at the expense of consumers;

(b) Distrust of the politics of local authorities: the private sector is apprehensive of excessive controls from LAs and WSBs particularly as far as tariff setting is concerned and imposition of taxes and fees;

(c) Lack of understanding of options available in PSP: the private sector has not been properly understood, indeed once the PSP options are explained even ardent opponents of PSP are receptive to the idea;

(d) Absence of clear policy guidelines of role of private sector in the management of rural and community water supplies;

(e) Size of small towns: the small sizes of most towns, coupled to the low per-capita demand for water, would not generate sufficient revenues to make them attractive;

(f) Lack of finance/high borrowing rates: there is limited access to finances and in the recent past interest rates have been volatile thus being a hindrance to PSP. This also implies that only PSP options that do not require investments from the PSP operator will find favour with private sector and these are management and service contracts; and

(g) Interest of international operators: the sizes of towns even if they were clustered would not interest international operators.

3.6 PSP and Pro-Poor

One of the principle reasons advanced for rejection of PSP involvement in the water sector is the fear that the service will become unaffordable for the poor. Truly, high proportions of urban population in the developing world live in informal and unplanned settlements. The Water Utility Partnership for capacity Building (WUP) Africa (2003 p9) estimates this population in Africa to be between 40% and 70%. Various names are given to these informal settlements including slums, low income areas, squatter settlements, unplanned areas, etc. The majority of these settlements lack legal recognition. The common characteristics of these settlements is lack of access to adequate and affordable basic water supply and sanitation, lack of adequate housing and limited or no access to infrastructure.

The major challenge that faces policy makers and utility managers is the mode of improving services in these areas. The problem is compounded by the fact that in most of these areas the housing is haphazardly built, they have high concentration of populations while their general environmental condition

is difficult. Yet as observed by the Public Private Infrastructure Advisory Facility (PPIAF) and Water and Sanitation Program (WSP) (PPIAF &WSP, 2002 p1), the poor in urban areas are important residents because they supply many goods and services that keep the urban areas running.

Given the fact that improved water supply and sanitation to these areas will certainly have major impacts on health, efficiency and productivity, there is need to identify innovative ways of serving the low income sections of urban areas. However, the question then arises on how these people currently gain access to the services. PPIAF& WSP (2002 p3) notes that most utilities do not respond to the range of options demanded by consumers in low income areas. Instead they observe that only two alternative options are provided a conventional private connection or a standard 'poor people's' solution such as communal stand posts or public bathing blocks. Due to the solutions adopted by utilities for the delivery of the services to the poor, most people assume that this can only be a public service obligation. Therefore, the utilities do not reach the majority of the poor in the final analysis and thus the small scale service providers' end up being the predominant service providers.

WUP (2003 p11) lists characteristic of low income service delivery as follows: most of the households purchase between 5 and 30 litres of water per capita per day; most households pay for water on a daily basis; most households rely on more than one source to obtain the water they need to survive; a few obtain water 'free of charge' from public stand pipes; and a majority purchase water from intermediaries who include landlords, kiosks and vendors.
The observations, about other sources of water, are supported by the Multiple Indicator Cluster Survey Report released by the Central Bureau of Statistics in March 2003 (MoP&ND 2003 p57) for Urban areas in Kenya. It is therefore evident that that the poor have alternative ways of accessing water services.

The concerns of the poor as listed by PPIAF & WSP (2002 p11), as far as PSP arrangements are concerned include:

1. The price of the service being delivered;

2. Expansion of the system to add new connections in previously unconnected neighbourhoods; and
3. Service levels such as water quality, hours of service, speed of response to service calls and the nature of administrative services such as billing, connection applications.

These concerns are certainly true as the following incident illustrates. In October 2004 when this researcher accompanied the Minister in charge of water affairs in a visit to the Kiambiu slum area within the City of Nairobi to break the ground for a communal toilet/ bathing block, the chairman of the slum residents asked the minister to ensure that; the Nairobi water and sewerage company does not raise the water prices, the pipeline is extended deep into the slum, the hours in which water can be collected are extended to beyond eight o'clock in the evening the fourth request was that the Minister should help them get a title deed for the land that they occupy.

Certainly the poor like all other consumers want to pay the lowest prices possible. However, unlike other consumers they are seriously affected by price increases as their incomes are low and inconsistent. Since private operator's motive is to make profit, the consideration for the poor and the underserved may not be high on their agenda. This in itself increases the fear for PSP as it is perceived that prices will be raised beyond the reach of the poor.

Further more, due to the nature of the low income settlements and the legal problems facing the land they occupy, private operators will not want to get embroiled in these legal issues and hence may not extend coverage. The cost of connection, billing and collection in these areas also discourages operators be they public or private. This therefore calls for innovative methods of serving these areas. In the City of Nairobi the few connections that exist have been provided with the help of Local and International NGOs.

3.7 PSP and Small Scale Independent Providers (SSiPs)

Most people who do not have direct access to water services in urban areas and those with inadequate services rely on SSiPs. These range from vendors, standpipes, kiosks, cooperatives, to private networks. UN-Habitat (2003 p182) carried out a study in Africa, which highlighted the following providers:

1. hand pushed carts that carry 100-200litres of water;
2. horse or donkey pulled carts with up to 500litres;
3. water truckers who serve larger customers; and
4. various types of water resellers operating from fixed points of sale including standpipe vendors and mini piped networks.

Three reasons are given on why these forms of provision are important. First they are providing water to large proportion of low income urban populations and always serve populations living in areas that are difficult to serve with conventional distribution. Second, they provide services with no subsidy and with prices and/or services that compare favourably with what official providers make available. Third, SSiPs in many locations are cheaper and more effective way of improving and extending provision of water than conventional public sector provision.

The Water Act 2002 does not directly address the issue of SSiPs and therefore the WSRB and WSBs have to formulate rules, to give independent operators some legal framework, as they continue to operate outside the law. Inspite of this, the government now recognises the importance of SSiPs and as a result the draft of first National Water Services Strategy noted that appropriate rules shall be set up for these operators (MENR 2001 p27). This is very important for PSP operations as there needs to be a clear interface between PSP operator and the SSiPs to avoid conflicts.

3.8 Public Enterprise Performance

The poor performance of the public sector is the main reason advanced for PSP involvement in public enterprises. Cook and Kirkpatrick (1988 p12), list three indicators, that summarise the performance of public enterprises.

(i) Economic Performance

This is sometimes referred to as cost efficiency. It is mostly concerned with producing the maximum output utilising cost minimising techniques in production and taking into account what the market actually demands. Evidence available does not demonstrate that public enterprises are outperformed by private enterprises.

(ii) Financial Performances

Most public enterprises do not generate investible surplus, they instead become a budgetary burden for the sector indeed the degree of self-financing for most public enterprises is low. In the end, therefore public enterprises deficits are financed by central government transfers. The result is the increase in the overall public sector deficit.

(iii) Distributional Performances

These are non- economic objectives that public enterprises are expected to pursue. These include social objectives such as subsidising particular groups, assisting certain regions of the country, and creating or maintaining employment. Public enterprises are also viewed as instruments to promote income redistribution.

However, there is a body of evidence, which indicates that public enterprises have not been an effective means for advancing redistributive objectives. Cited are the subsidies, which have not helped the lowest income groups, but only benefited the better off. While, uses of capital intensive technology has only managed to create privileged labour elite.

(a) Performance Measurement

If the public sector has not performed in accordance with expectations it becomes necessary to find out how this has been measured. Cook & Kirkpatrick (1988 p204), have defined four principle uses of performance measurement as follows:

1. Planning i.e. setting targets for activities and organisations and allocating resources between them;
2. Monitoring performance that is comparing output with plan;
3. Evaluation: helping to asses the cost effectiveness of policies or procedures; and
4. Accountability i.e. helping managers to account for their performance, which in turn helps ministers to report to parliament and the public.

(b) Performance Indicators

These are tools to assist in the measurement of the status of an organisation at any level. Cook & Kirkpatrick (1988 p205) noted that Performance Indicators (PI) usually take the form of statements, usually quantified, on resources employed and achievements secured in relation to areas relevant to the particular objective of the enterprise. WHO (1994 p5) listed some of the uses of information that is obtainable from PI as formulation of policies and implementation of actions that are relevant to the problems revealed, or avoid action that is irrelevant and/or inappropriate, and which might have been adopted in the absence of this information.

According to Cook & Kirkpatrick (1988 p205) PI should posses the following characteristics:

1. they must relate to the stated objective of the organisation;
2. they must be specific, quantifiable and standardised so that the information can be used for making valid comparisons within and between institutions;
3. they must be as simple as possible, consistent with their purpose;

4. they must be acceptable and credible in the sense of being free from systematic bias; and
5. they must be useful and acting as signposts to areas where questions concerning operations can and should be asked.

According to Seppala (2004 p52), the performance of organisations can be assessed using the following factors:

i.) Effectiveness i.e. the performance in activities that support the mission or how well the organisation is doing relative to its own set standards.

ii.) Efficiency i.e. performance in relation to resources available or the way resources are used to achieve the objectives.

iii.) Efficacy i.e. the measurement of long term impacts and sustainability of the activities-how things work or capacity to produce desired effects.

Cook & Kirkpatrick (1988 p207) listed the type of PI used in the public sector organisations and enterprises as follows:

1. *volume of activity:* i.e. number of customers and production tonnages;
2. *operational performance:* i.e. number of staff per customer and cost per unit of output;
3. *financial performance:* i.e. operating margins and sales related to cost; and
4. *quality of service:* i.e. waiting time for services and delivery success rates.

Performance indicators therefore readily find use in the water sector a service in which the public is the dominant provider in this country.

(c) Performance Indicators in Water Utilities

It is however necessary to look at performance indicators that can be used to measure the performance of the water sector and determine how realistically they can be used. U.N Habitat (1997 p81) noted the difficulties in defining performance indicators for use in African water utilities as due to

diversification of their culture, structure, priority, objectives level and development and management traditions. Whereas this is true, as some utilities put emphasis on cost recovery, some on community participation, others on government financing or some other factor, it should still be possible to have acceptable performance indicators which take into account these diverse considerations into account.

For performance measurement, WHO (1994 p5) proposed a framework which comprises of the '*audit*' of the functions using a checklist as this enables '*snapshots*' of the functions to be taken in order to make a rapid assessment for strategic purposes followed by use of *'performance reporting tool'*. The performance reporting tool is for use on regular basis by the management for close follow up of the functions. According to the same document, an audit is a systematic procedure to objectively obtain and evaluate the evidence about the organization and practices of an institution, whereas the performance reporting tools are relevant for performance evaluations and are therefore a product of selected PI's.

U. N Habitat (1997 p83) have identified what they consider priority PI's as follows:

1. service standard indicators i.e. type of supplied customers, population served, tariff structure, etc;
2. price indicators i.e. average price, budgetary allocation;
3. technical indicators i.e. supply output, UFW;
4. cost indicators i.e. sales and collection, total wage bill, etc; and
5. finance and balance sheet.

However, Alegre et al (2000, p145) have proposed standardised performance indicators which are grouped as follows:

(a) Water resources indicators i.e. the source of water for the utility and its sustainability; the indicator is used to estimate the yearly abstraction capacity and imported water allowance according to schemes, drought management and operation procedures.

(b) Personnel indicators i.e. welfare, training, qualifications, deployment in the scheme. However, the most important indicator under this heading is the number of employees per 1000 connections.

(c) Technological indicators i.e. use of computerized information systems, level of automation and controls, digitized mapping.

(d) Physical indicators i.e. treatment utilization, storage, pumping, transmission and distribution network including metering both for consumers and zonal.

(e) Operational indicators –this refers to inspection and maintenance including network inspection, leakage control, active leakage control repairs online water quality monitoring, meter replacement, pressure meters service connection rehabilitation, pump rehabilitation, failures in the main or power failures metering and water quality monitoring.

(f) Quality of service indicators –this refers to supply coverage including public taps and stand pipes and distances to these public taps, pressure of supply adequacy, continuity of supply, quality of water supplied, new connection efficiency, customer complaints.

(g) Financial indicators- this covers annual costs, annual revenue, annual investments, average water charges, efficiency indicators, non revenue water etc.

All these performance indicators are important; however, in a country like Kenya where most data is inaccurate or just non-existent and where the water utilities are heavily subsidized by the Government, their use may be limited. Indeed UN Habitat (1997 p81) observed that in African water utilities the most important PI's are UFW, billing collection ratio and water supply coverage. The first two fall within the technological and financial indicators respectively. The importance of the UN Habitat observation is that it takes into account the shortcomings and realities of the water utilities in Africa and as a result

proposes concentrating on what the staff in charge of the utilities should be capable of controlling.

However, the most important performance indicator must be that, which the customers (consumers) understand and are able to assess. This means that the quality of service indicator becomes absolutely important. Seppala et al (Seppala 2004 p255) categorised this particular indicator as outlined in the Table 3.4.

For any water service utility, what concerns the management and which determines the quality of service that the customers finally receive are the operational, personnel and financial indicators. Therefore the important PI for consideration can be seen to be operational, quality of service, personnel and financial. These indicators take into consideration both the customers and management requirements in a water supply. This is what Table 3.4 tries to depict under each indicator.

Table 3. 4: Performance Indicators for quality Service (modified from Seppala 2004 p261)

Supply coverage	**Supply reliability**	**Water quality**	**Connection efficiency**	**Customer complaints**
Coverage with service connections	Pressure of supply adequacy	Quality of supplied water	New connections	Service complaints
Coverage with public taps and standpipes	Continuity of supply	Aesthetic quality	Connection repairs	Continuity complaints
Distance to public taps and standpipes	Water interruptions	Microbiological quality		Water quality complaints
Quantity of water consumed	Interruptions per connection	Physical-chemical quality		Billing complaints
Population per public tap or standpipe	Population experience restrictions to water service			Other complaints
	Days with restrictions to water service			Response to written complaints

Therefore, it becomes important to find out which performance indicators are utilized or have been set for a water utility and how it is achieving them. On this basis the success of the utility can be determined.

(d) Quality Management Principles

If a water utility is considered as an "enterprise", it becomes necessary that this enterprise has an efficient corporate organization. To be efficient, the organization must be of adequate size. The word which is being used in the MWRMD to describe adequate size, as the Water Act 2002 is implemented is "lean". Therefore, the organization must be lean. The next issue that the organization management must embrace is the corporate "culture". The term used to describe this type of management is "quality management".

Quality management is, essentially the quality of the organization, evidenced in every vital part of the enterprise. It remains understood that an "enterprise" of "quality" cannot do other than supply a quality product (Republic of Italy, 1992 p60). This also applies to water utilities where the quality of the enterprises is equally important.

ISO 9000:2000 in their document Quality Management Systems Fundamentals and Vocabulary, has listed eight quality management principles including some application as follows:

Principle 1: Customer focus

- Researching and understanding customer needs and expectations.
- Ensuring that the objectives of the organization are linked to customer needs and expectations.
- Measuring customer satisfaction and acting on the results.
- Systematically managing customer relationships.

- Ensuring a balanced approach between satisfying customers and other interested parties (such as owners, employees, suppliers, financiers, local communities and society as a whole).

Principle 2: Leadership

- Considering the needs of all interested parties including customers, owners, employees, suppliers, financiers, local communities and society as a whole.
- Setting challenging goals and targets.
- Establishing trust and eliminating fear.
- Providing people with the required resources, training and freedom to act with responsibility and accountability.

Principle 3: Involvement of people

- People understanding the importance of their contribution and role in the organization.
- People identifying constraints to their performance.
- People accepting ownership of problems and their responsibility for solving them.
- People evaluating their performance against their personal goals and objectives.

Principle 4: Process approach

- Systematically defining the activities necessary to obtain a desired result.
- Establishing clear responsibility and accountability for managing key activities.
- Focusing on the factors such as resources, methods, and materials that will improve key activities of the organization.

- Evaluating risks, consequences and impacts of activities on customers, suppliers and other interested parties.

Principle 5: System approach to management

- Understanding organizational capabilities and establishing resource constraints prior to action.
- Targeting and defining how specific activities within a system should operate.
- Continually improving the system through measurement and evaluation.

Principle 6: Continual improvement

- Making continual improvement of products, processes and systems an objective for every individual in the organization.
- Establishing goals to guide, and measures to track, continual improvement.

Principle 7: Factual approach to decision making

- Ensuring that data and information are sufficiently accurate and reliable.
- Making data accessible to those who need it.
- Analysing data and information using valid methods.

Principle 8: Mutually beneficial supplier relationships

- Identifying and selecting key suppliers.
- Inspiring, encouraging and recognizing improvements and achievements by suppliers.

As the reforms in the water sector take root quality management culture has to be made to take root. It is however, necessary that a PSP operator be evaluated to determine if he is using some of these principles.

4 PSP IN KENYA

4.1 Kenyan experience with PSP

The private sector is not a new phenomenon in the water sector in Kenya. The private sector has always been involved in one form or another. This has ranged from consultants designing and supervising implementation of water facilities, contractors putting up water supplies, various suppliers to the sector as well as operating and maintaining water supplies. As noted earlier up to mid 1970s, there were over a dozen private water companies in operation in Nairobi including Runda water, Karen water, Langata etc WHO (1973 10a p23). As the city council improved services within the city, most of them ceased to operate. However, the private sector still continues to produce and supply water in small quantities in some areas of Kenya. The most notable of the private water companies is Runda Ltd, a private company that has been supplying water to Runda residents since 1975. The other notable example is a small public water supply known as Tala water supply, which has been fully handed over to a private water operator since the mid 1990s. The Operator supplies water to the town residents from a borehole source. There are also a few other individuals who operate their own supplies and have a limited number of consumers usually neighbours and some sell to water tankers for reselling. SSiP also operate as private water supplies. The problem is that the ministry in charge of water affairs has never taken these types of water suppliers seriously.

Licensing of SSiPs has been undertaken by the City Council of Nairobi for those within Nairobi city area. The majority of them, and they are many countrywide, are not licensed as water suppliers and some even do not have an abstraction license for the water they supply. The Central Bureau of Statistics estimated that of the 89.7% population of urban areas that use improved water sources about 11% depend on SSiPs and 2% in rural areas (MoP&ND 2003 p57).

4.2 Studies for PSP Options for Kenya

4.2.1 Introduction

In 1994 at the height of the devastating drought in Kenya, the then Ministry of Land Reclamation Regional and Water Development set up a Water Supply and Sanitation programme Coordination Committee. This body was consultative in nature and comprised of major intergovernmental agencies such as the World Bank, UNDP, Sida, and JICA and incorporated other Government Departments and bilateral donors, and other donor agencies. Initially its aim was to coordinate support to the Water Sector during the drought. Eventually the body started coordinating development of the Water and Sanitation programmes in Kenya.

In early 1998 the committee realized that to achieve its aims, in the face of a sector that was suffering from a slow down in attracting investments, it had to change its approach to coordination. The Committee therefore set up three working groups each of which was to focus on the main sub-sectors of the Water and Sanitation sector. These groups were the; policy and regulations, Rural Water Supply and Sanitation, and the Urban Water Group. Specifically the urban Water Group was to advise on various aspects of urban, peri-urban and informal settlements Water Sector issues. The urban water group identified six issues to be examined for a clear comprehension of the urban water sector problems. One of the six issues was commercialization and Private Sector Participation. Other issues were institutional arrangements and economic considerations for water supplies. However for detailed study the urban group decided to start with Commercialization and PSP. The other issues were to be left for follow up studies and only to be commented on in as far as they touched on PSP.

In as far as PSP was concerned the recommendations that emerged from the study included the need to revise the institutional framework in the Water Sector if PSP was to be effective and the need to review the different options

of PSP in the urban setting in Kenya (MENR/FAMA Resources Ltd, 2000, p51).

On the other hand the Rural Water Supply and Sanitation group also commissioned a parallel study to look into the study on PSP in rural WSS Sub-sector. This study also concluded that PSP had a place in the delivery of sustainable services in rural WSS especially in addressing management inadequacies which were in the sector. The study also observed that there were many options that could be applied in the rural areas depending on the circumstances to be addressed (MENR/CAS Consultants, 2000 p82).

In December, 2000, the MENR with support of other donors decided to carry out a review of the Water Supply and Sanitation Sector. Although the review covered the entire sector, its focus on management of urban water supplies was inescapable. Indeed most of the supporting documents to the main report detailed ways in which the Private Sector could help in improving the management of Urban Water Supply and Sanitation utilities (WB 2000). The importance of PSP was brought out by one of the Donors, KfW commissioning their own consultant during the joint donor review to specifically review PSP in the provision of Urban Water Supply and Sanitation Services in secondary towns in Kenya (KFW/Katalyst21, 2001). Both reviews recommended changes in approach in management of urban water supplies and especially the need to actively encourage the introduction of PSP in urban water utilities. Potential PSP models were noted and commented upon. Specifically the KfW review, noted the need to lobby GoK to adopt the recommendations on PSP in the sector review report and additionally lobby among leading donors to have a common approach and consensus on PSP (KFW/Katalyst21, 2001 p3). It was therefore not surprising when in June, 2001, the Government of Kenya, through the investment section of Ministry of Finance, but with full backing of the MENR and MoLG commissioned a study on options for PSP in the Water and Sanitation services in the City of Nairobi (Halcrow, 2002).

4.2.2 Nairobi City case study

In June, 2001 the Government commissioned a group of consultants led by Halcrow group to study the options for PSP in the Water and Sanitation Services of Nairobi. The study team's terms of reference limited them to compare four options of PSP which were divestiture, concession, lease contract, and management contract (Halcrow 2002, p2).

The comparative analysis of the four options concluded that neither divestiture nor concession would be feasible as the risk involved were said to be beyond the capacity of the Private Sector to absorb; lease would be financially feasible provided public sector funds could be mobilized to fund the initial capital programme. The study however observed that international companies had expressed only qualified interest in bidding for a lease contract in Nairobi. Of concern to the International Water Companies were the poor quality of management and financial information. The study concluded that before a lease is considered procurement study for lease stabilization would have to be carried out. A management contract was seen as the most appropriate for Nairobi City. PSP interest in this option was reported to be overwhelming.

The GoK indicated that it supported the management contract option, however the World Bank was opposed and indicated that it preferred a higher option. The Banks rejection of a management option was a result of limited benefits that Nairobi City would gain from such a PSP investment.

The Bank held the view that the consultants had exaggerated the required investment; in addition, the Bank pointed out that lease had been shown to work in most African cities smaller than Nairobi. The World Bank noted that it had also talked to other international operators, who had shown good interest in lease contract for Nairobi City, noting that their independent study had shown that consumers would be willing to accept close to 50% increase in tariff immediately.

In subsequent discussions both the Government and the Bank reached an agreement that the lease option would be feasible. It was therefore left to the Government to write formally to the Bank to indicate the option to be adopted before preparation of documents to facilitate contracting could start. This was however not to happen as after the December, 2002 general elections the new Government wished to understand what was happening in the sector before making a decision. Finally in December, 2003 the Government decided that it would not pursue any of the PSP options recommended for Nairobi City.

4.2.3 Mombasa City case study

In April, 2002 as part of support to the Kenya Government's reform in the Water Sector, the World Bank, on a request from the Kenya Government commissioned a consortium to undertake a review of PSP in the provision of Water Supply and Sewerage Services in Mombasa and Coastal Region (MCR). The major task of the consortium was to compare alternative decentralization and PSP options for the area in question based on technical, financial and legal review of the key factors influencing the selection of the most appropriate PSP arrangement. The other task was to identify and build consensus with the key stakeholders in respect of the preferred option (Price WaterhouseCoopers 2002, p1)

Due to the fact that stakeholder consultation was an important process in this option study, it was carried out in all the major towns within the MCR. The results of the stakeholder analysis showed that for a public sector option, which was one of the requirements for the study, the preference was for institutional arrangement in which water supply distribution was organized on a local level. That is local companies to carryout distribution throughout the MCR, but bulk supply to be given to a different entity or company. On the preferred PSP option the stakeholder results showed a preference in which the private sector took significant responsibility for commercial and operating activities. This implies that the stakeholders preferred either a lease or concession options (PriceWaterHouseCoopers, 2002, p10, p23).

However the consortium had a different view for both options; for the public sector option the team was of the view that one entity should be in charge of both bulk and distribution. The reasoning according to the team was that, when the time for PSP to be involved in the Water Supply was ripe, it would prefer to bid for the project on a fully integrated base. This, the consortium pointed out would offer the maximum scope for achieving economies of scope and scale and minimize contractual interface risks. On the Private Sector option the consortium was of the view that given the uncertainties over baseline data, the relatively small size of the utility and concerns over water pricing in Kenya and hence cost recovery, the private sector would be unwilling to accept significant responsibility for capital investment. The study team therefore concluded that the most appropriate option would be a management contract or simple lease contract. The consortium therefore went on to convince the stakeholder to accept a simple lease as this went some way in achieving their expectation of a PSP option (PriceWaterHouseCoopers, 2002 p25) .

4.2.4 Kisumu City case study

In early 2003 the Government with the support of the World Bank commissioned a consortium led by the Holcrow group to undertake a review of options for PSP in provision of Water Supply and Sewerage Services in Kisumu. However, unlike the studies for Nairobi and Mombasa Cities, the Terms of Reference listed four options that were to be considered; Concession, Lease, Management and Service contracts. However, section seven of the ToR seemed to have doubted the feasibility of the concession option although it was to be examined. It was noted in the ToR that whereas concession could logically be granted by Kisumu City Council, its feasibility was dependent on many factors including water tariff, availability of financing, appetite of international water industry for such a small utility as Kisumu and acceptability by stakeholders. It was emphasised in the ToR that concession may not be feasible and hence the consultant was encouraged to devolve deeply into the lease or even a management contract and only consider a

limited "Service" contract for specific tasks which were named as construction of connections, meter reading billing and collection (Halcrow , 2003 p3).

In effect therefore the Government already had a PSP option in mind, and may be there was no need for a study, apart from convincing stakeholders that some thought had gone in its selection. The governments option seemed to be a lease contract.

4.2.5 Small and Medium Towns case study

In early 2002 the Government with support of KfW commissioned a study to examine PSP options that could be considered for the contractual arrangements between Water Services Boards and Water Services Providers, in small and medium towns. In their study report (Richards an,d Farid 2002), the Consultants noted that based on available current operational and financial data, combined with a lack of reliable assessment of capital investment requirements, management contracts were the best option for these utility management. The study further noted that there would be no single fit management contract for all small and medium utilities but rather each utility would have management contract which is dependent on its circumstances.

This study went on to list the three advantages that management contracts would have in the small and medium towns as the short period of the contract (three – five years) would allow the new institutional system being set up to take root; more reliable operational and financial data, and the reliable assessment of capital investment would be possible to obtain, thereby setting a stage for higher PSP options; there would be useful lessons on operations of PSP, which would help the reform process that the Ministry was undertaking (Richards and Farid, 2002, p50). This study unlike the others also presented barriers to PSP in WSS services. These included; distrust that the Kenyan public had for the private sector, the distrust that the public sector had for local authorities especially in as far tariff setting and imposition of taxes/fees were concerned; lack of understanding of options available in PSP;

absence of clear guidelines on role of private sector in management of Community Water Supply; size of small towns which could not generate sufficient revenues to make them attractive and lack of interest from international operators due to the small size of the utilities.

In effect therefore the study examined a possible clustering of small and medium water utilities with the aim merging a number of utilities so as to satisfy the concerns on sizes of the utilities. Indeed even after carrying out the cluster study the consultant observed that size of the possible clusters was still too small to be of interest to international water operators in terms of returns that could be achieved. The study therefore concluded that the involvement of the private sector in any cluster would only likely be sustainable through local Kenyan companies, if there was indeed such an interest.

It is on basis of these studies that involved many stakeholders that operation of any PSP in Kenya can be seen. In all studies conducted the PSP option of choice recommended by consultants was a management contract.

4.3 Management options

The Water Act 2002 establishes WSBs, which are the licence holders for the provision of water services in their areas of jurisdiction, while the services are provided through agents procured for the purpose, the WSPs. The Act explicitly precludes LAs from entering into an agreement with WSBs to be WSPs. However the Act allows LAs to have interests in any company which is WSP. In effect, therefore, the following organisations in urban areas can be WSPs; water and sewerage companies in which LAs have either total or partial interest and private sector companies.

Therefore, the PSP management options, between the WSBs and the WSPs, under the Water Act 2002, will fall into one of the basic four types of contractual relationships; service contract, management contract, Lease

contract and concession. Key features of each of these options in as far as Water Act 2002 is concerned is summarised below (Richards and Farid, 2002 p44):

(a) Service Contract: under this option a Water Service Agent (WSA) provides specific services to WSP in order to support the WSP meet its contractual obligations with the WSB. Some of these could include; GIS mapping of the infrastructure, Preparation of asset management plans and investment needs, operation and maintenance of reticulation systems, pumping stations and treatment works, reduction of system losses and improvement metering, billing and revenue collection.

If utilised, a service contract, would normally be for short periods of up to three years. The strength in this type of contract is that it is relatively simple to set up, does not require the contracting WSP or WSB to have special skills in contract management and does not commit the client contracting party to long term arrangements. However, it has inherent weaknesses that include the full responsibility for provision of services would still remain with the contracted WSP and the licensee the WSB, the operational staff would still be those employed by the WSP, it is difficault to link performance improvements to WSA, payments have to be made without guarantee of success, will not address inadequate equipment and material resources and does not address access to capital finance. The fact that it can be implemented quickly is an opportunity that a service contact possesses.

(b) Management contract: under this option a WSP enters into a contract with a WSB to manage and operate the water and sewerage services on its behalf. Indeed all the commercialised water companies that have signed agreements with WSBs under the Water Act 2002 are operating with service provision agreements which are close to management contracts. These include the Nairobi Water and Sewerage Company and Nakuru Water and Sewerage Company, Kericho Water and Sewerage Company and the Nzoia Cluster Water Company. The Service Provision Agreement (SPA) that these WSPs have signed sets out the range of services to be provided together with

the performance standards to be achieved. However, these SPAs fall short of the management contracts as usually formulated as they lack clear procedures for performance monitoring, the WSPs pay themselves from the collection they make, there are no penalties for non performance and the contracts were not procured through competitive tendering procedure. In effect, therefore, a management contract requires a contract defining the range of services to be provided, performance standards to be achieved, procedures for performance monitoring, terms of payment and penalties for non performance.

A management contract does not address the issue of capital investment and will leave the WSB with the responsibility for securing capital funds, although the WSP may be required to carryout capital works to the WSB's instructions, as is the case between the Rift valley Water Service Board and the Nakuru Water and Sewerage Company. The Board is to carryout certain capital works for source works and trunk mains, while the company is to carryout all the capital works within the municipality boundaries but under the instructions of the Board, which has secured the funding from ADB.

Just as in the case of service contract, the management contract has its strengths and weaknesses. The strengths include; its relative simplicity to set up, contract is linked to performance, it does not commit the WSB to long term commitments as it will be for a period of three to five years, does not require the WSB to have special skills in contract management, and more important the WSB retains the final responsibility for provision of services. Its weaknesses include the fact that the WSB should have basic skills in contract negotiations; existing sector staff may become redundant if not required by WSP and does not address access to capital finance.

(c) Lease contracts: under this option the water and sewerage assets of the WSB will be leased to a WSP for a specified period (Table 3.1). The WSP operates and maintains the water supply at its own commercial risk, with income derived from tariffs. The WSP may be required additionally to finance and carryout improvements and capital investments in accordance with the

WSB needs. The investment funds will be derived from either cash generation or public sources or both. Payment to the WSP will be linked to performance in terms of service delivery standards and capital investments carried out but linked through an agreed formula to tariffs charged to consumers.

This form of contract is more complex than the above two, in terms of contractual arrangements and will require the WSB and WSP to have an equitable pre contact agreement on issues such as value and condition of leased assets, planned system replacement of short lived assets, service delivery standards, tariff setting formula and methods of dealing with changes in capital investments needs and penalties for non performance. Therefore, WSBs require comprehensive contract negotiations and management skills or advice to protect their interests. Its weaknesses include the complications in setting it up, WSBs being committed to long term arrangements, need to have strong skills in negotiations and the need to know the value of assets before contract negotiations.

(d) Concession contract: under this option the WSP manages the WSBs' assets operates them at commercial risk and accepts investment obligations, whether they are to build a new water supply or expand or rehabilitate an existing supply. The contract has a fixed term and involves transferring the assets back to the WSB at the end of the term. Its weaknesses are similar to those of lease contracts.

4.4 Private Sector Participation in Malindi Water Supply

4.4.1 Background

The only known large PSP in Kenya is the Management contract for Malindi Water Supply between H.P Gauff K. G. and NWCPC. On the other hand, Nyeri water supply and Eldoret water supply have successful commercial undertakings in place. Other towns and municipalities are also fast commercialising their water provision activities in order to conform to the new Water Act 2002. The operation of these new commercialised water supplies is

in its infancy and will need time before they are evaluated to determine the success achieved.

The original water source for Malindi was a number of small diameter boreholes producing 500m^3/day near Ganda, which is 5 kilometres west of Malindi municipality. The boreholes supplied two reinforced concrete storage tanks at Ganda from where water flowed by gravity to Malindi town for distribution. Although the boreholes were originally eight by 1991 only two were functional.

In 1960, a scheme based on extraction of surface water from Sabaki River at Kwa Alenya was constructed. For the next three decades, this scheme, which is 7 km from Malindi, remained the principal source of water to the town. This scheme was based on raw water being pumped to a conventional treatment works of maximum capacity of 2500m^3/day comprising pre-sedimentation, clarification, filtration, and disinfection. Incase of Malindi, the treated water was pumped, via high lift pumps, to two reservoirs each of capacity 1125m^3 at Kisimani, from where it gravitated to Malindi town (H.P. Gauff KG, 1980 p1).

In their preliminary design report for the design and supervision of Mombasa and Coastal Water Supply (MCS) in the first half of the 1970s, the consultant Scott Wilson Kirkpatrick and Partners recommended that Malindi and Gede/Watamu areas should be served from the same source as the Coast North of Mombasa. The proposed intake was to be at Lango Kubwa on Sabaki River with treatment works of 54,000m^3/day at Baricho. Unfortunately, the consultant was instructed to disregard these proposals prior to Final Designs for Mombasa and Coastal Supply (H.P.Gauff KG, 1981 p2).

In 1979 MOWD commissioned a consultant, H.P.Gauff, to design and supervise the construction of a pipeline to supply water to Malindi township, Kakoneni, Jilore, Kakuyuni, Ganda, Msabaha, Gede, Watamu and other centres north of Mombasa as approved by the DWD but within a strip of 3Km width of the pipeline. Accordingly the final design report was submitted in

1981. The consultants' recommendations were similar to those proposed earlier by ScottWilson Kirkpatrick.

The Kenya Government then negotiated a loan with the German government in the amount of DM 30.8 million to finance the project. The agreement was signed in early 1985 between the GoK and KFW (H.P.Gauff KG, 1991 p1).

An immediate works project was undertaken in advance of the main project aimed at improving the existing system of bulk supply into the town and the distribution within the Malindi urban area. These immediate works were completed in 1989, the year in which the NWCPC took over the management of the water supply.

Upon completion of the main agreement on agreed works in early 1990, there was still a balance from the negotiated funds in the amount of DM 7million. A supplementary agreement was negotiated and signed with the consultant H.P Gauff in which they were retained to undertake supplementary works to the Malindi pipeline utilising the available residual funds. The areas covered by the consultants' supplementary agreement included the preparation of a hydraulic model study of the Sabaki river in the vicinity of the Baricho intake; limited Baricho intake modifications; Baricho wellfield development; block mapping and consumer survey of the Malindi urban area and Malindi town reticulation expansion and improvements. This was the start of the technical improvements of the Malindi water supply.

On the other hand, in early 1990s the Government successfully negotiated and received a credit from the World Bank (WB) to cover works under the second Mombasa and Coastal Water Supply (MCS2) and Rehabilitation project. The credit covered priority rehabilitation works and pre-investment studies and engineering in most of the Coastal areas. As the water supply situation in Malindi-Watamu area was being taken care of by funding from KFW, the WB credit did not initially target Malindi-Watamu water supply area. In any case by the mid 1990s the water source, bulk pipelines and balancing storage situation in the Malindi area was adequate for the area up to and

beyond the year 2010. The NWCPC therefore decided that various management and organisational improvements could be tried in this area. The WB was therefore approached to fund some of the proposed pilot projects in the Malindi-Watamu area under the MCS2 credit. These were the service contracts that lasted 3½ years.

4.4.2 PSP Service Contracts

The NWCPC decided to use Malindi water supply as 'pilot' area for various management and organisational improvements, as it had adequate water supply and relatively good infrastructure. The aim was that if the activities could first be proven and refined there then they could be introduced in other areas at an appropriate time if proven successful. The three areas that required improvement were thus identified as follows:

1) Attaining and maintaining of high and acceptable levels of administrative efficiency in consumer metering, billing and revenue collection.
2) Attaining low levels of physical losses through zonal bulk metering, leak detection surveys
3) Establishment of a water management information system (MIS) through digitised mapping, GIS and computerised management control systems.

Therefore, in 1995 addendum 3 to the second Mombasa and Coastal Water Supply (MCS2) Engineering and Rehabilitation Project, rehabilitation of Sabaki Water works was signed between NWCPC and H.P Gauff to undertake the activities identified in items 1 and 2 above. The time period in which the services were to be carried out was 7.5months effective from June to December 1995. The purpose of the consultancy was set as follows:

i. to assist the NWCPC in meter reading;
ii. to improve billing;
iii. to maximise revenue collection; and

iv. to reduce commercial and physical losses in the Malindi sub-area of the Mombasa and coastal Water Supply area.

Appendix A4-1 and A4-2 outlines the Technical, commercial and operational primary problems as identified by the consultant at the beginning of the contact, the probable causes and actions taken to correct the situation. (Gauff Ingenieure 1996).

The improvements obtained during the life of the service contract were modest, as indicated in Table 4.1. The greatest impact was in reduction of estimated readings resulting to billing being based on actual meter readings. As for the other identified shortcomings, the Consultant only gave recommendations on the way forward. In effect, therefore, the objectives had not been achieved. It should however be noted that the contact duration was only seven and half months, a very short period indeed to fix a problem that had been in existence for a long time.

Table 4. 1: Summary of achievements as at December (1995 Adopted from Gauff Ingenieure, 1996 p3)

Item	Value (%)		Remarks
	June 1995	December 1995	
Percentage of billing based on read meters	21	89	Further improvements can only be realised if rate of stalling of meters is overcome.
Estimated readings	66	21	Further improvements can only be realised if rate of stalling of meters is overcome.
Improvement in %age of revenue collected as %age of billed amount	–	12	Only after establishment of correct opening balances and disconnection of major defaulters will further improvement be obtained.
Improvement in actual revenue collected as %age of billed amount	–	40	Further improvement likely to be limited until more accurate billing within Malindi commences and consumer trust redeveloped.
Reduction in physical losses	47	41	Further significant improvement likely to be limited until waste detection and replacement of older pipe network is undertaken.

However, the contract had provided a sound basis for improvement in administrative efficiency, and hence maximisation of revenue in Malindi Urban area. The contract helped in identification of the following major constraints that still had to be overcome in order to achieve the objectives of the contract:

(j) Inappropriate billing system;

(iii) Lack of trained meter readers;

(iv) Unmotivated and Inadequately trained key staff;

(v) Lack of customer relations strategy;

(vi) Poor accounting system and non utilisation of IT in operations;

(vii) Dissatisfied customers unwilling to pay their bills due to non functioning or mal-functioning meters;

(viii) Large number of outstanding bills most of which were in dispute.

The Consultant was retained for a further period of 6 months covering the period between January 1996 and June 1996. This necessitated the signing of Addendum 3A (WB, 1997a p8) to the main contract. The aim of the new contract was to enable the attainment of the objectives set under the initial service contract (Addendum 3), which had not been achieved due to various reasons mentioned from above, and on which the Consultant had identified the constraints. Specifically the following activities were to be carried out (Appendix A4-2 to A4-4):

(a) Recruit and train new meter readers;

(b) Recruit and train additional staff in consumer relations and financial issues;

(c) Commence historical data analysis on all consumer accounts;

(d) Replace the existing water billing package in use with in-house billing system; and

(e) Institute meter maintenance measures to reduce stalling and blocked meters.

A new goal of attaining low levels of physical losses that had been identified as one of the three areas requiring improvements was incorporated. Specifically the Consultant was required to reduce the administrative losses to a target figure of 19% and also attain efficient day to day operations and maintenance of the system.

Table 4. 2: Achievements of the second service contract (Gauff ingenieure,1996 p3)

Item/Problem	Situation as at December 1995	Situation at June 1996	Remarks
Percentage of billing based on read meters (%)	89	100	Consumer meters that stall due to blockage are dealt with routinely
Estimated readings (%)	21	10	• meter reading reorganised as a routine programme in each zone. • New meter readers conversant with the area in place
Improvement in actual revenue collected as %age of billed amount	+40	+93	• Billing carried out in Malindi using a computerised billing system • Routine and regular disconnections for unpaid bills undertaken regularly
Reduction in physical losses (%)	41	40	• Observed leakages dealt with regularly • Daily reading of system bulk meters
Magnitude and extent of the accumulated errors in virtually every water account	Develop replacement water billing package, analysis for realistic present supply situation and consumptions		A computerised billing system in full and regular monthly use inclusive of management reporting system
Errors in meter reading	Recruit and train new meter readers, institute quality control procedures		• New meter readers conversant with the area in place • Meter readers assigned different areas to read in successive months reducing likelihood of reporting artificial readings.
Job dissatisfaction and low morale of NWCPC staff	Recommend re-designation, introduce work related bonuses, recruit and train additional key staff		Incentive and other bonuses being paid
Poor revenue collection results	Improve meter reading; commence historical data on water accounts.		• Customer relations officer appointed to deal with new complaints from consumers • Reconciliation of accounts embarked upon
High level of consumer dissatisfaction	Improve accuracy of meter reading, recruit and train consumer relations officer, accountant and computer operator.		• All major consumer accounts analysed and recommendation given to NWCPC for implementation • Customer relations officer appointed to deal with new complaints from consumers • meter reading reorganised as a routine programme in each zone.
Dishonesty among consumers with regard to illegal connections and illegal reconnections.	Ascertain magnitude of the problem assist NWCPC to introduce rigorous disconnections of defaulters		Criminal prosecution for illegal connections and reconnections instituted

The Consultant set out a new matrix (Appendix 4-3) of the actions that were to be taken between January and June 1996. These actions were to solve the enumerated problems.

Table 4.2 shows the summary of achievements at the end of the second service contract under Addendum 3A.

Table 4.2 indicates that there were commendable achievements in the commercial operations. The other objectives of reducing the physical water losses and improving the day to day operations did not reach the set objectives.

However, the problem of financing the service contract beyond June 1996 arose. KFW had been expected to finance the service contract beyond June 1996. However, KFW was not ready to finance the contract at the time. According to the consultant, NWCPC was neither capable of maintaining nor improving upon the situation reached by June 1996 due to the follwing reasons (Gauff Ingenieure, 1997 p5):

1. Delay in receiving authorisation for a tariff increase, which meant that the revenue collection that had risen from KShs 1,299,548 in June 1995 to KShs 2,935,987 as at the end of June 1996 could not go any higher.
2. Inability of NWCPC to take over the staff recruited and trained by the consultant thus making it impossible for NWCPC to operate and maintain the separate billing system established for Malindi.
3. Incomplete historical analysis and establishment of a corrected opening balance of the various accounts.
4. Unauthorised salary increase of NWCPC staff that NWCPC could not maintain for staff in Malindi due to reasons of parity in the organisation.
5. Delays in reaching agreement with KFW over the provision of financial assistance of a management type of contract for the project area.

In the aide memoire of 1997, the WB mission observed the following: 'it was expected that future operations, to support the improvement of revenue collection and water management in Malindi, beyond July 1996 would be supported by KFW until self sustainability of the operations is assured. Due to delays in availability of KFW funds and given the importance of the Malindi pilot operations in feeding into the next Mombasa project and in general in support of the WB's PSP support in the sector, WB would consider continuous support to the operations of the consultant' (WB, 1997a p8).

With Financial support for the contract assured, the NWCPC decided to retain the consultant under a new Addendum 3B for a further period of 18 months (July 1996-December 1997) (Gauff Ingenieure, 1997). In effect therefore the service contract period was being set at 31months, stretching from June 1995 to December 1997. It was hoped that this period would prepare the sub area for a full management type of contract. One new agreement was reached with the consultant; this was the establishment of a viable self sustaining infrastructure inclusive of vehicles and equipment. To enable the achievement of this condition, the Consultant was allowed to retain 10% of the weekly revenue so as to make necessary prior approved procurements. According to the consultant at the end of the extended period, it was hoped that:

1. Tariff levels would be such that the sub area is financially self sufficient, inclusive of paying for management services and other costs;
2. A 3 to 5 year management contract would be in place ensuring a smooth transition into a fully self sustainable water utility; and
3. KFW would release funds for reticulation expansion programme as agreed.

In June 1997, a tariff increase was approved as hoped by the consultant. The monthly revenue collected increased to an average of KShs 4,065,815 by December 1997(Gauff Ingenieure 1998). This was 40% above the average collected in the earlier period. Notable achievements at the end of the service contract were as follows:

1. successful introduction of monthly meter reading;

2. a Malindi based billing and accounting software system;
3. enhanced revenue collection;
4. analysis and commencement of collection of historical debt; and
5. improved system operation and maintenance.

In January 1998, the NWCPC took over the financing of the service contract using its own resources. The NWCPC, after the first three months of operation, realised that it could not sustain the service contract from the revenue collections from Malindi water supply only. As a result, the service contract was not renewed after June 1998.

According to the consultant (Gauff Ingenieure, 2000) as soon as they moved out of Malindi in July 1998, the revenue collection fell, as the NWCPC personnel could not handle the billing system in use in Malindi as described above. The NWCPC management on the other hand contend that the consultant purposely refused to train NWCPC personnel in use of the billing system because of mistrust and also because they wanted to be retained for a longer period. Indeed the feeling of most personnel in NWCPC is that the consultant left abruptly without adequate handing over.

The key lessons that came out of this service contract, which the NWCPC used well in the subsequent, contract, include the following;

(i) For any contract, there must be clear targets set for all the agreed activities.

(ii) PSP should not be entered into unless the tariffs are adequate to cover the scheme costs i.e the tariff is such that it can cover full O and M and renewal costs.

(iii) For sustainability of the water supply, PSP option should not be donor driven regardless of the costs the donor may be willing to cover.

(iv) Knowledge transfer must be part and parcel of such contracts if the contracting entity is to receive some technical benefits.

These are important lessons for any urban utility that wishes to contract out part or all of its water activities.

4.4.3 Management Contract

Inspite of the abrupt ending of the service contract, there was need both from the donors and the NWCPC to make use of the experience gained during the duration of the service contracts. A management contract was therefore signed on 30thNovember1998 between NWCPC (the "Client") and an association of H.P.Gauff GmbH and Engineering & Utility Management Ltd ("Agents"). Due to the need to fulfil the requirements of clause 2.1 of the contract, it was not until March 2000 that the operations of the Agent (referred to as the "Operator" in this report) resumed. The clause in question, which was the contract effectiveness clause stated as follows (NWCPC 1998, p4):

"This contract shall come into force and effect on the date (the "Effective date") of the clients notice to the Operator confirming the following conditions have been met:

a) This contract has been approved by the Board of Directors of the NWCPC and signed by the Managing Director.
b) The cost covering tariff has been approved, gazetted and it is agreed between KFW, the Client and the Operator that the approved tariff level is adequate to meet the financial obligations of this contract.
c) The standing order to facilitate both operation and maintenance payments and fee payments to the Operator has been put into effect.

There was no tariff increase till December 1999 and hence condition (b) took longer than had been expected to fulfil thereby delaying the start of this management contract. This delay was necessary as the earlier service contracts had shown that scheme cost covering tariffs were necessary for PSP options.

(i) Scope of the Management Contract

The management contract covers the following (NWCPC 1998):

(a) Bulk conveyance and delivery of water to consumers;

(b) Operation and Maintenance of all assets and installations provided into their management which constitute service assets;

(c) Renewal and extension of installations for conveyance and distribution of potable water for which funds are availed by the client;

(d) Carrying out of studies, at additional remuneration, necessary to reinforce, improve or extend the system;

(e) Increasing number of connection;

(f) Responsibility for technical, financial and commercial aspects of water services in the scheme area including O&M, meter reading, billing and accounting;

(g) Throughout the duration of the contract, the right to exclusively perform all the above services described within the agreed area;

(h) The need for the Operator to comply with all Government and municipal bye-laws with regard to safety, traffic direction and flow, public access etc when undertaking or managing new works;

(i) Data capture and digitising of information on urban and peri-urban areas reticulation system, consumer connections and meter locations;

(j) To provide on annual basis at the end of financial year a hard copy of the block maps complete with pipework, meter location overlays etc as produced;

(k) Advise Client on tariff adjustment on annual basis, giving reasoned justification;

(l) Continue with analysis of historical debts and make regular recommendation to the client;

(m) In liaison with the legal officer of the client arrange for prosecution of all criminal and civil cases arising from theft of water and/or indebtedness to the client;

(n) Pay topping allowances, bonuses and overtime to the seconded staff;

(o) Deal with all consumer and public complaints in expeditious manner;

(p) Facilitate revenue collection; and

(q)Update the asset register at the end of every financial year.

(ii) Area Served

The Municipality of Malindi is located on the Kenyan coast about 118Km north of Mombasa.

The Baricho Treatment works are located about 40 Km North West of Malindi on the south bank of the Sabaki River.

The area served, which is about 450km^2, is bound to the north by the Sabaki river, to the east and south east by the Indian ocean, to the south and south west by the Arabuko/Sokoke Forest and to the west by the Baricho intake and treatment works. However, it is necessary to point out that the original contract did not have a map of the area attached to it. This is not surprising as the operator was already familiar with the area, having been involved with the water supply since the late 1970s.

According to the contract signed by the two parties, the operator was not allowed to use installations and pipeworks to serve the consumers outside the agreed water supply area without obtaining approval of the Client. However, the contract allowed for modification of the boundaries of the Malindi water supply area. In effect, therefore, the area could be expanded by the client during the life time of the contract.

(iii) Duration of the Contract

The duration of the contract was 4½years effective from March 2000 to September 2004. However, the contract allowed for three months closing down time after the expiration of the contract period. In addition, the contract allowed for extension of its duration on mutual agreement. The contract had a time extension clause based on force majeure events (NWCPC, 1998).

(iv) Rights and Obligations of the Operator

The Client expected the Operator to maintain high standards of performance, but the contract listed other obligations of the Operator as follows (NWCPC, 1998):

(a) Operator is not allowed to benefit from trade commissions, discounts etc arising from activities related to the contract;

(b) Advise the Client on procurements of goods and services while complying with the agreed procurement guidelines;

(c) The operator is prohibited from engaging in business or professional activities conflicting with assignments under the contract;

(d) Disclosing any propriety or confidential information relating to the project, the services, this contract or the Clients business or operations without consent;

(e) The Operator to be liable for any loss suffered by the client as a result of default of the operator in performance;

(f) Indemnify the Client for any losses;

(g) Take out insurances against risks and for coverage's;

(h) Keep accurate and systematic accounts and records;

(i) Get the Clients' approval to appoint personnel to carryout any part of the services;

(j) Get the clients approval to enter into any subcontracts for the performance of any part of the contract;

(k) Taking any action which requires the approval of the Client while supervising civil works without approval of the Client;

(l) The Operator shall be fully liable for the performance of the services performed by the approved sub agents;

(m) The Operator is required to report promptly as set out in the contract;

(n) All documents prepared by the operator in performance of the services to be the property of the Client;

(o) Equipment and Materials furnished by the Client or purchased by the operator through funds provided by the Client to remain the property of the Client; and

perator to provide only qualified personnel who shall require approval
s agreed in the contract before being engaged

esponsibility for Capital Expenditure

om the beginning, it was envisaged that funds from KFW would be
ailable, within the initial one and half years by the Client for carrying
e following capital works (NWCPC, 1998):

eplacement of the old pumps that are used at the sourceworks for
water supply;
ehabilitation and augmentation of the pipe network;
urther reduction of leakage through replacement of at least 1000
r connections;
rocure for scheme use adequate means of transport;
upply of billing soft ware and hardware;
Construction of offices in Malindi; and
Provision of more staff houses.

e of these funds by the Operator was however to be subject to a
ely separate contract. The contract, however, contained other
ns in as far as procurements are concerned. The operator had the
to enter into commitments and procurements of all and any goods
rvices deemed necessary. Inspite of this, all procurements were
ed to procurement guidelines. The procurement ceilings under the
es were in three categories as outlined hereafter (NWCPC, 1998).
expenditure not exceeding KShs 100,000 at the discretion of the
perator;
expenditure between KShs 100,000 and KShs 500,000, approval to be
sought from the regional manager of NWCPC in Mombasa; and
expenditure above KShs 500,000, the Managing Director of NWCPC to
approve.

All expenditure must be in an annual expenditure and procurement /implementation plan listing all items intended for procurement or small works. Small works were defined as small system expansion where a contractor may be needed. The expenditure plan required the Clients' prior approval.

(vi) Billing and revenue collection

The contract allowed the operator to operate and maintain the billing/accounting system that they had developed under the service contracts. The system was to incorporate the following financial measures and controls (NWCPC, 1998):

(a) a general accounting system on managers funds;
(b) a cash flow statement (Finance Plan);
(c) a general accounting system linked to the billing programme, which among others produced monthly statements for bank reconciliation for both collection and fixed deposit accounts, and billing and collection registers;
(d) monthly instalment payment records;
(e) monthly historical analysis records; and
(f) kiosk operation report.

The Client received monthly accounting reports as produced by the billing/accounting system.

As billing was carried out in Malindi the customers were supposed to receive monthly bills.

(vii) Obligations of the Client

The main obligation of the Client was payment to the operator a fee on a monthly basis. In this contract, the maximum fee payable for Operators fee, out of pocket expenses and O&M costs had a ceiling for the duration of the contract, which implies that they are fixed. On an annual basis, the fees were adjusted such that the monthly payment to the Operator contained this adjustment. The adjustment that took inflation into account was carried as follows (NWCPC, 1998):

(a) The monthly rates for O&M costs and the man months fees for professional services including salary and related costs, other social charges and overhead costs were increased by 10% after the initial six months of operations to reflect the projected costs that would be incurred during the first full financial year of the contract.

(b) The adjustment in subsequent financial years was based on the following formula

$$C_h = C_o \times G_n/G_o$$

Where

C_h = new fees and new rates (KShs)

C_o = original fees and rates (KShs)

G_n = cost of living of upper income earners in Nairobi

G_o = index as above in Nairobi at the start of the contract

It is important to note that the monthly O&M was first estimated based on the expenditure during the service contract; subsequently it had to be proven by documentary evidence as to their actual expenditure. Although billing by the Operator was made by a standing order at the Clients' account at the bank where revenue relating to the project was collected, nevertheless a monthly invoice to the Client was prepared for each payment.

Payment of fees attracted a penalty and bonus based upon performance collection indicators, which at the beginning of the contract was fixed at 85%+5%-2% after the initial 6 months and 85%±2% for the rest of the period, as follows (NWCPC, 1998):

i. Penalty for every one percent lower averaged over three consecutive months and applicable commencing at the end of the three months is equivalent of 25% of the extra deficit involved.

ii. Bonus for every one percent higher averaged over three consecutive months and applicable commencing the end of those three months and is equivalent to 25% of the extra revenue obtained.

The other obligations of the Client listed in the contract include (NWCPC, 1998):

1. Seconding staff to the operator as agreed in the contract but these can be returned or dismissed if the Operator is not satisfied with their performance;
2. Availing to the operator for official use of facilities and equipment;
3. Providing to the operator on daily basis sufficient quantities of potable water from the sourceworks;
4. Availing to the operator 40% of successful debt recovery for O&M and minor work improvements;
5. Transferring all the deposit accounts from the regional office in Mombasa to the operators account in the project area;
6. Ensuring that the tariffs, meter rents and other charges are adjusted annually by an amount that on aggregate and as a minimum keeps pace with inflation;
7. Not applying the penalty clause if there are no annual tariff increases;
8. Authorising the operator to carryout the annual licensing of all privately operated kiosks in the project area and to have authority to require a change of licensee at such times where irregularities over charges to consumers and or payments to water revenue account have occurred; and
9. Liaising with the municipal council to obtain town maps for digitising and block mapping.

(viii) Agreement on unaccounted for Water

The situation prevailing at the beginning of the contract was assumed to be that at the end of the last service contract end of December 1997. That is UFW value of 40%±5% (NWCPC, 1998).

(a) Penalty is imposed for every additional one percentage averaged over three consecutive months and is supposed to be three percent of the monthly fee becoming due only at the end of the three months.

(b) Bonus for every one percent improvement averaged over three consecutive months and subsequently maintained shall be three percent of the monthly fee becoming initially due at the end of the three months.

5. THE RESEARCH METHODOLOGY

5.1 Design

A descriptive survey research design utilising qualitative methods was selected for the study. This research methodology was arrived at due to the need to observe with close scrutiny and record the observations on the water supply management option that has been in use both before and after the introduction of the PSP partner. Mason and Bramble (1997 p37) noted that descriptive research is usually performed to develop knowledge on which the problems and explanations of subsequent research will be based. Leedy (1980 p98) noted that the recording of the facts resulting from observations can occur in the form of tables, charts, graphs, and other summary and trend indicating techniques.

Malindi water supply case study was chosen for this study as this is the only Public water supply with a PSP partner. Mason & Bramble (1997 p39) observed that case studies involve in depth study of one person, group, institution, agency or other entity. They further note that case studies are intensive investigations of the factors that contribute to the characteristics of the case, with the aim of fostering understanding of how current conditions developed in order to provide better public services or a more effective economic basis for those services. Onjala (2002 p126) noted that case studies are useful wherever 'how' and 'why' questions are being posed and when we have very little control over events. He further observes that case studies serve several roles that include describing existing practices, developing theories and testing theories. Therefore a case study design was chosen for this research as the findings will provide useful information on why and how the involvement of PSP option in Malindi area was undertaken so as to establish useful lessons for other urban water supplies in Kenya.

5.2 Concept

The research aim was to evaluate Malindi water supply with a view of identifying the problems that faced the water supply, reasons why the

management option in use was selected, the performance agreements and targets and the services introduced including the views of those who enjoy the service.

The information sought was for the evaluation of the replicability to other urban water supplies which are in similar situations as Malindi was before the start of the PSP contract taking into consideration the water supply and cultural variances found in each urban area.

The methodology used included:

(a) Literature review from documents on Malindi Water supply and PSP in the water service provision;
(b) A review of the contract entered into and how well it has been implemented.
(c) Administration of semi-structured and objective type of questionnaires to various stakeholders that included:
    i.) Senior Managers at the NWCPC who have knowledge of the Malindi water supply Management contract
    ii.) Staff from the Operator who manage the scheme.
    iii.) Consumers metered and those who use kiosks within the supply area; to check on the performance of PSP operator;
    iv.) Selected Senior Managers at the Ministry of Water resources Management who are Deputy Directors and one Assistant Director.

For the purpose of obtaining the required information seven questionnaires were administered all in line with the objectives of the study. These questionnaires were administered to managers of the of NWCPC who have played a key role in the PSP contract, professional staff from the operator who participate on the day to day management of the Malindi area and consumers within the supply area. Table 5.1 shows the purpose, coverage, objective and number of respondents to whom the questionnaire was administered.

Table 5. 1: Details of Field Survey questionnaires

Questionnaire	Purpose	Coverage/ (Number of Respondents)	Objective
1 (Appendix A5-1)	To Establish factors for decision to involve PSP in water supply.	-Senior Managers of NWCPC-(14) -Senior managers of operator-(2) -Senior managers in MWRMD-(4)	To provide information on issues that contributed to involvement of PSP
2 (Appendix A5-2)	To Establish the problems that faced the scheme prior to PSP management	-Senior managers of NWCPC including all those who have worked in Malindi.-(16) -Senior operators staff-(2)	To provide actual problems that faced the scheme
3 (Appendix A5-3)	To establish services that have been introduced by the operator.	-Senior Mangers of NWCPC-(12) -Senior operators staff-(2)	-To bring out the strategies that the PSP operator has adopted to overcome the problems.
4 (Appendix A5-4)	To establish the responsibilities of the operator	-Senior Mangers of NWCPC-(12) -Senior operators staff on site-(10)	-to determine if the responsibilities are in line with the contract -to assess if the responsibilities are supportive of the strategies adopted.
5 (Appendix A5-5)	To establish the responsibilities of NWCPC	-Senior Mangers of NWCPC-(10) -Senior operators staff-(2)	-to determine if the responsibilities are in line with the contract -to assess if the responsibilities are supportive of the operators strategies.
6 (Appendix A5-6)	To examine the quality of services to consumers with a connection	-Various categories of consumers with a connection (82)	-To determine the effectiveness of service delivery by the PSP operator.
7 (Appendix A5-7)	To determine services to consumers who use water kiosks.	-consumers without a water connection (18)	-To determine the effectiveness of service delivery by the PSP operator.

*Respondents before rejection of questionnaires not filled properly

5.3 Data collection methods

The data for this research are of two kinds: Primary data and Secondary data. The collection of this data has been described in section 5.2. A brief description and nature of each of each of these types of data is as follows:

(a) The primary data constituted the responses to the questionnaires by the Managers and senior officials of NWCPC, MWRMD and PSP Operators personnel on site and the responses to the interviews by consumers.

The field interviews in Malindi covered staff of the Operator and NWCPC Mombasa and Malindi area offices. The interviews were to verify facts gathered from reports and also to get responses on the questionnaires. The interviews involved recording views of selected officers. Suitable prompt questions were used whenever the answer was not clear. Once in a while the officer being interviewed would call some other officer who was not on the list of interviewees to help in clarifying issues.

At the time of the study there were 7712 registered connections in Malindi area. These were distributed as to the various categories of consumers as follows:

Domestic/household	7299 (94.6%)
Hotel/other commercial/industrial	206 (2.7%)
Kiosks	195 (2.5%)
Institutional	12 (0.2%)

Taking into consideration the time required for interviews in the field, it was considered that close to 1% of all connected consumers would be a good representative sample to be interviewed. Therefore 82 connected consumers were interviewed. The consumer population was considered to consist of definite strata, each of which is distinctly different, but the units within the stratum were taken to be as homogeneous as possible. Therefore simple stratified random sampling design was used to determine the numbers to be interviewed from each stratum. Although this simple method is not correct, it was considered to give a more representative sample from each category of

consumers than the appropriate sampling technique which should have been proportional stratified sampling. The rejection of the proportional stratified sampling was based to the fact that with 94.6% of the connection being domestic 94.6% of all respondents should have been from this group. However in Malindi area the majority of consumers rely on kiosks. Therefore the views of people who own kiosk connections (2.5%) are very important. In proportional sampling this group would have a minimum representation. The same goes for hotels (2.7%) which use a lot of water and contribute a lot to the revenue base. Therefore for questionnaire 6 to respondents with a water connection the representative samples of the 82 respondents were as follows:

Domestic/household	52%
Commercial(hotels)	15%
Kiosks	21%
Institutional	12%

The consumers themselves were very cooperative and readily answered questions.

Bondeni is an informal settlement area in Malindi. Like any other informal settlement in an urban area in this country it is not well served by the water supply. Therefore consumers in the area rely on kiosks for their water needs, as they do not have individual connections. For this group of respondents no prior arrangement was made. The chosen area was visited; eighteen houses were visited, nine by each of the two interviewers. The instruction was to interview the head of a house hold every after approximately 100m from the reference point which was a kiosk near the road. A total of 18 consumers without a connection were interviewed using this process in a single day.

(b) The secondary data included operator's annual, quarterly and other reports, published studies reports and unpublished dissertations and thesis dealing with private sector participation.

5.4 Specific treatment of data

The first step in the treatment of the primary data was to use the responses to in each questionnaire to construct frequency percentage tables followed by bar chart presentation of the dominant response. This enabled the trend to be gleaned from the data so as to point to further analysis required. The mean and standard deviation for each question in the questionnaire was then calculated for questionnaire 1 to 5. The mean for each question and that of the questionnaire were plotted on the same graph. Questions with the mean above that of the questionnaire were taken as representing an agreement on the issue under review. The reasoning behind this method is as follows:

(i) The rating scale used in the questionnaire ranges between 1 and 5, such that:

0 – 1 represents strongly disagree
>1 ≤ 2 represents disagree
>2 ≤ 3 represents undecided
>3 ≤ 4 represents agree, while
>4 ≤ 5 represents strongly agree

Therefore, the responses range from those which are highly negative to those which are highly positive with a mean at 2.5. This is equivalent to stating that the responses when plotted as a frequency curve would have an asymmetrical distribution commonly referred to as a normal curve. For the mean to represent agreement to the statement/question, it must be greater than 2.5. If the response to any single question is to represent an agreement to the issue under examination when looked at in terms of the questionnaire its mean should be above the mean of the questionnaire. The questions whose mean are below the mean of the questionnaire represent issues that the respondents do not consider to be important in relationship to the issue under consideration. This is the reason why only responses with a mean above the mean of the questionnaire were taken as the mean of the questionnaire representing the middle point of the normal curve of the questionnaire.

For questionnaires 1 and 2 factor analysis was used to the responses given on the summated rating scale of 5. This was necessary so as to determine and define the underlying factors to PSP undertaking and operations. Mason and Bramble (1997 p241), noted that this method is important in searching for a structure among a set of dependant variables. A computer package was used for factor analysis.

In order to extract factors, a correlation matrix between the variables was generated, which also indicates how the variables are related. Basically the extraction of the principal components amounts to a variance maximising (varimax) rotation of the original variables. The underlying assumption is that all the original variables are plotted on a scatterplot. If it is assumed that the regression line is the original X-axis this is rotated such that it approximates the regression line for the plotted variables. It is this rotating of the x-axis to near the regression line that is referred to as variance maximising. Therefore the rotation is to maximise the variance (variability) of the "new" variable generated which are now the factors, while minimising the variance around the variable.

One therefore stops extracting factors when there is very little "random" variability left. Only factors with *eigenvalues* greater than 1 are retained. In essence this is like saying that, unless a factor extracts at least as much as the equivalent of one original variable, it is dropped. *The alternative method* is a graphical method known as *the scree test*. This involves finding the place where the smooth decrease of eigenvalues appears to level off to the right of the plot. To the right of this point, presumably one finds only "factorial scree" (scree being the geological term referring to the debris which collects on the lower part of a rocky slope).

However, the factors will not extract all the variance from the items; rather only that proportion that is due to the common factors and shared by several items will be extracted. In factor analysis, the proportion of variance of a particular item that is due to common factors i.e. shared with other items is called *communality.* Communality for a variable is thus the sum of squared

factor loadings for that variable and hence it is the percent of variance in a given variable explained by all the factors. Therefore there is need to estimate the communalities for each variable. That is the proportion of variance that each item has in common with other items. The proportion of variance that is unique to each item is then the respective item's total variance minus the communality. What is used in calculations is the squared multiple correlation of an item with all other items as an estimate of the communality.

Factor analysis was limited to questionnaire 1 and 2 as these two questionnaires were all to establish the factors that led to adoption of PSP option. The problems that the supply faced (questionnaire 2) must have had a relationship with the decision to involve a private partner (Questionnaire 1). Therefore questionnaire 1 and 2 were complementary questionnaires. The questions were also to set the tempo that would establish if the PSP contract has solved the problems. This is unlike other questionnaires whose aim is different as outlined in table 5.1.

6 PRESENTATION AND ANALYSIS OF DATA

6.1 Introduction

This presentation is based on observations made in the water supply's operations; access to key documents such as quarterly progress reports, annual reports, special reports and the contract documents and the extensive questionnaires and interviews with various stakeholders of the supply over a period of two weeks. From the key documents performance of the PSP Operator and the extent to which the performance targets that were part of the contract had been fulfilled was determined.

As at February 2000, the NWCPC was directly providing the water services in the area. By the time of the field survey in April 2004, the PSP Operator was still in charge of water supply. The key parameters of the water supply at the start and at the time of the study were as indicated in Table 6.1.

Table 6. 1: Key Parameters on the water supply

PARAMETER	Feb-2000	Apr2004
Water Supplied m^3/month	292,410	317,290
Water Sold m^3/month	165,886	231,610
Water lost through leakages, major bursts, tanks overflows and that used for flushing (m^3)	No data	3,200
Unaccounted For Water (m^3)	126,524	82,480
Unaccounted for Water (%)	43%	26%
Number of staff	22	60
Number of active consumers	4,337	7,770
Number of operational vehicles	1	4
Number of operational Bicycles	6	22
Number of operational motorcycles	2	6
Expenditure(Kshs per month) (includes salary)	Data not available	3,538,824.00
Salaries (KShs per month)	185,615.00	780,405.00
Revenue billed (Kshs. Per month)	6,984,965.00	9,801,017.00
Revenue collected (Kshs.per month)	5,712,667.50	10,377,276.80
Outstanding Revenue (Kshs)	51,505,075.50	60,519,627.30

The Operators contract was output based when compared to the earlier service contracts. Specific performance targets were, however based on the client financing the implementation of the following activities: strengthening and extension of the Malindi reticulation system; replacement of two older Malindi treated water pump sets at the Sabaki waterworks; completion of the Malindi area

office; procurement of vehicles and the billing computer hardware; construction of housing at Kisimani, NWCPC office and rest house at Watamu; and commencement of consumer ferrule/consumer connection pipe replacement programme. Most of these items were undertaken.

6.2 Performance Targets in the Operator's Contract

Under this management contract a number of targets were to be achieved. These were to build on the experiences gained as a result of the 3½ years successive 6-months service contracts. The targets and the extent to which they were achieved are as outlined in the following sections.

6.2.1 Consumer base

The target on increasing the consumer base was subject to completion of the reticulation expansion project. The project in question was completed on 1st October 2002. The increase in the number of new connections is as shown Table 6.2.

Table 6. 2: Number of new connections registered per year

Year	2000	2001	2002	2003	2004
Connections	203	303	410	752	216*

NB * Registered new connections during the first 3months of the year.

The number of new connections achieved between March 2000 and March 2004 is 1886. The annual number of new connections has been rising since the start of the contract. This demand for new connections could be as a result of increased water reliability, and hence consumers abandoning alternative sources.
The major increase realised in 2003 was as a result of expansion of the reticulation system. As the contract requirement was 1000 new connections during the 4½year contract period, this performance target has been achieved.

6.2.2 Unaccountable for water

The target was to reduce UFW to not more than 25%. The operator's quarterly reports give the figures for UFW every month for the period being reported. It is therefore possible to determine UFW on mid-month basis. Figure 6.1 indicates the UFW up to March-April 2004.

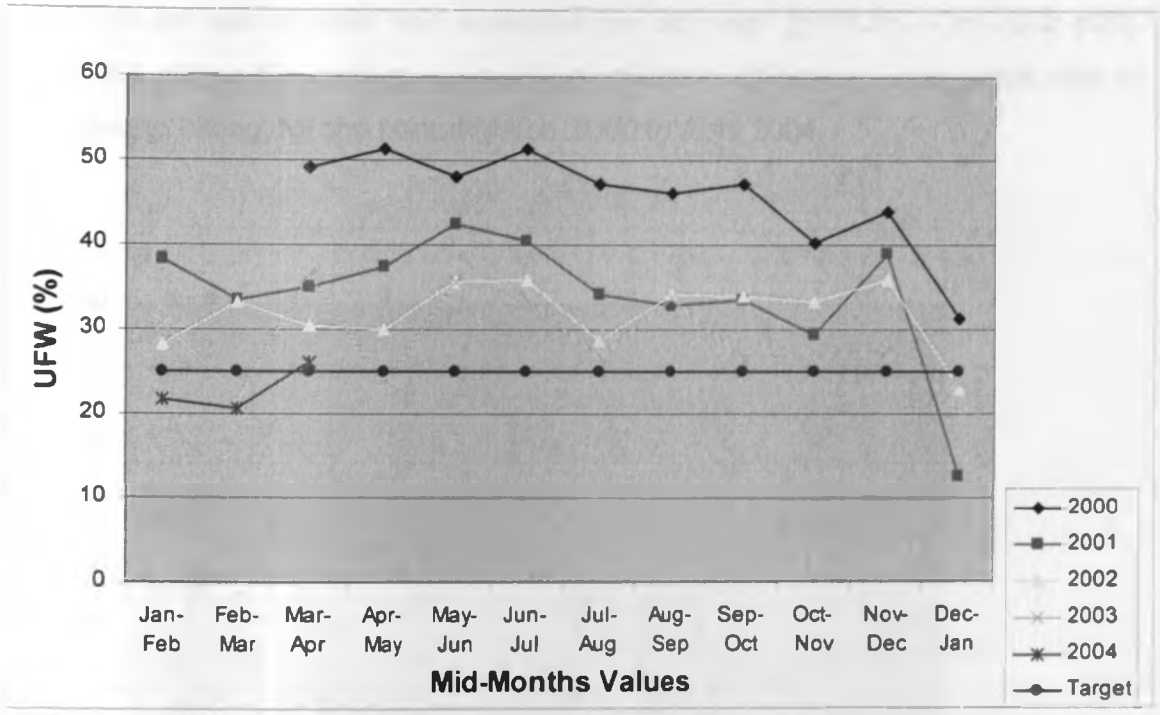


Figure 6. 1: Unaccounted for Water during the Contract Period

As from the beginning of the year 2004 there has been consistent achievement of the performance target. Figure 6.1 shows that for the year 2004, the UFW was already on the rise during the second month. The analysis also indicates peaks which coincide with low tourism season between May and August in any given year, when the abstractions from the pipelines are very low. The tourism season at the coast stretches between November and March and coincides with the months in which the UFW is lowest. The reduction in UFW has been achieved through replacement of 263 consumer ferrules, introduction of time modulated pressure modulating valves, metering, and regular servicing of defective meters, illegal connection detection and reduction. However, during the first 4 years of the Operator's contract, this performance target has not been achieved.

6.2.3 Collection efficiency

Normally collection efficiency is based on current billing and monthly revenue collection excluding old debt. It was not possible to split the percentage of old debt or arrears collected during each month. In their annual report for the Financial Year 2001/2002 the operator states that "*Despite consistent performances above the target for reducing UFW and improved collection efficiency no bonus payments have been sought, in part, due to the difficulty in distinguishing collection for current debt and collection for old debt*" (NWCPC Oct 2002 p34). Figure 6.2 shows the plotting curve of the collection efficiency, which is the ratio of collection to billing, for the period March 2000 to April 2004.

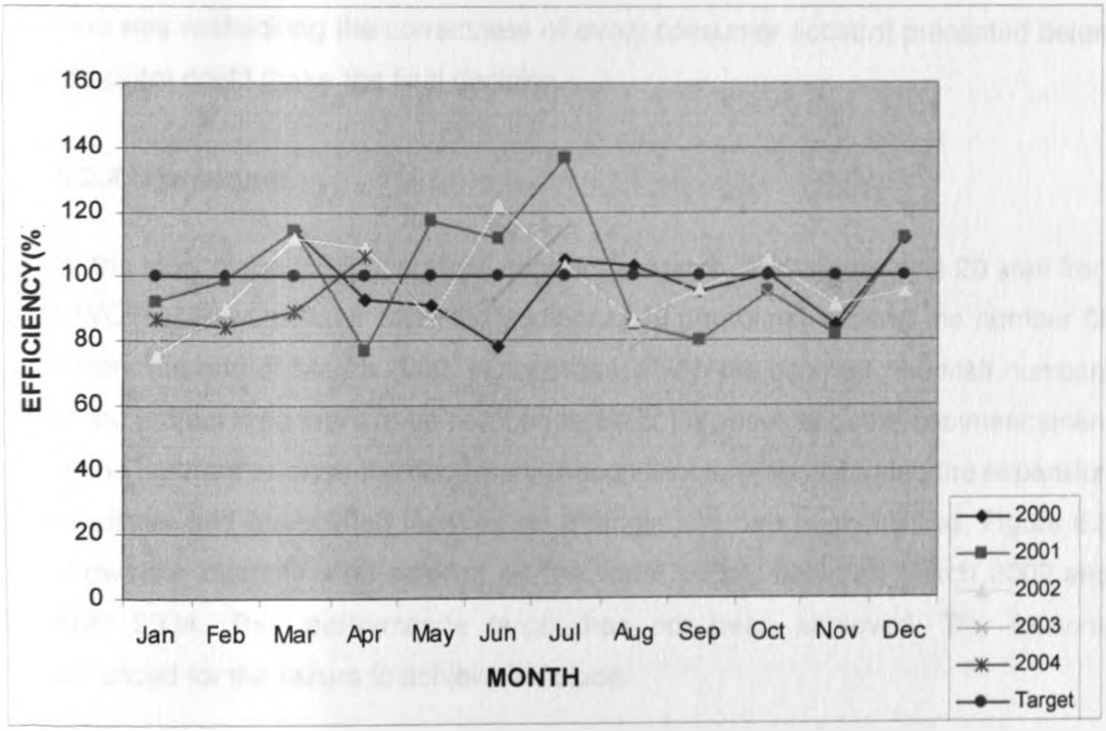


Figure 6. 2:: Revenue collection efficiency

Figure 6.2 indicates overall efficiency, which is collection of all owed amounts billed and arrears or debt, and not collection efficiency based on monthly billing. Peaks in collection occur between June and July when government institutions pay up pending bills to avoid returning money to the Treasury at the end of the financial year.

The Operator was supposed to develop an accounting system that was expected to determine collection efficiency but exclude arrears and/or old debt. At the time of this study, six months before the end of the contract period, this had not been done. Therefore, based on the average overall collection efficiency that was to be achieved as agreed in the contract, this particular performance target has in some months been achieved but on the overall the performance target on collection efficiency has not been achieved.

The other financial target was to finalise historic debt analysis and collect all amounts that are deemed to be collectible by end of the third year. The operator finalised the historic debt analysis in November, 2000 by providing NWCPC with a list of consumers whose water bill arrears can be termed as bad debt for purposes of writing off. At the time of the survey, the list had been returned to the Operator who was rechecking the correctness of every consumer account presented before the client could make the final decision.

6.2.4 Personnel

At the start of the PSP operators' contract in March 2000, there was 20 staff from NWCPC. The Operator recruited additional 48 personnel making the number 68 before the end of March 2000. In accordance with the contract, the staff numbers in the project area were to be reduced to 54 in 1½ years from the commencement of the contract or once the necessary preconditions, which included the expansion of offices and associated facilities on a single site had been fulfilled. Figure 6.3 shows the monthly staff working on the water supply between March 2000 and April 2004. This performance target has not been achieved. The reasons advanced for the failure to achieve it include:

(a) A house was not provided at Jimba reservoir site thereby requiring an extra watchman as a reliever.

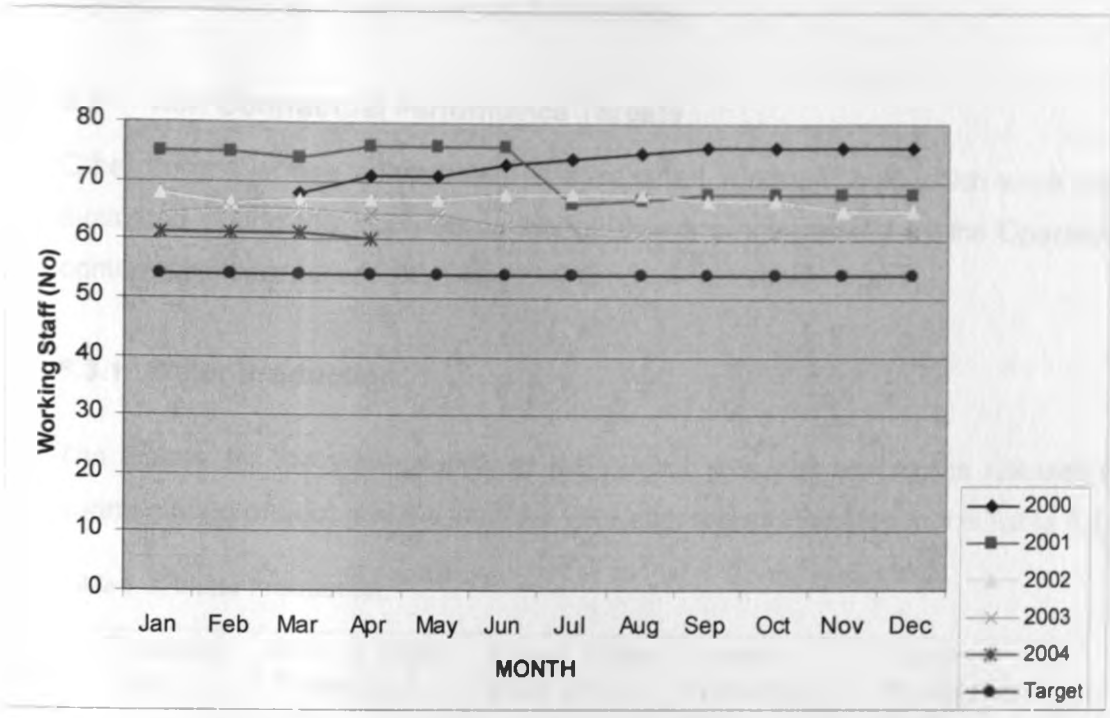


Figure 6. 3: Staff Numbers on Water Supply

(b) Revenue collection was to be undertaken by Kenya Commercial Bank on appointment by the client. This was not possible hence two cashiers had to be employed.

(c.) A booster station was introduced at Watamu requiring employment of two guards and a casual worker who were not in the original Operators plan.

Figure 6.3 shows a sudden drop of staff between June 2001 and July 2001. This drop was as a result of the operator reducing the number of seconded staff from NWCPC from 22 to 14. During this time the operator's staff took over all the meter reading activities, therefore the NWCPC meter readers were not required.

6.2.5 Geographical database

The target was to establish a complete digitised and updated GIS database and link it to consumer information. The GIS block maps and MIS consumer database are linked through AutoCAD as a means of providing the operator with a means of referencing the location/geographical information with the consumer information. However, due to absence of suitable software it is not operational. This

performance target has not been fully achieved in addition it was not accomplished in six months as per the contract.

6.3 Non Contractual Performance Targets

Other targets whose achievement is considered important and which were also evaluated during the study (even though they are not covered by the Operators contract) include:

6.3.1 Water Production

The figures for the water supply to the project area just before the reticulation augmentation project and the financial year after are as indicated in the Table 6.3.

Table 6. 3: Water Production

Financial Year	Annual Water Production (m^3)	Annual Water Sales (m3)	Monthly Production (m^3)	Daily Production (m^3)
2000/2001	3,039,050	1,776,720	253,254	8,320
2001/2002	2,934,470	1,979,003	244,539	8,040
2002/2003	3,138,930	2,105,711	261,578	8,600

The monthly water production went down during the financial year 2001/2002 as a result of reduced water losses. The figure increased in the year that followed due to the expanded reticulation network. Based on the figures for the first three quarters of the financial year 2003/2004 the monthly average production figure is projected to be 278,186m3. The monthly water production has been rising. Therefore in addition to the expansion of the reticulation system due to increased water reliability the use of water is rising in the scheme.

6.3.2 Repairs of leaks and bursts

Malindi water supply like most water supplies that were put up in early 1960s or before has asbestos cement distribution pipelines. Since the late 1980s efforts have been made to replace these pipelines. Due to the age of the pipelines bursts are common. The situation was made worse by the absence of pressure

controlling valves. Figure 6.7 indicates the bursts and leaks in each year since the start of the Operators contract. The years straddle the Malindi reticulation system augmentation project, which was implemented between Octobers 2001and 2002. The number of bursts has been going down since the completion of the reticulation strengthening project.

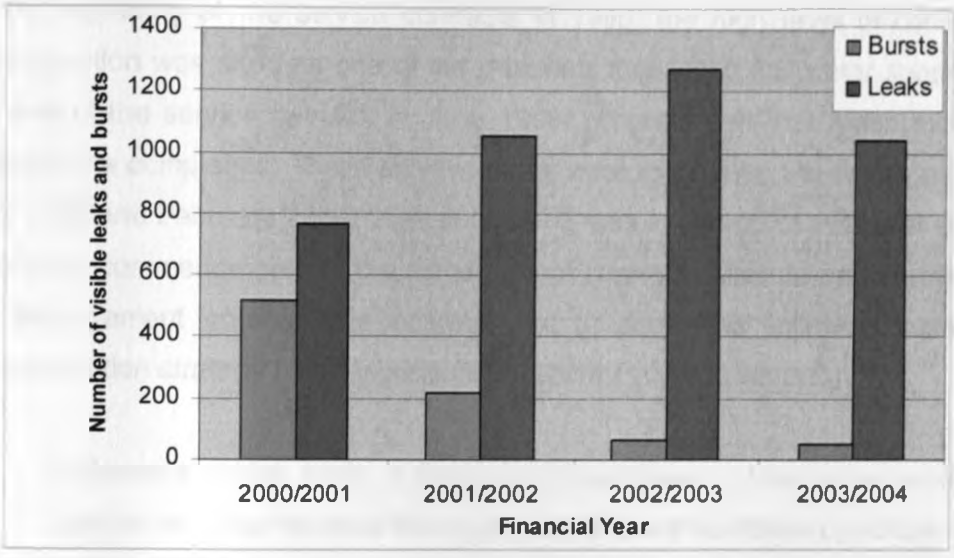


Figure 6. 4: Number of visible Leaks and Bursts since Start of Contract

The decrease in bursts in 2001/2002 was due to installation of time modulated pressure releasing valves for central Malindi at the beginning of the reticulation augmentation project. While the increase in leaks during the year 2002/2003 coincided with the completion of the same project, but specifically as a result of pressure boosting in Watamu area due to introduction of a booster station for the area. In addition more leaks were observed due to increased pressure in unprotected areas due to improvements realised after the completion of the reticulation system augmentation. Therefore, whereas the operator has been able to deal with the bursts, the same cannot be said of bursts. To similarly reduce the bursts the outmoded lines most of which were laid using asbestos cement pipes have to be replaced. It is also likely that further improvements can be realised through installation of automatic pressure regulators.

6.3.3 Employees per connection relationship

The total number of employees in the project area as at April 2004 was 60. The total numbe of connections at the time was 7,700. This puts the number of employees per 100 connections at 7.8. This is slightly above the contract targeted number of 7.4 employees wit

the same number of connections. However, the figure is above the overall NWCPC average number of 6.2 employees per 1000 connections. The PSP contract contrary to common belief has not led to reduction in employees, if anything the number of employees has risen from 20 to 60 during the period.

6.3.4 Customer relationship

At the beginning of the service contracts in 1995, the high level of consumer dissatisfaction was sited as one of the problems that faced the water supply. By the end of the service contract in June 1998, achievements had been made in reducing the complaints. These achievements were lost during the twenty months (July 1998 and February 2000) that the NWCPC was in charge of the water supply before the commencement of the management contract. After commencement of the management contract the operator put in place the following customer communication strategy (Gauff Ingenieure Quarterly Progress reports):

i) Customer inquiries made at the commercial offices in Malindi are recorded together with the nature of the inquiry or complaint for follow up action;
ii) Personal visits by consumers to the administration office to raise any problems was encouraged;
iii) Encouraged Telephone inquiries and complaints which are dealt with immediately
iv) Encouraged written complaints through correspondences by consumers who on average sent in about ten letters a month; and
v) Utilisation of public barazas for communicating with the customers. Initially the Provincial Administration Barazas were used; however the operator also initiated meetings when there was an important issue to be communicated.

The communication strategy reduced inquiries and complaints to 200 from 600 every month. Inquiries are generally about account balances, reconnections, instalment payment requests, change of address and new connections (Gauff Ingenieure Quarterly Progress reports).

An analysis of the number of complaints data per month for two mid contract years is presented in Appendices A6-14 and A6-15, the summary of which is presented in Figure 6.5.

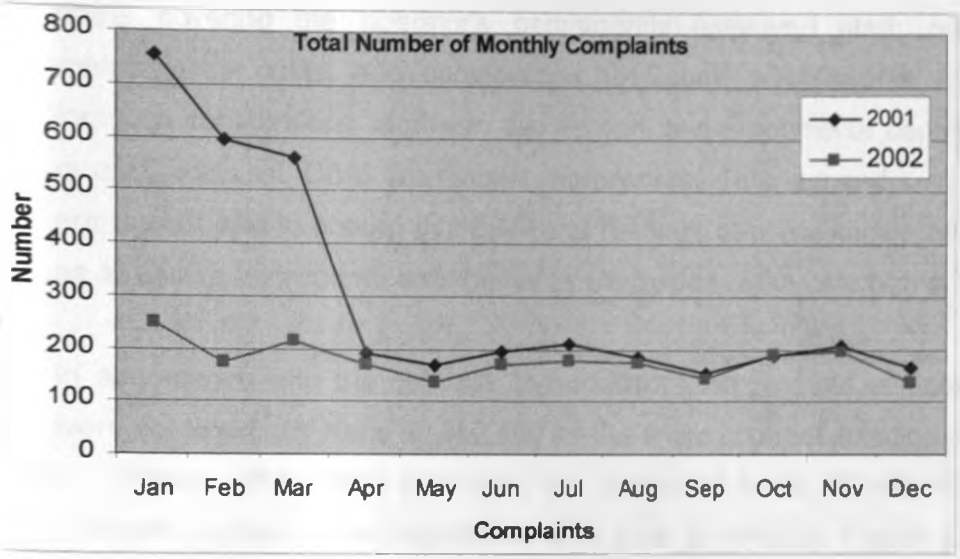


Figure 6. 5: Total Monthly Complaints 2001 and 2002

The total number of monthly complaints has almost stabilised at around 170 per month. The highest number of complaints or inquiries concerns customers requiring reconnections. This was due to the enforcement of the operator's policy on disconnections for non payment.

There are a number of complaints due to lack of water. These complaints still persist as our examination of the operators' first quarter progress report for the year 2004 showed. However they have considerably reduced to about 6 per month. Other complaints that arise and are registered range from water quality, leaks after the meter to delayed bills. Prompt responses to consumer complaints have ensured that in any month other than inquiries/requests on reconnection other requests/complaints have been kept to less than fifty in number. With over 7700 active accounts as at end of April 2004 the less than 50 complaints represent less than 1% of all the total accounts. Based on examined records the Operators customer strategy is satisfactory.

6.3.5 Collection and expenditure

The PSP management contract had an appendix covering three major categories of expenditure that had to be covered by either the income from water sales or directly by the client. These consisted of Operator's professional staff fees, with costs covering the operator's permanently employed staff; operations and maintenance costs; and contributions to Sabaki water works running, which includes contributions to power, disinfection, and proportional contribution on the overall costs of O&M for Sabaki waterworks. This appendix in the contract agreement was to ensure that O&M and revenue risks are known by all parties so as to ensure appropriate arrangements are made to take care of them.

In accordance with the contract, the operators fee and out of pocket expenses were not to exceed Kshs 85,812,480 for the entire contract duration or as adjusted for inflation, while O&M cost were not to exceed Kshs 153,468,000 during the contract duration or as adjusted to take care of inflation. Figure 6.6 shows the collection expenditure, transfers and savings during the contract period. Transfers represent the funds that the operator remits to the client either as demanded by the client or as excess unused funds at the end of each financial year. Before the start of every financial year the operator submits a budget showing the expected expenditure for the following year. The budget covers three major items which are operators professional staff fees; operation and maintenance costs that include, local contracted staff costs, NWCPC staff costs, office running expenses, minor and major stock requirements including costs of anticipated breakdown repairs, transport operating costs and operators out of pocket expenses; and contributions to Sabaki water works running. The first charge on collected funds from water sales is the operators budgeted requirements. At the end of the financial yea the operator may or may not have used all the budgeted funds. If the operator has not used all the budgeted funds there is a positive saving but if more funds than what had been budgeted are used then there is a negative saving as in Figure 6.6 year 2000/2001. Negative savings are reduced from remittances to NWCPC.

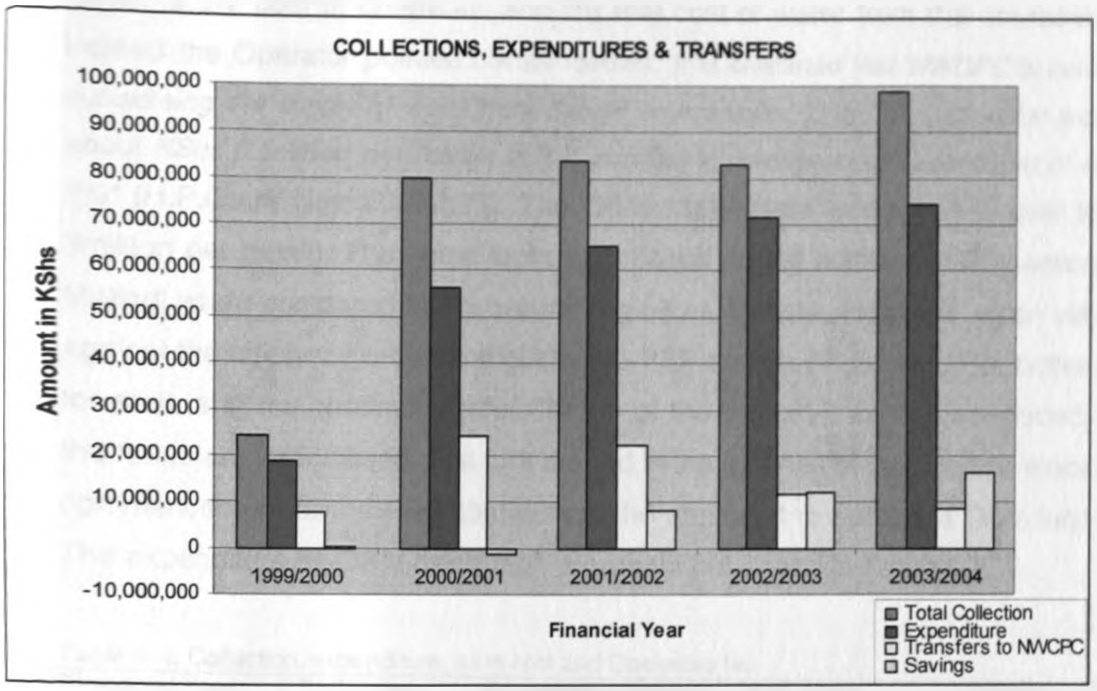


Figure 6. 6: Collection, Expenditures and Transfers in Malindi

The remittances to NWCPC peaked during financial year 2000/2001. This particular financial year started in July 2000, six months after the tariff increase of December 1999 and ended in June 2001. Furthermore there were no major works that required heavy capital expenditure. Effects of the tariff increase, and the rates collection measures were manifesting themselves. As there has been no tariff increase since December 1999, while inflation has continued to rise, the remittances to NWCPC have been declining. This is due to the fact that the Operator's fee and O&M costs rose annually in line with inflation adjustment agreed upon in the contract.

On average the NWCPC receives KShs 1.8 million monthly. This amount is supposed to cover the costs incurred by the Corporation for producing water for Malindi area. However, the NWCPC is also responsible for the chlorine boosting which is carried out at Kakuyuni reservoirs, whose costs are estimated at about KShs 1.0million (NWCPC, 2004). In effect at the current tariffs, NWCPC subsidises the contract through paying for chemicals used in chlorine boosting and meeting the real cost of operating Sabaki sourceworks. According to the Operators calculations the computed real monthly cost of water from Sabaki waterworks is KShs 1,652,000. To ensure that the supply is not subsidised by the

client, the remittances to NWCPC should be at least KShs 2.65 million monthly, which is the cost of chemicals and the real cost of water from the sourceworks. Indeed the Operator pointed out as follows *"it is estimated that NWCPC is currently subsidising the supply of water from Sabaki sourceworks to the Malindi water area by about KShs 0.5million per month; that is shortfall in revenue over expenditure of about 8%"* (H.P.Gauff Nov 2000 p23). The O&M expenditure works out to over KShs 3million per month. The figure looks high based on the number of connections in Malindi when compared to the coastal region as a whole. However, when viewed against the efficiency brought about by the PSP operator in terms UFW, better pay for staff, and the continuing rehabilitation of the system it can be concluded that the funds are well utilised. The turn around in the fortunes of the scheme since the commencement of the PSP contract can be attributed to adequate O&M funding. The expenditure on O&M being high is brought out clearly in Table 6.4.

Table 6. 4: Collection, expenditure, o&m cost and Operators fee

Financial Year	Collection (Kshs)	Expenditure (Kshs)	O&M Costs (Kshs)	Operators Fee (Kshs)
1999/2000	24,332,357	18,766,952 (77.1)	12,029,171 (64.1)	6,737,781 (27.7)
2000/2001	79,883,996	56,300,856 (70.5)	36,208,590 (64.3)	20,092,266 (25.2)
2001/2002	88,166,191	65,175,828 (73.9)	41,985,133 (64.4)	23,190,695 (26.3)
2002/2003	88,208,842	71,467,294 (81.0)	46,305,280 (64.8)	25,162,014 (28.5)
2003/2004	105,651,930	74,239,848 (70.3)	48,864,564 (65.7)	No final figure
TOTAL	386,243,316	285,950,778 (74.5)	185,392,738 (64.7)	

*( ) The figure in brackets is the percentage of the collection computed from the amount shown beside each.

As indicated in Table 6.4, the operators' fee takes a quarter of all collections while the O&M takes close to 65% of the collections. Therefore the expenditure on the water supply is high and if loan repayment was to be taken into account, it would not be possible to repay the loans based on current tariff levels. It is also clear that no major expansion can be carried out without the client putting more funds in the supply from other sources. This may imply upgrading of the PSP option if no investment funds are provided by the client.

6.3.6 Reviews of water tariffs

The commencement of this contract was delayed from late 1998 to early 2000 due to delay in approving a tariff increase. The six-stepped tariff now in use was introduced at the end of 1999 as part of the tariff revision. The new tariff increase

was expected to fully cover the costs of operating Malindi water supply area including the Operator's fee and supply amortisation. However, this proved not to be the case. The reasons advanced included slow recovery of tourism at the coast; rapid and major increase in electricity cost especially during the drought of 1999-2000 and a notable downward shift in consumption pattern from an average of 142,000m3 to 123,000m3 per month between June, 1998 and June, 2000 (NWCPC, 1998, p (xx), NWCPC 2000 p21), after the tariff increase of 1999, which took long to adjust to normal consumption (Gauff Ingenieure, 2000 p23). In effect the scheme was unable to raise adequate funds to cover the anticipated costs.

The present tariff steps do not encourage progressive movement to an improved, healthier water use, nor do they facilitate the socio-economic subsidy from the rich to the poor members of the community. It encourages reliance on a few large consumers. The importance of this comment has to be appreciated in as far as Malindi water supply is concerned where 70% of the population rely on kiosk water or brackish well water. Figure 6.7 shows the social inequity in unit costs under the present tariff. The figure, further illustrate the over dependence on institutional and high cost consumers. These are the only consumers paying a unit price, which is near or higher than the average tariff now in use. The argument that the price should be kept low for the poor therefore turns out to be a fallacy. The poor are paying a unit price higher than any category of consumer. The need to have supply-based tariffs that can be stepped to support the poor by all consumers therefore becomes evident. It is inconceivable that the tariff favours those with a water connection rather than the poor who cannot afford a connection.

modified from Gauff Ingenieure2000 p25

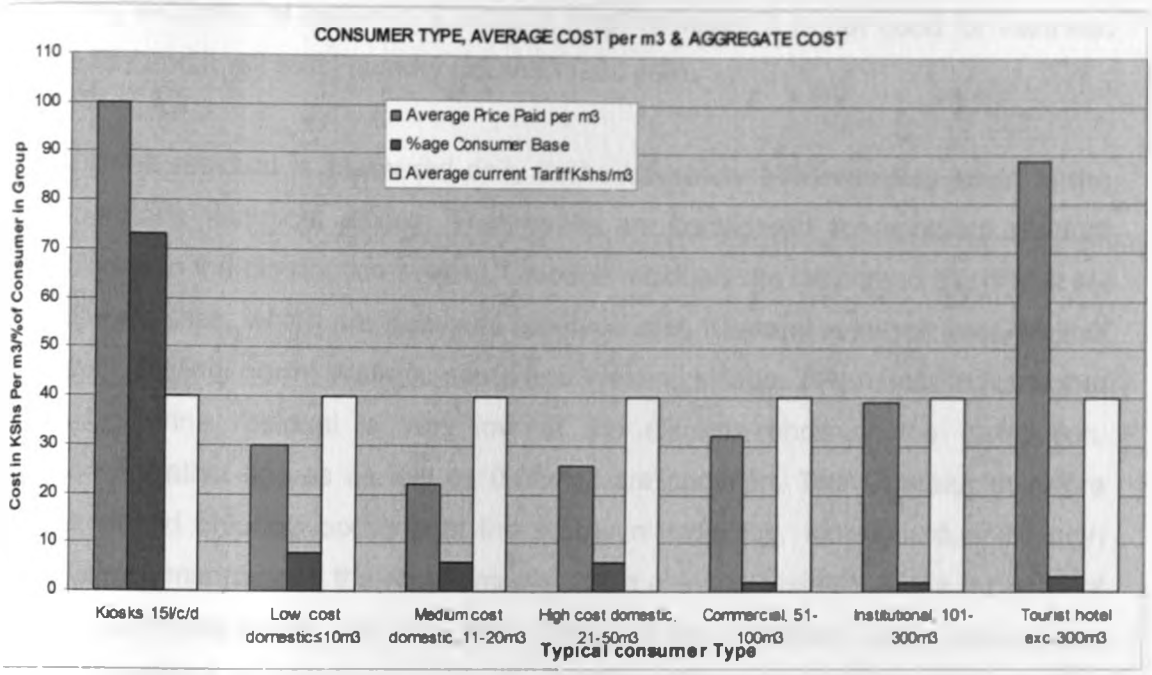


Figure 6. 7: Comparison of different type of consumer and average cost

Therefore, if the viability of the project has to be sustained, then tariff reviews that take into account the needs of the various categories of consumers, especially the poor, have to be more regular. The proposal would be to have a tariff review after every two years. Annual tariff revision as agreed in this contract does not appear realistic; evidence from this very supply seems to indicate that the effect of a tariff increase on revenue collection is noticeable only after six to seven months after tariff revision.

6.3.7 Quality of service

About ten connections report having experienced loss of supply in any one month. Records indicate that for most of these the problem is identified and rectified within 48hours of reporting (Gauff Ingenieure Quarterly Progress Reports). This indicates that most connections have water constantly. However, need to hasten consumer reconnections after payment of outstanding charges is necessary.

Water analysis that is carried out regularly by the operator covers residual chlorine, iron and manganese, conductivity, pH, dissolved oxygen, salinity and dissolved solids. Except for Manganese, which is above the recommended value for potable water of 0.1mg/l, all the other parameters are within the values

specified in the Kenya Standards for Drinking water (KS 05-459). The amount being recorded of between 0.3 and 1.1mg/l however, it is not good for aesthetic quality and it will stain laundry (MOWD 1986 p39).

Chlorine residual is measured daily in the laboratory from samples taken at the Operator's technical offices. The results are considered to represent residual chlorine in the distribution system. Chlorine residuals are monitored monthly at six different sites, which are Kakuyuni reservoir inlet, Kisimani reservoir inlet, Malindi south, Malindi north, Watamu south and Watamu village. The results indicate that the chlorine residual is very low at the extreme ends of the distribution. Concentration figures as low as 0.02mg/l are common. The Operator therefore introduced chlorine boosting at the Kakuyuni reservoir. However due the high levels of manganese the requirements of the chlorine residual at the far ends of the distribution are still not met. This chlorine boosting helps reduce the concentration of manganese (Gauff Ingenieure Quarterly progress reports). The operator checks on the Total Coliforms using the Palintest colilert test kit, which confirms presence or absence of indicator organisms in a simple test procedure. This microbial pollution test is carried out every fortnight and up to the time of the field surveys no positive indication had been detected. As a counter check measure once every six months water samples have been sent to SGS laboratory for a full bacteriological and chemical analysis and the results indicate that the water is within the recommended KBS requirements (Gauff Ingenieure Quarterly progress reports).

Inspite of these impressive results there is adequate case for the client to establish a fully operational water quality laboratory capable of testing a wide range of parameters rather than relying on once every six months full test by SGS.

6.4 Field Investigations

6.4.1 Decision to involve PSP

The decision to involve a private sector partner in the management of Malindi water supply area must have been arrived at after considering various factors for and against it. To analyse these factors, 30 identified factors were presented (Appendix 5-1 Questionnaire 1). The factors covered personnel, technological, operational, quality of service, and financial issues of water management.

As part of the evaluation process, it was necessary to extract the most important factors that the respondents rated as being critical in arriving at the decision to involve PSP partner in Malindi area. Factor analysis technique was used to determine these critical factors. The main application of factor analysis techniques was to reduce the number of variables and detect structure in the relationship between variables, i.e. to classify variables. Therefore, factor analysis was applied as a data reduction or structure detection method. Its main goal was to study the patterns of relationship among many dependent variables, with the aim of discovering something about the nature of the independent variables that affect them, even though those independent variables were not measured directly. The independent variables are what are referred to as factors. As a first step in the analysis, the mean and the standard deviation, of each question in the questionnaire was calculated. The results are shown in Appendix 6-1.

The most influencing factor had a rating (score) of 5, while the least influencing had a score of 1. Therefore, as noted in section 5.4 with a normal curve having a mean at 2.5 any variable with a mean score of 3.5 or more indicates that the statement *strongly* influenced the decision to involve PSP. The variables which meet this criteria include need to increase efficiency in the scheme; as a means to obtain donor funds in the supply; as a means of increasing technical capacity and knowledge transfer; the feeling that private enterprises are more efficient; to use Malindi as a model for other PSP engagements; donor pressure; as a means of introducing performance measurement and introducing professionalism in O&M as the main factors that led to introduction of PSP in Malindi water area.

The first task in factor analysis was to obtain the correlations of each variable with every other variable in the questionnaire. A correlation matrix is generated for this purpose. There are no fast rules that specify weak, moderate, or strong relationships in interpreting correlation coefficients. General guidelines propose correlation values of between ±0.01 to ±0.3 for a weak relationship; ±0.31 to ±0.70 for a moderate relationship; ±0.71 to ±0.99 for a strong relationship; ±1 for a perfect correlation and a figure of zero indicates that the variables are not related (Elifson, Runyon and Huber 1998, p194)

The principal factor analysis method was then used to come up with total variance explained in Appendix 6-2. Using the variance explained table the Eigen Values, which are the proportion of total variance in all the variables which are accounted by that factor, were computed. An Eigen Value is the sum of the squares of its factor loading and shows the amount of variance extracted by that factor. A factor is extracted if its Eigen Value is equal to or greater than 1. In the decision to involve PSP in Malindi water supply six components were extracted. The six factors account most for the decisions to involve a private sector partner in the management of Malindi water supply. These factors accounted for a total of 79.3% of the total basket of decisions. The other factors accounted for only 20.7% of the decision. The six factors extracted are so important that Factor 1, for example, accounts for 27.6% (which is more than the dropped factors) of the total weight of the decisions to involve the PSP operator in Malindi supply area.

The rotation sums of the squared loadings give the Eigen Values after rotation and helps improve the interpretability of the factors. Use of varimax rotation minimises the number of variables which have high loadings on each given factor. The factor loadings are the correlation coefficients between the variables and the factors. The component matrix for the factors leading to the decision to involve the PSP operator is shown in Appendix 6-2. A variable loading of 0.5 and above was considered high enough for the variable to explain the factor.

The six most important factors accounting for the decision to involve PSP in Malindi water area in order of importance are as follows:

Factor 1: Desire to improve operational and Strategic management in the supply

Although six factors were extracted on why the PSP operator was put in charge of the management of water supply in Malindi area, factor 1 accounts for close to 35% of the total extracted weight of 79.3%. This factor, which accounts for 27.6% of the cumulative decisions to involve the PSP is made up of the following variables, improvement on cost recovery in the supply; failure to give O&M high priority; need to reduce consumer complaints; need to reduce subsidy and the belief that private enterprise are more efficient.

Self sustainability of the scheme operations had all along been a key consideration in the successive service contracts that the NWCPC had entered into with the Operator. During the 21 months between the last service contract and the start of the management contact, the supply had to operate on subsidies. The need to commence the management contract in Malindi and specifically to ensure its sustainability was one of the principal reasons that made the MENR to revise the water tariffs in late 1999. Since then up to the time of this research no other tariff increase had been approved inspite of yearly proposals from the MWRMD and NWCPC staff. The other achievement is that since the financial year 2000/2001, the supply has been meeting its expenditure from the revenue collected indicating that the tariff increase just before the commencement of the PSP contract was justified. With the overall increase in collection efficiency, the budget for O&M is fully funded. Staff morale was very low before the start of the service contracts; the Operator has increased staff morale through proper deployment and pay incentives resulting in increase in output of each member of staff, which has increased the efficiency of operations in the scheme. These measures have reduced the consumer complaints on the scheme. In effect, therefore, the private sector operations have proved to be more efficient than the public service operations.

Factor 2: Enhancing technical capacity

This is the second critical factor extracted, it accounts for 14.6% of the extracted cumulative weight of the decision to involve PSP and has two variables which are,

the NWCPC to use the PSP operator as a means of a long term strategy to develop the capacity of the scheme to cope with high population and as a means of increasing technical capacity and knowledge transfer.

The introduction of PSP partner in the management of the water supply was a long term strategy of the NWCPC to develop the capacity of Malindi water supply to cope with high population. Malindi water supply area is one of the most popular tourist destinations on the Kenyan coast. The NWCPC had done well in ensuring that the area had enough water, but most of this water could not be accounted for. It therefore required someone different to reverse this state of affairs. While changing the scenario, the operator has introduced a new billing system, use of computers, water testing capabilities, leak detection and a number of other new technical methods as part of operations. Therefore, one of the operator's contributions has been technical capacity building, and knowledge transfer to NWCPC staff who have had a chance to work and to be trained on the scheme. NWCPC has been offered several training opportunities in an effort to build its institutional capacity. The training carried out included motor bike riding, installation and servicing of customer water meters, exchange working visits to Tanga water utility in Tanzania, maintenance and repair in water supply network, driver refresher course, advanced certificate in business management and leak detection.

Factor 3: Development partners pressure

This factor accounts for 12.9% of the extracted weight in the decision to involve the private sector partner. The extracted variables under this factor are the need to insulate the supply from local authority involvement; it was the only way of obtaining donor financing to the water supply; it was a pre-condition by donors to further funding in the water sector in the Coastal region and NWCPC was under pressure from donors to involve PSP before receiving rehabilitation funds.

Malindi water supply required rehabilitation, augmentation and expansion of its distribution network. The funds required for the works were substantial, which the Government could not fully finance from its own budget at the time. The World Bank at the time was financing selected rehabilitation works and studies covering

water sources, rehabilitation and augmentation needs within the Mombasa and most of the Coastal area. The Germans who had financed most of the water developments in Malindi had some substantial balance funds left over from earlier loans to the water utility. They were unwilling to commit these funds for improvement of the distribution network with the same institutional arrangements. The French, who had financed some management improvements within parts of Mombasa city in early nineties, were willing to fund rehabilitation of water supplies under NWCPC, but only if management could be improved. No development partner was willing to finance rehabilitation of NWCPC operated projects given the high amounts of UFW, poor and delayed billing, under collection of revenue and host of many other problems that the water supplies faced. Furthermore, GTZ had aroused the interest of LAs' in management of water utilities, through promises of support to LAs' that took over water supplies from the then MENR and operated them on commercial principles. As a result many LAs were clamouring to become water undertakers, Malindi municipal council included. Therefore there was external pressure and need of investment funds that the NWCPC had to contend with.

Factor 4: Demand for professional management

The analysis also highlights this factor as being influential in the decision to involve a PSP in the water supply. The factor accounts for 10.4% of the decision weight. The specific variables under this factor are: a means of pressurising other urban supplies under NWCPC to perform or risk privatisation; it was a means of introducing professionalism in O&M; as a means of getting changes in the water sector and as a means of introducing performance measurement.

By 1998, the NWCPC had been in existence for 10 years, since its establishment. However, management of its water supplies was still similar in most aspects to that of the MWRMD. The demand from government, for the Corporation not only to meet O&M but also minor rehabilitation costs, from water sales was increasing. Up to the end of the 1990s NWCPC with only 48 water utilities under it, was getting close to 50% of all development budget allocation to the sector. The high allocation of its development budget to the NWCPC had been causing uneasiness within the Ministry in charge of water affairs since the mid 1990s. There was need

for the situation to change. In any case the NWCPC had been created to operate water on commercial basis and generate surpluses that could be directed elsewhere in the water sector. At the same time, commercialisation of water supplies in LAs was also gaining ground and therefore the pressure to professionalise management of NWCPC water supplies was intense. This pressure forced the Government to change top leadership of NWCPC between 1995 and 2000 three times, an average of 2 years per Managing Director. Therefore, the acceptance of the water supply management contract in 1998 was part of the NWCPC's top management in trying to introduce changes within its utilities, specifically to introduce professionalism in management and to pressurise other water utilities that if they did not change the mode of operation they would all go the Malindi way.

Factor 5: Increasing tariffs by using Malindi Water supply as a test case

This factor accounted for 7.8% of the extracted cumulative weight. The factor loadings for the variables under this factor are a means of increasing water tariffs in the water sector and the feeling that the Government wanted to use Malindi as a test case for other PSP involvements in the sector.

Tariff revision in this country, like in many other countries, is highly politicised. Initially the general agreement was that Malindi water supply being a test case in PSP engagement in the country would have its tariffs revised whenever there was acceptable justification for it from the Operator to NWCPC. The need for annual tariff review was to take care of the changes in the water supply area funding demands; so as to keep the scheme cost covering. This was never to be. The government found it hard to approve tariff of one utility when there is a uniform tariff for all NWCPC water utilities.

Factor 6: Introducing new technology and efficiency

The final extracted factor accounts for 6.1% of the total extracted weight. The corresponding variables and loadings are the need to bring managerial experience and technology and the need to improve efficiency in the scheme.

Most of the water supplies in the country were constructed more than 20 years ago. New technology in pressure control, air release valves, leak detection equipment, water testing equipment, have come to the market and are cheaper and more efficient. Furthermore most water utilities elsewhere are now computerised. Some of the systems that the Operator has introduced include computerised stores, and billing at the scheme level. Though some of the new technology introduced has not operated as expected, on the whole the efficiency on the water supply has increased as a result of new technology.

In section 3.4, literature review, various reasons on why PSP has been introduced in the water sector in various countries were identified. The six critical factors extracted are consistent with those identified in other countries.

6.4.2 Problems prior to PSP involvement

One of the issues that the NWCPC had to face before entering into private sector arrangements in the water supply was what problems it wanted solved.
To arrive at the problem faced by the water supply, principal component analysis of the 35 prior identified problems was carried out. The initial analysis followed methods described in section 6.4.1 for decision to involve PSP. The mean and standard deviation obtained are in Appendix 6-3. This was followed by preparation of a correlation matrix of the 35 variables. The initial output of the variables, communality, and eigen values from the correlation matrix are also in the same Appendix.

Following the same reasons given for decision to involve PSP, factors with an eigen value of more than 1 were extracted. These were found to be 13 in number, and with communality of 1 indicating that the underlying constructs for all these factors have a good contribution to the factors. To improve on the results and reduce the factors extracted, a varimax rotation was used. However, there was no convergence of the values for the factors. Therefore the factors as identified in the principal component matrix are presented.

From the total variance explained table (Appendix 6-4) 10 factors accounted for 90.2% of the problems faced by the Malindi water scheme prior to the involvement

of the private sector Operator. However, the most important of these are only 7 which account for a significant 79.2% of the 90.2%. The remaining 3 factors are somewhat correlated with the 7 important ones. The extracted factors are as follows:

1. Factor 1: Poor financial and operational procedure
2. Factor 2: Poor quality of service delivery
3. Factor 3: Personnel and social infrastructure constraints
4. Factor 4: Mismanagement in the scheme
5. Factor 5: Poor record keeping
6. Factor 6: Bureaucratic bottlenecks
7. Factor 7: Dilapidated infrastructure

Alternative Analysis

It was not possible to improve on the interpretation of the principal component extraction in the initial factor matrix. This is due to the fact that the initial factor analysis has no clear association between the variables attributed to the factors themselves. For example factor 5, poor record keeping, is brought about by poor operational procedures, which implies that variables under the factor should be variables under factor 1. On the other hand, factor 3, personnel and social infrastructure constraints, is a management problem, which makes variables under it part of variables under factor 4, while dilapidated infrastructure is an operational issue. Therefore there is a mix up of financial, managerial and operational issues. This lack of clear association of variables runs through most of the factors, necessitating further analysis. Further analysis so as to reduce and have more focused factors is usually achieved through rotation of the initial factors. This was attempted; however, further factor analysis by use of the varimax rotation scheme did not bring out convergence of the variables. As such no terminal solution for the factor analysis was arrived at. This then called for analysis using a different method to improve or check on the results of the component analysis. The first attempt was therefore to use scree test to see if the factors could be reduced. The other method is to use other forms of descriptive statistics specifically the central tendency.

(a) Scree Test

Scree test is a graphical method in factor analysis, where the one analysing attempts to find out the place where the smooth decrease of eigen values appears to level off to the right of the plot. Only factors to the left of the point of levelling off are taken.

From Figure 6.8, the levelling off can be said to start at factor 7 or 8. This would imply therefore that instead of considering the seven factors above we should consider 8 factors.

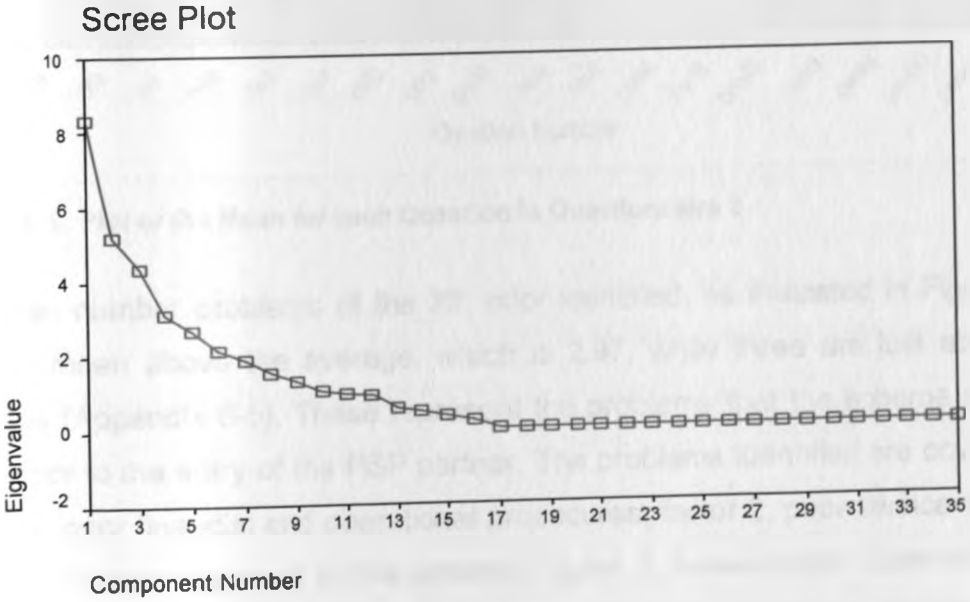


Figure 6. 8: Scree Test Analysis plot

Therefore the scree test does not reduce the factors and as a result does not improve the results.

(b) Plot of the Means

This method involved plotting the average means of each question and comparing it to the average mean of the questionnaire. The purpose of this is to determine which problems are ranked above average (Figure 6.9). These are the problems faced by the water supply prior to involvement of the PSP partner.

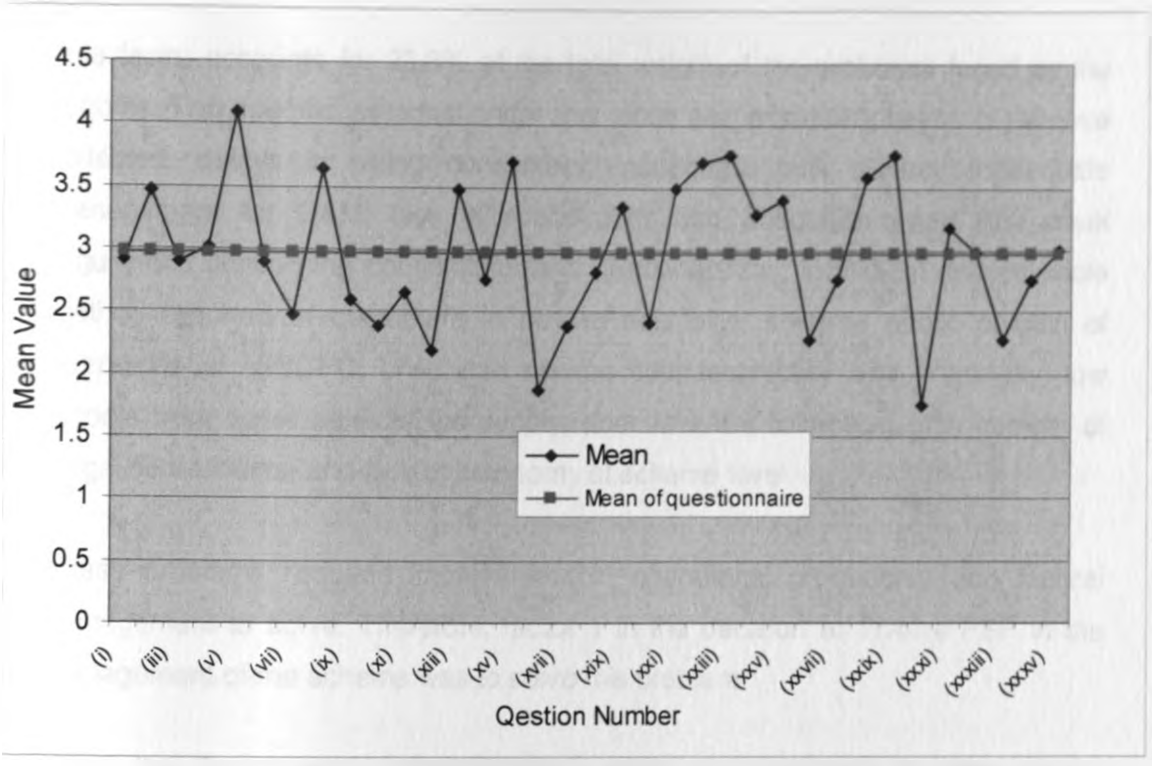


Figure 6. 9: Plot of the Mean for each Question in Questionnaire 2

Fourteen number problems of the 35, prior identified, as indicated in Figure 6.9, have a mean above the average, which is 2.97, while three are just about the average (Appendix 6-5). These represent the problems that the scheme suffered from prior to the entry of the PSP partner. The problems identified are covered by factor 1, poor financial and operational procedures; factor 2, poor service delivery; factor 4, mismanagement in the scheme; factor 6, bureaucratic bottlenecks and factor 7, dilapidated infrastructure under factor analysis. Therefore, the five factors are the only important ones that the scheme suffered from prior to the entry of the PSP partner.

In effect therefore the method of analysis by plotting of means is in agreement with the factor analysis method except for the number of factors that the plotting of means brings out.

Factor 1: Poor financial and operational procedure

This factor accounts for 23.8% of the total weight of the problems faced by the scheme. The specific variables under this factor are: misappropriation of revenue collected; delays in billing consumers; inadequate bulk meters; inadequate management for O&M; lack of spare parts and adequate repair kits; weak regulations concerning connections and disconnections; inefficient and inflexible method required of customers in paying their bills; adverse public opinion of operations of NWCPC; unreliable service both technically and financially; low income from water sales in the supply; poor revenue collection; high number of illegal connections; and lack of autonomy at scheme level.

These problems required improvement in operational procedures and tactical management to solve. Therefore, factor 1 in the decision to involve PSP in the management of the scheme was to solve this problem.

When the Government commissioned a group of consultants to carry out an options study for Mombasa and Coastal Region in April 2002, the first criteria given to the consultants for assessing the merits of the alternative institutional options was '*operational effectiveness*' with the key consideration being operational logic. The second criterion was "*economic efficiency*" with some of the key consideration issues being cost recovery and efficiency of operations (PriceWaterHouseCoopers, 2002 p54). The implication of this is that the issue of the effectiveness and efficiency of operations in the water sector is of a major concern to all the stakeholders in the sector. The changes that have been taking place in the sector since the creation of the Ministry of Water Development in 1974 have all been aimed at ensuring that the organisations performance in activities that support their mission is improved. Further these changes have been aimed at ensuring that the resources given to the sector meet the objectives of providing sustainable water services. Although these issues refer to the sector organisations, how the organisation performs depends on the efficiency and effectiveness of its individual units which are water schemes in this case. Therefore it is only by focusing on poor financial and operational procedures that the individual supplies and ultimately the organisation will perform effectively, efficiently and sustainably.

Factor 2: Poor quality of service delivery

The problems of poor quality of service delivery accounted for 14.9% of the problems. The variables are the high number of non-operational meters; inadequate numbers of consumers in the supply; inefficient and unreliable water services; unreliable pumps for the scheme; difficulties in procurement of O&M supplies; poor water quality; lack of transport to carryout O&M activities; poor metering and lack of preventive maintenance.

Poor service delivery is brought about by poor technical capacity in a water utility and failure of the supply to generate adequate funds for its operations. These are covered by the second and fifth factors that led to the decision to involve a PSP operator in the scheme.

Customer satisfaction is the ultimate aim of any water utility. This can be determined through measurement of the quality of service that is delivered by the utility. The current water service providers have not adequately addressed the poor quality of service provided by the water utilities. The country strategy on water and sanitation services issued in September 2001 states as follows *"Under the repealed Water Act (cap 372) it is not mandatory for service providers to offer or maintain specified service levels"* (MENR 2001 p8). There being no legislation on service levels that could be provided, it was left to individual service provider to determine what was best for their customers. The result is that supply coverage; reliability; water quality and connection efficiency all suffered in the majority of public water supplies.

Factor 3: Personnel and social infrastructure constraints;

The analysis showed that the scheme suffered from constraints and availability of adequate social infrastructure (accounting for 12.4% of the total). Variables extracted included inadequate water storage facilities, scheme staffed with untrained personnel, inadequate housing and low personnel morale. These problems already existed and had been observed to have led to the earlier service contracts spanning 3½ years.

Factor 4: Mismanagement in the supply

The supply to some extent also suffered from mismanagement by the water undertaker, NWCPC. However, this accounted for only 8.9% of the total basket of problems. The variables extracted are high level of unaccounted for water, adverse public opinion and poor accounting procedures at scheme level.

Factor 5: Poor record keeping

This factor accounted for 7.6% of the total problem weight. The variables cited are lack of proper records at the scheme level; and absence of professional staff on the scheme. In effect the scheme required managerial experience, use of technology in order to improve efficiency. Factor 6 of the decision to involve PSP operator was the need to introduce new technology and efficiency.

Until about 1990, record keeping in the water sector was generally good. As a matter of fact the data available covering the 1970s' and most of the 1980s' is to a good extent accurate. Thereafter and with the onset of downsizing in the public service, record keeping also appears to have been downsized. Therefore poor record keeping on most public water supplies is now common. The use of computers is still alien to field offices let alone the water supplies. The situation is made worse by the fact that most water schemes are manned by non-professional staffs, who do not understand the importance of record keeping. Therefore information on Production data, consumption, pipelines, reservoir and pump stations, asset condition and drawings is hard to come by.

Factor 6: Bureaucratic bottlenecks

In addition, delays in making operational decisions by regional and head offices and inadequate funds for O&M were also cited as important problems that the scheme suffered from.

Factors 3, 4, and 6 are interrelated and indicate a management problem faced by the scheme prior to PSP involvement. Factor 4 extracted under the decision to involve the PSP Operator in questionnaire one was the demand for professional

management. Therefore the decision to involve PSP operator in the water utility was to solve the problems identified under factors 3,4 and 6 in this section.

As at the end of March 2004, the NWCPC had 1604 employees. Of these close to 1300 were sub-ordinate staffs a good percentage of whom are carrying out technical duties. However, their salary is still that of any sub-ordinate staff deployed elsewhere in non- technical duties. The result is untrained staff with low morale. The social infrastructure problem sited was related to inadequate storage, which has largely been solved except for Watamu area, and inadequate office space and housing. To date the Operator still maintains two offices due to inadequate office space. Some storage and pumping stations are in isolated places which require housing that has not been provided.

The attention given to water works design and construction does not correspond to the same attention given to their management. The water sector has failed to inculculate the culture of management in the personnel. Indeed the few who appear to be good managers in the field get promoted and move far away from where the real management of facilities is situated.
Bureaucratic Bottlenecks affects the operational activities of any water scheme. Those who have to give direction in operation and maintenance of the installations are usually not involved in the day to day operations of the supply. Some have even never visited the facilities. The result is that a report on a breakdown has to pass through layers of bureaucracy before a decision is made. It is this bureaucracy that leads to unreliability of the services in schemes.

Factor 7: Dilapidated Infrastructure

The problem of dilapidated infrastructure was also cited as being important, it accounted for 5.4% of the basket weight.

Malindi water scheme was first put up in 1948. Thereafter the scheme was only expanded with shifting to the new intake at Kwalenya. Most of the pipelines were laid in the period between 1960 and 1987. Indeed the water supply still has asbestos cement pipelines in some areas, which were first laid in early 1960s. One of the conditions in the contract agreement was that funds would be availed

from the donor to rehabilitate/augment and expand the distribution network. The scheme, therefore, required rehabilitation funds, which the government did not have immediately. These had to be obtained from development partners, however, after the government had fulfilled certain conditions. Factor 3 of the decision to involve a PSP operator in Malindi is development partner pressure. The donors were fully aware of the infrastructure condition in Malindi area, and used this knowledge to push for change in the management of the supply, before rehabilitation funds could be released.

6.4.3 Services Introduced by the PSP Operator

A survey was carried out on the changes that have been brought about, in the supply area, as a result of the involvement the private sector operator. The interviews covered issues such as staff output improvement; operation and maintenance; service quality; water quality; financial and commercial issues and general management. The direct responses are as shown in bar graphs in Appendix 6-7.

Analysis by Plotting of Means

Graphs of the plot of the means including the services that have been introduced by the PSP operator as extracted from the graphs are presented in Appendix 6-8 and Appendix 6-9 respectively.

Having determined the problems that the scheme faced in section 6.4.2, in the analysis, an attempt was made in marching the services that had been identified through the plotting of means with the problems. The results of this marching are as indicated in Table 6.5.

Table 6. 5: Problems & solutions (factor analysis) that faced the scheme.

1.Poor Financial and Operational Procedures
• Billing at scheme level • Increase in Maintenance Funds • Historical Analysis of all Records • Meter Maintenance • Regular Reading of Meters • Increase in Consumer base • Metering of all Consumers • Enforcement of Disconnection Rules • Introduction of More bulk meters
2.Poor Quality of Service Delivery
• Regular Inspection and Monitoring • Preventive Maintenance • Special Maintenance Teams • Leak Detection • Complaints Desk • Personalised Attention to Customer Complaints • Regular Monitoring of Water Quality • Increased Water Volume
3.Personnel and infrastructure constraints
• Staff Training Programmes • Top up to NWCPC staff
4.Mismanagement in the Scheme
• Increased Number of Professionals • Marching Staff to Work • Regular meeting of Operators and NWCPC HQ Staff • Regular Assessment of Staff Output • Target setting for Every Staff • Clear Reporting Procedures • Introduction of Performance Targets
5.Poor Record Keeping
• Use of Computers • Keeping of revenue records
6.Bureaucratic Bottlenecks
• Direct Procurement of O&M Needs
7.Dilapidated Infrastructure
• Systematic Rehabilitation

The services introduced were then marched to the problems as identified by plot of means. This marching is very good and most of the problems appear to have been solved by the services introduced. The link is in two areas, one is that professionals are deployed to the scheme and the other is that there are adequate O&M funds. These two issues seem to be the link between the problems and the solutions. Table 6.6 represents this marching.

Table 6. 6: Problems (plot of means) that faced the scheme.

Problem as Identified	Service introduced
Dilapidated Infrastructure	• Systematic Rehabilitation
Insufficient Funds for O&M	• Increase in Maintenance Funds • Billing at Scheme Level • Historical Analysis of Customer Records • Keeping of Revenue Records
Low Service Coverage in Scheme Area	• Increase in Consumer Base
Preventive Maintenance was not Being Practiced	• Preventive Maintenance • Special maintenance teams
Lack of Spare Parts and Adequate Repair Kits Most Times	• Direct procurement of O&M needs
Inadequate Bulk Meters	• Introduction of more bulk meters
Lack of Transport to Carryout O&M Activities	• Regular Inspection and Monitoring
Poor Metering	• Metering of all consumers
High Number of Unoperational Meters	• Meter maintenance • Regular reading of Meters
The Scheme was Unable to Meet Demand	• Increased water volume
Difficulties in Procurement of Supplies	• Increased maintenance funds • Direct procurement of O&M needs
High level of Unaccounted for Water	• Leak detection • Regular inspection and monitoring • Introduction of more bulk meters
Lack of Autonomy at Scheme Level	• Direct Procurement of O&M needs
High Number of Illegal Connections	• Metering of all consumers • Regular inspection and monitoring • Personalised attention to consumer complaints
Weak Enforcement of Disconnection and Reconnection Rules	• Strict enforcement of disconnection and reconnection rules
Inadequate Management for O&M	• Increase in number of professionals • Marching staff to work • Regular meetings between Operators and NWCPC staff • Clear reporting procedures • Complaints desk • Regular monitoring of water quality • Target setting for staff • Clear reporting procedure • Personalised attention to consumer complaints • Use of computers

The services that have been introduced deal with the problems that were identified as having faced the water scheme before the entry of the PSP operator. These services can be categorised under seven headings as follows:

(I) Employee focus

One of the problems that faced the scheme was linked to personnel issues, analysis shows that the PSP Operator has dealt with this problem through introduction of staff training programmes; marching staff to work; regular meetings of Operator and NWCPC at headquarters; top up to NWCPC staff; target setting for staff and increased number of professionals.

Professionalism introduced in the scheme by the PSP management contract is very important if water utilities are to provide quality services. An organisation cannot provide quality products by using employees who do not value quality. Professionals value their work and also value the order of carrying out activities. Professionals will march staff to work, set up staff training programmes and also set targets for the staff all geared towards ensuring that the product that is produced is that expected by the customers. One of the weak motivational links in the water utilities is the low remuneration. The Operator in Malindi remunerates all the employees well and pays NWCPC staff a top up or overtime. Regular meetings between the Operator and NWCPC head office staffs are important in ensuring that both sides are updated on what is happening in the supply area and any problems that may arise are ironed out and decisions are not delayed. Staff training programmes are important if the utility is to keep up with changing technology and to teach staff new ways of doing things. Marching staff to work and target setting for staff is necessary in a water utility, as everyone ends up carrying out the work for which they are best suited to do. Additionally each employee knows exactly what one is supposed to achieve or deliver within a given time.

(II) Improvement of O&M

Poor operational procedure was identified as a problem that faced the scheme. Poor operational procedures in a water utility is a function of poor management and especially poor process of O&M. The analysis indicate that the following services that lead to improvement in O&M have been introduced: increase in maintenance funds; direct procurement of O&M needs; preventive maintenance; meter maintenance and specialised maintenance teams.

Operations and Maintenance of a water utility is a process. Unless there is an efficient administration of the process necessary for providing drinking water the objectives of a water utility cannot be achieved. One part of ensuring that this process is continuous is professional managerial staff including personnel with knowledge of the variables that can easily affect the continuity, reliability and amount of water supplied to customers. The personnel should be able to carry out activities that ensure variable that can affect the process are attended to promptly and effectively. This will involve both preventive and programmed maintenance. Poor performance of water supplies is attributed to inadequate funds for O&M. Improved O&M involves ensuring that the process has the necessary spares and tools that it requires to be continuous in operations. Therefore increase in availability of O&M funds is a major introduction in the water supply. One of the complaints that some officers interviewed at the NWCPC have with the management contract in Malindi is that it has excessive funds for O&M when compared to other schemes. It was however acknowledged that adequate finances have to be availed to water supplies if they are to perform. In a full cost recovery water utility such as Malindi the funds have to come from the customers based on payment of bills for the water that they consume. The customer meters have to be kept in operational state through regular meter maintenance. Less than 1% of the meters in any one month are not operational. Procurement in NWCPC water schemes is by the regional offices or the head office depending on the item to be procured and its value. It is rare for scheme to procure O&M items. Therefore direct purchases as is practiced in the scheme considerably reduce delays in receipt of maintenance items. The Operator has introduced specialised maintenance team in Malindi water supply. The importance of such a team lies in its ability to mobilise fast in case of disruptions in services.

(III) Improvement in service standards and extension of the system

Poor quality of service delivery and dilapidated infrastructure were identified as problems that Malindi faced. From analysis the service introduced to deal with these problems include, use of computers; systematic rehabilitation; leak detection; metering of all consumers; introduction of bulk meters and increased volume of water.

Systematic rehabilitation of the scheme has been undertaken through both donor and self financing. Between October 2001 and October 2002, a reticulation augmentation and expansion project rehabilitated and strengthened 29.5km of pipelines ranging in diameters from 500mm to 50mm. Since then, however, and with full approval of the client, NWCPC, the Operator has continued to rehabilitate and expand sections of pipeline using internally generated revenue. Continuous rehabilitation of schemes ensures that the scheme provides services as per design at all times. This is then followed by metering of all consumers. By successfully having carried out block mapping in the project area it was possible to pinpoint the full extent of the pipeline and structures on the route. As such, metering of consumers was made easy as their location is easily ascertained. All these issues are simplified through use of computers. Computers are used in keeping of stores inventory and in keeping records of the day to day activities on the project. These improvements cannot be complete unless the UFW is reduced. The reduction in UFW involves introduction of bulk meters and leak detection. The reduction in UFW from the high 46% to 26.5% implies that more water is available for distribution to consumers.

(IV) Improvement in revenue base

Poor financial position of the scheme was identified as a problem. The services introduced to deal with this problem are billing at scheme level; regular reading of meters and increase in consumer base.

One of the ways the Operator has used in revenue improvement is billing at scheme level; as it reduces delays in bills dispatch; it simplified counterchecking of disputed readings and those that look suspicious and also implies that complaints can be rectified immediately. Furthermore, meters are read at least once a month. Meter readers have been assigned areas and targets they have to achieve. The importance of this is that most bills are prepared on actual readings rather than on flat rate or estimated consumptions. However, after carrying out all these measures the only other method of further improving the revenue is increasing the consumer base. By April 2004 the Operator had long passed the target of 1000 new connection that they were expected to achieve by end of the contract. The

increase in consumer base ensures that the scheme is more likely to be self sustaining and that more people are also benefiting from the water services.

(V) Customer focus

Customers complain when services are poor. The analysis indicates the following services have been introduced to deal with this problem: Introduction of a complaints desk and personalised attention to consumer complaints.

A complaints desk means that there is someone responsible for handling complaints. The Operator has also gone further by according personalised attention to consumers through temporary field offices, which involve visits to various water supply areas on specified days of the week to obtain complaints directly from the consumers. This personalised attention to consumers is very important as it ensures that consumers are treated as valuable customers who should give suggestion on how the product, water, is handled.

(VI) Water supply monitoring

Services introduced have to be continued and maintained and this is only possible through monitoring. To achieve this, the operator has introduced regular scheme inspection or monitoring and regular water quality monitoring.

For the Operator's services to continue successfully there should be continuous monitoring. Monitoring of any activity is to indicate to those in charge on how the system or process is performing as a basis of decision making on what changes, if any, may be required in the operations. The results of monitoring are for feeding into the decision making process, once the impact of what is being monitored has been determined. In effect therefore monitoring generates information and data which is then processed at different levels of an organisation in accordance with the decision making hierarchy. One important aspect of monitoring in a water utility is water quality. Water quality monitoring is important as it ensures that chlorine residual levels are maintained and further that the water is free from substances that may be injurious to health.

The Malindi area has been divided into sections and each assigned to a meter reader who also doubles up as a line patroller. In this way the distribution system including the meters and other fittings are monitored on a daily basis. A part from this the operator has attempted to incorporate the consumers in the monitoring programme through encouraging them to report leaks and illegal connections. Due to this monitoring programme the number of non-operational meters in any one month has been kept to less than 1%. However the operator has not been able to eliminate illegal connections. As at the time of the survey the total number of illegal connections uncovered since the commencement of the contract stood at 179. This works out to an average of 4 illegal connections per month during the contract duration.

(VII) Improvement in management services

Mismanagement in the scheme was identified as one of the problems that the scheme faced. The services introduced to deal with this problem include historical analysis of account records; clear reporting procedures; enforcement of disconnection rules and introduction of performance targets.

Efficient administration of the processes necessary for providing drinking water is necessary if the utility is to attain the objective of providing efficient and reliable service. Whereas all levels of management are important, the operational management level is responsible for formulating short term plans among, which is clear reporting procedures; and activities to improve efficiency, reduce costs and increase availability of drinking water. One of the performance targets that the Operator was expected to meet is completion of analysis of all old debts. This historical debt analysis was therefore an important service introduced by the Operator. The Operator divided the operations in the Malindi area into two major components: commercial and technical. Although there is harmony and sharing of information every member of staff knows where he reports on the targets that have been set. The clear reporting procedures ensure that the employees are accountable for their activities. One of the policies that the Operator has enforced is one on disconnections. Those who do not pay on time are promptly disconnected the following month.

The services introduced by the Operator are thus to solve the problems that the scheme faced prior to engagement of the PSP partner. Some of the services introduced are related to the decision to engage a PSP partner. These include desire to improve operational and tactical management of the scheme; demand for professional management; enhancing technical capacity and introduction of new technology.

6.4.4 Responsibilities of the PSP Operator

Having established the services that have been introduced by the Operator, the next step is to establish the actual responsibilities of that Operator. In effect, therefore the services introduced must be those that deal with the problems that faced the water supply. The responsibilities on the other hand should be commensurate with the services that have been introduced. One cannot introduce a service unless it is within ones responsibility to do so. Therefore the services and the responsibility should be able to satisfy the decision and to involve the PSP Operator and the problem that the scheme faced.

Questionnaire 4 (Appendix A5-4) was utilised for the purpose of determining the operators responsibilities as viewed by the respondents. The mean for each question was plotted and the results are as shown in Appendix 6-11 while the responsibilities as extracted from the plotting of means is as shown in Appendix A6-12. From the analysis the obligation of the Operator on the Malindi contract are categorised as follows:

(I) Improving and extending system coverage

The obligations identified under this category are extension of reticulation system; increasing coverage level; putting in new connections; dealing with leakages; entering contracts with new consumers and working as a consultant for NWCPC.

(II) Financial responsibilities

Under this categorisation the obligation identified are billing and dispatch of bills; receiving payments; remitting payments to the NWCPC; increasing collection efficiency and disconnecting and reconnecting consumers.

In contracted out water utility such as Malindi there are two important stakeholders; the client or owner and the customers. Although both categories of stakeholders want an efficient water service their expectations are somehow different. The customers are more concerned with the service quality parameters and therefore the issues that interest them most will include supply coverage and reliability; water quality; connection efficiency and how complaints are dealt with. These are issues that are identified as improving and extending system coverage. Indeed most of the obligations identified above had a performance target attached to them in the Operator's contract. In addition they are obligations intended to improve operational and tactical management in the scheme. Whereas, the client finds these issues very important but his expectations will be on utility sustainability. The client wishes to have a system that does not operate on subsidies. As such the issues that ensure that the collection efficiency is improved are his interest. These are the obligations that are handed over to the contracted party. Therefore, financial responsibilities are important obligations of the Operator. Enforcement of regulations through disconnections and reconnection is a means to an end, which is to ensure that the customers meet their obligation which is paying for water consumed. Malindi water scheme under the PSP operator has shown that even government institutions can pay their bills if they are aware that they can be disconnected.

6.4.5 Responsibilities of NWCPC

In a PSP contract the obligations and duties of the client like that of the operator has to be clear, except that it should be facilitative and supportive of the contract. Questionnaire 5 Appendix A5-5 was used to determine the respondent's views on the responsibilities of the client NWCPC. The plot of the means is indicated in Figure 6.10.

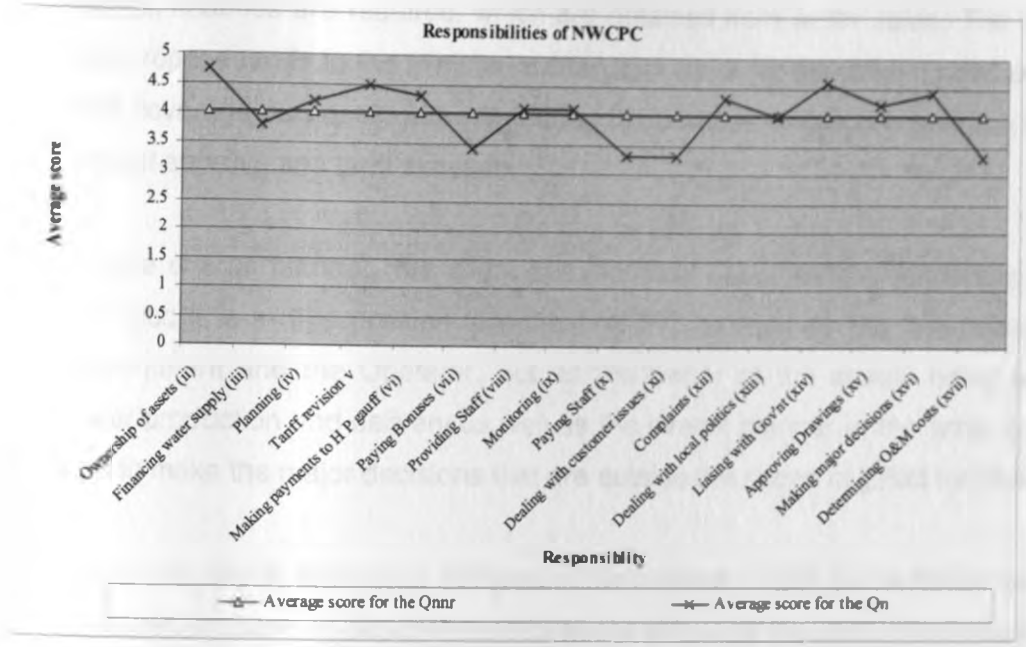


Figure 6. 10: Responsibilities of NWCPC

From this plot the responsibilities of the operator as directly extracted are as shown in Appendix A6-13. These can be categorised as follows:

Financial: The identified responsibilities under this heading are ownership of assets; obtain tariff revision and making payments to Operator.
Leadership: The responsibilities under this heading are liaising with Government; making major decisions and planning for the water supply.

Regulatory and staff responsibilities: The responsibilities under this category are institution of last resort for customer complaints; monitoring the PSP Operator and providing staff when called upon.

The foremost responsibilities of NWCPC are to act as a link to the central Government and retaining the ownership of assets. Other responsibilities include supervision and guidance in decisions relating to the water supply (planning and approving contracts) besides monitoring the activities and making payments to the PSP Operator. Thus, the respondents perceive the role of the NWCPC as not only a client but also a regulator. These responsibilities if successfully carried out support the operations of the Operator. Under financial considerations, the NWCPC is the legal custodian of the Assets used in water production in Malindi. The asset base determines the financial worth of an organisation. To sustain the

assets, finances are required, which are obtained from water sales. The NWCPC can propose tariffs to the Minister in charge of water for approval if need arises for cost coverage purposes; however during the duration of this contract, the Minister did not approve any tariff increase.

As the overall planner, the client automatically assumes the leadership in this contract; it is in this position that the NWCPC is seen as the link between the Government and the Operator. But as the owner of the assets being used for water production and delivery as well as the overall planner in the water supply, it has to make the major decisions that are outside the scope of O&M functions.

One of the characteristics of Kenyans is their desire to rush to courts for resolution of issues. In case of disagreement between the customer and the Operator they will certainly appeal to NWCPC the agency that they signed the contract with. Therefore the NWCPC remains the agency of last resort in case of customer disagreements with the Operator. The client's responsibility, in addition to the monitoring of the PSP operator, is to ensure that the Operator observes the requirements of the contract makes the NWCPC a regulator in this contract.

6.4.6 Customers with a service connection

Improvements to the water services was assessed through interviews of beneficiaries of the water supply that have a connection. The survey covered the problems affecting this group of customers with regard to water flow, reliability, quality and general management. The distribution of the sampled consumers was as indicated in Figure 6.11.

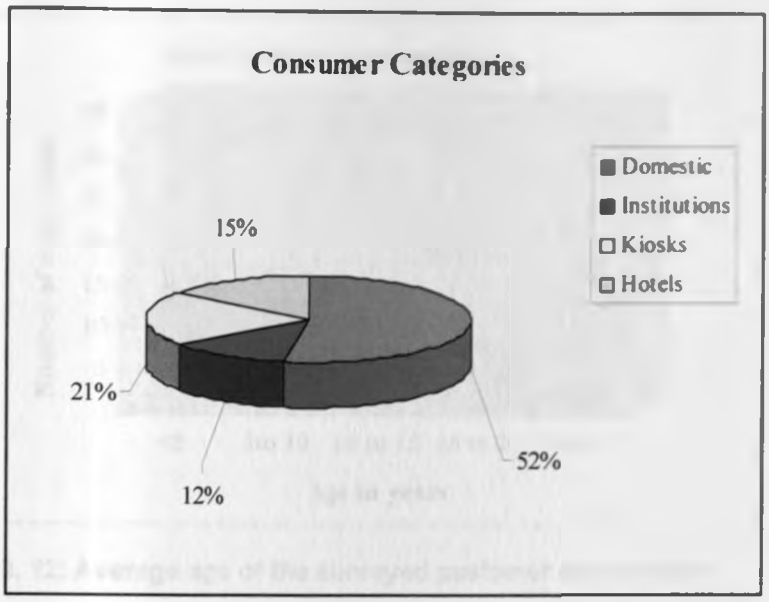


Figure 6. 11: Distribution of the customer sample interviewed

The sample took into account the fact that 96% of all connections belong to domestic consumers, with nearly 50% of the 149,000 people who are covered by the water supply network relying on kiosks while close to 50% of the water is used by hotels and institutions. The age of the connections indicated in Figure 6.12 was not a factor for consideration when sampling the consumers for the interview, it however turned out that 45% of the consumers surveyed had had a connection for less than 5 years. This is comparable to the 55% who had had a connection for more than 5 years. This indicates that nearly half of the respondents were connected during the duration of the PSP contract. The accuracy of this sample can be seen when you compare the number of connections at the start of the contract, when there were 4400 connections and the number at the time of carrying out the survey, when there were 7700 connections, i.e. 57% of the current connections existed before the start of the PSP contract, while 43% have been registered during the Operators contract.

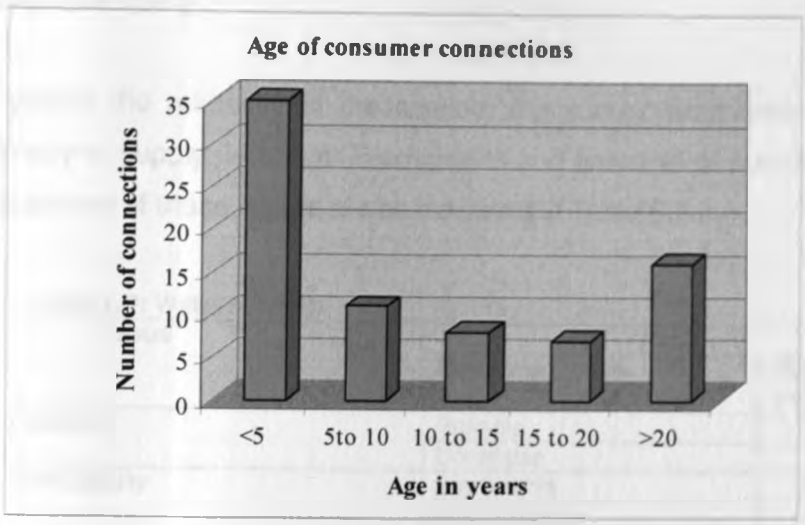


Figure 6. 12: Average age of the surveyed customer connections

Since close to 50% of the estimated 149,000 people rely on water kiosks further analysis of the seventeen sampled kiosks was carried out and the results indicated in Figure 6.13 obtained.

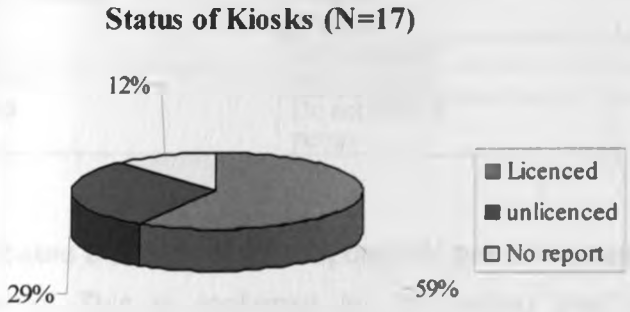


Figure 6. 13: Status of the surveyed Kiosks

There are many unlicensed kiosks in the project area as a result of some domestic consumers converting their connection into kiosks without following the established channels of applying for a kiosk connection. It is likely that the 12% kiosks on which there was no report may also be domestic connections which have been converted to kiosks. It could therefore be concluded that for every three officially licensed kiosks, there are two unlicensed kiosks in operation, in which case the total number of kiosks in Malindi is higher than what is officially known.

Supply Reliability

To assess the reliability of the service, the survey examined issues such as continuity of supply; length of interruptions and pressure of supply. The results of the analyses of these issues are as indicated in Table 6.7.

Table 6. 7: Water reliability

Issue	N=82	
	Response	**Percentage (%)**
Reliability	Reliable	51
	Unreliable	49
Predictability	Predictable	59.8
	Unpredictable	26.8
	No problem with flow	13.4
Length of interruptions	After a day	72
	More than a day	14.6
	No problem with flow	13.4
Lack of water in last six months	Once	43
	More than once	35
	No problem with flow	22
Adequacy of pressure	Enough pressure	80
	Low pressure	20
Customers with a booster pump	Have a pump	16
	Do not have a pump	84

The survey indicates that 51% of the respondents are of the opinion that the water supply is reliable. This is confirmed by the finding that only 43% of the respondents missed water once in six months while 22% of the respondents have no problem with water. This is further reinforced by the finding that 72% of the respondents reported that the interruptions are never longer than one day and 79% of the respondents indicated that the water pressure was adequate while 16% of the respondents indicated that they had booster pumps. The respondents with low pressure are some of those who must be having booster pumps, but since not everyone can afford a booster pump there is a difference of 5% between those who claim low pressure and those with pumps. Since replacement of the small diameter pipelines laid before 1985 has not been completed in the entire supply areas, the areas with such pipes are most probably the ones experiencing low pressures. One of the supply areas experiencing low pressures is Jimba-

Mbaraka which is a fairly large area but is served by a 50mm diameter pipeline without a functional air valve. The other area experiencing low pressure, is the Kakuyuni-Jimba, as a result of encrustation of the main 200mm uPVC line.

Continuity of flow of water in any water supply is a measure of reliability and hence one of the factors that determine if consumers will turn to alternatives. Almost 60% can predict the water availability. This analysis shows that storage in the water supply is adequate to cater for extended interruptions. Therefore, the only disruption that will interfere with flow is that arising from bursts. Since rehabilitation/augmentation of the pipelines has not been undertaken in the entire supply area, bursts will occur in areas with old asbestos cement pipeline thus making the flow unpredictable. Appendices 1-1 (ix) and 1-2(v), list some of the problems faced by the scheme before PSP involvement, as poor water pressures and inadequate supply and or dry areas leading to high consumer dissatisfaction. The reliability of a water supply is a factor of efficiency in O&M, the efficiency of the water supply has therefore improved when compared to the period before the PSP operator took over the management of the supply.

Secondary Water Sources

54% of the consumers interviewed indicated that they had additional storage in their premises. This group of consumers rely on this storage during periods of flow interruptions. Customers will usually invest in additional storage capacity if the water flow is unreliable i.e. not constant and there is no known pattern of water availability or the water pressure is low. 55% of the respondents surveyed had been connected before the PSP operator took over the management of the supply as indicated in Figure 6.13. There is a possibility that the 54% with additional storage are the same 55% who were connected when the water supply was still under the NWCPC and was therefore unreliable. However, the respondent's secondary sources of water were as indicated in Table 6.8.

Table 6. 8: Sources of water during Shortages

Sources of water during shortages	Percentage (%)
Water Tankers	4
Wells	37
Storage tanks	51
Others	7

Wells are a big source of water during periods of interruptions, while the other sources listed included; Kiosks, Neighbours, River Sabaki, and standpipes. In effect therefore, the storage tanks, as expected play an important role in times when there are disruptions in flow. Indeed those who listed neighbours as an alternative source of water depend on the neighbour's storage tanks. The 46% consumers without additional water storage have an alternative water source not to be bothered by investing in storage. A few kiosks have invested in plastic storage tanks and these come in handy during shortages. Whereas 54% of the respondents have additional storage tanks only 51% depend on the storage in times of shortage. The three percent use the additional storage as water selling points. However, the survey shows that a high number of consumers in the water supply rely on more than one source to meet their needs. Consumers tend to rely on more than one source if the supply is not reliable or the price is not right. The fact that wells are an important alternative source of water in the area is well documented. The Operator has been blaming the law for failure to close these wells. It is possible that well water is used for other purposes other than drinking to cut on water bills, in which case it will be a bit hard to eliminate them unless the possession of a well is made a criminal offence. What the analysis also brings out is that a high percentage of people with their own connections do not have adequate storage in their premises to last them through periods of disruptions as a result of having other convenient water sources.

Water Quality

About 57% of the respondents think the water quality is good, while 43% think the quality is not good. Those who think the quality is not good cite water quality problems like dirty, coloured and muddy water and/or excess chlorine. The water in Malindi contains high levels of manganese and iron. High dosages of chlorine are added to oxidise the manganese. It is the settling particles of manganese and

iron that is causing concern to some consumers. The appearance, taste and odour of water are important quality aspects that the consumers look out for. In areas where there are alternative water sources such as in Malindi, consumers will not hesitate to turn to these alternatives if they are not satisfied with tap water quality. However, more than half of the surveyed consumers with a connection are satisfied with the water quality.

Connection efficiency

About 64% of the respondents indicated that it takes less than a month to get a connection. There are about 189,000 people in the supply area, of which only 80% are served. The average monthly applicants for new connections are about 60 whereas the Operator manages to install an average of 40 per month (Average from Table 6.2) this is about 66% of all the applicants. Therefore apart from the survey confirming the actual situation on the ground it is also evident that the connection efficiency is fair although it can be improved upon.

Customer Complaints

Consumers will complain when they are not satisfied with the services being offered by a water utility. The survey showed that 42.5% of the respondents had filed a complaint with the operator in the period between April 2003 and April 2004. Indeed 64.6% of the respondents knew of someone else who had also filed a complaint with the operator within the same period. The important finding of the survey under this category was that 89% of the respondents knew where to lodge their complaints. The complaints as analysed in the paragraphs below covered service provider; billing and response to complaints.

Between 1989 and 2004, the water service provider in Malindi area has changed from the Ministry to NWCPC and finally to the PSP operator. Evaluation of the consumers feeling of the operator indicated that 52.4% of the respondents mind who the operator is, while 47.6% do not mind. 60% of the respondents were able to name the current operator, while 40% did not know. Many respondents pointed out that they did not know the distinction between the current Operator (H.P Gauff) and NWCPC. Indeed further analysis showed that most of the 40% were part of

the 47.6% who did not mind the operator. Thus the survey shows that the service provider is known, even though some consumers could not tell the difference between the current Operator and NWCPC.

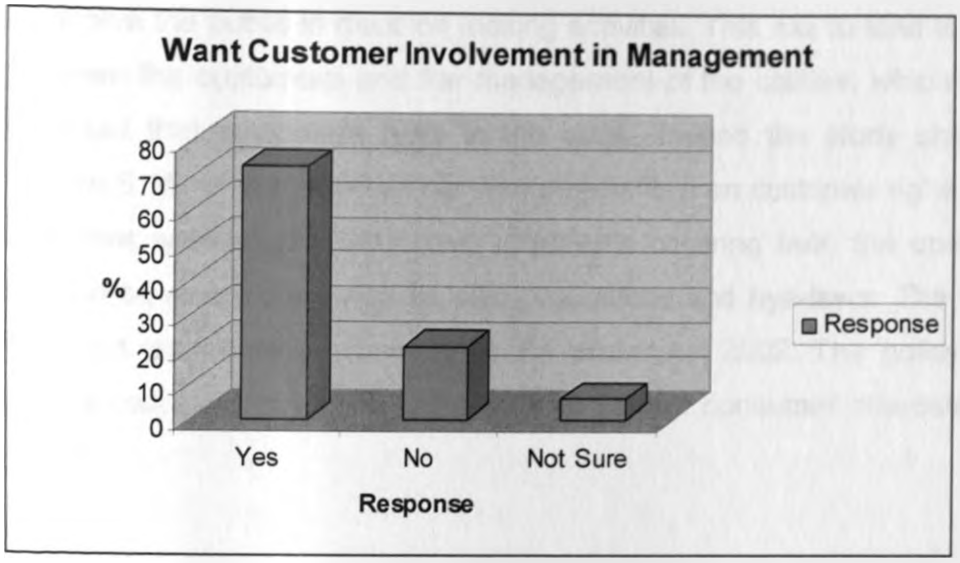


Figure 6. 14: Customers Responses on need to be involved in Management

From Figure 6.14, 73% of the respondents want to be involved in the management of the water supply while 6% are not sure in which case they could be influenced to join the group that wants to be involved in the management. Therefore, the survey raised issues such as how much customers in urban areas can be involved in management of the water utility and specifically the decisions the customers should be involved in. The problem may be about ownership of the water utility. Urban water customers believe they are involved in decision making if their elected representatives are involved in the decisions. The other aspect is that inspite of the improvements brought about by the PSP Operator; customer expectations are not being fully met. This brings to the fore the importance of upholding customer rights. The analysis shows that customer rights are upheld. 73% of the respondents are of the view that the customer rights are upheld by the operator. This implies that the customers have trust in the Operator. Customers with trust will also cooperate with the operator, and voice their concerns openly. Therefore trust in the operator is important for the water supply. However, the 27% who hold the view that customer rights are not upheld raise issues such as the operator is too strict and should be removed

The reforms in the water sector, where the Government is getting out of management of water utilities and handing it over to autonomous agencies formed by the local groups, is a step in the right direction. However, the institutions mandated to handle customer interests have to come up with innovative strategies to involve the public in decision making activities. This has to lead to a partnership between the customers and the management of the utilities, which may increase the trust that customers have in the utility. Indeed the study shows that 87% (Figure 6.15) of the respondents want regulations on customer rights. Though the customer agreement forms have covenants covering both the operator and the consumer, every utility has its own regulations and bye-laws. The need to have common guidelines is spelt out in the Water Act 2002. The policy makers may have to consider setting up of a body to protect consumer interests in the water sector.

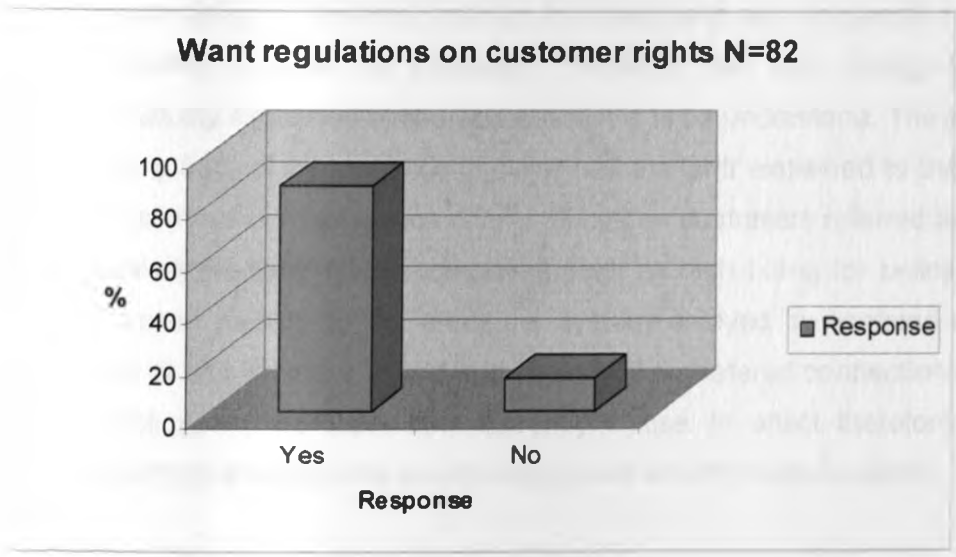


Figure 6. 15: Is there need for Regulations on Customer Rights?

Meter reading and billing are some of the problems found in water supplies. The survey shows that 72% of consumers had no problem with bills. Indeed the survey indicated that consumer meters are read once a month. The 28% who have problems with their bills raised complaints which included being billed even after they have not had water for a whole month; high bills; bills with a different account number but with the same customer's name; late posting of bills; high charges for unlicensed water kiosks than for licensed ones; wrong bills; non explanation of the tariff and billing based on estimated consumption. The billing complaints were brought to the attention of the Operator, who explained that problems of billing

arise from estimated or incorrect meter readings/consumption as a result of the gate to the property having been locked at the time of reading, stalled meters, erroneous posting of payments during bills preparation and inclusion of the value of illegally consumed water. The complaints and the response from the operator confirmed that meter reading and billing have not been fully perfected in the water supply. It could also imply that the number of stalled meters or those mul-functioning may be higher than the operator reports. The survey also shows that the consumers are not receiving adequate explanation on the problems that they may be having with their bills.

If the tariff charged is explained, it makes customers to determine how water will be used in their premises. Thus some of the complaints raised by the respondents about their bills would not arise at all. Malindi Municipality like many other municipalities in Kenya has a good number of new customers taking up residence in the municipality. Most of these are new employees either in Government departments or in the hotel industry, but they could also be people coming to the municipality to start up business. Therefore, the tariff charged has to be continuously explained by the Operator if it is to be understood. The survey shows that only 61% of all respondents have had the tariff explained to them. The 39% who have had no explanation cannot all be new customers referred to. The failure to explain the tariff raises complaints such as high billing for unlicensed kiosks. Unlicensed Kiosks do not enjoy the subsidy enjoyed by licensed kiosks. As a matter of fact they are considered as any other metered connection and charged as such using the block tariff currently in use. In effect therefore there is no continuity by the operator in explaining how the tariff structure works.

Other Complaints

The survey revealed other complaints that include; high charges for deposits and fines; delay in reconnection; meter thefts and need to remove the PSP operator for strictness. Other complaints raised included need to regulate chlorine dosage in the water; kiosks licensing; slow repairs of bursts by the operator; high domestic meter costs and poor communication to customers.

Water deposits are supposed to cover one month's consumption that is usually determined by the type of premises one occupies. But sometimes utilities may set deposits to cover other incidentals such as replacement of the consumer line that is the pipe connection between the Operators line and the customers' meter. On the other hand reconnection fee is supposed to cover the expenses incurred in operator sending a team for both disconnection and reconnection. The other charge is fines, for interfering with the meter. All these charges are supposed to be a deterrent to customers who may wish to break the rule for which the charge has been set. The survey showed that the operator has not explained the charges to all customers as 39% have no idea on the charges.

Customers raised the issue of meter thefts. Certainly meters must be put where they are accessible to utility personnel for inspection and also for reading. Thefts arise when customers who cannot afford the cost of a meter are requested to acquire one on their own before they receive a connection. In a few instances meters are stolen just to be sold to merchants who sell them to other water utilities. Therefore to minimise incidences of meter thefts proper marking of meters including markings for visible inside parts needs to be enforced. Further more customers who are unable to afford a meter should not be forced to produce one before they are connected. Instead the operator should supply the meter and spread the payment over a reasonable length of time.

The minor issue raised is the regulation of chlorine in water. This is minor because standards already exist for chlorine residual in the water which is 0.3-0.5ppm at least 30minutes after contact. The operator only has to enforce this standard.

The study indicates that it takes approximately one year to obtain a kiosk license. To operate a kiosk, one has to make an application for a license to the Operator. Once the application is received, field checks and investigations are arranged and executed. Analysis to determine those to be licensed is then done. Between July 2003 and end of March 2004, a total of 37 applications for a license to operate kiosks had been received. However, by the time of the survey none had been licensed. Our inquiry revealed that those that pass the rigorous screening process will be licensed during the financial year starting in July 2004. In effect, therefore, it takes approximately one year to obtain a kiosk license. The issues that are

checked before licensing are; income level of the applicant, distance from nearest kiosk, average consumption at the applicants' connection over the last 3 months, payment history of the applicant, and general consumer record. All this information is in the possession of the operator.

The other complaints raised are about slow process in repair of bursts and poor communication with the customers. The Operators contention in his quarterly reports is that bursts and leaks are repaired within a reasonable time. Based on the complaints the Operator needs to inform the affected customers the approximate period that the repairs will take. According to the Operator's records there are many communication channels used to reach the customers. A lot still requires to be done to reach at least 90% of the customers if complaints about poor communications with the clients are to be reduced.

Response to complaints

The success of a water utility depends on its customers and therefore the management should understand current and future customer needs, should meet customer requirements and strive to exceed customer expectations. This is an important quality management principle that water utilities have to embrace. The water utility has to systematically manage customer relationships. This can be best achieved through continuously measuring customer satisfaction and acting on the results. Table 6.9 shows that about 48% of the respondents are dissatisfied with the information flow during periods of disruptions.

Table 6. 9: Information to Customers about interruption of flow

Informed of flow interruption	Percentage (%)
Yes	39
No	47.6
No problem with flow	13.4

However consumers can only complain if they know where to direct their complaints and if they think their complaints will be attended to. The survey shows that 89% of the respondents know where to go if they have a complaint. However the survey also revealed that at least 27% of the complaints are not attended to.

Though it may not be possible to attend to all complaints efforts have to be made to reach at least 90% of all complainants if not all of them. Therefore, the percentage of respondents whose complaints were not attended to is on the higher side. This could indicate that either the Operator considers the complaints to be minor hence requiring no attention or the complaints were not made to the relevant office. The results therefore show that the customer care desk is working and receiving complaints but the attendance to the complaints requires to be improved.

Operational Issues

One of the operational issues surveyed was enforcement of regulations. 99% of the respondents know what would happen if they don't pay their bills. The Operators enforcement of regulation of disconnection for non-payment of bills is well understood by the customers.

Support to monitoring activities

One of the major sources of UFW is unattended to leakages in pipelines. On the other hand, leakages within the customer premises, leads to unrealistic high consumption, and complaints arising there from. It is necessary that customers are encouraged to report leakages as a supplement to Operators own leakage detection teams.

81% of the respondents agreed to having been encouraged to report leakages if they spotted one, while 19% reported that no such encouragement has been imparted to them.

The survey also indicated that consumers take seriously repair of leakages especially those that occur in their premises. Figure 6.16 shows the responsibility for repairing of leakages in the customers premises. 81% of the respondents indicate that they are responsible for repairing leakages within their premises, 15% indicate that NWCPC local office has been responsible, and 4% show that the Operator has been responsible.

Figure 6. 16: Responsibility for Repairing leakages in Customer Premises

The study shows that the operator is doing all he can in as far as leakage detection and repair is concerned wherever it occurs and in this regard the operator is assisted by the client.

Generally the study points to an improved service delivery in Malindi water supply area. However, the problems raised by consumers indicate inappropriate strategy of dealing with customer complaints and poor communication channels.

6.4.7 Customers without a Connection

Access to water by the poor or those who cannot afford a personal connection is a tricky issue. In Malindi area all those without a connection are served by kiosks/standpipes. Given the fact that more than 50% of the 149,000 people in Malindi area covered by the water supply have no connection, the implication is that each of the 195 licensed kiosks serves at least 400 people. A sample of 18 respondents was picked randomly from 18 houses within the area. The Analysis covered the issues presented in the paragraphs that follow:

Primary and Secondary Sources of Water

The primary water source for the 60% of the 18 respondents surveyed is standpipes or kiosks, 10% from neighbours, 20% fetch water from wells mostly, and only 10% acknowledged that they buy water from vendors.

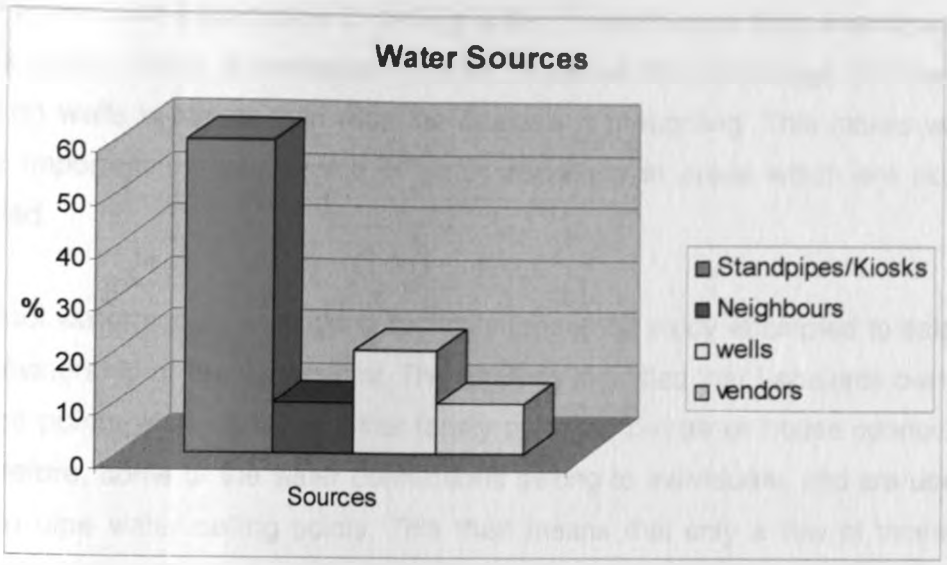


Figure 6. 17: Sources of water for those without a water connection

Therefore kiosks/standpipes play an important role as a water source for those without a water connection. However, there is a significant percentage of the area residents who draw water from wells as their primary source or rely on vendors. An estimated 149,000 people are covered by the water supply, representing a coverage percentage of 78.8%. The 20% who use wells as their primary water source compares very well with the percentage of the Malindi area residents who are not covered by the water supply. Those who rely on neighbours and vendors also consume water from the water supply.

The situation changes dramatically during periods of shortages when the numbers who rely on wells and vendors rises to 44.5% and 22.2% respectively from 20% and 10% respectively as indicated in Table 6.10.

Table 6. 10: **Comparison of primary sources of water at different times**

Primary source of water	Normal flow times (%)	Times of flow interruptions (%)
Kiosks/Standpipes	60	-
Neighbours	10	33.3
Wells	20	44.5
Vendors	10	22.2

In times of shortages vendors can only be getting water from wells since they have no sources of their own. On the other hand most neighbours do not have

their own water connection except those who own kiosks and a few who have a connection with a standpipe for selling water, in which case they also depend on wells during times of shortages. In effect therefore the percentage of those who rely on wells is higher than what the analysis is presenting. This makes wells a very important primary source of water especially in areas which are not well served.

Malindi water supply area being basically urban, the study attempted to establish the ownership of the water point. The analysis indicated that Landlords own 71% of the points while 29% are either family operated private or house connections. Therefore, some of the water connections belong to individuals, and are used as stand pipe water selling points. This then means that only a few of those who would wish to have a water connection can actually qualify for it. In effect therefore kiosks/standpipes and water vendors will continue to play a significant role as a primary source of water in the area.

Role of Vendors

59% of the respondents agreed that there were vendors in the area, while 41% of the respondents stated that there were no vendors in their areas of residence. With close to 60% of respondents acknowledging the presence of vendors in the area the implication is that vendors are an important source of water. Vendors become a source of water in areas without good water coverage, or where reliability is a problem. The price charged by vendors is high when compared to that charged by official kiosks, therefore if vendors are still an important feature in water distribution in the area then the water coverage and or reliability is poor.

Desire to have a Connection

Though 71% of those surveyed may be tenants, however, all wished to have their own connections. This tends to imply that they are not satisfied with the level of service being provided by the primary water sources. The issue is made clear when collection time is examined.

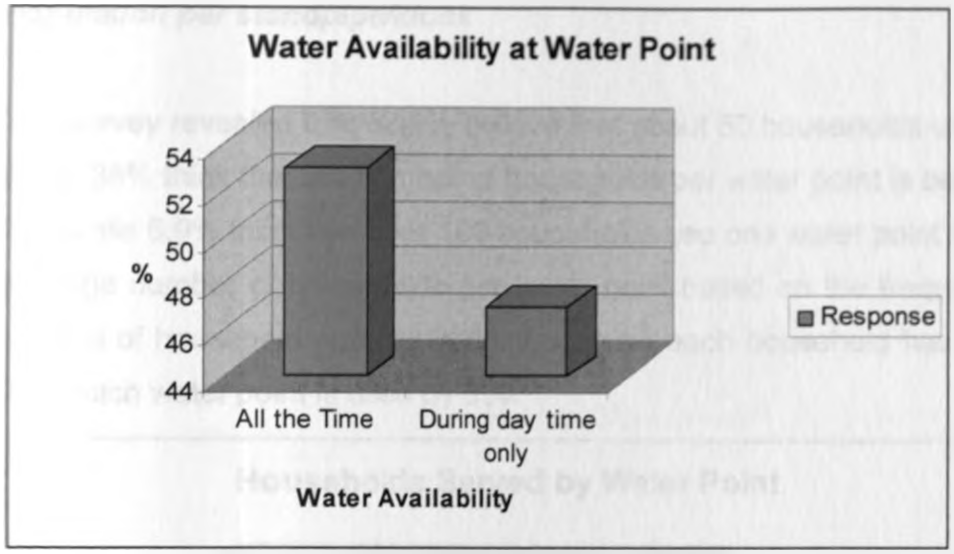


Figure 6. 18: Times when Water can be collected

Figure 6.18 shows that 53% of the customers interviewed get water any time they want it, while 47% get water only during the day. One complaint voiced was that most of the water points are closed at lunch hour and they close for the day at 06.30pm. Therefore, close to half the customers cannot access the water when they require it. However, the reasons given by the respondents for wishing to have their own connection included: to avoid buying water at exhorbitant prices; to have water near their premises and to avoid walking long distances in search of water. The dissatisfaction with the kiosks is on two accounts; price and number of kiosks. Inspite of this desire to have a private connection, 94% of the respondents reported that they do not know the procedure for acquiring a connection.

Distance to water point

59% of the respondents indicated that they have standpipes/kiosks/wells less than 50m from their houses, while 41 % reported the water source to be more than 50m away. In terms of distance covered to fetch water it appears that the majority of respondents are near enough to the water point. However, slum areas are high population centres, as such to determine if the distance to nearest collection point is realistic the survey had to examine the number of households who rely on any one water point.

Population per standpipe/kiosk

The survey revealed that 52.9% believe that about 50 households use each water point, 35% think that the number of households per water point is between 50 and 100 while 5.9% think that over 100 households use one water point (fig 6.19). The average number of households per water point based on the frequency for each interval of household number is 55. Assuming each household has 6 occupants, then each water point is used by 330.

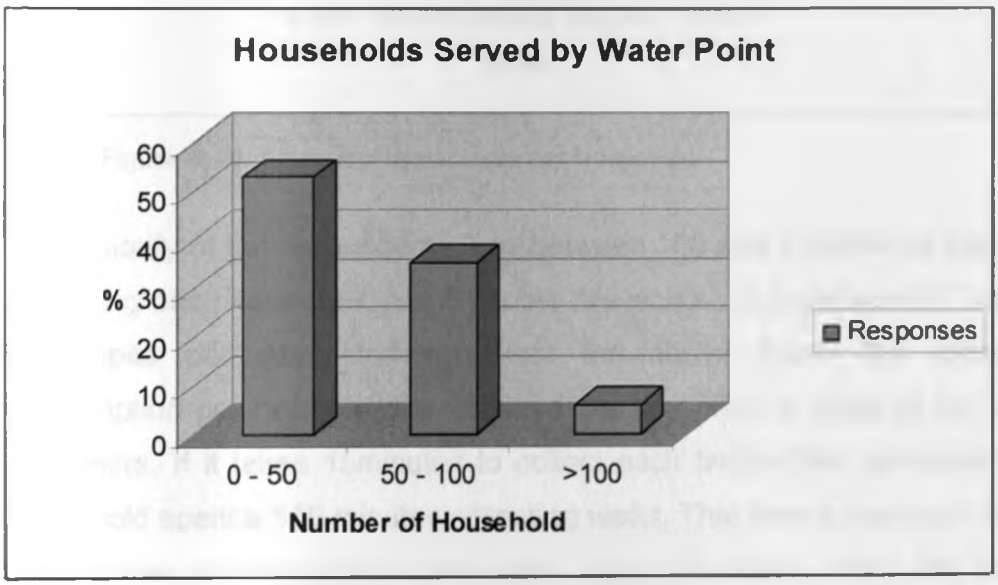


Figure 6. 19: Approximate Number of House holds that use a Water Point

The number of households served by each kiosk/standpipe is on the higher side and thus more kiosks are necessary.

Water use by Households

Figure 6.20 shows the distribution of water consumption per household without a water connection.

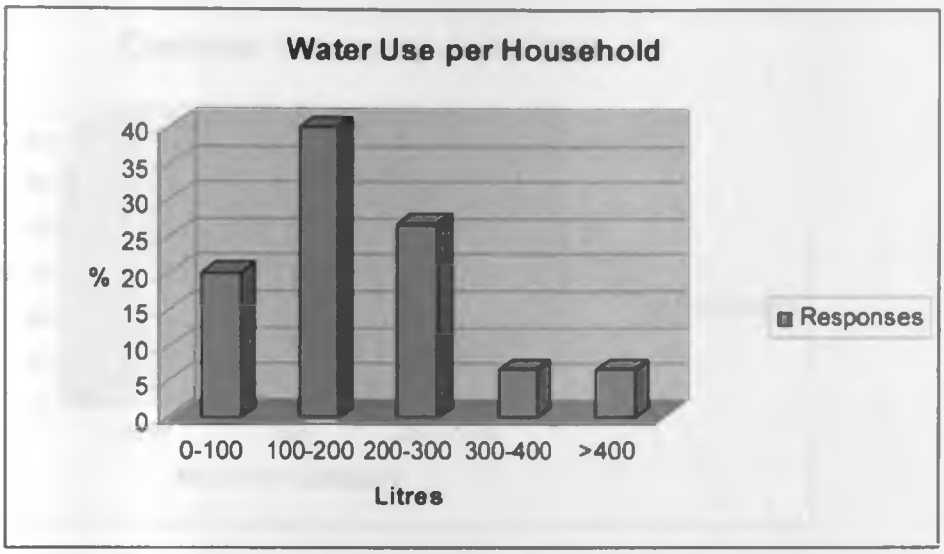


Figure 6. 20: Amount of Water Used per Household

The majority of the respondents, use between 100 and 200litres of water per day. Assuming each household has 6 people this works out to between 17 and 33 litres per capita per day. However, from the above figure the average water consumption per household is 185litres per day. This is close to ten twenty-litre containers. If it takes 15minutes to collect each twenty litre container then each household spends 150 minutes collecting water. This time is too much considering the number of households per water point. However, from the study, 59% respondents are of the view that the amount they collect is not the maximum they can use per day and they think they require more water. This certainly calls for more kiosks. The study further revealed that 100% of the respondents want to have more than one water collection point. This is can reduce the time taken to collect water which is close to two and half hours in a day, which is twenty percent of all daytime.

Cost of Water and Willingness to pay

Average charge for a 20litre container in Malindi water supply area is KShs 2. The views of the consumers about this price are as indicated in the Figure 6.21.

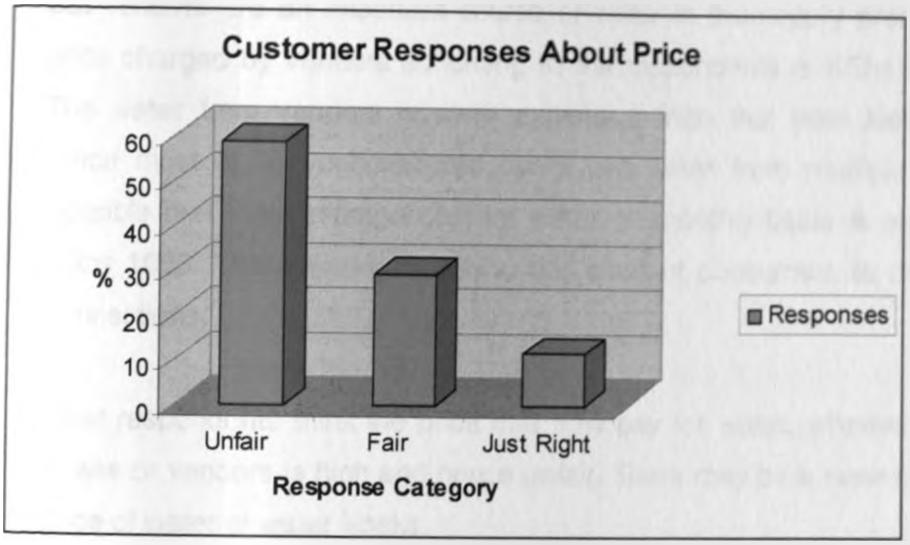


Figure 6. 21: Views about the Price of Water at Water Points

About 59% of those surveyed think the price is unfair, 29% are of the view that the price is fair, while 12% think the price is just right. The proposal of the price that should be charged from the survey is shown in Figure 6.22.

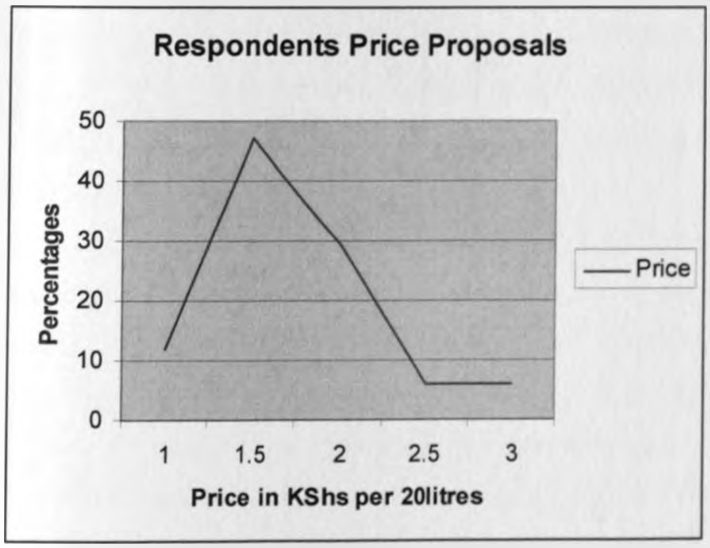


Figure 6. 22: Customer Proposals for the Price of a 20litre Container.

From Figure 6.22, it would be financially beneficial for the customers who use water kiosks to be charged not more than KShs 1.50 per 20litre container. This is the price that the customers are willing to pay. This translates to KShs 300/m^3 for the water used. The median price is KShs 150/m^3. The monthly average water consumption per household ranges between 3m^3 and 6m^3. The price paid by this category of consumers therefore ranges from KShs 450 to KShs 900 per month for a house hold of 6. A connected consumer pays about KShs 200 per month for the same consumption.

But vendors are an important source of water in the supply area. The average price charged by vendors according to the respondents is KShs 6 per 20 litres. The water from vendors is more expensive than that from kiosks/standpipes. Since most of the unconnected users use water from multiple sources, it is possible that their average cost for water on monthly basis is much more than KShs 1000. This therefore leads to this class of consumers to desire individual connections.

Most respondents think the price that they pay for water, whether from licensed kiosks or vendors is high and hence unfair. There may be a case for reducing the price of water at water kiosks.

7 CONCLUSIONS AND RECOMMENDATIONS

7.1 Summary

Malindi water supply was faced with poor financial and operational procedures, poor quality of service delivery as a result there was a desire within the Government in general and the NWCPC in particular to improve operational and strategic management in the supply. Furthermore, there were personnel and social infrastructure constraints that necessitated enhancement of the technical capacity of the supply. There was general mismanagement in the supply, including poor record keeping and bureaucratic bottlenecks especially in procurement and approval of desired improvements, as such professional management was necessary if the supply was to improve in operations. The Malindi water supply dates as far back as the late 1940's though most of the infrastructure now in use was put in place between 1960 and 1985, the technology in use including air valves, pressure valves asbestos pipes was not only old but the infrastructure was dilapidated, the supply therefore required injection of new technology such as pressure regulating valves, upvc and ductile iron pipes to increase scheme efficiency in addition the supply required rehabilitation. All these measures required funds. To give these funds the development partners insisted that the management had to be through PSP arrangements as public management had not been very successful. But the operator could not come in without a review of the tariff, thus the review of tariff, before the commencement of the contract agreement, which took place about eighteen months after the signing of the contract. Therefore the desire to improve operational and strategic management in the supply, the need to enhance technical capacity, development partner pressure, demand for professional management, increasing tariffs by using Malindi water supply as a test case and introducing new technology were the factors that contributed to the adoption of PSP arrangements.

The contract agreement entered into between the NWCPC and the operator had strengths and weaknesses. Some of the strengths in the contract agreement included; specified performance target, provision of incentives for good performance and penalties for poor performance, facilitation of the client to carryout periodical inspection of operator's accounts, assurance of cost covering tariffs and assurance that funds for infrastructure development would be available.

However, the contract had visible weaknesses that included; lack of clear objectives in the agreement for the management contract of the operator, lack of clear monitoring guidelines that the client could use to review the management of the contract, lack of provisions to review the performance targets or penalties and incentives, failure of the contract to give the operator freehand in procurements, lack of a requirement for competitive bidding at the end of the contract.

The performance targets set for the operator in the agreement were achieved as follows; the consumer base increased by more than 1000 connections, which was the target figure, the target for UFW figure of 25% was on the overall not achieved, collection efficiency of as close as possible to 100% was also not achieved, the incentive collection of 85% was achieved, but the target incentive figure of 85% was ridiculous, as at the start of the contract the parties agreed that collection efficiency was already 80%. Historical debt analysis was finalised as per the target, the operator was unable to optimise the number of area personnel as per the agreement. The operator did not employ a water bailiff and an assistant as agreed in the contract, direct computerisation of consumer meter readings had not been implemented as at the time of the study. Although the GIS/MIS system for the area was established and updated, it was not operational as it required further software. On the overall, therefore, most performance targets, although they did not appear competitive were not achieved.

Although most of the performance targets were not fully achieved, there is a general agreement that there has been a marked improvement in efficiency and effectiveness of service delivery in the water supply. The strategies adopted by the operator for efficient service delivery included; employee focus that included setting performance targets, training and good pay for employees. There was general improvement in Operations and Maintenance, which included increased maintenance funds, introduction of preventive maintenance and provision of adequate transport. The PSP operator also made improvements in service standards and coverage through increased number of connections and replacement of damaged connections in addition the reticulation system was extended and also strengthened. The other strategy adopted was improvement in revenue collection through improved meter reading and billing. Customer focus was also introduced through public meetings and news briefs attached to bills to

customers and dealing with most of consumer complaints. The operator introduced water supply monitoring through leak detection and regular meter inspection. The most important strategy introduced was the deployment of professionals in the management of the water supply.

Generally the consumers with a water connection indicated an improved service delivery in Malindi water supply area, however, they also had complaints. The extent of improved water services and complaints by the respondents with a water connection is indicated by Table 7.1.

Table 7. 1: Respondents indicators for improved quality of services and Complaints

Indicator and % satisfaction		Complaint
Supply reliability	- 51%	No Knowledge of where to direct complaints -21%
Continuity of supply	- 57	Not informed about interruptions - 48%
Pressure of supply adequacy	- 80	None attendance to complaints -27%
Regularity of meter reading	- 100	Tariff used not explained - 39%
Problem free bills	- 72	Not involved in management - 73%
Upholding of consumer rights	- 73	Slow repair of bursts
Satisfaction with quality	- 57	Operator to strict
Connection efficiency	- 64	Imposing of unreasonable charges

The consumers without a connection and that draw water from kiosks were of the view that the kiosks were very few and should be increased in number. This group of consumers used an average of 185 litres of water per household per day and 59% thought this average was not the maximum they could use in a day. The

water charges ranged between Kshs 2 and 3, for a twenty litre container at a water kiosk while the price by water vendors averaged Kshs 6 for the same container. About 59% of the unconnected consumers were of the view that the price charged at the water kiosk for a twenty litre container was unfair, they proposed a price of Kshs 1.50. Indeed 94.4% of them said they have no ability to pay more than what they recommended. About 47% of the respondents without a water connection had alternative water source which appeared to be wells. There was underlying feeling among consumers that access to a regulated water supply system would result to cheaper costs and better quality besides ensuring a reliable water supply.

7.2 Conclusions

At the time of the study, the contract had been in force for a period of 4 years of the agreed contract period of 4½ years. The following conclusions can be drawn from the study:

1. The need for management, technological, operational, quality of service and financial improvements, led to PSP engagement in the water supply. There was lack of professional staff at the scheme level and the management structure was inflexible. Furthermore use of modern information management system was limited. In addition the management of the water supply suffered from key problems that included lack of preventive maintenance, inadequate transport, difficaulties in procurement, poor metering and poor billing and revenue collection. Development partners and decision makers in the NWCPC were convinced that these problems could best be solved through PSP.

2. The management contract was well prepared with strong financial provisions, however, the incentives and penalties were based on poor performance standards. For example the range to which a bonus was payable to the operator was 40% ± 5% for UFW. At the start of the contract the average water loss was about 50%. Therefore the bonus payment figure for UFW was too low. Another weakness was in some performance targets, specifically the ones concerning collection efficiency and UFW. Attainment of a collection target of 85% after twelve months was too low,

when at the start of the contract the estimated collection efficiency was close to 80%. On the other hand a target figure for UFW of 25% for a PSP operator was rather on the lower side.

3. Through the involvement of the PSP operator, new services were introduced, which included increase in maintenance funds, increased use of computers and thus improving record keeping and information flow, increase in operational efficiency through good meter maintenance system, introduction of leak detection system, increase in professional staff and improved billing.

4. Generally the consumers were happy with the services offered, thus indicating that the PSP operator had succeeded in increasing water reliability and capacity for service delivery. However, from the point of view of the customers, complaints were not well addressed or attended to and therefore more attention is required in this aspect of operations. In addition the consumers who bought water from kiosks and vendors thought that water was very expensive and the price should be reduced.

The PSP option adopted in Malindi water supply area (i.e. management contract) was successful in solving the problems that the scheme faced and in the process improved service delivery and water reliability in the area. The PSP operator has increased efficiency in the water supply. The PSP option adopted however may not work in any other urban area without adequate preparation similar to what the Malindi area had in form of the service contracts.

However, there are important lessons from the study, that can be replicated in other urban water supplies without necessarily involving a PSP operator.

I. High calibre staff with sufficient and appropriate management and administrative capacity is necessary at scheme level. These professional staff will appreciate the need for technical and financial planning and the appropriate structures in staff deployment and assignment to ensure efficiency and effectiveness.

II. Malindi Water Supply covers an area of 445 Km^2 and has 7,700 connections. Its monthly O & M budget is between Kshs 3-4 million this is backed up by 4 vehicles, 22 bicycles and 6 motorcycles. The rest of Mombasa and Coastal region with about 52,000 connections in an area of 30,000 Km^2 has monthly O&M budget of Kshs 6 million. Therefore the second lesson is that sufficient funding and transport has to be provided to O&M functions if performance improvements are to be realised.

III. When customers are assured of reliable water supply system, they are willing to pay for the services rendered. Further if customers know that the utility managers are willing to provide information and listen to them and attend to their complaints and needs, the confidence in the utility increases. Therefore customer focus is an important aspect of a water utility.

IV. Before the 4.5year management contract, Malindi had had a 3.5 year service contract, whose degree of success was fair. This certainly laid ground work for the management contract. The lesson is that do not enter into PSP arrangements unless the water utility has sorted out and understands the problems that may be the cause of non-performance. It is only after the utility analyses and evaluates its weakness that the PSP option necessary to further improve the services can be determined.

v. Kiosks and standpipes are an important source of water for consumers without their own connection. The distance between kiosks in Malindi Bondeni area is long for an urban area with high concentration of unplanned houses. The situation is made worse by the fact that it takes about twelve months to get approval to put up a kiosk. The lesson is that while planning to supply water to consumers without a connection in densely populated urban areas the distance between kiosks should be anticipated and allowance made for probable kiosk locations during planning phase. Further the approval for construction of kiosks should be flexible in such areas.

VI. There is no doubt that customer care in the Malindi contract has been above average for any water utility in this country. There however complaints from consumers regarding high charges for consumers without official kiosks, tariff

structure not having been explained, dirty water and the operator being to strict. The lesson is that tariff structure, quality of water supplied and penalties that can be applied to consumers in case they default on their obligations require to be explained clearly. Furthermore the explanations have to be continuous.

VII. The Water Act Cap 372 had rules and regulations covering disconnections and reconnections for non payment of water fees. Most water undertakers rarely enforced these rules. In Malindi water supply the rules were vigorously enforced. As a result most inquiries at the operators' office are connected to payment of water charges. The lesson is that rules and regulations concerning disconnections and reconnections for non payment of water charges have to be enforced by water service providers.

VIII. When PSP contract in Malindi commenced the understanding was that water tariffs would be reviewed on annual basis. For the duration of the contract there was no tariff review by the client. As the result the client was subsidising the operation of Malindi water supply to the tune of KShs 2.65 million (Cost of boosting chlorine at Kakuyuni and cost of producing water at Sabaki water works) per month. Further more based on the tariff structure in use and the tariff itself, only large consumers utilising over 300m3 of water per month and consumers who buy water from kiosks were paying a unit price higher than the average tariff in use. The lesson from the study is that cost covering tariffs that take the interests of all consumers in mind are essential for sustainable water services.

These are important lessons from the study, which utilities that do not wish to adopt PSP option could utilise to improve the management and operations of the water utilities in order to provide efficient and sustainable services.

7.3 Recommendations

7.3.1 Skilled Personnel in water utilities

Most water utilities are faced with various problems including inadequate service coverage and quality and poor operations. The problem is usually due to the fact that management systems have failed to provide the necessary guidance and structure for effective operation and maintenance. Whereas the PSP management option adopted in Malindi water supply which was mostly donor driven managed to solve the problems that the water supply faced, this study has shown that all the client required was skilled and trained personnel to manage and operate the water supply to achieve the same results. The services introduced by the PSP operator which included employee focus, improvement of O&M, extension of the system, water supply monitoring, customer focus did not have to wait for a PSP operator.

Therefore, skilled and well trained personnel are needed in our urban water utilities if the public sector has to provide to efficient water services. This type of personnel will be able to introduce effective management that focuses on the consumers, understands technical aspects of a water supply and recognises utility employees is the key to efficient water utilities.

7.3.2 Operation and Maintenance Funding

In any water utility operation and maintenance bears the responsibility for ensuring that the utility accomplishes its most important objective, which is providing water services in sufficient quality, quantity and continuity to meet the needs of those served. Inadequate funding of O&M causes water supply failures as there will be no funds with which to buy the necessary materials required. In Malindi water supply the budget for the projected financial requirements for O&M for the whole financial year is approved by the client at the beginning of that financial year. The full required O&M budget is obtained from water sales revenue during the financial year. As a result all the O&M requirements are funded as budgeted.

Therefore, if water utilities are to operate effectively and efficiently then operation and maintenance activities have to be properly determined budgeted for, and be fully funded.

7.3.3 Customer Prioritisation

At the beginning of the service contracts customer dissatisfaction and dishonesty were noted as major problems. From the start of the management contract the PSP operator set out a deliberate strategy to achieve customer satisfaction and reduce dishonesty and complaints. This strategy generally succeeded.

Therefore, water utilities have to keep their consumers informed about pricing, water quality and quantity and probable disruptions. The study also showed that customers wish to be involved in management of the water utility. In effect, the water utility management should involve their consumers in the decision making on key issues that affect them such as willingness and ability to pay and positioning of kiosks.

7.3.4 Outside interference in water management

After the commencement of the contract there was minimum interference in the management of water either by the municipality, politicians from the area or the client. The result is that the PSP operator was able to provide adequate and reliable water services.

This indicates that if there if there is no heavy ideological or political interference in urban water supplies, from whichever quarter, then the management in place will be able to provide viable and quality water services. However, if the public thinks interference cannot be avoided then simple PSP contracts moving to more complex PSP contracts may be what is required to solve the problems that our water supplies face.

7.3.5 Consumer involvement in utility management

The Dublin principle calls for management of water at the lowest possible level. Malindi water supply was managed by the PSP operator as a separate entity from the other Coastal water supplies. The Malindi municipality was the lowest possible level of management of this water supply. However, most respondents (73%) wished to be involved in the management of the water supply.

The implication of this is that, the municipal residents wished to exercise power and influence in the management of the water supply. This can only happen if ownership of the water supply is retained under municipal administration. The MWRMD may therefore have to re-look at the clustering of urban water supplies that is now gaining prominence in the country as it reduces each of the participating municipals residents influence in the management of the water supply. The other issue is that the residents if consulted may not wish for PSP involvement in water supplies for which they have paid for the assets, as they do not wish to share the profits with the private operator. Urban water supplies may therefore have to be handed over to individual LAs as called for by the Water Policy of 1999.

7.3.6 Procurement and supervision of a private Operator

The normal practice in procuring a private operator is through competition by different operators. The PSP operator in Malindi was single sourced contrary to established norms. As a result the PSP contract had apparent weaknesses including lack of mention of clear objectives in the contract document, lack of clear guidelines for the contract that would assist the client monitor the contract implementation, lack of provision to expand and review the performance targets during the contract period. It is also probable that if there had been competition, the fee charged by the operator would have been less. Single sourcing could have been due to donor pressure as the investment funds were expected from that particular donor.

The MWRMD has to strengthen the regulatory board so that it guides the WSBs when preparing PSP contracts. Further no PSP contract should be signed that has not been prepared or at least reviewed by experts.

7.4 Assessment of the study

The topic of study was a real challenge at the beginning of the study as the political leadership in the MWRMD made it clear six months into the study that PSP was not an alternative in the management of urban water supplies. However

there was consolation as the overall government policy for privatisation did not exclude water utilities.

The author would have wished to compare the performance of the PSP operator to that of NWCPC before the commencement of the service contracts or even MWRMD fifteen years earlier; however lack of proper records prevented this important input in the study.

Furthermore the questionnaires were only administered to senior managers of the PSP operator and the client, it is possible that if the other workers who are not in managerial positions had been included in the study the results could have been a little different in as far as questionnaire 3 dealing with services introduced and responsibilities of the operator and the client are concerned.

There had been an audit of the financial performance of the PSP operator two years prior to this study. The results of that audit were not very favourable to the PSP operator; the senior managers at the operators head office were unwilling to cooperate through releasing some raw field data that was in their possession. However all reports including monthly, quarterly and annual reports submitted by the PSP operator, were availed to the author by the client. If the PSP operator had released the raw data may be the assessment of the fulfilment of the performance targets could have been different; most probably more critical than what is reported in the study.

The results could also have been improved upon if each consumer category had been interviewed separately rather than considering all categories of metered consumers as homogeneous. The problem however was that there weren't sufficient numbers for some metered categories while if sufficient numbers of each category had to be interviewed the cost and time required would not have been sufficient.

The author recognises that in such a study it is not possible to have all conditions perfect. The results obtained therefore give a good view of the performance of the PSP operator in Malindi water supply.

7.5 Further Research

Public water utilities have not been very open to researchers unless you are an insider like in this study. There is need to improve research collaboration if the water sector is to benefit from research.

For example: one of the lessons learnt is that privatisation can only succeed if a water utility has identified and understands the problems that are hindering efficient and effective delivery of the water services. Option studies for the cities have been undertaken in this country. None of the studies was explicit on the option that is best suited for a particular city. It is possible that the compromise option agreed upon for each city may not work as there are many missing gaps in the infrastructure and operational information in the water utilities. Therefore, a period of preparation is necessary before any of the agreed options can be put into effect. In effect the many management options being implemented in various urban areas of this country are proper preparations for the entry of the private sector in provision of water. Therefore there is need for further study in the following areas.

i. ***Research into Other Management Options***

A number of management options are being tried in various urban centres. These include management through trustees which is a form of public-public-partnership, management through utility reorganisation and management through the various water companies that have been formed by various local authorities. Case studies of these management options need to be undertaken to determine their performance and effectiveness.

ii. ***Customer Orientation strategies***

Customers are becoming bolder in demanding their rights. One of the findings from the Malindi case study is that customers want to be involved in decision making in water utilities. This is in line with the Water Act 2002 that encourages public consultation in the decision making process in the water sector. Customers' perception needs and expectations, therefore, need to be understood if customer responsive strategies are to be developed.

iii. ***Demand Management***

With dwindling water resources, increasing urban water demand and shortage of funds for rehabilitation/augmentation and developing new water supplies, there is need to look into demand management as a means of delaying investment through responsible use and reduction of UFW. This will lead to realistic planning of investment needs and hence ward off donor pressure for PSP due to requirement of investment funds.

iv. ***Scope of the necessary regulation in the water sector***

There seems to be a misconception in the policy makers in the water sector that water regulation is about legal issues in as far as preparation for PSP or other management options in the water sector are concerned. The other side is that the donors supporting the establishment of the regulatory process are more obsessed with economic regulation. All these are no doubt important. There is therefore, need to research in the actual regulation requirements in as far as the different management options are concerned especially in this country where water coverage is just about 50%.

v. Services to unconnected consumers

The public sector has not fared very well in providing water and sanitation services to unconnected consumers in slum areas. The case study of Malindi water supply also indicates that the private sector has not performed any better. There is a need to look into the best options of serving the unconnected consumers in slum areas.

8 REFERENCES

1) Alegre, H., Hirner, W., Baptista, J.M., and Parena, R. (2000). Performance Indicators for Water Supply Services IWA Publishing. London.
2) Aseto,O. and Okello,J.A. (1997). Privatization in Kenya, Basic books (Kenya) Limited , Nairobi 1997
3) Baum, W.C & Tolbert, S.M. (1985). Investment in Development: Lessons of World Bank experience, Oxford University Press, 1985
4) Bayliss, K. (2000). Water Privatization in Africa; "Lesson from three case studies" PSIRU University of Greenwich (htt://WWW.psiru.org)
5) Business and Economic Research (BER) Co Ltd (2003). Report on the first workshop for political heads and chief officers of LAs within Nairobi City and environs July 2003.
6) CAS Consultants (2000), Study on Private Sector Participation in Rural Water Supply and Sanitation. Final Report, MENR, October, 2000.
7) Cook, P & KirkPatrick, C. (1988) Privatisation in Less Developed Countries, Harvester Wheatsheaf Books, 1988.
8) Department of Water Development (2001). Country Strategy on Water Sanitation Services, MENR, September, 2001
9) Elifson K, Runyon R.P, Huber A (1998). Fundamentals of Social Statistics. McGraw Hill. Third edition.
10) Fama Resources Ltd (2000): Water and Sanitation Sector Programmes Co-ordination Committee: The Urban Water Group: study team 1: Commercialization and Private Sector Participation, MENR.
11) Gauff Ingenieure (1996): Second Mombasa & Coastatal Water Supply; Engineering and Rehabilitation Poject: Improvement in Revenue Collection and Water Management-Malindi Sub Area, May 1996.
12) Gauff Ingenieure (1997): Second Mombasa and Coastal Water Supply; Engineering and Rehabilitation Project: Improvement in Revenue Collection and Water Management-Malindi Sub Area: Addendum 3B for the Period July 1996 to December 1997, September, 1997.
13) Gauff Ingenieure (1998): Second Mombasa and Coastal Water Supply; Engineering and Rehabilitation Project: Improvement in Revenue Collection and Water Management-Malindi Sub Area:Summary Progress Report No.12 for the period October to December, 1997, March 1998.
14) Gauff Ingenieure (2000). A brief on the Malindi Water Supply,November, 2000.

15) Gauff Ingenieure: The Sabaki Water Project; Malindi Water Area, Agency Contract for Management Services. Collection of Quarterly Progress Reports, Spanning the period February 2000 to April 2004, National Water Conservation & Pipeline Corporation.

16) H. P. Gauff KG (1980). Report on Existing Water Reticulation in Malindi, Ministry of Water Development, July, 1980.

17) H.P. Gauff KG (1991). Malindi Pipeline Project Supplementary Works, Ministry of Water Development, February 1991.

18) H.P.Gauff KG (1981). Malindi Pipeline; Preliminary Design: Part 1 Report, Ministry of Water Development, February, 1981.

19) Halcrow Group Ltd (2002). A Study of Options for Private Sector Participation in the Water and Sanitation Services of Nairobi. Report on the Preferred PSP Option (draft) January 2002.

20) Halcrow Group Ltd (2003). Review of Options for Private Sector Participation in the Provision of Water and Sanitation Services in Kisumu. Preliminary Report Volume 1, April 2003.

21) Hifab International AS (1988): Report of Appraisal Mission Minor Urban Water Supply Programme, 1988-1992, NORAD, April 1988

22) Hukka, J., Juhola, P., Katko,T., Morange, H., and Pietila, P., (eds). (1994). Sound Institutional Strategies for Water Supply and Sanitation Services- Seminar proceeding; Tampare University, Publication No. B59.

23) Hukka, J.J & Katko, T.S (2003). Water Privatization revisited; Panacea or PanCake IRC, International Water and Sanitation Centre Delft Netherlands 2003.

24) ICS Interconsult (1984). Water Use and Tariff Study. Policy Options, Ministry of Water Development, July 1984.

25) International Monetary Fund (1986). World Economic Outlook, Washington DC: IMF.

26) International Monetary Fund (1986a). Fund Supported Programmes, Fiscal Policy and Income Distribution: Occassional Paper 46 Washington DC: IMF.

27) ISO 9000:2000 (2004). Quality management Fundamental and Vocabulary (www.bsi-global.com/Global/iso9000).

28) Janssens, J.G (1996). Private Sector Participation option in the Water Supply and Sewerage Sector. First Eastern and Southern African Region/IWSA Water Conference, 1996, Gaborne, Botswana.

29) Japan International Cooperation Agency (JICA) (1997). Seven Towns Study, for Water Supply in Eastern Province of Kenya, The Ministry of Water Development. Nippon Koei 1997.

30) Japan International Cooperation Cooperation Agency (JICA) (1998). The Study on Kisumu Water Supply and Sewerage system in the Republic of Kenya. Ministry of Local Authorities. Kisumu Municipal Council.

31) JICA (1992). The National Water Master Plan. Japan International Cooperation Agency (JICA). Ministry of Water Development, (1992).

32) Kenya Colony (1929). Water Ordinance. Government Printer, Nairobi.

33) Kenya colony, (1958). Mombasa Pipeline Board Cap 373, Government Printer, Nairobi.

34) KFW/Katalyst21 (2001). Private Sector Participation in the provision of Urban Water Supply and Sanitation Services in Secondary Towns in Kenya, February 2001.

35) Krathwohl, D.R. (1998). Methods of Educational and Social Science Research, An Integrated approach. Longman, London, Second edition.

36) Leedy, P. D (1980). Practical Research Planning and Design. Macmillan publishing co. Inc New York, Second edition.

37) Manifesto for the National Rainbow Coalition (Narc), 2002: Titled Democracy and Empowerment. Narc November, 2002.

38) Mason, E.J. & Bramble, W.J. (1997). Research in Education and behavioural science concepts and methods. Brown & Benchmark Publishers, (1997).

39) Ministry of Local Government (1996). Institutional Reforms for water and sanitation services in non water undertaking LAs Vol1 Main Report GTZ-UWASAM, GTZ, June 1996.

40) Ministry of Planning and National Development (2003). Multiple Indictor Cluster Report, 2000 Central Bureau of Statistics, March, 2003.

41) Ministry of Water Development (1974). Progress report on the Implementation of Rural Water Supply Programme I and II GoK/Sida, September, 1974.

42) MOWD (1986). Design Manual for Water Supply in Kenya.

43) MOWRMD (2004). Brief on Broad framework of reforms in the water sector: unpublished policy paper, Water Sector Reform Secretariat.

44) National Water Conservation and Pipeline Co-operation (1998): The Sabaki Water Project; Agency Agreement Between NWCPC and Gauff Ingenieure dated 30th November, 1998.

45) National Water Conservation and Pipeline Corporation (NWCPC), (1993): Corporate Development Plan, Water Sector Study. WS Atkins Consultants.

46) Nganga,J.M.(1999). Commercialization process of Water Supplies and Sanitation Services in Kenya Urban Areas. A case study of Nyeri Municipal Council, Unpublished Master Thesis, Faculty of Commerce, University of Nairobi.

47) Nippon Koei, (1998). AfterCare Study on the National Water Master Plan, JICA, July, 1998.

48) Onjala, J .O. (2002). Managing Water Scarcity in Kenya: Industrial Responses to Tariffs and Regulatory Enforcement, PhD, Thesis Roskilde University, Denmark. 2002.

49) Onjala, J.O. (2002a). Good Intentions, Structural Pitfalls: Early Lessons from urban Water Commercialization Attempts in Kenya. Centre for Development Research Working Paper 02.2 of 2002.

50) Osborne, D & Gaebler,T(1993). Reinventing Government: How the Entrepreneurial Sprit is transforming the Public Sector. A Plune Book February 1993.

51) PriceWaterHouseCoopers (2002). Review of options for Private Sector Participation in the Provision of Water Supply and Sanitation Services in Mombasa and Coastal Region (Kenya). Preliminary Report on the Comparison of Options, September 2002.

52) Public Citizen's critical Mass Energy and Environment. Top 10 reasons to oppose Water Privatization, Washington DC, 2001 www.citizen.org/cmep.

53) Public Private Infrastructure Advisory Facility, and Water and Sanitation Program (2002). New Designs for Water and Sanitation Transactions: making Private Sector Participation Work for the poor, May, 2002.

54) Rees, J.A (1998). Regulation and Private Participation in the Water and Sanitation Sector Global Water Partnership TAC Background paper no.1 series, July, 1998.

55) Republic of Italy (1992). Water in Italy, Technology, Legal and Administrative Aspects Ministry of Public Works, Rome, 1992.

56) Republic of Kenya (1965). Sessional Paper No. 10 of 1965 "African Socialism and its application to Planning in Kenya". Government Printers, Nairobi.

57) Republic of Kenya (1974). Development Plan 1974 – 78. Government Printer, Nairobi.

58) Republic of Kenya (1975). Legal Notice No. 94 "Water Act Cap 372: Government Printers, Nairobi.

59) Republic of Kenya (1979). Development Plan 1979 – 1983. Government Printer, Nairobi.

60) Republic of Kenya (1981). Water Act Cap 372 Legal Notice No. 194 of 1981 Government Printers, Nairobi.

61) Republic of Kenya (1983). District Focus for Rural Development (Blue Book) Revised. Office of the President, Government printer, Nairobi.

62) Republic of Kenya (1983). Kenya Gazette Supplement No. 87 Legislative Supplement No. 4 Water Act Cap 372 pp 28 – 42 Government Printers, Nairobi.

63) Republic of Kenya (1984). Development Plan 1984 – 1988. Government Printer, Nairobi.

64) Republic of Kenya (1986). Sessional Paper No. 1 of 1986 "Economic Management for Renewed Growth". Government Printer, Nairobi.

65) Republic of Kenya (1988). The National Water Conservation and Pipeline Corporation, Order, 1988 Cap 446 Legal Notice No. 280; Government Printers, Nairobi.

66) Republic of Kenya (1999). Sessional Paper No. 1 of 1999 "National Policy on Water Resources Management and Development, Government Printers, Nairobi, 28th April 1999.

67) Republic of Kenya Water Act 2002 Act No. 8 of 2002 Government Printers, Nairobi.

68) Richards, T and Farid, M (2002). Study on identification of utility management options for small and medium Towns water supply. Report prepared for KFW July 2002.

69) Schalkwyk, A van (2001). Institutional arrangement and support services required for sustainable community water supply. Water Research Commission Report No. 959/1/01, April 2001.

70) Seppala,O.T (2004). Visionary Management in Water Service: Reform and development of Institutional Framework. PhD. Thesis, Tampare University of Technology Publication 457, 2004. Finland.

71) Shanker,A & Rodman, L (1996). Public Private Partnership AWWA April, 1996.

72) Sida (1983a). Operations and Maintenance study, Ministry of Water Development, 1983.

73) Sida (1992). Delineation Study, The Water Sector In Kenya, MENR, July, 1992.

74) Sida, (1977). Evaluation of the Rural Water Supply Programme I, II, III, Ministry of Water Development, September, 1977.

75) Sida, (1983b). Water Use Study Report, Ministry of Water Development, 1983.

76) Stoltmann, W. (2000). The Role of the Private Sector in the Provision Of Water and Waste Water Services; problems of Urban Water concern.

77) Stufflebeam, D.I, Foley, W.J, Gephart, W.J, Guba, E.G, Hammond, R.L, Meriman, H.O and Provus, M.M (1971). Educational Evaluation and Decision Making, Phi Delta Kappa (1971).

78) TARM Consultants (1991). Framework for self help and NGO component In Water and Sanitation. First draft outline report, Sida, 1991.

79) Ugaz C (2003). Privatization in Latin America: Seminar Proceedings, Greenwich University 2003.

80) UN – Habitat (2003). Water and Sanitation in the World's Cities: Local Action for Global Goals, Earth Scan Publication Ltd. 2003

81) UN Habitat (1997). Partnership in the Water Sector for Cities in Africa. Report of the Cape Town Consultations Cape-Town December, 1997

82) UNIDO (1979). Industrial Priorities in Development Countries, New York United Nations

83) Urban Water and Sanitation Management (UWASAM) (2001) Report on the mid term progress review GTZ Gmbh Eschborn, Sept 2001.

84) Water Utilities Partnership for Capacity (WUP) Africa (2003). Better Water and Sanitation for the Urban poor: Good Practice from sub-Saharan Africa. WUP, July 2003.

85) Webster, M & Sansom, K (1999). Public – Private Partnership and the Poor: An Initial Review, Review, Task No. 164 well study, March 1999.

86) Westerhoff,G.P & Lane,T.J (1996). Competitive ways to run Water Utilities. American Water Works Association, April, 1996.

87) WHO (1973a). Sectoral Study and National Programming for Community and Rural Water Supply, Sewerage and Water Pollution Control Report No. 10. Recommendations on Administration and Organizational Structure for Water supply and Sewerage Development to the Government of Kenya. WHO Brazaville August, 1973.

88) WHO (1973b). Sectoral Study and National Programming for Community and Rural Water Supply, Sewerage and Water Pollution Control Report No. 12. Ten Year Development Programme for community water supplies. Recommendations to the Government of Kenya. WHO Brazaville April, 1973.

89) WHO (1994). Operation and Maintenance of Water Supply and Sanitation Systems. Case Studies: Edited by H. J. McPherson Geneva February, 1994.

90) WHO (1994). Tools for the Assessment of Operation and Maintenance status of Water Supplies; Draft Report June, 1994.

91) World Bank (1983). World Development Report: Washington DC: World Bank.

92) World Bank (1997). Toolkits for Private Sector Participation in Water and Sanitation The World Bank Washington DC 1997.

93) World Bank (1997a); Mombasa Water and Sanitation Project and Second Mombasa and Coastal Water Supply Engineering and Rehabilitation Project (Credit 2333-KE): Mission Aide Memoire, October 22 – November 7, 1997.

94) World Bank (2000). Review of the Water Supply and Sanitation Sector in Kenya. Aide Memoire, Joint World Bank, KFW, GTZ and AFD Mission November, 2000.

95) World Bank, (1981). Accelerated Development in Sub-Saharan Africa: An Agenda for Action, Washington DC: World Bank.

The Definition of terms

i) **Commercialization** - public water utility formed to operate as an autonomous commercial enterprise with a Managing Director and a Board of Directors.

ii) **Effectiveness** – Measure of how an well an organisation achieves its own objectives and goals.

iii) **Efficiency** – Process of maximising the productivity of inputs

iv) **Evaluation** - A process of determining the value or worth of something.

v) **Institutional setup** - The organizational structure for a water supply utility.

vi) **Management practices** - Operation and maintenance modalities of water supply facilities.

vii) **Private sector participation** - The role the private sector plays in delivery of services.

viii) **Performance Indicator** – A measure of a particular aspect ofvthe organisations performance or standard of service.

ix) **Regulation** – supervision and control through a set of rules over activities of a business in the interest of societal efficiency and fairness.

x) **Water Utility** – An organisation or institution ultimately responsible for providing water services also referred to as Water Undertaker.

xi) **Water undertaker** – Same as water utility

APPENDICES

Appendix A4-1: Physical situation of water in Malindi (December 1995)

Physical situation improvement Matrix adopted and modified from Gauff Ingenieure 1996 p 1

S/No	Problem before 1st service contract	Cause	Action Taken by Dec 95
i.	Physical Water losses of the order 50%	Poor condition of older pipe network within town centre	Established extent of older network and its general condition, routine reading of bulk meters when operational
ii.	Estimated billing in excess of 80%	Lack of regular meter reading, lack of routine cleaning of stalled meters	Introduction of regular monthly meter reading and cleaning/replacement of stalled meters
iii.	Poor condition of the small diameter water mains laid since 1985	Poor quality of installation lack of routine O&M, lack of transport	Recommended the setting aside of part of additional revenue realised towards replacement by NWCPC
iv.	Poor condition and unserviceability of line valves	Lack of routine O&M, lack of transport	none
v.	Poor condition and unserviceability of washouts and washout valves	Lack of routine O&M	Location of washouts commenced
vi.	The amount of accumulated loose and broken materials within the system and the resulting stalling of bulk water meters	Lack of care during repair of leakages and bursts, lack of repair materials, lack of transport	Obtain quotation for online strainers
vii.	The amount of accumulated loose and broken materials within the system and the resulting stalling of consumer water meters in particular areas	Lack of care during repair of leakages and bursts	Institute cleaning programme for stalled meters
viii.	Ineffective ways of making disconnections	Time and cost of the exercise	Install meter plugs(lockage washers) and seal across meter
ix.	Poor water pressures and inadequate supply and/or dry areas	Growth of town beyond planned area of supply damaged removed pipes towards some areas	Reinstate booster pumps at water office and at fisheries department.
x.	The relative frequency of water leakages and temporary nature of most repairs	Insufficient cover to older mains, lack of transport lack of tools lack of spares	Acquisition of tools and permanent repair materials

Appendix A4-2: Financial situation of water in Malindi (December 1995)

Financial situation Improvement Matrix adopted and modified from Gauff Ingenieure 1996 p2

S/No	Problem	Cause	Action Taken by Dec 95
	Magnitude and extent of the accumulated errors in virtually every water account	Inappropriate and outdated water billing programme, inaccurate data, poor quality control, use of inappropriately estimated consumptions where meters are non operational, billing consumers in known dry areas	Develop replacement water billing package, analysis for realistic present supply situation and consumptions
ii.	Errors in meter reading	Dishonesty and incompetence of meter readers, lack of quality control and lack of transport	Recruit and train new meter readers, institute quality control procedures
iii.	Job dissatisfaction and low morale of NWCPC staff	Inadequate salary levels, lack of transport, inadequate staffing at some levels.	Recommend re-designation, introduce work related bonuses, recruit and train additional key staff
iv.	Poor revenue collection results	A background of total disbelief on the part of consumers as to the reality of their billed amounts, inadequate disconnections for non payment.	Improve meter reading; commence historical data on water accounts.
v.	High level of consumer dissatisfaction	Inaccurate billing and crediting, poor water pressures in some areas, no water at all in other areas.	Improve accuracy of meter reading, recruit and train consumer relations officer, accountant and computer operator.
vi.	Dishonesty among consumers with regard to illegal connections and illegal reconnections.	Years of slack sanctioning, often with connivance of meter readers	Ascertain magnitude of the problem assist NWCPC to introduce rigorous disconnections of defaulters

Appendix A4-3: Physical situation of water in Malindi (June 1996)

Physical Situation improvement Matrix Adopted and modified from NWCPC/Gauff Ingenieure 1996 p 1

SNo	Problem	Cause	Action Taken by Dec 95	Proposed Action to be taken by June 96
I	Physical Water losses of the order 50%	Poor condition of older pipe network within town centre	Established extent of older network and its general condition, routine reading of bulk meters when operational	Relating of zonal consumption to zonal bulk supply to highlight major problem areas.
Ii	Estimated billing in excess of 80%	Lack of regular meter reading, lack of routine cleaning of stalled meters	Introduction of regular monthly meter reading and cleaning/replacement of stalled meters	Continuation of regular monthly meter reading and cleaning of stalled meters
Iii	Poor condition of the small diameter water mains laid since 1985	Poor quality of installation lack of routine O&M, lack of transport	Recommended the setting aside of part of additional revenue realised towards replacement by NWCPC	Action by NWCPC
Iv	Poor condition and unserviceability of line valves	Lack of routine O&M, lack of transport	none	Commence replacement programme in most critical locations
V	Poor condition and unserviceability of washouts and washout valves	Lack of routine O&M	Location of washouts commenced	Replacement of all non operational washouts valves and routine flushing of systems
Vi	The amount of accumulated loose and broken materials within the system and the resulting stalling of bulk water meters	Lack of care during repair of leakages and bursts, lack of repair materials, lack of transport	Obtain quotation for online strainers	Routine flushing out at washouts, procure and install in-line strainers
Vii	The amount of accumulated loose and broken materials within the system and the resulting stalling of consumer water meters in particular areas	Lack of care during repair of leakages and bursts	Institute cleaning programme for stalled meters	In worst hit areas, replace volumetric meters by piston meters that are less prone to stalling due to blockage
viii	Ineffective ways of making disconnections	Time and cost of the exercise	Install meter plugs(lockage washers) and seal across meter	Physically remove meters until improved blockage washers are obtained
Ix	Poor water pressures and inadequate supply and/or dry areas	Growth of town beyond planned area of supply damaged removed pipes towards some areas	Reinstate booster pumps at water office and at fisheries department.	Seek KFW approval to release funds for reticulation expansion programme, develop programme for zonal control using line valves
X	The relative frequency of water leakages and temporary nature of most repairs	Insufficient cover to older mains, lack of transport lack of tools lack of spares	Acquisition of tools and permanent repair materials	Development of work schedule, monitor and assist repair gangs

Appendix A4-4: Financial situation of water in Malindi (June 1996)

Financial situation Improvement Matrix adopted and modified from NWCPC/Gauff Ingenieure 1996 p2

S/No	Problem	Cause	Action Taken by Dec 95	Proposed Action to be taken by June 96
i.	Magnitude and extent of the accumulated errors in virtually every water account	Inappropriate and outdated water billing programme, inaccurate data, poor quality control, use of inappropriately estimated consumptions where meters are non operational, billing consumers in known dry areas	Develop replacement water billing package, analysis for realistic present supply situation and consumptions	Use new billing package for issuance of water bills in Malindi sub-area with rationalised 'estimated' consumptions
ii.	Errors in meter reading	Dishonesty and incompetence of meter readers, lack of quality control and lack of transport	Recruit and train new meter readers, institute quality control procedures	Provide additional vehicles, selection of best meter readers for permanent employment, introduce stringent control measures
iii.	Job dissatisfaction and low morale of NWCPC staff	Inadequate salary levels, lack of transport, inadequate staffing at some levels.	Recommend re-designation, introduce work related bonuses, recruit and train additional key staff	Put in place output related overtime payments, continue training of NWCPC and additional staff
iv.	Poor revenue collection results	A background of total disbelief on the part of consumers as to the reality of their billed amounts, inadequate disconnections for non payment.	Improve meter reading; commence historical data on water accounts.	Continue review of historical data and commence reconciliation of accounts and debt collection
v.	High level of consumer dissatisfaction	Inaccurate billing and crediting, poor water pressures in some areas, no water at all in other areas.	Improve accuracy of meter reading, recruit and train consumer relations officer, accountant and computer operator.	Issue circular letter regarding account reconciliation and institute Malindi in-house billing
vi.	Dishonesty among consumers with regard to illegal connections and illegal reconnections.	Years of slack sanctioning, often with connivance of meter readers	Ascertain magnitude of the problem assist NWCPC to introduce rigorous disconnections of defaulters	Prosecution for illegal reconnection; prosecution for illegal connection

Appendix A4-5: Achievements after one year of service contract June 1996

End of Addendum 3A June 1996 adopted from NWCPC/ Gauff Ingenieure 1996 Modified by author

Item	Figure/Recommendation as at December 95	Figure/Situation at June 96	Remarks as at June 96
Percentage of billing based on read meters	89%	100%	Consumer meters that stall due to blockage are dealt with routinely
Estimated readings	21%	10%	• meter reading reorganised as a routine programme in each zone. • New meter readers conversant with the area in place
Improvement in actual revenue collected as %age of billed amount	+40%	+93%	• Billing carried out in Malindi using a computerised billing system • Routine and regular disconnections for unpaid bills undertaken regularly
Reduction in physical losses	41%	40%	• Observed leakages dealt with regularly • Daily reading of system bulk meters
Magnitude and extent of the accumulated errors in virtually every water account	Develop replacement water billing package, analysis for realistic present supply situation and consumptions		A computerised billing system in full and regular monthly use inclusive of management reporting system
Errors in meter reading	Recruit and train new meter readers, institute quality control procedures		• New meter readers conversant with the area in place • Meter readers assigned different areas to read in successive months reducing likelihood of reporting artificial readings.
Job dissatisfaction and low morale of NWCPC staff	Recommend re-designation, introduce work related bonuses, recruit and train additional key staff		Incentive and other bonuses being paid
Poor revenue collection results	Improve meter reading; commence historical data on water accounts.		• Customer relations officer appointed to deal with new complaints from consumers • Reconciliation of accounts embarked upon
High level of consumer dissatisfaction	Improve accuracy of meter reading, recruit and train consumer relations officer, accountant and computer operator.		• All major consumer accounts analysed and recommendation given to NWCPC for implementation • Customer relations officer appointed to deal with new complaints from consumers • meter reading reorganised as a routine programme in each zone.
Dishonesty among consumers with regard to illegal connections and illegal reconnections.	Ascertain magnitude of the problem assist NWCPC to introduce rigorous disconnections of defaulters		Criminal prosecution for illegal connections and reconnections instituted

Appendix A5-1: Questionnaire 1

DECISION TO INVOLVE PSP IN MALINDI WATER SUPPLY

SOME FACTORS BELOW ARE IDENTIFIED AS HAVING INFLUENCED THE DECISION TO INVOLVE H.P GAUFF (READ PSP) IN MANAGEMENT OF MALINDI WATER SUPPLY. PLEASE INDICATE BY TICKING YOUR PERCEPTION OF THE EXTENT TO WHICH EACH OF THE FOLLOWING FACTORS CONTRIBUTED TO THE DECISION BY USING THE FOLLOWING SCALE.

1. Strongly disagree
2. Disagree
3. Undecided
4. Agree
5. Strongly agree

(i) O & M was not being given high priority by the NWCPC	1	2	3	4	5
(ii) There was need to bring managerial experience and new technology in The Water Supply which H.P.Gauff had	1	2	3	4	5
(iii) There was a need to improve efficiency in the scheme i.e. operating Performance and the use of the Capital Investment	1	2	3	4	5
(iv) Reduce subsidy to the scheme (i.e. it was the only way of reducing Subsidy to the scheme)	1	2	3	4	5
(v) Insulate the scheme from the Local Authority's demand to be involved In it's the management.	1	2	3	4	5
(vi) Consumer complaints had become to much and there was need to respond to consumer complaints as this is a tourist town	1	2	3	4	5
(vii) It was the only way to obtain funds from the donor for investment in the water supply	1	2	3	4	5
(viii) Costs recovery from the scheme was poor and required a different mode of management to improve it	1	2	3	4	5
(ix) It was a means of increasing the technical capacity of NWCPC through Knowledge transfer	1	2	3	4	5
(x) There was a feeling that private enterprises are more efficient than public Institutions	1	2	3	4	
(xi) The Government wanted to test performance of PSP in water supplies and Malindi was chosen as it had tried it before	1	2	3	4	
(xii) It was a means of achieving long term capacity strategy i.e. ability of scheme to cope with the increasing population in the municipality	1	2	3	4	
(xiii) It was a World Bank condition for further funding of investment in coastal region	1	2	3	4	
(xiv) NWCPC was under pressure at the time from donors to involve PSP in its schemes before receiving rehabilitation funds	1	2	3	4	
(xv) NWCPC management at the at the time may have had other interests rather than technical or managerial	1	2	3	4	
(xvi) It was a means of getting tariff increases in the water sector	1	2	3	4	
(xvii) It was a means of getting changes in the water sector	1	2	3	4	
(xviii) it was a means of putting pressure on the management of other urban schemes under the NWCPC to perform	1	2	3	4	

(xix)it was a means of introducing performance measurements in the water sector	1	2	3	4	5
(xx) it was a means of introducing professionalism in o&m in the water sector	1	2	3	4	5

Please give additional reasons and comments if they are not covered above

Appendix A5-2: Questionnaire 2

PROBLEMS FACED BY MALINDI WATER SUPPLY PRIOR TO THE INVOLVEMENT OF PSP MANAGEMENT

SOME STATEMENTS ARE PRESENTED ABOUT THE PROBLEM MALINDI WATER SUPPLY FACED BEFORE THE INTRODUCTION OF PSP. PLEASE INDICATE HOW YOU PERCEIVE THEIR VALIDITY BY TICKING ONCE USING THE FOLLOWING SCALE.

1. Strongly disagree
2. Disagree
3. Undecided
4. Agree
5. Strongly agree

(i)	Inefficient and unreliable water services	1	2	3	4	5
(ii)	Dilapidated infrastructure that required rehabilitation	1	2	3	4	5
(iii)	Low personnel morale	1	2	3	4	
(iv)	Inadequate management for O & M	1	2	3	4	
(v)	Insufficient funds for O & M	1	2	3	4	
(vi)	Low income from water sales in the scheme	1	2	3	4	
(vii)	Adverse public opinion of operation of NWCPC	1	2	3	4	
(viii)	Low service coverage in the scheme area	1	2	3	4	
(ix)	Poor accounting procedures at the scheme level	1	2	3	4	
(x)	Unreliable service both technically and financially	1	2	3	4	
(xi)	Delays in billing consumers	1	2	3	4	
(xii)	Overstaffed scheme with majority staff being untrained	1	2	3	4	
(xiii)	Preventive maintenance was not being practiced	1	2	3	4	
(xiv)	Lack of proper records at the scheme level	1	2	3	4	
(xv)	Lack of spare parts and adequate repair kits most times	1	2	3	4	
(xvi)	Poor Water Quality	1	2	3	4	
(xvii)	Inadequate number of consumers in the scheme	1	2	3	4	
(xviii)	Unreliable pumps for the scheme	1	2	3	4	
(xix)	Inadequate bulk meters	1	2	3	4	
(xx)	Absence of professional staff on scheme	1	2	3	4	
(xxi)	Lack of transport to carry out O&M activities	1	2	3	4	

(xxii)	Poor metering	1	2	3	4	5
(xxiii)	High number of unoperational meters	1	2	3	4	5
(xxiv)	The scheme was unable to meet demand	1	2	3	4	5
(xxv)	Difficulties in procurement of supplies for O&M	1	2	3	4	5
(xxvi)	Misappropriation of revenue collected	1	2	3	4	5
(xxvii)	Inadequate housing in the scheme area	1	2	3	4	5
(xxviii)	High level of unaccounted for water	1	2	3	4	5
(xxix)	Lack of autonomy at scheme level	1	2	3	4	5
(xxx)	Inadequate water storage facilities	1	2	3	4	5
(xxxi)	High number of illegal connections	1	2	3	4	5
(xxxii)	Poor revenue collection	1	2	3	4	5
(xxxiii)	Inefficient and inflexible method required of customer in Paying their bills	1	2	3	4	5
(xxxiv)	Delay in making operational decision by regional and head Office of NWCPC	1	2	3	4	5
(xxxv)	Weak regulations concerning connection and disconnection that discourage Personnel from their enforcement	1	2	3	4	5

Others please specify.....

Appendix A5-3: Questionnaire 3

SERVICES INTRODUCED AS A RESULT OF PSP INVOLVEMENT

BELOW ARE SOME STATEMENTS ABOUT THE SERVICES THAT HAVE BEEN INTRODUCED OR BENEFIT THAT HAVE BEEN BROUGHT ABOUT BY THE PSP OPERATOR H.P GAUFF SINCE 2000. PLEASE KINDLY GIVE YOUR VIEW ON THE STATEMENTS BY TICKING ONCE THE MOST APPROPRIATE NUMERAL FOI EACH QUESTION USING THE FOLLOWING SCALE.

1. Strongly disagree
2. Disagree
3. Undecided
4. Agree
5. Strongly agree

(i)	Staff training programmes i.e in meter reading, computer use	1	2	3	4
(ii)	Marching staff to work	1	2	3	4
(iii)	Use of computers in the scheme	1	2	3	4

(iv)	Employment of water bailiffs	1	2	3	4	5
(v)	Billing at the scheme level	1	2	3	4	5
(vi)	Increase in maintenance funds to the scheme	1	2	3	4	5
(vii)	Increased number of professionals on the scheme	1	2	3	4	5
(viii)	Construction of staff houses throughout the scheme area	1	2	3	4	5
(ix)	Regular inspection or monitoring of network.	1	2	3	4	5
(x)	Systemic rehabilitation of the scheme	1	2	3	4	5
(xi)	Preventive maintenance teams	1	2	3	4	5
(xii)	Special maintenance team	1	2	3	4	5
(xiii)	Introduction of leak detection team	1	2	3	4	5
(xiv)	Subcontracting some specialized jobs (maintenance activities) to others	1	2	3	4	5
(xv)	Meter maintenance system (internal or external)	1	2	3	4	5
(xvi)	Fully equipped Laboratory	1	2	3	4	5
(xvii)	Annual licensing of kiosk owners	1	2	3	4	5
(xviii)	Standardized E/M equipment	1	2	3	4	5
(xix)	Maintenance of household based installations	1	2	3	4	5
(xx)	New consumer agreement forms	1	2	3	4	5
(xxi)	Emergency planning Programme	1	2	3	4	5
(xxii)	Historical analysis of all records	1	2	3	4	5
(xxiii)	Regular reading of meters	1	2	3	4	5
(xxiv)	Regular meeting between scheme staff and regional office staff	1	2	3	4	5
(xxv)	Regular meetings between operator and NWCPC head office staff to review performance	1	2	3	4	5
(xxvi)	Introduction of a complaint's desk	1	2	3	4	5
(xxvii)	Personalised attention to every consumer complaint	1	2	3	4	5
(xxviii)	Close involvement of financial staff at both scheme and NWCPC in O & M activities	1	2	3	4	5
(xxix)	Regular assessment of staff output	1	2	3	4	5
(xxx)	Regular scheme performance evaluation by NWCPC	1	2	3	4	5
(xxxi)	Close collaboration with the Municipal Council	1	2	3	4	5
(xxxii)	Independent water quality checks	1	2	3	4	5
(xxxiii)	Co-operation between operators and health workers to educate rural peri- urban And informal customer on connection between water and disease	1	2	3	4	5
(xxxiv)	Campaign to encourage the unconnected consumers water to get water connection	1	2	3	4	5
(xxxv)	Direct computerization of consumer meter readings	1	2	3	4	5
(xxxvi)	Introduction of standby pumps	1	2	3	4	5
(xxxvii)	GIS Mapping of the entire network	1	2	3	4	5
(xxxviii)	Information sharing for staff at all levels	1	2	3	4	5

(xxxix)	Increase in consumer base	1	2	3	4	5
(xl)	Top up to corporation staff	1	2	3	4	5
(xli)	Metering of all consumers	1	2	3	4	5
(xlii)	Target setting for every staff	1	2	3	4	5
(xliii)	Clear reporting procedures at scheme level	1	2	3	4	5
(xliv)	Introduction of feedback process i.e decision checked against objectives	1	2	3	4	5
(xlv)	Clear structure of management of the water supply	1	2	3	4	5
(xlvi)	Introduction of forecast horizon i.e. looking a head by the management before O & M decision are made	1	2	3	4	5
(xlvii)	Keeping of revenue records at the scheme level	1	2	3	4	5
(xlviii)	Regular monitoring of water quality	1	2	3	4	5
(xlix)	Increased water volume to the scheme	1	2	3	4	5
(l)	Reduced interruption of water to consumers due to increased storage	1	2	3	4	5
(li)	Enforcement of the disconnection rules	1	2	3	4	5
(lii)	Introduction of performance targets for the staff of the water supply	1	2	3	4	5
(liii)	Direct procurement of O& M needs at scheme level	1	2	3	4	5
(liv)	Clear identification and design action of what constitutes O & M	1	2	3	4	5
(lv)	Introduction of more bulk meters in the scheme	1	2	3	4	5

Appendix A5-4: Questionnaire 4

RESPONSIBILITIES OF PSP OPERATOR (H.P.GAUFF)

THIS QUESTION SEEKS INFORMATION ON KEY RESPONSIBILITY OF THE CURRENT SERVICE PROVIDER H.P. GAUFF. PLEASE KINDLY INDICATE YOUR VIEW BY TICKING ONCE EACH OF THE STATEMENTS USING THE SCALE BELOW

1. Strongly disagree
2. Disagree
3. Undecided
4. Agree
5. Strongly agree

(i)	Strengthening and extension of Malindi reticulation system	1	2	3	4	5
(ii)	Billing and posting of bills	1	2	3	4	5
(iii)	Receiving payments from the consumers	1	2	3	4	5
(iv)	Investments in some parts of the scheme	1	2	3	4	5
(v)	Remitting payments to NWCPC after deducting an agreed amount	1	2	3	4	5

(vi)	Working as a consultant for NWCPC for rehabilitation and expansion issues	1	2	3	4	5
(vii)	Working as a contractor directly on rehabilitation and extension issues	1	2	3	4	5
(viii)	Maintaining high water quality standards	1	2	3	4	5
(ix)	Increasing coverage level in the scheme	1	2	3	4	5
(x)	Putting in new connections	1	2	3	4	5
(xi)	Replacing consumer pipelines and connections to reduce leakages	1	2	3	4	5
(xii)	Increasing collection efficiency in the scheme	1	2	3	4	5
(xiii)	Annual valuation of assets	1	2	3	4	5
(xiv)	Provision of staff houses in outer stations	1	2	3	4	5
(xv)	Expansion of area and sub area offices	1	2	3	4	5
(xvi)	Carrying out disconnections and reconnections of the service	1	2	3	4	5
(xvii)	Ensuring that the assets are maintained in good conditions	1	2	3	4	5
(xviii)	Procurement of vehicles and billing hardware	1	2	3	4	5
(xix)	Arranging for regular evaluation of the performance by NWCPC	1	2	3	4	5
(xx)	Ensuring that the financial staff at NWCPC are fully informed on scheme issues	1	2	3	4	5
(xxi)	Entering into contracts with new consumers	1	2	3	4	5

Any other responsibility please indicate

Appendix A5-5: Questionnaire 5

RESPONSIBILITIES OF NWCPC

THESE QUESTIONS SEEKS YOUR PERCEPTION TOWARDS WHAT YOU CONSIDER TO BE THE KEY RESPONSIBILITIES OF NWCPC IN THE MALINDI WATER SUPPLY. KINDLY CIRCLE EACH OF THE STATEMENT USING THE SCALE INDICATED

1. Strongly disagree
2. Disagree
3. Undecided
4. Agree
5. Strongly agree

(ii)	Ownership of assets	1	2	3	4	5
(iii)	Financing investments on the water supply	1	2	3	4	5
(iv)	Planning for region in general and Malindi Water Supply in particular	1	2	3	4	5
(v)	Obtaining tariffs revision from Central Government	1	2	3	4	5
(vi)	Making monthly payments to H.P.Gauff	1	2	3	4	5
(vii)	Paying bonuses based on performance	1	2	3	4	5
(viii)	Providing staff whenever needed	1	2	3	4	5
(ix)	Monitoring the activities of the operator H.P Gauff	1	2	3	4	5

(x)	Paying the staff salaries for non-core PSP operators (Gauff staff)	1	2	3	4	5
(xi)	Dealing with issues of peri-urban and rural customer as far as the Water supply is concerned	1	2	3	4	5
(xii)	Institution of last resort for customers' complaints	1	2	3	4	5
(xiii)	Dealing with local politics in as far as the scheme is concerned	1	2	3	4	5
(xii)	Liaising with Government on issues requiring government support	1	2	3	4	5
(xiv)	Approving drawings and signing all contracts on the water supply	1	2	3	4	5
(xiv)	Making all major decisions on the water supply	1	2	3	4	5
(xv)	Determination of O & M costs	1	2	3	4	5

Others please specify

Appendix A5-6: Questionnaire 6

QUESTIONS TO CONSUMERS WITH A WATER CONNECTION

1. How long have you had the water connection?
2. which organization did you sign with the consumer agreement? H.P gauff/NWCPC/MOWD
3. Is water flow continuous or does it some time fail? YES/NO
4. In case of water shortages where do you get water? BOWSER/WELL/STORAGE/OTHER
5. If from the bowser is the water sold? YES/NO
6. Can you give approximate time when you have not had water in the last 6 months? ONCE/MORE THAN ONCE
7. When there is no water do you have an idea when you expect it? Does it just appear? YES/NO
8. Roughly how long does it take before water starts to flow again? A DAY/MORE THAN A DAY
9. Are you informed well in advance that water will not flow? YES/NO
10. How often is your meter read? ONCE A MONTH/ TAKES MORE THAN A MONTH
11. Do you also read the meter to confirm that what is read is right? YES/NO
12. How often are bills sent to you? ONCE A MONTH/ MORE THAN A MONTH
13. Are the bills sent through the post office or dropped by someone? POST OFFICE/ DROPPED/Other explain
14. Do you have any problems with the water bills? YES/NO
15. Have you been told what would happen if you do not pay your bills? YES /NO
16. If you have a complaint concerning water do you know where to go? YES/NO
17. Have you made any complaint in the last 12 months? YES/NO
18. Do you know of someone who has made a complaint? YES/NO
19. Was that complaint responded to? YES/NO
20. What can you say about water appearance and taste? GOOD/NOT VERY GOOD/I AM NOT SURE
21. Are you satisfied with the Water? YES/NO
22. Do you know who is in charge of the water supply? YES/NO
23. Do you mind who is in charge of water supply in Malindi? YES/NO

24. Has the tariff charged been explained to you? YES/NO

25. Who owns the meter? MYSELF/NWCPC/ I DO NOT KNOW

26. Have you noted any leakages as you move around? YES/NO

27. Are you encouraged to report leaks/bursts if you see them? YES/NO

28. Who repairs the leakages in your premises? I AM RESPONSIBLE/OTHERS

29. Does the water have adequate pressure? YES/NO

30. Would you wish to have a sewerage system that is water based? YES/NO

31. Do you have a private storage tank? YES/NO

32. Do you have a pump to boost pressure? YES/NO

33. Has the operator of the water service explained to you your rights? YES/NO

34. Do you have an idea on how long it takes from the day you apply to when the connection is made?<1M

    >1M

35. Are you of the view that customer rights are protected by the water operator YES/NO/I DO NOT

    KNOW

36. Would you wish that the customer rights were protected by clear regulations? YES/NO

37. Would you wish to see the customers more involved in the management of the water scheme?

    YES/NO/NOT SURE

38. Do you have any comment to make on the current water situation?

39. Are there any issues you may wish to raise on the water supply? YES/NO

If yes what are they

Appendix A5-7: Questionnaire 7

QUESTIONS TO CONSUMERS WITHOUT A WATER CONNECTION

1.Do you have a water connection? YES/NO (if your answer is YES move to question 29 if NO continue to no.2)

2.Do you know the procedure for getting a connection? YES/NO

3. Please briefly describe the process

4. Would you wish to have your own connection? YES/NO
5. Please give reasons for the answer to question 2.
6. If you do not have a connection, from where do you get water for your daily use?
7. If from a standpipe or kiosk how far is it from your house? LESS THAN 50 m/ MORE THAN 50m
8. Do you have any other source other than the standpipe /kiosk? YES/NO
9. What is this other source? WELL/NEIGHBOUR/WATER TANKER/ VENDOR/OTHER
10. Have you and the others who get water from the same source ever thought of applying for a connection YES/NO
11. Has someone from the water supply ever come to talk to you about a water connection? YES/NO
12. Who owns the water the water point? LANDLORD/COMMUNITY/WATER CORPORATION/OTHER
13. Are there special times for collecting water or can you get it anytime day or night?
14. Do you know for how long the water point has been in existence?
15. Are there any water points that have come up recently that you know of?
16. Approximately how recently was the water point established?
17. How many other people collect water from that standpipe/kiosk? UP TO 20/ MORE THAN 20
18. How many homes get water from the same point?
19. Can you estimate the amount of water you collect from there in a day?
20. Is this the maximum that you require for your daily use?
21. How much do you pay for each jerry can of water?
22. What can you say about the price you pay? Fair/Unfair/Just Right
23. Can you afford to pay slightly more? YES/NO
24. How much are you willing to pay?
25. Are there any water vendors in your area? YES/NO
26. If the answer to no25 is yes how much do they sell water? .....
27. Do you think laws to guide water vendors should be enacted? YES/NO
28. Would you wish to have more than one collection point? YES/NO

Appendix A6-1: Mean and Standard deviation for questionnaire 1

Question No	Mean (Nr=18)	Std deviation
i.)	2.94	1.43
ii.)	3.39	1.09
iii.)	4.00	0.84
iv.)	2.50	0.99
v.)	2.17	0.86
vi.)	2.67	1.08
vii.)	3.56	1.29
viii.)	3.22	1.00
ix.)	3.56	0.98
x.)	3.94	0.80
xi.)	3.78	0.94
xii.)	3.28	0.89
xiii.)	3.39	1.24
xiv.)	3.61	1.20
xv.)	2.44	1.04
xvi.)	2.11	0.96
xvii.)	3.39	1.24
xviii.)	3.06	1.21
xix.)	3.72	1.07
xx.)	3.78	1.00

Appendix A6-2: Variance explained for decision to involve PSP

Variable	Initial Output			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Eigen Value	% Variance	Cumulative %	Eigen Value	% Variance	Cumulative %	Eigen Value	% variance	Cumulative %
i.)	5.513	27.566	27.566	5.513	27.566	27.566	3.786	18.932	18.932
ii.)	2.926	14.629	42.194	2.926	14.629	42.194	3.095	15.473	34.404
iii.)	2.570	12.851	55.046	2.570	12.851	55.046	2.713	13.566	47.971
iv.)	2.073	10.364	65.409	2.073	10.364	65.409	2.432	12.158	60.129
v.)	1.551	7.755	73.165	1.551	7.755	73.165	1.966	9.830	69.958
vi.)	1.229	6.146	79.310	1.229	6.146	79.310	1.870	9.352	79.310
vii.)	0.908	4.540	83.851						
viii.)	0.782	3.909	87.760						
ix.)	0.656	3.280	91.040						
x.)	0.584	2.919	93.959						
xi.)	0.457	2.283	96.242						
xii.)	0.298	1.491	97.732						
xiii.)	0.223	1.116	98.848						
xiv.)	0.109	0.544	99.392						
xv.)	0.069	0.343	99.735						
xvi.)	0.045	0.225	99.960						
xvii.)	0.008	4.01E-02	100.000						
xviii.)	0.000	1.53E-15	100.000						
xix.)	0.000	9.38E-16	100.000						
xx.)	0.000	-6.8E-16	100.000						

Appendix A6-3: Mean and Standard deviation for questionnaire 2

Question No	Mean (Nr=17)	Std deviation
(i)	2.91	1.36
(ii)	3.50	1.23
(iii)	2.93	1.07
(iv)	3.00	1.06
(v)	4.10	0.87
(vi)	2.89	1.19
(vii)	2.47	1.12
(viii)	3.65	0.70
(ix)	2.59	0.87
(x)	2.40	0.92
(xi)	2.65	1.11
(xii)	2.19	1.03
(xiii)	3.50	0.94
(xiv)	2.76	0.97
(xv)	3.71	0.85
(xvi)	1.88	1.27
(xvii)	2.29	1.16
(xviii)	2.82	1.38
(xix)	3.35	1.06
(xx)	2.41	0.80
(xxi)	3.49	0.94
(xxii)	3.71	0.59
(xxiii)	3.76	0.56
(xxiv)	3.29	0.99
(xxv)	3.41	1.33
(xxvi)	2.28	1.15
(xxvii)	2.76	1.15
(xxviii)	3.53	0.72
(xxix)	3.76	0.90
(xxx)	1.76	1.03
(xxxi)	3.18	0.88
(xxxii)	2.99	1.11
(xxxiii)	2.30	1.07
(xxxiv)	2.76	1.20
(xxxv)	3.00	1.22

Appendix A6-4: Total variance explained for problems prior to PSP involvement

Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	8.336	23.818	23.818	8.336	23.818	23.818
2	5.200	14.858	38.676	5.200	14.858	38.676
3	4.332	12.376	51.052	4.332	12.376	51.052
4	3.115	8.901	59.953	3.115	8.901	59.953
5	2.673	7.637	67.590	2.673	7.637	67.590
6	2.135	6.100	73.691	2.135	6.100	73.691
7	1.899	5.425	79.116	1.899	5.425	79.116
8	1.510	4.314	83.430	1.510	4.314	83.430
9	1.326	3.788	87.217	1.326	3.788	87.217
10	1.027	2.936	90.153	1.027	2.936	90.153
11	.953	2.724	92.877			
12	.898	2.567	95.444			
13	.577	1.648	97.092			
14	.491	1.402	98.494			
15	.332	.947	99.441			
16	.196	.559	100.000			
17	1.132E-15	3.233E-15	100.000			
18	9.741E-16	2.783E-15	100.000			
19	5.372E-16	1.535E-15	100.000			
20	3.537E-16	1.011E-15	100.000			
21	3.048E-16	8.708E-16	100.000			
22	2.309E-16	6.596E-16	100.000			
23	2.045E-16	5.842E-16	100.000			
24	1.473E-16	4.210E-16	100.000			
25	6.087E-17	1.739E-16	100.000			
26	-6.78E-18	-1.936E-17	100.000			
27	-3.87E-17	-1.105E-16	100.000			
28	-6.35E-17	-1.814E-16	100.000			
29	-1.89E-16	-5.399E-16	100.000			
30	-2.14E-16	-6.124E-16	100.000			
31	-2.81E-16	-8.034E-16	100.000			
32	-3.65E-16	-1.044E-15	100.000			
33	-4.02E-16	-1.149E-15	100.000			
34	-5.33E-16	-1.524E-15	100.000			
35	-6.68E-16	-1.907E-15	100.000			

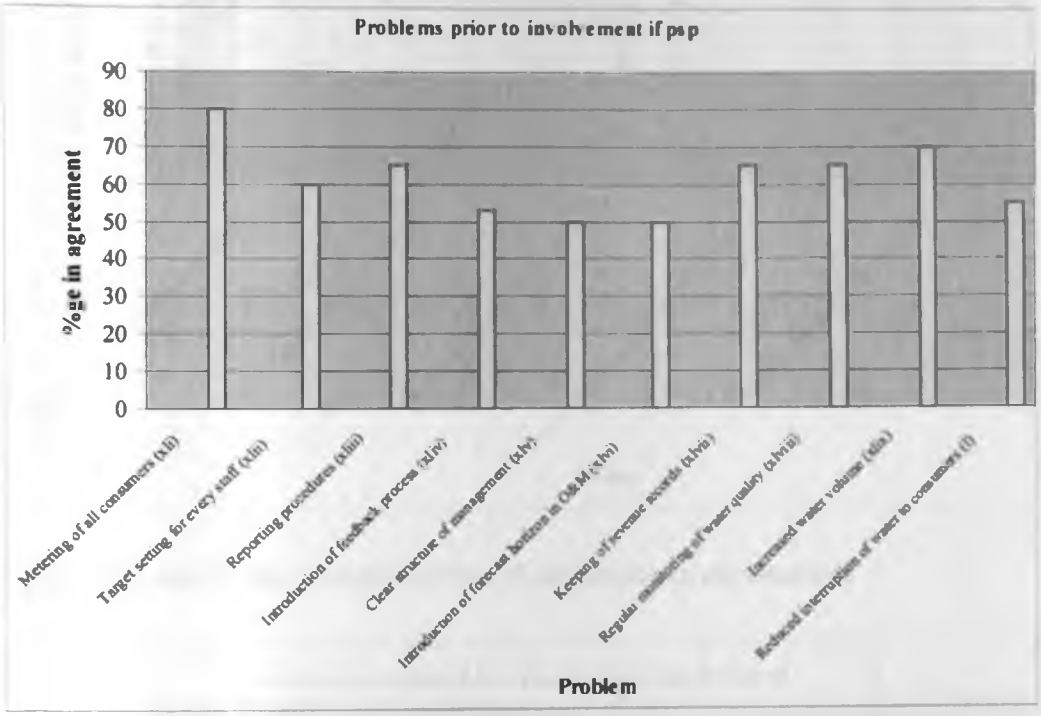
Extraction Method: Principal Component Analysis.

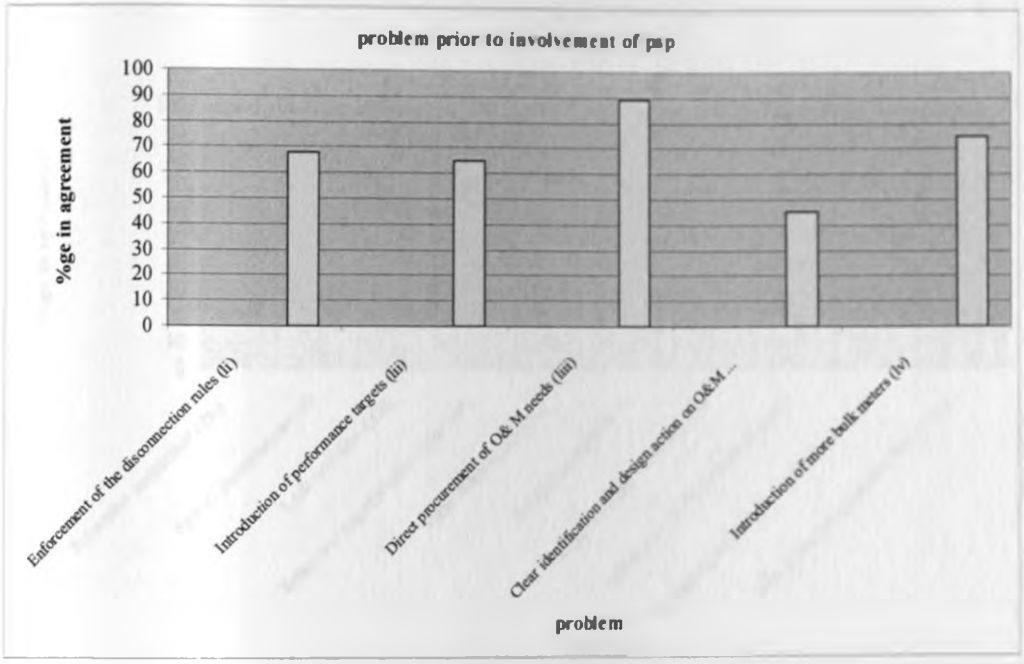
Appendix A6-5: Problems with mean above average faced by the scheme prior to PSP

Question No.	Problem statement	Mean
(ii)	Dilapidated infrastructure that required rehabilitation.	3.47
(v)	Insufficient funds for O & M.	4.00
(viii)	Low service coverage in the scheme area.	3.65
(xiii)	Preventive maintenance was not being practiced.	3.41
(xv)	Lack of spare parts and adequate repair kits most times.	3.71
(xix)	Inadequate bulk meters.	3.35
(xxi)	Lack of transport to carry out O&M activities.	3.47
(xxii)	Poor metering.	3.71
(xxiii)	High number of unoperational meters.	3.76
(xxiv)	The scheme was unable to meet demand.	3.29
(xxv)	Difficulties in procurement of supplies for O&M.	3.41
(xxviii)	High level of unaccounted for water.	3.53
(xxix)	Lack of autonomy at scheme level.	3.76
(xxxi)	High number of illegal connections.	3.18
(xxxv)	Weak regulations concerning connection and disconnection that discourage Personnel from their enforcement.	3.00
(iv)	Inadequate management for O&M.	3.00
(xxxii)	Poor revenue collection.	2.99

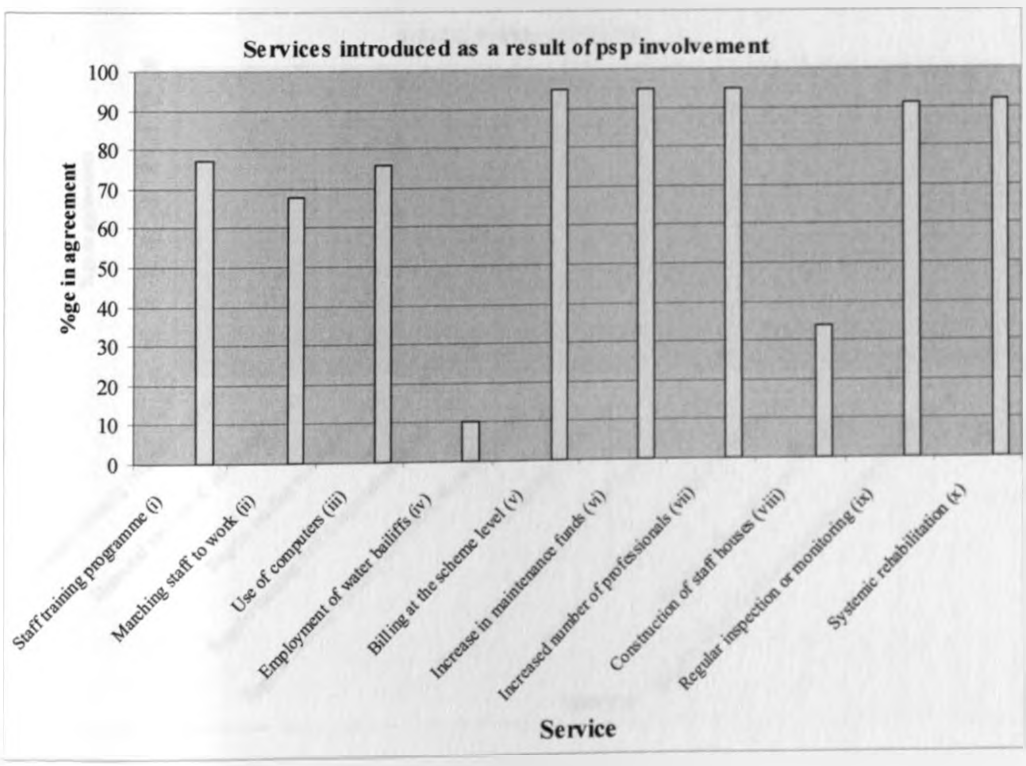
Appendix A6-6: Bar graphs for responses to questionnaires 2 and 3

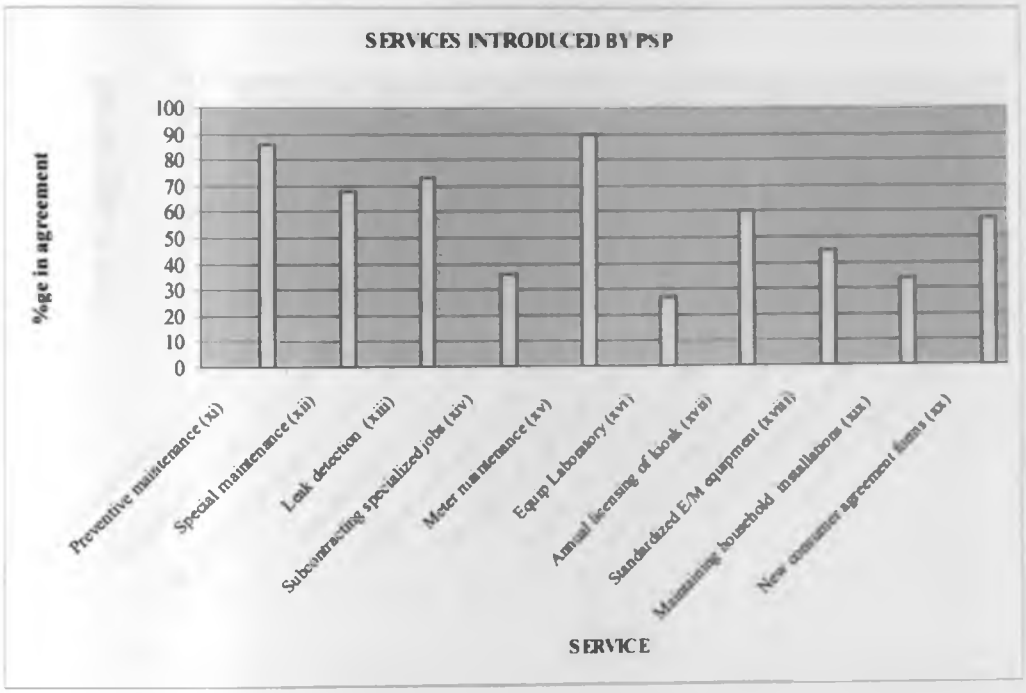
Bar Graphs of the Respondents on problems prior to PSP involvement

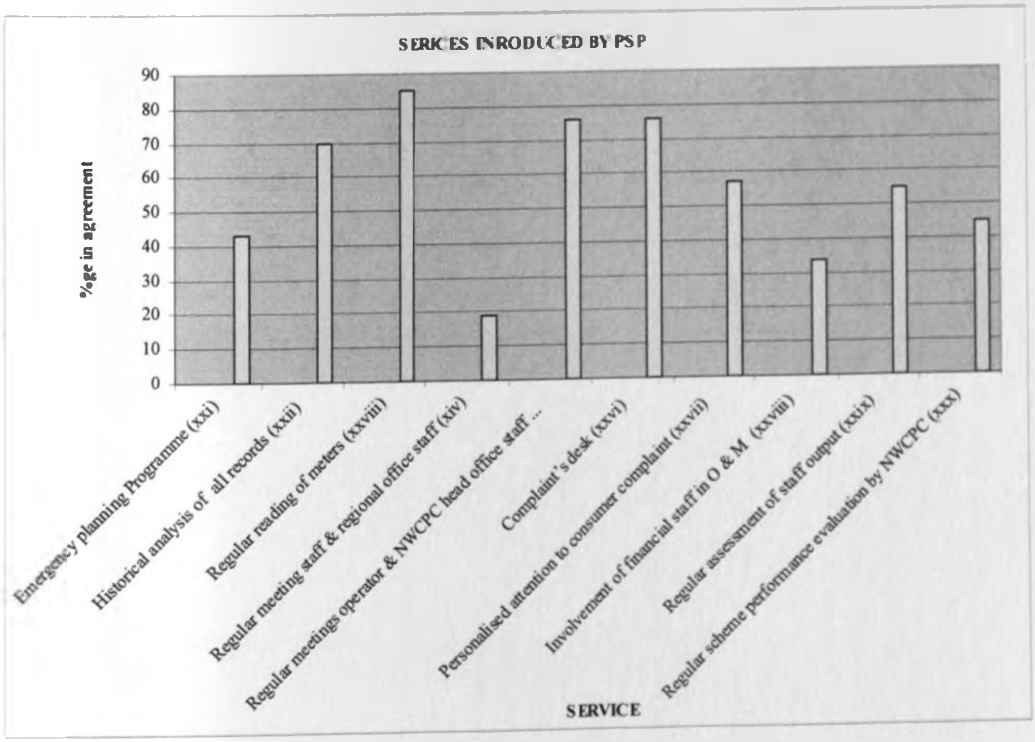


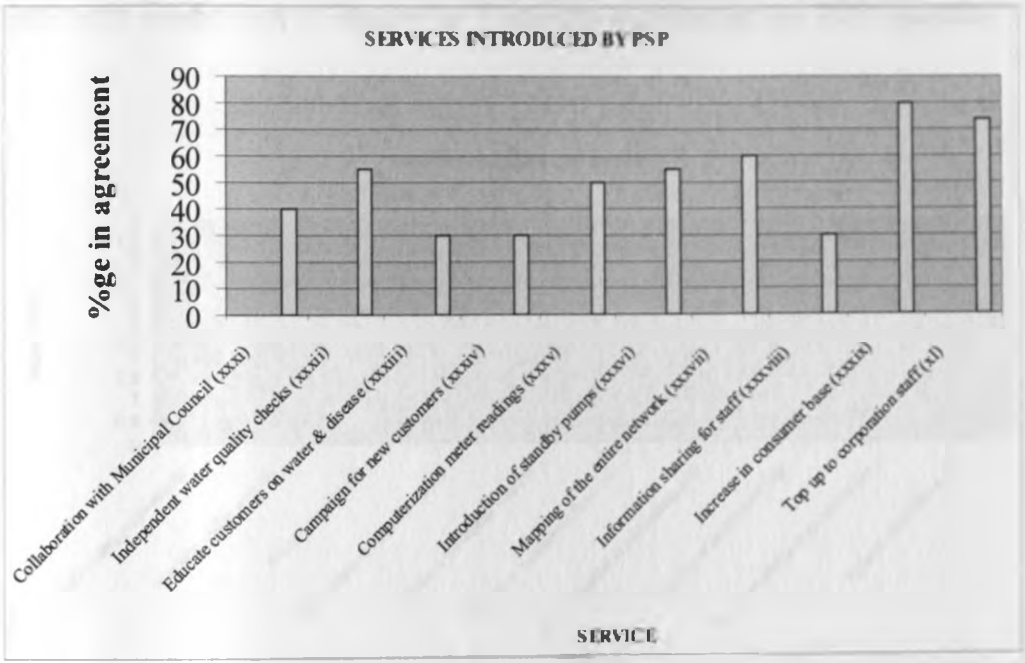


Appendix A6-7: Bar Graphs of the Respondents agreement

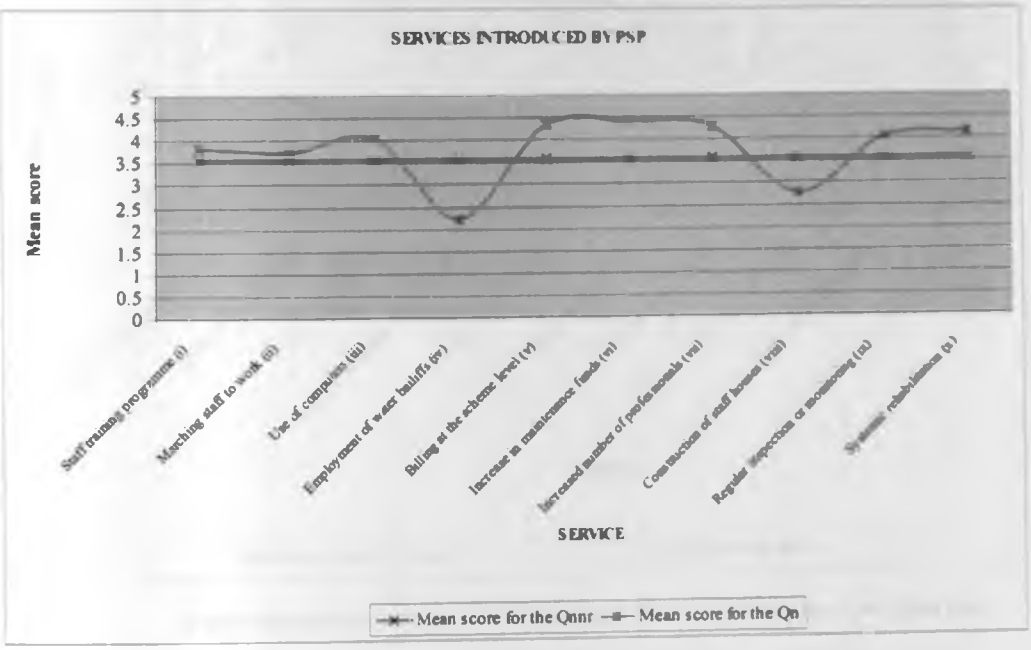



SERVICES INTRODUCED BY PSP
%ge in agreement
100
90
80
70
60
50
40
30
20
10
0
Preventive maintenance (xi)
Special maintenance (xii)
Leak detection (xiii)
Subcontracting specialized jobs (xiv)
Meter maintenance (xv)
Equip Laboratory (xvi)
Annual licensing of kiosk (xvii)
Standardized E/M equipment (xviii)
Maintaining household installations (xix)
New consumer agreement forms (xx)
SERVICE

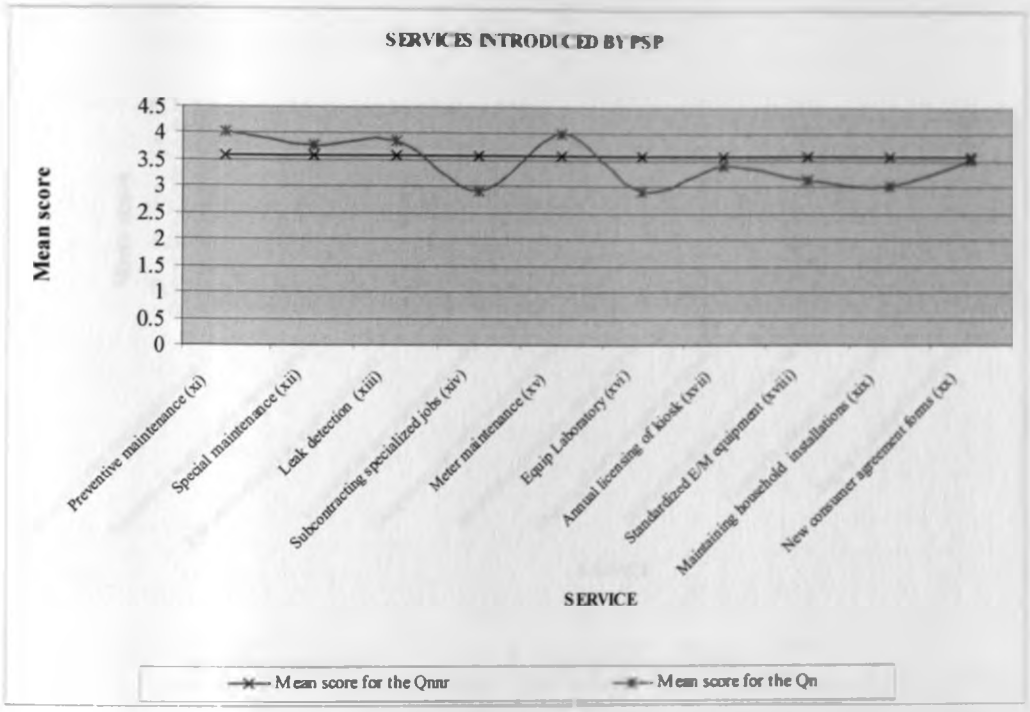

SERICES INRODUCED BY PSP
%ge in agreement
90
80
70
60
50
40
30
20
10
0
Emergency planning Programme (xxi)
Historical analysis of all records (xxii)
Regular reading of meters (xxviii)
Regular meeting staff & regional office staff (xiv)
Regular meetings operator & NWCPC head office staff ...
Complaint's desk (xxvi)
Personalised attention to consumer complaint (xxvii)
Involvement of financial staff in O & M (xxviii)
Regular assessment of staff output (xxix)
Regular scheme performance evaluation by NWCPC (xxx)
SERVICE


SERVICES INTRODUCED BY PSP
%ge in agreement
90
80
70
60
50
40
30
20
10
0
Collaboration with Municipal Council (xxxi)
Independent water quality checks (xxxii)
Educate customers on water & disease (xxxiii)
Campaign for new customers (xxxiv)
Computerization meter readings (xxxv)
Introduction of standby pumps (xxxvi)
Mapping of the entire network (xxxvii)
Information sharing for staff (xxxviii)
Increase in consumer base (xxxix)
Top up to corporation staff (xl)
SERVICE

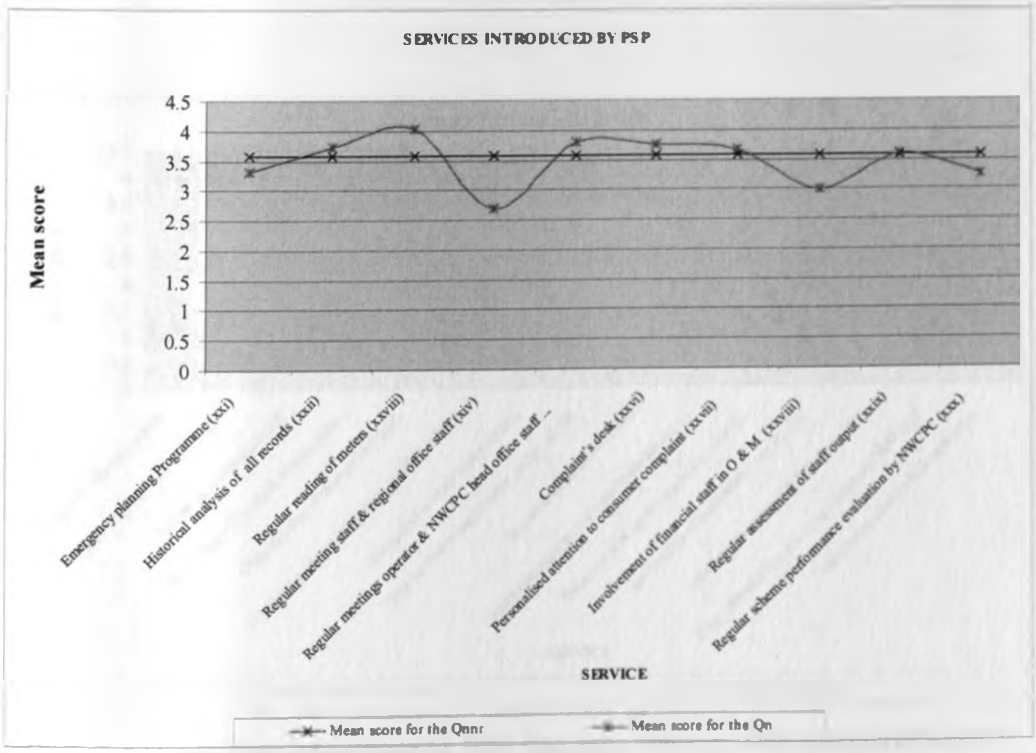
Appendix A6-8: Plot of Means for Services introduced by PSP operator



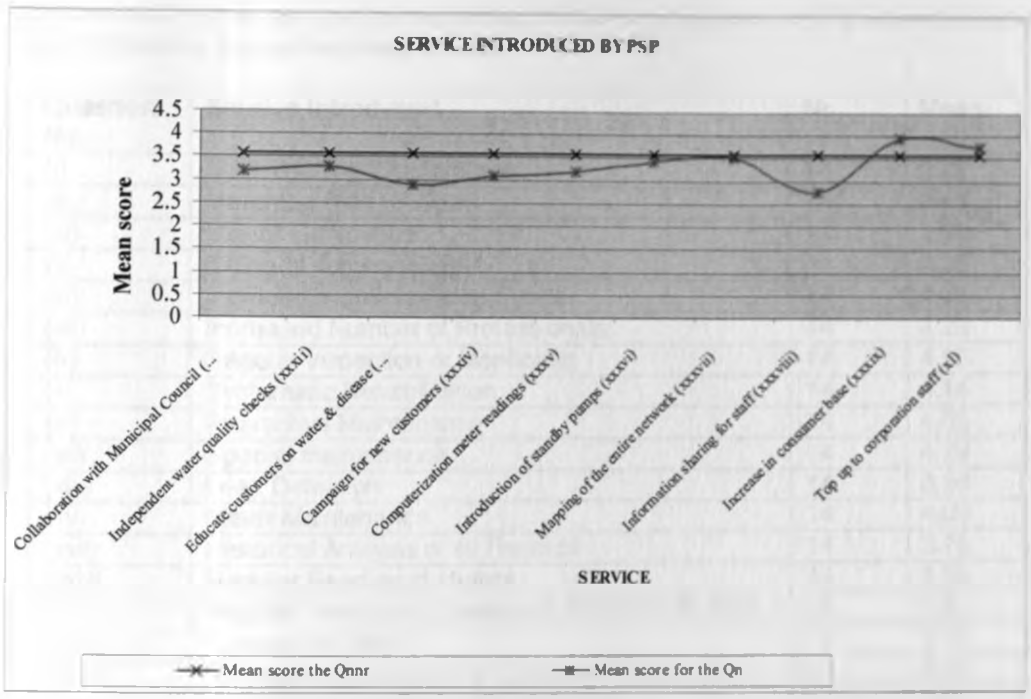
Services introduced by PSP Operator Plotting of Means Qn (i)to (x)



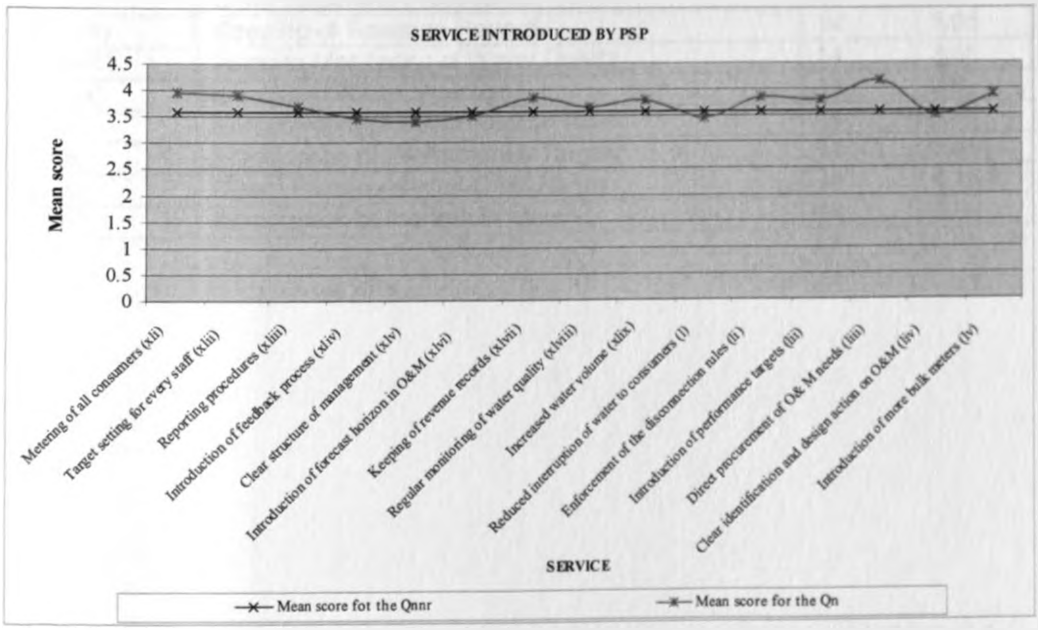
Services introduced by PSP Operator Plotting of Means Qn(xi)to (xx)



Services introduced by PSP Operator Plotting of Means Qn(xxi)to (xxx)



Services introduced by PSP Operator Plotting of Means Qn(xxxi)to (xl)



Services introduced by PSP Operator Plotting of Means Qn(xli)to (lv)

Appendix A6-9: Summary services introduced by operator

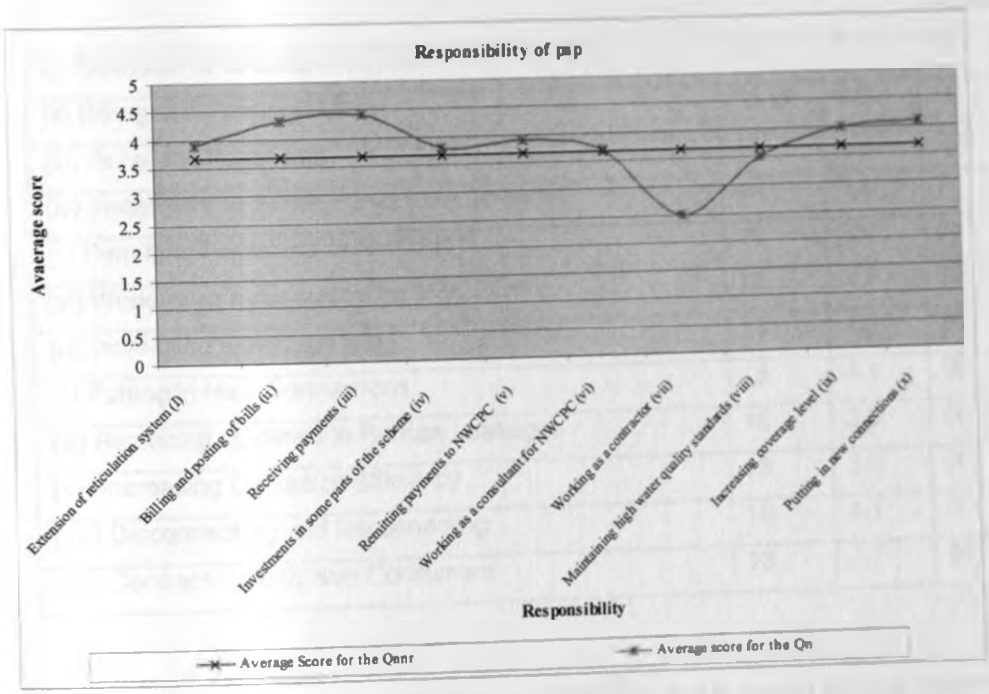
The results show that the services indicated in the table below, whose mean is 3.58 or more, have been introduced by the PSP Operator (Derived From Plotting of Means)

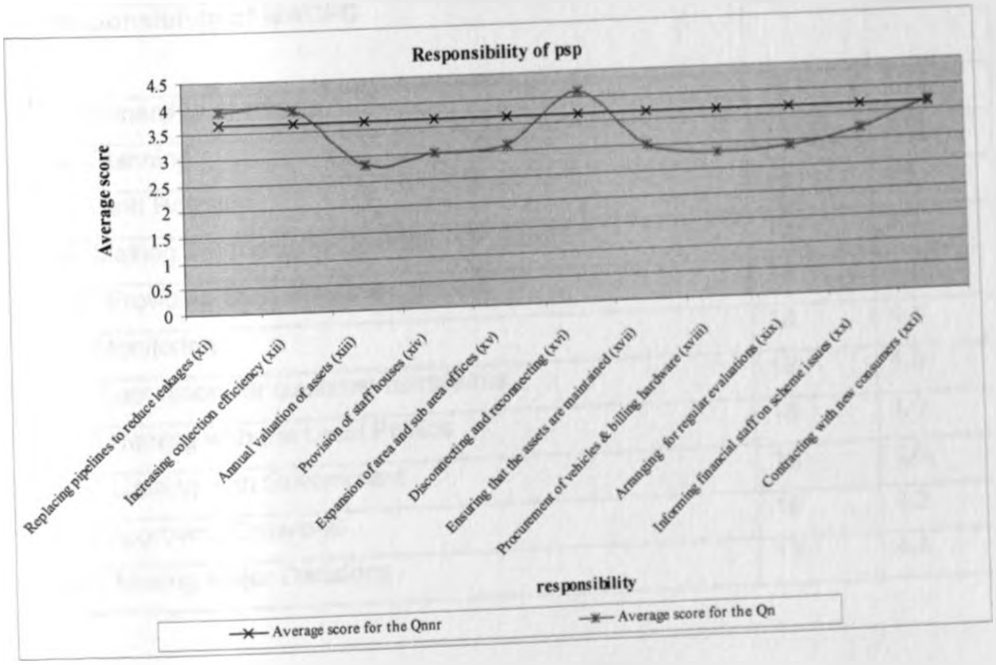
Question No.	Service Introduced	Nr	Mean	% in Agreement
(i)	Staff Training Programmes	14	3.82	77
(ii)	Marching Staff to Work	14	3.73	68
(iii)	Use of Computers	14	4.06	76
(v)	Billing at scheme Level	14	4.36	95
(vi)	Increase in Maintenance Funds	14	4.41	95
(vii)	Increased Number of Professionals	14	4.29	95
(ix)	Regular inspection or Monitoring	14	4.05	92
(x)	Systematic Rehabilitation	14	4.14	91
(xi)	Preventive Maintenance	14	4.05	86
(xii)	Special maintenance	14	4.29	68
(xiii)	Leak Detection	14	3.86	73
(xv)	Meter Maintenance	14	4.00	90
(xxii)	Historical Analysis of all Records	14	3.75	70
(xxiii)	Regular Reading of Meters	14	4.05	85
(xxv)	Regular meeting of Operator & NWCPC HQ Staff	14	3.81	76
(xxvi)	Complaints Desk	14	3.76	76
(xxvii)	Personalised attention to Customer Complaints	14	3.67	57
(xxix)	Regular Assessment of Staff Output	14	3.6	55
(xxxix)	Increase in consumer Base	14	3.95	80
(xl)	Top up to Corporation Staff	14	3.74	74
(xli)	Metering of all consumers	14	3.95	80
(xlii)	Target setting for every staff	14	3.89	60
(xliii)	Clear Reporting Procedures	14	3.7	65
(xlvii)	Keeping of Revenue Records	14	3.85	65
(xlviii)	Regular Monitoring of Water Quality	14	3.65	65
(xlix)	Increased Water Volume	14	3.8	70
(li)	Enforcement of Disconnection Rules	14	3.84	68
(lii)	Introduction of Performance Targets	14	3.8	65
(liii)	Direct Procurement of O&M Needs	14	4.16	89
(lv)	Introduction of more Bulk Meters	14	3.9	75

Appendix A6-10: Problems faced by scheme and services introduced to solve them

Problem as Identified through plot of means	Relevant service introduced
Dilapidated Infrastructure	• Systematic Rehabilitation
Insufficient Funds for O&M	• Increase in Maintenance Funds • Billing at Scheme Level • Historical Analysis of Customer Records • Keeping of Revenue Records
Low Service Coverage in Scheme Area	• Increase in Consumer Base
Preventive Maintenance was not Being Practiced	• Preventive Maintenance • Special maintenance teams
Lack of Spare Parts and Adequate Repair Kits Most Times	• Direct procurement of O&M needs
Inadequate Bulk Meters	• Introduction of more bulk meters
Lack of Transport to Carryout O&M Activities	• Regular Inspection and Monitoring
Poor Metering	• Metering of all consumers
High Number of Unoperational Meters	• Meter maintenance • Regular reading of Meters
The Scheme was Unable to Meet Demand	• Increased water volume
Difficulties in Procurement of Supplies	• Increased maintenance funds • Direct procurement of O&M needs
High level of Unaccounted for Water	• Leak detection • Regular inspection and monitoring • Introduction of more bulk meters
Lack of Autonomy at Scheme Level	• Direct Procurement of O&M needs
High Number of Illegal Connections	• Metering of all consumers • Regular inspection and monitoring • Personalised attention to consumer complaints
Weak Enforcement of Disconnection and Reconnection Rules	• Strict enforcement of disconnection and reconnection rules
Inadequate Management for O&M	• Increase in number of professionals • Marching staff to work • Regular meetings between Operators and NWCPC staff • Clear reporting procedures • Complaints desk • Regular monitoring of water quality • Target setting for staff • Clear reporting procedure • Personalised attention to consumer complaints • Use of computers

Appendix A6-11: Plot of means- responsibilities of operator





Appendix A6-12: Responsibilities of the operator rated above the mean of the questionnaire

Responsibility	Nr	Mean	% in Agreement
(i) Extension of reticulation System	18	3.9	81
(ii) Billing and Posting of Bills	18	4.3	96
(iii) Receiving Payments	18	4.4	100
(iv) Investment in Some Parts of the Scheme	18	3.8	76
(v) Remitting Payments to NWCPC	18	3.9	81
(vi) Working as a consultant for NWCPC	18	3.7	72
(ix) Increasing Coverage level	18	4.0	85
(x) Putting in New Connections	18	4.1	90
(xi) Replacing pipelines to Reduce Leakages	18	3.9	90
(xii) Increasing Collection Efficiency	18	3.9	90
(xvi) Disconnecting and Reconnecting	18	4.1	95
(xxi) Contracting with New Consumers	18	3.7	80

Appendix A6-13: Responsibilities of NWCPC with mean above questionnaire mean

Responsibility of NWCPC	Nr	Mean	% in Agreement
(ii) Ownership of Assets	18	4.75	100
(iv) Planning	18	4.2	83
(v) Tariff Revision	18	4.5	100
(vi) Making Payments to Operator H.P Gauff	18	4.3	91
(viii) Providing Staff whenever needed	18	4.1	83
(ix) Monitoring	18	4.1	75
(xii) Last resort for customer complaints	18	4.3	83
(xiii) Dealing with the Local Politics	18	4.0	67
(xiv) Liaising with Government	18	4.6	100
(xv) Approving Drawings	18	4.2	83
(xvi) Making Major Decisions	18	4.4	92

Appendix A6-14: Complaints in 2001

Complaint	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	%age
Objection to consumption billed	5	18	7	5	6	5	3	6	8	12	9	4	88	2.5
Incorrect rectified bill	10	14	13	9	8	5	2	2	2	7	7	5	84	2.4
No water	7	5	6	11	7	8	9	2	12	13	9	8	97	2.7
Requiring meter reading	3	6	4	6	8	2	6	2	7	5	3	5	57	1.6
Bills not received	29	11	4	6	10	2	2	0	3	0	0	3	70	1.9
Complaints on adjusted May 1998 arrears.	22	18	10	3	1	7	3	5	3	7	4	3	86	2.4
Requiring reconnections	247	184	217	133	105	161	179	158	106	137	164	129	1920	53.8
Other	431	340	299	17	25	4	5	10	13	6	8	7	1165	32.7
Total	754	596	560	190	170	194	209	185	154	188	204	164	3568	100
%age	21.1	16.7	15.7	5.3	4.8	5.4	5.9	5.2	4.3	5.3	5.7	4.6	100	

Appendix A6-15: Complaints in 2002

Complaint	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total	%age
Objection to consumption billed	16	16	12	5	14	4	7	10	7	3	6	8	108	5.1
Incorrect rectified bill	5	5	6	4	3	4	9	6	3	3	2	5	55	2.6
No water	10	9	12	5	12	9	6	7	7	16	15	9	117	5.6
Requiring meter reading	5	5	6	3	3	6	1	5	7	1	3	1	46	2.2
Bills not received	20	13	15	5	3	10	8	7	4	4	7	8	104	4.9
Complaints on adjusted May 1998 arrears.	10	7	9	3	3	3	7	9	3	1	3	1	59	2.8
Requiring reconnections	172	111	145	142	94	130	130	120	107	147	157	103	1558	73.9
Other	10	6	10	5	2	3	7	12	1	1	2	1	60	2.9
Total	248	172	215	172	134	169	175	176	139	176	195	136	2107	100
%age	11.8	8.2	10.2	8.2	6.3	8.0	8.3	8.3	6.6	8.3	9.3	6.5	100	