

REPUBLIC OF KENYA

REVIEW OF THE WATER AND SANITATION SECTOR

**Urban Water Supply and Sanitation Services
in Low Income Urban Settlements**

A Paper Supporting the Aide Memoire of December 19, 2000

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Introduction

This paper supports a “Review of the Water Supply and Sanitation Sector” prepared in Kenya by a joint World Bank, KfW, GTZ and AFD Mission that took place in November and December 2000. It outlines issues affecting the delivery of Water and Sanitation Services to Low Income Households in Kenya and provides recommendations for the way forward. It is supported by data gathered from over 700 households in Nairobi, Mombasa and Kakamega through a random sample survey carried out in a selection of low and lower-middle income households. The full results of the survey are contained in a separate report prepared for the Mission.

A. Overview

By 2020 it is estimated that over 50% of the population in Kenya will reside in urban centers. Rapid urbanisation is a critical challenge for those charged with service provision to urban centers in developing countries. Unable to keep up with the rapid pace of population growth, urban centers have experienced a substantial increase in the number of people living below the poverty line - between 1993 and 1998 the percentage of urban population below the absolute poverty line increased from 29% to 49%.

Low income households account for 30-70% of the population in Kenya's urban centers, and comprise the fastest growing segment of the urban population. Most low income households or about 3.6 million people live in informal settlements where WSS utilities do not provide a direct service. Although 80% or 90% of the total population in Mombasa and Nairobi respectively, receive water from the main piped network¹, more than 60%² of the population in these urban centers rely on either a kiosk, vendor or natural sources. More than 85% of low income households use a pit latrine.

Current deficiencies in access to basic water and sanitation by the poor, have largely been influenced by the firm stance that the Government took against the provision of water within "informal" settlements in the first three post independence decades. In line with the Government of Kenya's human settlements strategy, which focussed on rural development and promotion of secondary towns in order to stem the growth of informal settlements, the provision of services was considered a "pull factor" that would attract further in-migrants to settlements that were unplanned and often illegal. Although reform efforts have been initiated, policies, legislation and regulations that discourage or prohibit utilities and local authorities from providing adequate services within informal settlements, are still in place today.

As a result, over this period the Government did not invest in the development of water supply and sanitation systems in informal settlements. Many utilities deliver services up to the periphery of informal settlements. The role of internal distribution has gradually been assumed by small scale service providers, who through formal or informal means, now account for 20 - 70% of water retailing in urban centers. Small scale service providers, including NGOs and Community Based Organisations (CBOs) offer a variety of service options including kiosks/retail outlets, hand cart delivery, water tankers, and house connections from private boreholes. However, as they often operate informally, most of their activities are not officially recognised and are unregulated.

For many of the reasons outlined above, most poor urban residents also do not have access to conventional waste water/sanitation systems. The majority rely on on-site technology, ranging from the wrap-and-throw method to communal septic tanks systems, many of which have proved inadequate in the face of growing urbanisation and rapid densification. As such, problems created by poor environmental sanitation have become more acute, and waterborne diseases such as diarrhoea and malaria, and epidemics such as cholera and typhoid, are occurring with increasing frequency and greater impact. The effects of poor environmental sanitation on public and environmental health are borne by urban communities and their riparian rural neighbours.

¹ 1999 Census Report, Volume, II

² November 2000, Survey of Water Supply in 3 Urban Centers

Rapid urban growth is occurring at a time when the performance of many water and sanitation utilities is on the decline. The high cost of increasingly inaccessible and unreliable infrastructure and services has been borne by the poor who pay 10 times as much per unit purchased as rich families do, for a lower level of service. In addition, inefficient management and operation of existing facilities has limited the availability of resources for investment in needed services, especially to the poor. This has led to a downward trend in 'formal' service coverage statistics in many developing countries. These statistics often do not account for 'informal' service providers, and are often misleading as they do not illustrate the difficulties under which the bulk of the poor obtain water. Although results from the 1999 census indicate that 93% in Nairobi or 80% in Mombasa receive water from the piped water network, only 51% in Nairobi and 45% in Mombasa have a private connection, the rest access water from yard taps, kiosks or vendors linked to the piped network under less favorable conditions.

The poor suffer first (and most) from the effects of declining utility performance. During shortages, rationing of water affects the poor most adversely as storage facilities are either non-existent or inadequate and forces of supply and demand quickly translate into higher costs to the consumer. A survey conducted in November 2000 indicates that although 98% of low income households had storage facilities these were typically the jerricans (78%) that they used to collect water. Despite having the piped water network as their primary source, most low income households spent about 30 minutes collecting water from a kiosk or yard tap, and paid Ksh 5 for 20 litres of water from a kiosk or Ksh 14 from a hand cart vendor³.

Autonomy, accountability, partnership and competition are key to the improvement of overall service efficiency and the drive to expand coverage to poor urban communities. Lessons learned from a decade of Private sector participation (PSP) initiatives offer hope for the future, provided that the effort is made to better understand the necessary requirements for ensuring that the benefits of PSP reach the poor. Building on current knowledge and experience, and given the scale and complexity of the problem, partnerships between Governments, utilities, the private sector - both formal and informal, and community organisations, will continue to play an important role in meeting the current shortfall in water and sanitation service delivery in the medium to long term.

As Government policy has shifted to focus on poverty eradication, various interventions have been made towards improving access to water and sanitation in informal settlements in Nairobi, Mombasa, Kisumu and several other medium sized urban centers. Given that the majority of future water and sanitation utility customers are low income households in informal settlements, a flexible, targeted and site specific approach that focuses on addressing specific local needs and characteristics should be adopted. Improved access, measured in terms of reliability, affordability and sustainability will require user consultation, innovation and coordination among the various actors involved in informal settlements such as private providers and landlords. A key element of this strategy will be to remove hindering legislation, regulations and standards that inhibit service delivery to informal settlements.

³ The bulk kiosk tariff for 20 litres in Nairobi is Ksh 0.20.

B. Urban Poverty and its implications for Water and Sanitation Service Delivery

1. Kenya's urban population is growing at a rapid pace. Currently 30% of the population is in urban areas, but by the year 2020, it is expected that over 50% of Kenya's population will be urban⁴. Thirty percent of the total urban population is in Nairobi. When combined with Mombasa, Kisumu and Nakuru, the four largest urban centers account for 50% of the total urban population.

2. Low income⁵ households account for 30-70% of the urban population and comprise the fastest growing segment of the population. This is because a growing number of the urban population are poor. Between 1993 and 2000 the percentage of total urban population below the absolute poverty line rose from 27% to 49%⁶, while in Kisumu poverty levels are now as high as 63%. Low income households are not homogeneous and the diverse circumstances and complex nature of settlement patterns and living conditions presents a challenge for service delivery. While some live in formal settlements that are either planned or unplanned, others live in informal settlements that are unplanned and unserviced. In small towns many live in peri-urban settlements that have rural characteristics. A description/definition of low income urban settlements is attached as Appendix 1.

3. Informal settlements, house the bulk of the low income households and account for 3 million people or 40% of the total urban population. There are 237 informal settlements in 14 of the 23 Municipalities and towns in Kenya. In Nairobi, informal settlements account for 55% of the population, or 1.2 million people, while in small to medium sized towns informal settlements account for 5-50% of the urban population. In small towns many low income households are located within the municipal boundaries, but outside the "urban" area typically defined as the WSS utility service area. Many of these households (48% in Kakamega) rely on their own water sources, vendors, traditional sources or community initiated small piped networks.

4. With growth rates as high as 12% in some informal settlements as compared to 6-10%⁷ for urban areas, it is clear that the bulk of future new customers for water utilities will be low income households. Strategies for improving utility operations will therefore need to focus on understanding the specific requirements of these households. Given that this sector has been neglected for some time, special priority should be accorded to it by Government. Differences in access to water supply and sanitation services across urban centers (see Table 1) will necessitate flexibility in the Governments strategy for the sector. In particular, the strategy will need to look beyond the sector at the broad policy and legal reforms required to pave the way for involvement of small scale and large scale private sector, community and individual initiatives.

B. Policy Framework for the Urban Poor

5. The Government has established a broad policy basis for extending services to the urban poor. The Sessional Paper on Water Policy notes the importance of *evolving a conscious strategy*

⁴ Human Settlements Basic Statistics, UNCHS, 1997

⁵ Low income areas (see Annex 1) include informal settlements such as Kibera (see Annex 2), formal but unplanned settlements such as Zimmerman, and formal settlements such as Dandora (in Nairobi).

⁶ Mean monthly non-agricultural household income for a poor household in Kenya is 2,648; Nairobi it is Ksh 8,634; Coast (Mombasa) it is 5,022; and Western (Kakamega) it is 2,898.

⁷ 1979 census and JICA Water Master Plan Aftercare Study.

aimed at providing water to the poor and indicates that the Government will give *preference to water programmes that have direct impact on vulnerable sections of society*. A participatory approach is proposed that involves consumers more actively in decision making and management and builds partnerships with the private sector and NGOs. These sentiments are echoed in the Sessional Paper on National Poverty Eradication which recognises the role of the private sector in providing services to the urban poor and places emphasis on involving poor communities in the management of their water supplies. The Government is also preparing an Urban Slums Policy and an Environmental Sanitation Policy which will form part of the framework for serving the poor.

The current policy framework is not adequately backed by supporting legislation. While the effort has been made to establish a framework for supporting implementation of these policies through the Government's draft Water Supply and Sanitation Sector Strategy and draft Water Amendment Bill, various steps are still required to strengthen and harmonise these documents with other acts such as the Local Government Act (and related building codes), and the Public Health Act that restrict service provision in informal settlements. Efforts will also be required to revise and adapt supporting regulations and by laws at local level to allow direct service delivery within informal settlements, and to create room for small scale providers, community groups and the private sector. The strategy also recommends specific actions to incorporate the poor more specifically in investment and development plans prepared by the Government or future water supply and sanitation service providers.

C. Access to Water Supply and Sanitation

6. **Water Supply.** WSS utilities currently play a minor role in the direct provision of services to informal settlements⁸. This is a result of several factors including unclear tenure, lack of development control (planning approval, plot coverage ratios, etc), and rigid technical standards (way leaves, building codes). Although the majority of households in large urban centers obtain water from the main piped network – 80% in Mombasa and 90% in Nairobi - most poor households, particularly those in informal settlements, receive this water through indirect means such as water kiosks and handcart vendors. Figures vary from one town to the next. In Nairobi 22% of households in informal settlements have access to water from a private connection compared to less than 10% in informal settlements in Mombasa, and Kakamega.

7. A large number of low income households and the majority of those in informal settlements rely on water kiosks. In Nairobi and Mombasa, 41% and 66% of the informal settlement population, respectively, rely on kiosks. In smaller urban centers, the number of licenced water kiosks is lower. Instead, privately connected households sell water to their neighbours (2%) and in some cases (e.g. Kakamega), these households operate as kiosks and are charged the kiosk tariff by the utility⁹. A smaller number of households (less than 10% in all three urban centers) rely on water vendors who purchase water from the utility network, or from independent sources such as boreholes and wells.

⁸ Given that poor households live in both formal and informal settlements, the distinction is used in the rest of the report to highlight differences in service levels for low income households as a whole and for the subset that lives in informal settlements.

⁹ This is between 10 and 15 Ksh per cubic meter.

8. A large number of low income households in small and medium sized towns, rely on traditional sources. In Kakamega, 48% of low income households within the municipal service area rely on untreated ground or surface water sources.

Table 1
Low Income Households by Water Source.

	Nairobi	Mombasa	Kakamega
<i>Private Connection*</i>	22%	7%	19%
<i>Yard tap*</i>	34%	3%	25%
Own Source	1%	1%	1%
<i>Water Kiosk*</i>	31%	67%	5%
Water Vendors	7%	10%	1%
Neighbours	4%		1%
Ground and other Natural Sources	1%	12%	48%
	100%	100%	100%

* Water Sources that depend on water from the main piped water supply network

9. **Sanitation.** Most WSS utilities including departments in Local Authorities that are water undertakers are not responsible for on-site sanitation. With the exception of Nairobi, 80% of low income households in urban centers do not have access to waterborne sanitation. In Nairobi 38% of low income households (mostly in formal/permanent housing areas) have a waterborne toilet compared to only 10% in informal settlements. As on-site sanitation is generally considered a private or household affair, limited funding is available from NGOs/donors for improving households or community facilities. As a result the majority of on-site sanitation systems in informal settlements are poorly constructed and provide a poor service to users. Results from the survey indicate that 60% of those without a private toilet in Nairobi indicated that they were not satisfied with their current sanitation service compared to an average of 50% in all three cities.

10. As a result of this institutional void most households in informal settlements rely on the small scale private sector to provide them with a sanitation service. In addition to artisans who construct pit latrines and small contractors who build septic tanks, in some informal settlements, private initiatives include construction of bathing/toilet facilities for rental, and exhauster services. Out of 75% of households in informal settlements who indicated that they empty their latrines, on average 40% of them use private exhauster services.

D. Water and Service Delivery Arrangements in Low Income Areas

11. As outlined in section C. above, low income households obtain water through a variety of service delivery arrangements including, private and yard connections, kiosks, vendors, or from other sources including, wells, streams and their neighbours. Service delivery arrangements in each urban center have evolved in relation to settlement patterns and service requirements of consumers. A description of the key service delivery arrangements and recommendations for their improvement is provided below.

12. **Kiosks.** The majority of low income households purchase water from a kiosk located between 40 and 200 metres from their dwelling. In some urban centers water kiosks are run by individuals licenced to operate kiosks by the WSS utility. However, due to poor WSS utility billing and collection systems, funds collected from users by kiosk owners are not always

remitted to the utility. In others, such as Malindi and Athi River, the WSS utility manages the kiosks directly. MENR recommends a price of 1 ksh per jerrican for retailing water from kiosks¹⁰. However prices range from 2 to 5 ksh when a regular supply is available, and fluctuate when demand increases. Currently, as a result of the drought and consequent water shortage in Nairobi, prices are between 5 and 8 shillings per jerrican for water bought from a kiosk.

13. Most households who use water kiosks do not have the option of obtaining a private connection. Due to their status as tenants, the nature of their housing (a 10 x 10 foot room), and income earning capacity (daily wage), the majority consume about 30 litres of water per capita, per day purchased in 20 litre jerricans paid for on a daily basis. Results of the survey carried in Nairobi, Mombasa and Kakamega indicate that 38% of households are satisfied with the service they receive from their kiosk. When given a choice of a private connection with a 6 month deposit fee, lower tariff and monthly charges, 16% chose to use a kiosk within closer proximity of their dwelling, compared to a yard tap (24%) or private connection (39%) from which said they would sell water to their neighbours (30%).

Recommendations

14. Due to current dwelling sizes and settlement patterns, many low income households, particularly in large urban centers will continue to rely on water kiosks (and other retailers, such as their neighbours) for some time to come. In addition, limited and declining purchasing power may mean that poor households are forced by circumstance to rely on water supply systems where they can pay for water as and when they use it.¹¹ For improved efficiency of kiosk operations, efforts should therefore be aimed at:

- increasing the density of, and competition among, kiosks with a view to improving affordability and convenience to users;
- extending networks within closer reach of households (distribution infilling) to reduce investment costs and reduce the high costs and risks often assumed by kiosk owners;
- enabling more frequent payment of bills by kiosk owners who often do not have access to a banking system and cannot accumulate revenue over extended periods (up to 6 months in Nairobi); and
- upgrading from kiosks to yard connections¹². Since most kiosks are located adjacent to residential compounds, these can quite quickly be converted into yard connections¹³;

15. **Vendors.** Most households that use handcart vendors often have access to a kiosk but prefer the convenience of door to door delivery and are willing to pay as much as 10 times more than they would for water collected from a kiosk. Of those households surveyed, those using vendors (40%) indicate that there is a nearby kiosk but this is either unreliable, too far or there is often a queue for water. Hand cart vending is the most common form of vending in low income areas. Vending through water tankers is not common among the poor, as the costs are

¹⁰ A survey carried out in 1993 indicated a cost per jerrican of 1 ksh.

¹¹ In Kibera, Nairobi only 11% of kiosks received bills and 5% of revenue billed was collected. Kiosk owners pointed to delayed bills, inaccurate meter readings as key issues affecting payment of water bills.

¹² The block tariff is not favorable to groups of households sharing a tap since they are classified as domestic consumers (typically a household of less than 8 persons). Applying to operate a water kiosk offers more advantages as a flat tariff is applied.

¹³ A study of water kiosks in Kibera, Nairobi indicated that 18% of kiosk owners said their customers were captive tenants; many were landlords resident in Kibera

often exorbitant and few households have adequate storage facilities.¹⁴ Handcart vendors typically buy water from water kiosks, private connections or other unimproved sources, and retail it for as much as 30 Ksh per 20 litre jerrican. Given the high cost that these households pay for water, it is likely that most are able to afford a higher level of service (such as a private connection) but are denied access to a connect for various reasons, such as distance from the WSS utility mains, or a prescribed level of service (public water point) that is linked to the informal status of the settlement.

Recommendations

17. While recognising the role of vendors, care should be taken not to over regulate this form of service provision. In the short to medium term, WSS utilities should develop arrangements for monitoring the quality of water supplied by water vendors. In the medium to long term, improvements in service within informal settlements will enable many households that currently use handcart vendors access to a more reliable service such as a yard connection or private connection.

- for consumers relying on handcart vendors, quality control is more difficult to ensure. Meeting the needs of consumers who currently rely on vendors may require (i) offering a range of services to higher income segments of the market within informal settlements.
- for water tankers, (ii) legalisation and regulation of water tanker supply may lead to a higher quality service for the consumer; but (iii) tanker filling stations may need to be established at reasonable distances, to deter stealing of water from fire hydrants and allow a bulk rate.
- for vended water purchased from boreholes, measures to regulate quality could be introduced through introduction of permits that require (i) regular water quality testing and (iv) displaying information on source and quality on the body of tanker, among other measures.

18. **Yard Connections.** Between 80 and 90% of low income urban households in Kenya's major¹⁵ urban centers are tenants. As a result many low income households that are tenants often depend on their landlords to provide water and sanitation services. Although the level of service provided to households varies from one informal settlement to another – yard connections are usually found where land tenure (e.g. Kangemi) is secure and housing has been developed for rental purpose. A survey of low income households in Nairobi, indicates that 70% of those using yard connections are not aware of how much they pay for water. 77% indicate that the cost of water is part of their monthly rental charges.

19. Since yard connections share the same tariff structure as private connections and all WSS utilities in Kenya use progressive tariffs, landlords may have the incentive to limit consumption in order to ensure that they can cover their water bills through the standard monthly rental fee charged to tenants. In Kariobangi, Nairobi, some storied buildings have one domestic connection serving as many as 250 people. Water bills are either (i) shared between tenants; (ii)

¹⁴ Consumers in middle and high income areas purchase water from tankers at a further 10 times the price of water sold by hand cart vendors. As a result of the current drought more than 200 tankers are now operating in Nairobi. At the height of the water shortage, most tankers reported operating 24 hours per day, and charging rates of 6,000 to 8,000 per 8m³ tanker. As there is currently no regulatory framework for water tanker services (only the WSS utility is authorised to provide this service). The WSD has recently initiated steps towards regulating the quality of water delivered by tankers.

¹⁵ Survey of Informal Settlements in Twelve Urban Centers, November 2000.

consumption is controlled by limiting the number of hours of access to a water point, (iii) households are provided a fixed number of jerricans on a daily basis (any water required in excess of this is paid for separately); or (iv) the landlord may offer unlimited supply at no additional cost to the tenant.

20. Tenants are often reluctant to contribute to improvements in WSS services because most consider this the landlords role. While landlords may limit the level of control tenants have on consumption, they may also be better able to afford improvements in services required through sector reforms implemented by Government (e.g. revisions to building codes, by laws) Landlords have an incentive to improve services in order to increase the value and rental income from their property. However, additional requirements placed on landlords (to offer a higher level of service) could translate into higher rents for tenants.

Recommendations

21. Given the large percentage of consumers who rely on landlords to deliver water supply and sanitation services, further study is required on yard connections to establish means by which tenants can gain access to improved water supply and sanitation services without reducing affordability of current housing to the poor.

- current consumption patterns and payment arrangements should be assessed and consultations held with landlords to establish appropriate and mutually beneficial service delivery arrangements (for tenants).
- options for facilitating service improvements should be studied, including credit facilities for landlords to connect to sewer networks (including septic tanks and condensation systems), and where appropriate to finance in house installations.
- mechanisms for enforcing building codes and development controls should be strengthened and appropriate standards for service delivery in low income areas developed.
- sample layout plans and technical drawings should be prepared to facilitate infrastructure development and improvements by landlords and private developers.

21. Private Connections. In low income areas less than 22% of households have private connections. Most households with a private connection reside in permanent dwellings in underserved peri-urban areas in Nairobi, and in formal low income housing in both large and small urban centres. In several urban centres (e.g. Thika), water is still provided free to council estates. Although the Thika municipal council has resolved to meter connections in council estates, efforts to install meters have been resisted by tenants and bulk meters destroyed. The councils inability to charge for water in these settlements has made collection of revenues in other parts of the municipality more difficult. When compared to low income areas, 4-12% of households in informal settlements have private connections and most of these are operated as kiosks, selling water to their neighbours.

Recommendations

22. In order to improve access to low income households, future urban water supply and sanitation projects should place priority on improving access to a private connection. Efforts should be made to:

- extend distribution networks within informal settlements and enable low income households connect at reasonable prices.

- rationalise parallel pipelines that have been laid in many informal settlements including connections made at the periphery of the settlement (nearest legal secondary or tertiary distribution line) at distances of up to 1.5 kilometres.
- set tariffs, deposits and connection charges that enable more households to connect at a reasonable cost. Measures could include introduction of installment payments for connections, subsidised connections for poor households and user friendly bill payment arrangements – closer proximity and more frequent collection period.
- establish tariff policies that allow unconnected households to purchase water from their neighbours at a reasonable cost

23. **Community Water Supply.** A growing number of households in urban areas have access to water through community initiated water supply systems. While some community water systems are officially recognised (e.g. bulk purchase of water from the utility) others are informal (small piped borehole networks). Most compete with the main piped water supply network for customers. At least 30 of the urban water supplies run by MENR and NWCP have community water supplies within their service area. In effect there are already multiple service providers operating within the service area designated to the water undertaker.

24. In partnership with the utility and NGOs, some communities have contributed towards the cost of installing independent point or piped water supplies. There are more than 40 small piped borehole systems serving small communities in Nairobi and Ngong town and 5 piped gravity water schemes within Meru municipalities boundaries. In Nairobi and Embu several communities have contributed toward the extension of distribution networks served by the utility network and buy water in bulk from the utility.

Box 1. Community Water Supplies in Meru Municipality – MENR Water Service Area

There are 20 community water supply systems within the MENR water supply area. These schemes have been developed over the last 30 years as gravity or point systems managed by local community groups. They serve as many as 700 households each, cover supply areas ranging from 2 sq. km to 10 sq. km and produce 20 m³ to over 300 m³ per day. Many households within the Meru supply area are connected to more than one community scheme (used mainly for farming and livestock) while the MENR supply is used for domestic purposes. None of the schemes is metered and only in a few cases charge a flat rate. Operation and maintenance is in most cases financed on an ad hoc basis. Capital investments range from Ksh 100,000 to over Kshs 2 million, mostly raised through member registration and monthly contributions. Only a few of the groups have received financial assistance from donors. Community groups are reluctant to connect to the MENR water supply system as they fear they may be subjected to regulation and be barred from the use of water for irrigation.

Recommendations

25. In some urban centers and particularly in peri-urban areas and informal settlements that are not always reached by the utility, community managed systems are an appropriate solution. However, as utility efficiency improves in the future, some schemes may eventually be phased out by community preference to function as consumers rather than scheme managers. Future urban water supply and sanitation projects should therefore aim to:

- involve communities more effectively in determining levels of service that are appropriate;
- mobilise and utilise local resources more effectively by preparing guidelines and procedures for delegating management responsibility to communities;
- clarify ownership of assets and ensure that entry and exit rules for community members are clear;

- improve the legal framework for community water supply in urban areas, including issuance of licences for sale of water from boreholes¹⁶.
- establish a financing mechanism to support community initiative and incorporate community systems in long term rehabilitation and expansion plans
- require professional management of community schemes and where appropriate provide technical backstopping to community groups.

26. **Waterborne sanitation.** Only 23 of the 104 urban centers have sewerage systems and despite huge investments in these systems less than 15% of the population in these urban centers has access to waterborne sanitation. In smaller towns, on site systems such as septic tanks and pit latrines are commonly used and emptying services are inadequate or constrained. In Ruiru Municipality a population in excess of 250,000 most of whom reside on the periphery of Nairobi (e.g. Zimmerman) have no access to the nearby sewerage system for Nairobi Municipality and rely on septic tanks for waste water disposal. Despite the magnitude of the wastewater problem in Ruiru, the municipality has only 2 exhausters. Zimmerman registered a higher priority ranking for sanitation than other settlements surveyed.

27. **Exhauster Services.** Exhauster services are provided by a wide range of actors including the private sector, who currently operate without license¹⁷ in Nairobi, Mombasa and several other towns. Due to lack of accessibility in most informal settlements, many pit latrines cannot be reached by mechanical exhausters. Waste is manually removed, diverted into open drains or where space is available, a new latrine is constructed. The average cost of emptying a pit using conventional equipment ranges from 3,150 to 7,500 Ksh¹⁸, depending on the travel distance from the pit latrine/septic tank to the discharge point which is often a sewer manhole. However, a community managed exhauster service that relies on a specialised emptying machine (vacutug) has been operational in Kibera informal settlement for the past 5 years and is able to cover all its operating costs from revenue.

Recommendations

- improvements in on-site sanitation require changes in regulations and by laws at city level to enable households in informal settlements connect to the sewer. The option of using innovative arrangements such as condominal systems should be investigated;
- given the high per capita cost of installing off-site systems (sewers) that are under utilised, financing of on-site sanitation should receive attention from public authorities. Sustainable financing mechanisms such as the sanitation surtax on water should be investigated.
- for households that continue to rely on on-site systems, public monopoly of exhauster services should be de-regulated to allow the private sector participate more actively in the delivery of this service. Improvement in sludge disposal facilities/points would be essential.
- for households with yard connections, where feasible, the sewerage network should be extended to allow users to connect at shorter distance. This is a priority for high rise buildings in the rapidly growing peri-urban areas (Zimmerman) in Nairobi that currently rely on septic tanks.

¹⁶ Schemes connected to the utility network should be regulated by the utility, while independent small piped systems should be regulated by the WSSC.

¹⁷ Exhauster services have not been deregulated. Currently only municipalities are allowed to carry out this function.

¹⁸ Small Scale Independent Providers Study, Mombasa and Nairobi, Water and Sanitation Program, 1999

D. Demand for Water Supply and Sanitation Services

Water

28. As water utilities provide less than 20% of low income households direct access to water through a private connection, a thriving market for water and sanitation services exists in most urban centers. The gap left by formal utilities, has been filled by numerous formal and informal private and community organisations offering a range of different services (kiosks, vendors, exhauster services, etc), often at a much higher cost to users. In line with Government policy, standpipes dispensing “free” water are virtually non-existent and all utilities have established water kiosks¹⁹ for which they provide a special bulk rate (10 ksh per meter³).

29. Although they consume the smallest quantities of water, the poorest households pay the highest unit price for water. Assuming an average price per jerrican of 3 Ksh a household of 4 consuming 4 jerricans per day (20 litres per capita) would spend 360 Ksh²⁰ per month on water while a middle income household with a piped connection would pay the same amount for 60 litres per capita from a private connection. Expenditure on water constitutes about 8-10% of income and the average amount of water consumed is 20 to 30 litres per capita per day. For households obtaining water from kiosks consumption is limited by distance (what can be carried) and any increase in consumption would depend on increased proximity to the dwelling. In more permanent settlements such as Kawangware, where yard connections are common, consumption is between 30 and 40 litres per capita per day.

30. Demand for improved water supply among low income households is high. Water is a (first or second) priority of low income consumers in all three urban centers surveyed. On average 64% of households rated it a first priority, and 55% of households indicated that they were not satisfied with their current water supply (only 5% were very satisfied). When offered the choice to improve their current level of service in terms of price, proximity, and reliability only 20% chose to maintain the status quo. The remainder opted for either a private connection (38%), improved yard connection (24%) or improved water kiosk (16%). Of those choosing a private connection, 30% indicated that they would sell water to their neighbours.

31. In choosing a preferred option, location, tenancy and dwelling size appear to play a key role. For a majority of households occupying a single room, the preferred choice was a yard connection or kiosk. Similarly, control of household expenditure/consumption may have influenced some households to choose a kiosk over their current yard connection.

¹⁹ The Ministry of Environment and Natural Resources, Department for Water Development has issued a circular regarding the establishment of kiosks in informal settlements.

²⁰ This has increased to between Ksh 720 to 1200 in Nairobi as a result of the current drought.

Table 2.

Water supply improvement options chosen versus number of rooms at current home

Number of rooms*	Option Chosen				Total	N
	Pvt. Conn.	Yard Conn.	Kiosk	Status Quo		
1	40.20	61.25	62.75	54.93	52.96%	161
2	24.51	20.00	19.61	25.35	22.70%	69
3	7.84	6.25	9.80	7.04	7.57%	23
4	10.78	5.00	1.96	4.23	6.25%	19
5	8.82	2.50	5.88	4.23	5.59%	17
6	3.92	1.25	0.00	4.23	2.63%	8
7	1.96	1.25	0.00	0.00	0.99%	3
8	0.98	1.25	0.00	0.00	0.66%	2
9	0.98	1.25	0.00	0.00	0.66%	2
Total	100%	100%	100%	100%	100%	
N	102	80	51	71		304

* May refer to total rooms in a shared building occupied by several families

Sanitation

32. An assessment of household priorities indicates that demand for sanitation is a third priority after water supply and electricity²¹. This is despite the fact that access to adequate sanitation in urban centers in informal settlements is poor (see priority ranking by settlement and location, Annex 2). One indication of the limited access to sanitation facilities is the large number of households in Kibera who indicate that they use "wrap and throw" methods for disposing of excreta (See Annex 3). Another indication is the mean number of households sharing a pit latrine - an average of 12 households (50 people) in Nairobi's informal settlements compared to 6 households in Mombasa. In contrast, 40% of those surveyed in Kakamega, where densities are lower, indicated that their household did not share a pit latrine with others. With the exception of Nairobi, 80-90% of the population in urban centers rely on on-site sanitation.

33. Despite the fact that several informal settlements are located close to the sewer network, very few houses are connected to it. However, low income households occupying rental housing in upper-lower income settlements, (e.g. Kariobangi and Zimmerman in Nairobi) 80% have access to waterborne sanitation systems connected to septic tanks installed by housing developers. Limitations to increasing the number of low income households connected to the network include (i) distance from the sewer network, (ii) low volumes of water consumed, (iii) lack of on-plot access to running water and (iv) the informal or illegal status of settlements.

²¹ Despite the expectation that sanitation is a high priority in informal settlements, the survey showed that after water, electricity is in fact a higher priority among those in informal settlements. This may have to do with the fact that due to their status as tenants, poor households do not have much control over facilities (provided by landlord), but do have the choice of an electricity connection. In Nairobi compared to the overall city average of 13%, 21% in informal settlements considered electricity a high priority and ranked it higher than sanitation.

Recommendation

34. Limited financial support for on-site sanitation is currently available from municipalities. In addition, most WSS utilities do not deal directly with on-site sanitation, although they may collect revenue on behalf of local authorities that are responsible for operating sewerage and wastewater treatment facilities. To respond to demand for improved services from low income households it will be necessary to gain

- a better understanding of customer preferences, consumption patterns and external constraints (tenancy) and implications on demand for services
- establish teams, or units within utilities and/or contract out sanitation and hygiene education tasks in order to focus attention specifically on strategies to serve the poor.
- efforts should also be made to develop alternative models for service delivery that build on and support the work of SSIPs and NGOs
- performance monitoring indicators should be developed to allow WSS utilities monitor improvements in service to low income households

E. Pricing of Water Supply and Sanitation Services: Implications for Low Income Households

35. The majority of low income households do not benefit from the current social blocks in tariffs applied by utilities in Kenya because they are often not connected to the WSS utilities network; do not have access to a private connection and/or share a tap with other households. About 30% of household connections in low income areas are shared by multiple households (both yard or private connections). High volumes of consumption resulting from multi-family use of facilities means that low income households do not benefit from the social blocks in the tariff that are designed to meet the needs of the poor. Tariff structures of all key urban WSS utilities include a bulk rate for water sold through kiosks - 10-40 Ksh per m³. MENR recommends a price of 1 ksh per jerrican for retailing water from kiosks²². However, due to the high overheads often associated with establishing a kiosk²³ the actual price of water sold by kiosks ranges from 2 to 5 ksh and this amount fluctuates when demand is high.

Table 3

Tariffs and Prices for water supply (Ksh)

City	Tariff (20 litres) Flat rate/unmetered private connection	Tariff (20 litres) Metered first block private connection	Tariff (20 litres) Kiosk bulk rate	Price (20 litres) Kiosk	Price (20 litres) Vendor
Nairobi	4.00	0.40- 2.00	0.20	2.00 – 8.00	
Mombasa	4.00	0.40- 2.00	0.20	5.00 - 25.00	30.00
Kakamega	4.00	0.40-20			

36. Many low income households are unable to connect to the sewer due to their dwelling type and location. For those with access to the sewer connection charges (estimated to cost Ksh

²² A survey carried out in 1993 indicated a cost per jerrican of 1 ksh.

²³ The cost of establishing a cost in informal settlements may be borne entirely by the kiosk operator and can be as high as 100,000 Ksh for a kiosk located far from the mains. In addition operation and maintenance costs and official or unofficial fees are incorporated into the price.

43,000 for a single dwelling, with materials and labour costs included) are high, and monthly sewerage charges which are pegged at 50% or 75% of the charge for water may be unaffordable to most poor households. No financial support is currently available from municipalities or utilities for low income households to connect to the sewer network or for on-site sanitation, and under current circumstances, most utilities lack adequate funds with which to support improvements in sewerage systems let alone support household sanitation.

Recommendations

37. Measures to improve the pricing of water in favour of low income households should include:

- reassessment of the proposed kiosk tariff (Ksh 1 per 20 litres) to reflect actual overhead costs incurred by the operator;
- introduction of tariff structures that recognise the prevalence of shared taps among multi-family household units;
- increase the density of kiosks and introduce other incentives for kiosk owners to improve their services;
- enable utilities to generate cash for financing on-site sanitation. In Burkina Faso a sanitation surtax imposed on water bill has funded 20,000 additional latrines over a 5 year period;
- assessing the viability of other appropriate technology such as condominal systems for densely populated areas.

F. Decentralisation of Service Provision - the role of Community Organisations

38. In decentralising responsibility for service delivery to Local Authorities, efforts should be made to allow services to be managed at the lowest appropriate level. This will ensure that the specific service requirements of local communities are properly understood and that decision making regarding the choice of service and appropriate management arrangements are tailored to the needs of consumers. In some cases such as Meru where there are currently more than 20 communities operating within the service area, this will entail, recognition and support for parallel initiatives, while in others such as Embu, bulk sale of water by the utility to a community entity for retail among their members may be appropriate.

Recommendation

39. In order to build capacity of community organisations to manage or oversee their water supply systems in partnership with water utilities and or local authorities:

- questions of ownership and responsibility for maintenance of facilities should be clarified
- procedures and legal requirements for establishing community networks should be developed. These should include responsibility for maintenance of primary and secondary distribution systems (e.g. establishing the cutoff point for the utility at the bulk);
- rules for allowing new community members to connect to community networks at a reasonable price should be established.

F. Private Sector Participation and the Poor

40. Private Sector Participation is often associated with profit motive and therefore seen as negative for the poor. However private participation provides an opportunity for improved efficiency in service delivery leading to a reduction in the high prices currently paid by poor households under poorly managed public sector WSS utilities. Recent experience regarding PSP

and the poor, has shown that a well designed transaction can improve access to the poor if a proper assessment of demand is carried out and consumers participate in identifying an appropriate service level. Performance targets can be used to ensure that the private operator explicitly targets the poor in service expansion plans. The role of the Government in creating an enabling environment for this is key - the policy framework for improving infrastructure and services in informal settlements should be clarified and tariff setting/pricing policy reformed and rigid technical and service standards reviewed.

Recommendation

41. In extending services to the poor, private operators would be required to increase the number of connections to low income households. However, in informal settlements where access is limited due to land tenure or other concerns, private operators would need to work with alternative providers such as kiosks, and community organisations who are currently the main providers of service to the informal settlements. While maintaining the target of providing all households a private or yard connection, efforts should also be made to:

- recognise, support and accommodate small scale providers in utility plans for service extension. This may include actions such as deregulating services (e.g. exhauster services);
- initiate franchising, leasing and other arrangements that enable service improvements and quality control
- increase the density and proximity of kiosks through network extensions and regulate operations of SSIPs, thereby encouraging SSIPs to improve the quality of service
- for service providers that are independent of the WSS utilities network, e.g. small piped networks for by private boreholes, licences may be introduced and permits linked to water quality by the relevant regulatory body. As these operators effectively compete with the utility and deliver a service within the boundaries of the utilities service area, responsibility for regulation of their activities should be done by the WSS regulator.

G. Financing of Water Supply and Sanitation Services

42. Currently, most financing for developing water supply and sanitation systems and providing services to low income households is provided through private and community initiatives. Where the Government has been involved, the focus has been on extending and upgrading infrastructure and services through distribution infilling and standpipe installment programs. In Nairobi, the Kibera Distribution Infilling Component is one example of this. The majority of funding for informal settlements has been provided by NGOs (often with support from donors) in partnership with local communities. Much of this funding has not had a sustained impact due to the lack of an adequate institutional framework for planning and delivering services. The bulk of financing for connections and installations (kiosks, tanks, etc) have been provided by the private sector through landlords, kiosk operators, septic tank emptiers, etc. Private investments in 59 kiosks within Kibera amounted to Ksh 1.3 million (an estimated 14 million Ksh for all 650 kiosks in the settlement).

Recommendations:

39. To overcome constraints to financing improvements in low income areas, Government should ensure that financing mechanisms are established to support strategies and legislation that create an appropriate institutional environment for investing in infrastructure and service delivery for the poor. Actions could include:

- establishing financing mechanisms (such as the proposed Kibera Development Fund or Water Sector Trust Fund) to enable the extension of infrastructure and channel funds to households and communities for household or neighbourhood improvements;
- criteria for access to matching grants, credit facilities, etc should be established and linked responsibilities of utilities (e.g. for maintenance and replacement costs) clearly spelled out
- contributions from users should be encouraged and supported through clear guidelines regarding ownership of systems developed with community contributions.
- legal arrangements for community based networks should be strengthened and support for community initiatives tied to credible business plans and commercial management arrangements.
- credit facilities should also be established to enable households improve in house sanitation facilities.

Annex 1. Definition of Low Income Urban Settlements

1. Low income settlements constitute between 30 and 70 % of the population in major urban centres in Kenya. Low income settlements include a mixture of *informal (including peri-urban)* and *formal* settlements. As access to water supply and sanitation services and the potential for improving this service is dependent on the type of settlement (e.g. legal status and tenancy), the information provided in this report attempts to define service improvements for each of these. Landlords play a pivotal role in developing services for their tenants - any strategy to improve services to this category of consumers will need to involve landlords.

2. **Informal settlements** account for the bulk of low income population. In Nairobi, this figure is 55% while in smaller centers it ranges from 5 and 50%. In large urban centers most informal settlements are located on public land (either Central or Local Government). While in smaller centres a larger number of informal settlements are located on private land. A large percentage of the population in informal settlements are tenants. In many cases the structure owners do not reside within the informal settlement. Owners of the structures have either quasi legal rights of occupation or no rights at all. Only in a few cases do the residents or structure owners have temporary occupation licenses issued by the provincial administration. This creates a constant fear of eviction and increases the level of risk assumed by small scale providers. Improvements to services in informal settlements require government recognition of informal settlements and the role of small scale providers.

3. **Peri urban settlements** combine formal tenure with semi-permanent housing on the fringes of urban centers. Peri-urban settlements are located on private land (tenure freehold) with formal tenure but often lacking proper physical planning. In the Nairobi peri urban settlements include a mixture of semi-permanent housing and storied buildings with single rooms for rent such as Githurai and Zimmerman which fall within Ruiru Municipality. Levels of service provided to tenants are normally determined by individual landlords/private developers and depend on access to finances. Services in storied buildings are often of a higher quality (often waterborne) although residents may share ablution facilities. Improvements to water and sanitation services in peri-urban settlements will require rationalisation of public rights of way to enable development of trunk infrastructure including sewerage facilities. In smaller urban centers, peri-urban settlements have a more rural character with many households falling within the municipal boundary but outside the utility service area using traditional water sources.

4. The majority of low income **formal settlements** are sites and service schemes or housing developments built by either government or private developers. Housing is usually provided with private connections of yard connections during construction – levels of service are prescribed. While sites and services schemes have higher levels of owner occupancy than either peri-urban or informal settlements, a large number of low income units, including sites and services schemes intended for owner occupancy have been converted into rental units. As most of these settlements have already been provided with a service, improvements may include upgrading the level of service from a yard tap to a private connection.

Annex 2 - SOCIAL PRIORITIES:										
FIRST PRIORITY	Improve Electricity	Improve Water supply system	Improve Sanitation	Improve garbage collection/disposal	Improve roads	Improve schools &	Improve storm water drainage	Improve health clinics & services	Improve street lighting	
NAIROBI										
Kibera	7.5%	77.5%	2.5%			5.0%		7.5%		
Kawangware	12.5%	65.0%	7.5%	2.5%		5.0%	2.5%			5.0%
Kayole	15.0%	45.0%	10.0%	2.5%	5.0%	2.5%		5.0%		5.0%
Total	11.7%	62.5%	6.7%	1.7%	5.0%	4.2%	8.0%	4.2%		3.3%
MOMBASA										
Magongo	10.0%	46.7%	6.7%	6.7%	3.3%	6.7%	16.7%	3.3%		
Likoni	16.7%	66.7%	3.3%	3.3%	3.3%	3.3%	3.3%			
Bombolulu	16.7%	56.7%	3.3%	3.3%		6.7%		10.0%		3.3%
Total	14.4%	56.7%	4.4%	4.4%	2.2%	5.6%	6.7%	4.4%		1.1%
KAKAMEGA										
Maraba	4.0%	60.0%	8.0%	4.0%				12.0%		
Shikhambi	28.0%	52.0%		12.0%						
Lurambi	4.0%	80.0%	4.0%					8.0%		
Total	12.0%	64.0%	4.0%	5.3%				6.7%		
SECOND										
NAIROBI										
Kibera	12.5%	5.0%	17.5%	7.5%	22.5%	20.0%		5.0%		10.0%
Kawangware	27.5%	12.5%	10.0%	12.5%	15.0%	7.5%	2.5%	7.5%		5.0%
Kayole	20.0%	17.5%	2.5%	20.0%	7.5%	2.5%	2.5%	12.5%		15.0%
Total	20.0%	11.7%	10.0%	13.3%	15.0%	10.0%	1.7%	8.3%		10.0%
MOMBASA										
Magongo	6.7%	16.7%	13.3%	16.7%	6.7%	13.3%	16.7%	6.7%		3.3%
Likoni	33.3%	13.3%		16.7%	3.3%	10.0%	6.7%	6.7%		10.0%
Bombolulu	16.7%	26.7%	10.0%	10.0%	3.3%	3.3%	3.3%	10.0%		16.7%
Total	18.9%	18.9%	7.8%	14.4%	4.4%	8.9%	8.9%	7.8%		10.0%
KAKAMEGA										
Maraba		20.0%	16.0%		6.0%	12.0%		24.0%		4.0%
Shikhambi		24.0%	16.0%		32.0%	4.0%		8.0%		
Lurambi		56.0%	4.0%	4.0%	4.0%			16.0%		
Total		33.3%	10.7%	1.3%	17.7%	5.3%		16.0%		1.3%

Annex 3.

Summary of Characteristics and WSS Issues in Kibera *an informal settlement in Nairobi*

1. Nairobi is the largest urban area in Kenya accounting for about 45% of the total urban population. Nairobi has an estimated population of 2 million²⁴. Of this population, about 50% are estimated to live in informal settlements²⁵. The population growth rate of Nairobi (7%) is among the fastest in Africa. Growth rates are much higher in informal settlements – estimated at 12% in Kibera. The population of Kibera now estimated at 500,000 quadrupled between 1980 and 1993).

2. There are currently about 30 informal settlements in Nairobi - several have been demolished/burnt down in the past few months. These settlements have the following characteristics²⁶:

- Owners either have of *quasi-legal right of occupation* (temporary license of occupation, letter from the chief (public land), agreement with land owner (private land) or *no right* at all.
- Structures are constructed largely of temporary materials *and do not conform to the minimum standards* as laid out in the by-laws. The recently revised building code - 1995, allows for semi-permanent housing material (see annex 1), however these codes have not been adopted by the City of Nairobi.
- The majority of structures are let on a room by room basis and *the majority of households are tenants* occupying a room (3-7m²) or part of a room. In some settlements “bed rent” is used by casual laborers. The average monthly room rent in 1992 was 200 shillings representing about 9% of income.
- Densities are high, typically *250 units per hectare* compared to 25 per hectare in middle income areas and 15 per hectare in high income areas. The land area covered by informal settlements is *just over 5 per cent of the total* residential land area in Nairobi. *Overcrowding is a limiting factor* and a particular problem for on-site sanitation - full pits cannot be replaced (due to space constraints).
- The physical layout of these settlements is *haphazard/ unplanned*, making access difficult and complicating the development of infrastructure - roads, pathways, drainage, water and sanitation.

²⁴ OED Impact Evaluation Report, 1995, Nairobi Master Plan for Sewer, Sanitation and Drainage, 1996. Population statistics based on 1989 census data - SAR 7500-KE, p. 14 and Kenya Economic Survey 76-93.

²⁵ The term “Informal Settlements” has been adopted by those working with the urban poor in Kenya. It refers to settlements that are of an informal nature either by virtue of land tenure, housing standard, or access to services. These include squatter settlements, sub-standard housing areas, unplanned settlements, and peri-urban settlements on public or private land.

²⁶ Source: Nairobi’s Informal Settlements, 1993

- Access to urban services, such as water and sanitation, is *inadequate, irregular and costly*. Water is provided through kiosks/standposts managed by private sector or community groups -there are about 650 kiosks in Kibera alone. An average of 40-50 households share a kiosk and about 85% of households derive water from kiosks at a cost of between Ksh 0.50²⁷ and 2.00 for 20 litres. About 50% of households surveyed in 1995 indicated that they spent 5% of their income on water (OED survey).
- 94% of households in Kibera share sanitation facilities. Most households rely on on-site sanitation and in some areas, as many as 200 persons are sharing a single latrine. There are a large number of unused – full - pit latrines in all informal settlements. An estimated 60% of latrines are inaccessible - mainly because they are full. Waste from full latrines is sometimes channeled into open (stormwater) drains.
- Refuse is usually burnt or dumped in drainage channels with the expectation that it will be washed away by (rain) stormwater. Poor collection/disposal services from the Nairobi City Council, make community managed solid waste collection programs un-sustainable.
- The majority of tenants reported their individual incomes as ranging between Ksh 600 and 1,800 per month in 1992. Some urban households receive rural-urban transfers to supplement their incomes. A large number of those resident in informal settlements are migrant (casual) laborers who's families live in rural areas. Others derive their income from the informal sector (jua kali). Many are women headed households.

Key Issues

Tenants comprise the bulk of the population in informal settlements (80%). Twenty to 50% of respondents to a recent (OED) survey indicated that their children reside in rural areas, the majority own land in rural areas, and (over 50%) intend to retire to their rural home. **There are therefore limitations to the involvement of tenants (as community members) in infrastructure provision and management.**

The high **cost of water** and **limited access to on-plot water** in informal settlements **has implications for water borne sanitation**. The price paid for water fluctuates depending on availability and will therefore continue to be affected by access and competition (private sector vendors have formed cartels in some settlements). **Irregular water supply** was seen as the primary problem by residents of informal settlements. Findings from an (OED survey) indicated that water is available on an average of 4 days per week.

This general shortage in the city will be alleviated by completion of the Third Nairobi Water Supply project (1996) which is expected to increase the availability of water to about 200lcd until 2005. **The average consumption in informal settlements is 20 to 30 lcd and despite improved availability (through 3rd Nairobi Water Supply Project) this will remain low as long as water is purchased from kiosks/vendors.** This is both a function of price and convenience (distance, waiting and transportation - water is carried by women and children).

²⁷ Metered kiosks paid about Ksh 0.17 for 20 litres in 1992. The tariff for kiosk operators has remained unchanged since 1978, but it is not adhered to by vendors, and prices are difficult to regulate. The tariff is Ksh 1.40 per cubic metre which is about 20% of the *lowest house connection* rate. The actual average kiosk selling rate is Ksh 50.0/cum which is twice the *highest house connection* rate. The number of kiosks increased from 150 in 1978 to 1500 in 1995. SWECO report indicates up to 20Ksh/20 litres being charged in Kayole.

Despite the fact that tariffs for water sold through kiosks have not been raised since 1978, prices in some settlements increased from 0.70 to 2 Ksh for 20l between 1992 and 1996. **Even if water prices dropped, increased water use would be constrained by lack of access to bathing, washing and cooking facilities and inadequate or non-existent wastewater disposal/drainage facilities.** Yard taps/house connections could improve *access to water but may not improve costs* to tenants if landlords are responsible for making this water available²⁸.

Due to lack of adequate bathing facilities some households use latrines as showers/or causing them to fill up quickly. Between 40-80% of households in 9 villages in Kibera surveyed in 1992 did not have access to bathing facilities/showers. Most residents wash clothing and utensils outside their houses. Sullage is thrown on the ground outside the house, and in nearby drains.

High and growing densities/overcrowding in informal settlements have exacerbated the flooding and drainage problem. Results from a survey (OED) indicated that in Kibera the incidence of flooding has increased with population growth. In many settlements drainage is poor (road networks in some areas are unplanned, without stormwater drains) or non-existent - *where open drains exist, these are also used for disposal of solid and liquid waste thereby increasing the problem during rainy season.*

²⁸ Water is often built into rents by landlords and consumption controlled by limiting the number of hours during which it is available each day (i.e. water mains are shut off after 4 hours/day). Tenants are often reluctant to have their rents increased to cover a marginal increase in water made available by the landlord.

Appendices Major characteristics of Water Supply and Sanitation Services in 3 towns

PRIMARY SOURCE:			
	NAIROBI	MOMBASA	KAKAMEGA
Private connection to piped water	5.8%	5.6%	14.7%
Yard tap	35.0%	3.3%	24.0%
Own source	8.0%	1.1%	
Water kiosk	41.7%	66.7%	4.0%
Water vendors	10.0%	10.0%	1.3%
Neighbors	5.0%		
Ground and other natural sources outside the house	1.7%	12.2%	56.0%
Yard not shared			

WATER SUPPLY LIMITED BY:							
	Low pressure	Access controlled by landlord	Too many users	All three reasons	Access controlled, too many users	Low pressure, too many users	Don't know
NAIROBI							
Kibera							
Kawangware	52.9%	17.6%	5.9%	5.9%	5.9%	5.9%	5.9%
Kayole	61.3%		12.9%	3.2%		9.7%	12.9%
Total	58.3%	6.3%	10.4%	4.2%	2.1%	8.3%	10.4%
MOMBASA							
Magongo	100.0%						
Likoni	100.0%						
Bombolulu			100.0%				
Total	66.7%		33.3%				
KAKAMEGA							
Maraba			50.0%				50.0%
Shikhambi	33.3%		66.7%				
Lurambi	33.3%	33.3%	33.3%				
Total	29.4%	17.6%	47.1%				5.9%

HOW IS THE HOUSEHOLD BILLED FOR WATER				
	Landlord charges a flat rate per month	Landlord incorporates in rent	Pay cash for every jerrican	Don't know, not sure
NAIROBI				
Kibera			100.0%	
Kawangware	10.0%	50.0%	40.0%	
Kayole	5.7%	88.6%		5.7%
Total	7.0%	71.9%	17.5%	3.5%
MOMBASA				
Magongo		100.0%		
Likoni				
Bombolulu		100.0%		
Total		100.0%		
KAKAMEGA				

Maraba	66.7%	33.3%	
Shikhambi		100.0%	
Lurambi	12.5%	87.5%	
Total	15.0%	85.0%	

HOW OFTEN DO YOU PAY FOR WATER			
	Charged per jerrican	Every month	Don't know / not sure
NAIROBI			
Kibera	100.0%		
Kawangware	41.2%	58.8%	
Kayole	2.9%	88.6%	8.6%
Total	18.5%	75.9%	5.6%
MOMBASA			
Magongo		100.0%	
Likoni			
Bombolulu	100.0%		
Total	50.0%	50.0%	
KAKAMEGA			
Maraba			
Shikhambi			
Lurambi			
Total			