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Only 10-15% of the urban population in Africa are connected into the sewer network.

Improving Domestic Sanitation

On-site sanitation is the main form of excreta disposal in most sub-Saharan African cities and will remain the most appropriate level of service for the urban poor in the medium term. Despite heavy public investment in sewerage systems in most primary and some secondary cities, typically only 10-15% of the urban population benefit from access to the sewer network. About 80% of the urban population depends on on-site facilities such as septic tanks and pit latrines which, unlike sewers, are usually the responsibility of households. The majority of poor households use communal or shared pit latrines, although a few urban centers (such as Accra and Kano) still have bucket latrines and in some densely populated settlements, the "wrap and throw method" or "flying toilets" illustrated in Box 19, are prevalent.

Despite the stated importance of environmental health and hygiene education as a means of improving sanitation, evidence from the field suggests that only a small number of utilities are directly involved in these activities. For the most part, municipal public health departments are expected to take up this role. Given that many utilities still are not responsible for sewerage, let alone sanitation, it is not surprising that they limit their involvement in hygiene activities. The Durban Metropolitan Water Supply and Sewerage Department is one of a few such programs in place (See Box 23). In Burkina Faso and Senegal, health and hygiene programs linked to on-site sanitation initiatives are carried out on a limited basis by separate departments affiliated with the utilities.

The "Flying Toilets" of Kibera, Nairobi

With an estimated population of 500,000, the Kibera informal settlement is home to a quarter of the population of the City of Nairobi. The settlement covers an area of about 250 hectares resulting in a density of 2,000 people per hectare. This makes Kibera one of the most densely populated informal settlements in sub-Saharan Africa.

One of the key problems facing the Kibera community is inadequate infrastructure. This problem is compounded by the lack of a clear policy framework and effective programs for meeting the needs of the residents of informal settlements. Poor water supply and sanitation are among the most serious infrastructural deficiencies.

In 1997, a rapid assessment of community priorities carried out with 99 focus groups in each of the nine villages that comprise Kibera, identified **excreta disposal** as the **top priority** in 5 of the 9 villages. It is no wonder this is the case as there are few sewerage toilets in Kibera and most households rely on traditional pit latrines. Community members consulted through the assessment pointed out that existing latrines are inadequate for the population: up to 150 people share a single pit latrine causing it to fill up quickly. The problem is further exacerbated by the limited access for exhauster services, rendering about 30% of the latrines unusable.

The shortage of pit latrines is also brought about by the **lack of space** for new construction and because landlords are unwilling to incur the additional expense. Due to the **scarcity of latrines** within the settlement, **excreta-filled plastic bags** referred to as "flying toilets" (otherwise known as the wrap-and-throw-method) are the most common means of excreta disposal for many households. A majority of the participants (69%) identified flying toilets as the primary mode of excreta disposal available to them.

Flying toilets were used to illustrate the scale and importance of the sanitation challenge at the Johannesburg Summit. An article prepared by Reuters noted that "you simply use a plastic bag then fling it as far out of sight as possible". A walk into any of the "scores of slum settlements" makes the "scale of the task for one African city alone seem staggering".

Box 19

Source:

Mbuvi and Kariuki, 1997
Reuters, September 05, 2002

6.1 Promote good on-site sanitation

Financing improved pit latrines

Improved sanitation¹ is increasingly considered a priority for many poor households. Increasing densities and/or rising housing occupancy rates have fuelled demand for better sanitation services. Open space to build a second or third latrine is increasingly difficult to find and as the number of users of existing facilities is on the increase, latrines require more frequent emptying and maintenance. Despite increased demand, most local authorities have not provided financial support for on-site

¹ In this section, the word 'sanitation' is used in the narrow sense to mean human excreta disposal.

Box 20

Cost-sharing arrangements for financing household sanitation facilities in Ouagadougou, Burkina Faso

Ouagadougou, the capital city of Burkina Faso, has an estimated population of 900,000, which represents 60% of the total urban population. The annual growth rate over the past 25 years has been quite high, ranging from 4.4-9.1%. In 1991, 70% of the population used traditional pit latrines, 18% used improved latrines, 5% had built septic tanks and 7% were without facilities. There were a limited number of water connections (only 38% of households) and this, combined with poor sanitation services, resulted in the deterioration of health conditions. One in every four medical visits were attributed to water and excreta-related diseases.

Generating funds through a sanitation surcharge

In 1985, the municipality of Ouagadougou and ONEA (an autonomous public water and sanitation utility) introduced a sustainable financing arrangement for on-site sanitation. A key feature of this arrangement is the 'sanitation surtax' financed entirely by local resources. Through the surcharge, ONEA was able to generate funds CFA14 (US\$0.02) per m³, representing 4% of the average water tariff) for the construction of on-site sanitation facilities. By 1999, CFA 350 million (US\$0.5 million) had been collected through the sanitation surcharge.

The 'surtax' or levy is added to the water bill collected by the water and sanitation utility, ONEA for the sole purpose of subsidizing improved household and public latrines. The tax is charged to all households and funds collected are then deposited into a dedicated sanitation account (established in 1995) managed by ONEA. Households receive financial and technical assistance for ventilated improved pits (VIP) and pour flush latrines, soakaway pits and improved bathrooms.

By 1999, a total of CFA350 million (US\$0.5 million) had been collected and 20,000 sanitary facilities developed. All public primary schools have sanitation facilities financed by ONEA, benefiting about 100,000 children, and 206 artisans have been trained to assist households in the construction of their sanitation systems and to provide hygiene education.

Subsidizing on-site sanitation

The subsidy more or less covers the additional costs of the improved standard and the use of approved contractors, (i.e. about 20-25% of the total cost of a latrine). Technical standards provided by ONEA aim to keep costs moderate and construction is carried out by local masons, trained and registered by ONEA with support from local NGOs. Based on the success of this approach in Ouagadougou, it is currently being extended to Bobodioulasso, the second largest city in Burkina Faso.

Management of the fund poses the biggest challenge. Key issues include the transaction costs and management complexities of the sanitation subsidy mechanism, particularly if the design is labour intensive and staff are either: (i) required to check on qualifications of households applying for the subsidy, or (ii) involved in sophisticated and rigorous supervision procedures.

Note:

Exchange Rate
US\$1 = CFA 700 (2001)

Source:

Ouayoro, 2000

On-site sanitation is the only viable option in the medium term for many low-income settlements.

sanitation facilities on a sustained basis as these are considered a household rather than public responsibility. As a result, the supply of sanitation services continues to lag far behind water supply on the public agenda.

Although the high densities that are common in low-income areas suggest that sewered systems would be the option of choice, the higher costs associated with developing, connecting to and using sewered systems, mean that this option is not accessible to most households in the short to medium term. On-site sanitation will therefore remain the only viable option in many low-income settlements in the foreseeable future. As households will continue to be responsible for developing and managing these facilities, access to finance will be a key factor in the drive toward improved sanitation for the poor. Efforts will need to focus on developing a sustainable financing and upgrading approach that provides households financial support, technical inputs, and the incentive to improve their sanitation facilities.

Access to adequate sanitation in sub-Saharan Africa is also complicated by existing institutional arrangements. A majority of utilities involved in water supply in sub-Saharan Africa are not responsible for either developing or managing sewerage systems and very few utilities are responsible for, or involved in, financing or developing on-site sanitation facilities. In most countries, sewerage systems are developed and managed by municipal authorities. Typically, they obtain investment financing from central government, cover recurrent costs through the water tariff² and achieve subsidies through local taxes. Municipal financing of public on-site sanitation facilities is common, and in some cases, this support has been extended to communal facilities in low-income areas.

Subsidizing household latrines

Subsidies for on-site household sanitation improvements are not common in sub-Saharan Africa, and certainly not as common as subsidies for the development of sewerage systems. In most cases, household sanitation subsidies are based on

² This charge is a % of the water charge and is collected by the utility as a part of the bill.

The Role of Micro-credit in Financing Sanitation Improvements in Lesotho

Box 21

The Lesotho project was initiated in 1980 as part of a wider urban development scheme. The program provided credit to households for investment in VIP latrines. The program was motivated by the household need for extended payment. In order to receive credit, households had to first dig a pit and provide a deposit of 30-40 per cent of the total cost. Loans were typically in the range US\$50-300. Although the money came from the Lesotho government, the Lesotho Bank administered the loan since they had a better record on loan defaulters.

In 1990, 600 loans had been approved in response to 4,500 inquiries, 252 latrines had been built and 81 per cent of individuals had paid up. Close to 1,000 VIP latrines were actually built in the target area. The fact that 80 per cent had actually been built through private initiatives highlights the success of the promotion program and the availability of an affordable and acceptable sanitation option.

Key factors that influenced the success of the program included:

- affordable and acceptable latrine design;
- minimal direct grants or subsidies to householders;
- a comprehensive program of health / hygiene education, VIP latrine promotion;
- integration of the project into existing government structures; and
- strong coordination in policy and planning between different departments promoting improved sanitation.

Note:

Exchange Rate
US\$1 = LSL 3.63 (1994)

Source:

Saywell, (undated);
see also Blackett, 1994

external or project financing, through urban development or water supply projects. This type of funding, like donor funding elsewhere, is generally not considered sustainable as it is fixed in scope and duration and is not easily scaled-up. Examples of good practice in delivering sustainable financing for on-site sanitation include sanitation surcharges on the water bill, as developed in Burkina Faso and illustrated in Box 20, and cost-sharing arrangements for financing communal facilities, as developed in Ethiopia and described in Box 22.

Facilitating household access to credit

Access to credit from private sector sources is currently a more common means of facilitating improved household-level sanitation services. Although less prevalent in sub-Saharan Africa, in a few cases, credit facilities for building, extending or improving housing (and thereby on-site sanitation facilities) are available through micro-credit institutions, commercial and/or community savings and loans systems. The latter may include informal credit systems, such as revolving funds (also known by local names such as the 'merry-go-round' system in Tanzania).

Managing communal or shared latrines

Communal facilities are common where many households live in shared quarters, yards or compounds, or in neighborhoods where there is limited space for constructing individual household latrines. Groups of households (or landlords) may pool their resources to build blocks of latrines shared by all the residents in the

Subsidies for on-site household sanitation improvements are not common in sub-Saharan Africa.

Box 22

Communal Latrines in Addis Ababa, Ethiopia

In 2000, the population of the city of Addis Ababa was estimated at 2,640,000. The majority of low-income households in the city live in houses owned and administered by the 'Kebele' (the smallest administrative units of the city administration) since the nationalization of property by the Government in the previous military regime. Many are mud and wattle structures.

Domestic sanitation in the city is mainly provided through pit latrines and septic tanks. According to the 1994 census, 75% of households in Addis Ababa had toilet facilities, however in congested areas, where the majority of the poor live, there is not enough space to build individual latrines. Residents in these areas therefore use communal latrines shared by between five and ten families. In some cases the figure is much higher.

The **operation and maintenance** of shared facilities is often difficult, all the more because the housing is occupied by tenants and this discourages investment and dilutes the household's sense of responsibility for maintenance of the facilities. Occasionally Kebeles assist users to service the latrines and collect contributions. In most cases, users attempt to organize the cleaning themselves and pay for the emptying of latrines.

Through a **project undertaken by an NGO**, the Integrated Holistic Approach Urban Development Programme (IHA-UDP), sanitation conditions in four Kebeles were improved for 42,000 people, i.e. 5,000 households, of which 76% did not have latrines. The NGO approach was based on building an enhanced sense of ownership and responsibility on the part of the users by delegating management of these facilities to them.

Each communal block consists of blocks of latrines, located in a public area, and made up of two to ten rooms. Each room is used by three or four households/households all of which have a key and take turns to clean the latrine. When a pit is filled up, all users contribute funding to get it emptied. Users also select a representative to deal with **general management of the latrine**, including the co-ordination of cleaning rosters and collection of money for emptying the pit by vacuum truck.

Source:
Simie, 2000



The cost of a sewerage connection is as prohibitive as a connection to the water supply, perhaps more so.

defined area. In some cases, cost sharing arrangements are made with financing support provided through projects or NGOs. These latrines are often jointly managed (by the owners or tenants) under a variety of arrangements introduced by the NGO. In some cases, especially where clear ownership has not been established, this has led to the benefits being captured by landlords (who lock the facilities for the exclusive use of their own households) or by other actors (e.g. the street kids in Nairobi who have taken control of public sanitation facilities and now extort fees for their use).

The owner of a block of rooms or housing units may also construct latrines and pass on responsibility for maintenance of these facilities to the tenants. In some cases, the costs of pit emptying and other repairs are included in the rent (although this is contentious when services are not provided in a timely manner). More often, households are expected to jointly manage and maintain the latrine on a rotational basis and collect funds for emptying and rehabilitation when necessary. In general, public and NGO financing is more readily available for communal facilities but the lack of clear ownership remains a key problem that must be addressed at the outset.

6.2 Reduce barriers to network sewage

Subsidizing private sewerage connections

Sewerage systems in most sub-Saharan cities serve few people. They cover only a small fraction of the urban area and even where available, the connection costs are high and unaffordable for poor households (see Figure x). For those households within proximity of the sewerage network, the cost of a connection can be twice as much as a water connection. In addition, householders must then consider the cost of in-house installations (e.g. connecting toilets and modifying plumbing). Further, once connected, households also incur a wastewater charge that may represent over 50% (sometimes as high as 90%) of the water bill.

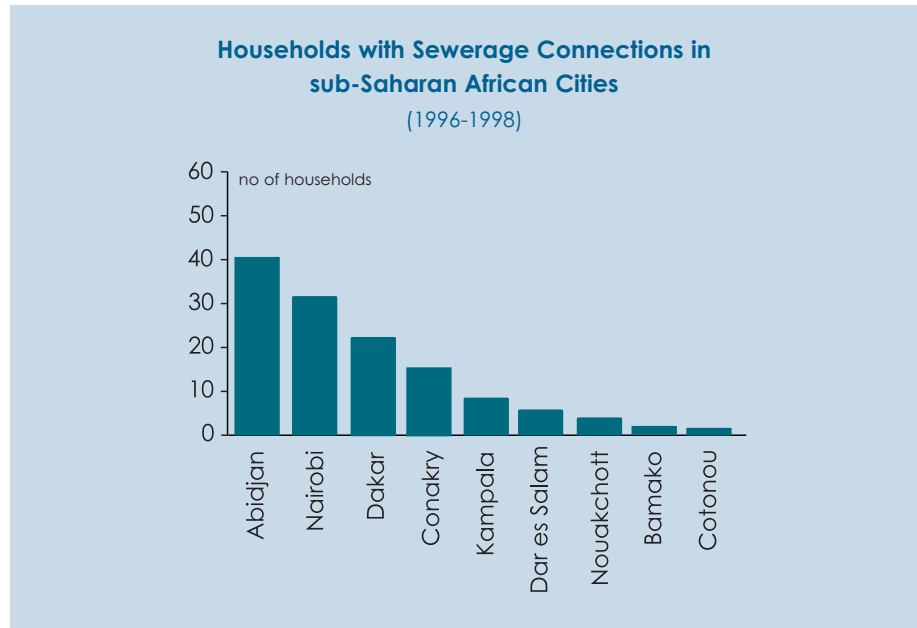
In some cases, such as in Abidjan and Durban where more than 40% of the dwellings in the urban area are connected to the sewer network, subsidizing sewerage connections is an appropriate aspect of a sanitation improvement strategy.

In Abidjan, the Sanitation Department at National Level and the utility SODECI³ have instituted a subsidy for household sewerage connections, representing 50% of the cost.⁴ This amount only covers the costs of the installation between the sewer and the manhole at the boundary of the property. The subsidy is funded by a 'sanitation fee' which also covers the cost of developing the sewerage network and public sanitation facilities. The amount of the fee depends on whether a household is connected, unconnected or cannot be connected due to their location. For households that cannot be connected, a lower fee is charged. The difference in charges between connected and unconnected customers is kept to a minimum in order to provide an incentive for people to get connected. The policy only applies to households in formal/planned areas within the city; those living in unplanned or informal settlements are excluded.

In Senegal, the subsidy arrangement for off-site sanitation is funded through grants provided by donors and not through an internal cross-subsidy arrangement.

³ SODECI has recently entered into a lease contract for the management and operation of the sewerage network.

Figure x



Increasing access to sewerage systems for low-income households

Financing for in-house connections can be facilitated by utilities working in partnership with municipal authorities and local micro-credit/finance agencies. Efforts may also be required to reduce distances between plots or houses and the network. In many cities, the sewerage network is confined to better-off, formal and planned areas, and even here the rate of connections has been slow as households often already have on-site sanitation facilities in place. In some cases a compulsory connection policy has been instigated for households within a specified distance from the network. However, even in these areas, many households have not yet connected and/or utilities have not enforced the connection policy, as they are unable to ensure a regular water supply to their customers.

Affordability: a key constraint to the expansion of off-site systems

Even with a subsidy, the residual investment costs for households to connect to a sewer network remain high. This is because connection costs are themselves high, and where subsidies exist, these only cover a portion of the connection costs (approximately 50% in Abidjan)⁴. The additional costs of in-house installation must be met directly by the household. This is a serious burden for low-income people.

Low and constrained water consumption levels in poor households (as little as 10 liters per person per day) may inhibit the proper functioning of sewerage networks (see Box 23 on Durban Public Awareness and Hygiene Education Program). Households with budgetary constraints may be reluctant to connect to the network as they fear that it will lead to higher bills – a result of both the additional water consumed and wastewater disposal charges (typically 50-75% of the water bill). The lack of affordability may explain the behavior of some households in Abidjan, who have connected sinks and showers, but continue to use on-site sanitation facilities.

⁴ i.e. US\$110 out of the total cost of US\$220. For water the subsidy is 90%, i.e. US\$240 out of US\$270 (and includes an advance of US\$40 for consumption, standing charges and meter fitting, that does not have to be paid again for sanitation).

Public Awareness and Hygiene Program in Durban, South Africa

Box 23

In the mid 1990s, Durban Metro Wastewater Department experienced problems with blocked drains, leaking pipes and overflowing toilets as a result of household disposal of inappropriate waste material (newspapers, plastics, clothing items). This caused the system to malfunction and led to high maintenance costs for the utility.

A perception survey conducted within the area highlighted various issues, including a **lack of knowledge** of sewerage and stormwater systems and how they work. The Department contracted out the design of an **education programme** that included the design of a model sewer used to demonstrate function to students, design and dissemination of posters and leaflets, staging of street theatre at strategic public points and schools, the design and implementation of educational curriculum and a hygiene programme developed in consultation with the medical profession for women of all education levels.

The programme has been exceptionally successful with **operational cost savings** to the client amounting to approximately ZAR1.6 million (US\$230,000) per annum which is a fraction of the ZAR 6 million (US\$860,000) cost previously being incurred by the utility. As a result of the programme, costs of misuse and abuse to the system dropped significantly.

Note:

Exchange Rate
US\$ = ZAR 6.96 (2000)

Source:

Gounden, 2000

Condominial systems may provide more affordable services in those areas where consumption is sufficiently high.

An alternative: condominial sewerage systems

Given the need for significant investment and high operation and maintenance costs, conventional sewerage systems may be inappropriate in some situations. Alternative systems called "condominial" systems developed and tested in the Latin American region may provide more affordable services, especially in those areas where household water consumption is sufficiently high. Condominial systems are secondary networks built upstream of the main sewerage network and are often lower in cost than conventional systems. Investment costs are reduced through a combination of:

- (i) technical innovation – small diameter pipes laid in private property (often in backyards to reduce distances between houses); and
- (ii) community participation – labor inputs and cost sharing arrangements with households. Lower operational costs are achieved by reducing the volume of water required to flush the system and delegating maintenance functions to connected households/neighborhoods.

This practice is used in Latin America, particularly in Brazil, where it was originally developed, and in Bolivia, where it has been replicated to improve access to low-income areas.⁵ In El Alto, Bolivia, illustrated in Box 5, condominial systems are a key element of the privately operated utility's strategy to achieve its objective of connecting 65% of the population by the year 2001. In 2002, following several years of testing and refinement, technical standards were developed and adopted for use nationwide.

6.3 Improve management of and access to public sanitation facilities

Given the constraints mentioned above, a private connection to the sewer network is unlikely to be possible for many poor households in African cities for several decades to come. Yet at the same time it is clear that private sanitation

⁵ Condominial systems are being tested in Durban and Johannesburg and shallow sewers have also been developed in Kumasi, Ghana.

facilities also have their limitations: growing densities exert pressure on land, making the installation of latrines more and more difficult. Under these circumstances, the development and improved management of public sanitation facilities may also be an essential component of sanitation strategies adopted for low-income areas.

Improving the management of public latrines through private operators

In the 1980s, poorly maintained public latrines were a common feature of many urban centers. Unable to afford the costs of upkeep, municipal authorities lacking the financial resources are gradually turning these over to the private sector through lease contracts. As a general rule, public toilets (usually latrines sometimes combined with blocks of shower facilities) are constructed and owned by the municipality or government with funding made available through projects and donors. These facilities are then leased to a private sector operator for an initial deposit fee plus a monthly or annual rent or lease fee (see Figure xi).

Public sanitation facilities may be an essential component of sanitation strategies in low-income areas.

Figure xi

Comparative Cost of Leasing Public Latrines

	Initial fee (US\$)	Annual rent (US\$)
Mali – latrines and showers	0	600
Nigeria – latrines and showers	250	10
Côte d'Ivoire	0	0

Source:

Cisse, 2000;
Iliyas and Sani, 2000;
CREPA, 1999

Fee structures are approved or set by municipalities or higher levels of government and users are charged under various different arrangements, including:

- **A cost recovery rate.** Cost recovery allows for funding of new latrines. Whether it is compared to the absolute value or the cost of the facility. It is more costly to the user as they are charged a commercial rate. This is the case in Bamako, Mali, where an annual rent of US\$600 is charged per unit.
- **A token amount.** A small user fee encourages private participation even in less profitable low-income residential areas and simultaneously permits access to low-income residents. This presupposes, however, that the municipality can allocate other tax revenue or find grant funds for new facilities. This is the case in Kano, Nigeria.
- **No user charge.** In some countries such as Côte d'Ivoire and Kenya, facilities have been constructed and funded by an NGO and multi-lateral (UNICEF). There is no fee charged to users, nor is there a policy to promote public sanitation facilities.

Leasing public latrines to the private sector requires consideration of the following key issues:



- **Location** Sanitation facilities in markets or transport terminals are much more profitable than in low-income residential areas. Public authorities (national or local) can encourage private managers to take on services in low-income areas by:
 - offering them incentives (lower rents in less profitable areas);
 - establishing cross-subsidies with latrines in commercial-areas;
 - combining management of standpipes and public latrines;
 - offering a bulk rate for water supply; and/or
 - allowing the development of small businesses centers (e.g. telephone, fax, etc) alongside public toilets.

Privately Funded and Operated Public Toilets and Washrooms in Kano, Nigeria

Box 24

Kano is the third largest city in Nigeria, with a population of over 1.7 million. As in most large cities, the sanitation conditions are poor, mainly due to a lack of facilities in:

- (i) congested urban areas without enough space for household toilets or communal latrines; and
- (ii) business areas (markets, bus stations, car parks) particularly for devout Muslims who carry out their ablutions before prayers and for whom privacy in toilets and washrooms is a matter of importance.

Lack of facilities led to privately funded initiatives

In the 1950s, the municipality built and maintained some public toilets near the market in Kano. It soon became clear, however, that they were too few in number and users (market traders and their customers) were dissatisfied with their level of cleanliness. Some of the market traders applied for and obtained approval from the Government to build and run the facilities on a commercial basis.

In 1981, the Kano Urban Development Board (KUDB) encouraged the mobilization of private investors to increase the number of public latrines. However, where it was considered essential to have the facilities but no individual or organization had the financial resources to build them, the Board itself would do the installation and hand it over to interested individuals on a credit or lease basis.

Generally, privately-financed toilets are built on private land. Applicants have to complete an application form and provide evidence of land tenure (ownership or landlord authorization). Consultation with civic and community leaders is not required before construction however many applicants inform and mobilize residents and leaders as a marketing tool.

Standards and specifications

The Kano State Environmental Planning and Protection Agency (KASEPPA) has fixed standards and specifications for building designs and site selection (see insert), to avoid any nuisance or health hazard in the surrounding area. This includes:

- In the case of private funding, the owner must pay an annual fee of ₦800 (US\$8) to the Government.
- Where the Government constructs a facility, the allottee (individual operators leasing from Government) must pay an allocation fee of ₦25,000 (US\$250) and an annual rent of ₦1,000 (US\$10)

There are currently 145 such toilets currently in place indicating that they meet demand and that the operation is profitable. By allowing such arrangements with private operators, the authorities have been able to improve the sanitation and hygiene service – setting up of public facilities that they would not have been able to install or manage. The Kano experience has been replicated far beyond the boundaries of Kano State, in, for example, Kaduna, Jos (in Plateau State), Katsina, Sokoto, etc.

Specification for site selection

- i. A site should not encroach on a right-of-way;
- ii. The site must be at least eight metres away from the road;
- iii. The site should not cause traffic congestion or obstruct visibility;
- iv. The site must not block access to any public facility, e.g. drainage;
- v. The site must be at least five metres away from any existing structure.

Note:

Exchange Rate
US\$1 = N 100 (2000)

Source:

Iliyas and Sani, 2000

- **Increasing competition** To reduce prices to users and improve the terms of leasing contracts, some municipalities call for tenders. In most cases however, there is no real competition between private applicants and no means of ensuring that leases will be provided to those who offer to reduce prices or a better service. Restrictions on competition should not be applied in such a way that they allow cherry-picking and exclude the poorest areas.
- **Profitability.** The duration of the contract must be sufficient to encourage managers to maintain the facilities and secure the loyalty of 'customers' without restricting competition. In Bamako, contracts are let for five years after which tenders are invited again but this process does not exclude the previous manager.

Encouraging private investment and management of public latrines

In several cities, the delegation of management to a private operator has been extended to include the construction of facilities. In some cases this is similar to a concession where the municipality takes the initiative and calls for private investment for pre-defined facilities in specific areas. In other cases, the private investor selects the location, applies for authorization from the municipality (and agrees to respect standards and specifications), builds and then operates the facilities.

In Kano, Nigeria, public latrines in markets and bus terminals are funded on the initiative of private investors. This is carried out according to standards set by the Kano State Environmental Planning and Protection Agency (KASEPPA) and the developer pays an annual fee of US\$8 to KASEPPA (see Box 24).

Supporting pit emptying and disposal services

Utilities or municipalities that have responsibility for sewerage systems are often involved in activities relating to on-site sanitation through the development of sludge tipping sites and drying beds. In some cases they may also provide pit-emptying services. There is also a trend in some countries for public utilities and departments to promote private sector involvement allowing them to withdraw from their role in pit emptying and disposal services. Yet, many local authorities have not taken the necessary steps to deregulate the provision of this service, and thereby allow the private sector to offer a competitive and more reliable service to the general public. While public financing of this basic service (public institutions and emergencies) is being maintained for public health reasons, provisions should be made to ensure long-term financial sustainability. The same principle should be applied by CBO/NGO managed emptying services after grant funding comes to an end (e.g. Addis Ababa).

Private sector services in many urban centers have often developed informally in response to demand and more often than not prior to the deregulation of service provision functions by the municipality. There is currently a wide range of emptying services operating in the region. These range from manual latrine cleaners, used by most low-income households, to large volume suction trucks. For the latter, prices charged per trip range from US\$10 to US\$60, depending on location and distance from tipping point, volumes emptied, and the level of competition.

Competition and other operating terms play a key role in determining pricing of services. In Dar es Salaam, the municipality decided to open up the provision of emptying services to those licensed private operators who complied with a common set of rules and regulations intended to ensure fair pricing and proper handling of

Many local authorities have not deregulated service provision to allow the private sector to offer a competitive and reliable service.

waste. Because of the high level of competition, the tariffs charged have quickly stabilized at approximately half of the official recommended price and this was achieved without reducing the quality of service, or indiscriminate dumping of sludge. In other countries, administrative constraints lead to ineffective services (e.g. the price controls and restricted operating hours in Cotonou) or create a disincentive to private sector investment (e.g. inappropriate registration criteria, prohibitive fines and unrealistic requirements).

A role for manual latrine emptiers and appropriate technologies

Manual latrine emptying services are still widely used in many poor urban communities. They are often the only means by which a latrine can be emptied when limited access makes it impossible for exhaustor services and affordability makes other options unreachable for a large number of low-income households.

Few technological options exist between manual and conventional emptying services. Innovations have generally been restricted to a few experiments, such as the "vacutug" found in Kibera in Nairobi and illustrated in Box 25. Most innovative or experimental initiatives are carried out by NGOs (as seen in the cases of Bamako, Nairobi, Dakar and Port-au-Prince) and managed by community organizations. Although successful on technological grounds, the vacutug has yet to be replicated on a wide scale.

Vacutug in Kibera, Nairobi

In densely populated settlements, the option of abandoning a pit is no longer practical. Emptying pits is the only viable solution, but most existing pit emptying systems are unsuitable in low-income areas because of the physical conditions of the sites and settlements such as non-surfaced, narrow or steep roads, deep pits with solidified wastes and inaccessible latrines.

In 1996, UNCHS selected a consultant to develop and test a **latrine emptying vehicle** which could function in the prevailing conditions in informal settlements and would have a capital cost low enough to encourage the private sector to operate a service. At the same time it has to be designed for local manufacture and repair and affordable for the consumers. The 'vacutug' prototype was provided to an NGO in Kibera, Kenya where it has been on trial for the past 4 years. The trial illustrated the viability of the technology but also highlighted the importance of establishing **adequate institutional arrangements** and financial management systems as a basis for sustainability of the system.

The vacutug consists of: (i) a vacuum tanker which is fabricated from mild steel with a nominal volume of 500 litres (equivalent to 1 load) mounted on a steel frame; and (ii) a tug which comprises a small 4.1 kW petrol engine which can propel the vehicle at speeds of up to 5 km/h. When connected to the vacuum pump, it is capable of exhausting at 1,700 liters airflow/minute. The pump can be reversed to pressurize the tank to assist the discharge of sludge to the sewer or to raise it to discharge into a transfer tank. The vehicle is fitted with a motorcycle throttle and braking system and equipped with 75mm diameter PVC hoses connected to the tank.

Box 25

Source:

Wegelin-Schuringa, 2001;
Alabaster, 2002

Further effort will be required to move to scale and expand the range of service options available to poor households. At the same time, it was necessary to examine the key issues and constraints for the private sector in delivering services using appropriate technology.

Increase access to dumping or tipping facilities

In low and medium density areas when a pit latrine is filled to capacity it is often closed off and a new pit is dug adjacent to it. After a safe period of time the sludge is excavated and buried elsewhere on the plot or in a nearby dumpsite enabling the latrine to be used again. This practice is common in all cities, but where densities are high, on-site disposal is becoming increasingly difficult. Indiscriminate disposal of sludge is a major environmental and hygiene problem in many cities. Lack of authorized or accessible disposal sites leads to unauthorized dumping of untreated sludge, either in rivers, open drains, in the sea or in open/public space within the city. The latter is particularly the case for manual cleaners without access to transport. Although this action is prohibited, there is often little alternative as efforts to develop tipping sites within proximity of service providers are not widespread. Extending access to authorized disposal sites should become a priority and a key component of a sanitation improvement strategy.

Box 26

Pit-emptying Services in Dar es Salaam, Tanzania

In 1996, the Dar es Salaam City Commission (DCC) responsible for sanitation in the city decided to **deregulate pit-emptying services**. Until then, under existing law, the Dar es Salaam Sewerage and Sanitation Department (DSSD) was the only organization permitted to provide pit-emptying services to the public. However DSSD was unable to meet the demand from a long waiting list of customers many of who had paid an advance equal to TSh 20,000 (US\$25) per trip in 1995. Consequently, over several years, clandestine private operators began to fill the unmet demand.

The advent of the El Niño floods of 1996 led to an outbreak of cholera on an unprecedented scale in a number of areas of the city. This forced the DCC to look for alternative means for improving access to cesspit-emptying services. DCC therefore began to explore the possibility of **authorizing private operators** to provide this service.

In 1995, a study was conducted to determine the real cost of operating an emptying service within the city of Dar es Salaam. DCC organized a meeting with potential operators to discuss the findings of the study and agree upon a way to implement the approach. In the course of this meeting, it was agreed that private pit-emptying services would be licensed to operate provided that they complied with a common set of **rules and regulations** intended to ensure fair pricing and proper handling of waste by all actors.

These deliberations led to the establishment of a pit-emptying licence (at a cost of US\$2) for operators that complied with the following conditions: (i) to charge a minimum fee of TSh17,000 (US\$21.25) to eliminate price undercutting of public operators; and (ii) to maintain prices within the range affordable to customers (particularly low-income households). **Permission to dump waste** at the DSSD ponds was granted. However only organic waste dumping would be authorized and operators would only be allowed to discharge waste at the treatment plant specified on their individual permits. (Random dumping was clearly not permitted). A dumping fee of TSh3000 (US\$3.75) per trip was payable to DSSD.

While at the start of the process in 1996, there were three known private operators operating without a permit, after deregulating the service in 1999, eight private operators applied for and received permits. The increase clearly shows that the activity is profitable, even in a **strongly competitive market**.

Competition has played a key role in the success of this practice. Private operators are now charging less than the initial minimum rate of TSh17,000 (US\$21 in 1999). Rates range from TSh10,000 (US\$12) to TSh15,000 (US\$18) about 50% less than the former DSSD rates.

Note:

Exchange Rate
US\$1 = TSh 800 (2000)

Source:

Wandera, 2000

In developing sludge disposal facilities, it is necessary to balance financing with the need to control and regulate indiscriminate dumping.

The use of sludge to fertilize agricultural sites is often mentioned but is still relatively rare, except in Bamako. It is more common for waste from sewerage systems to be diverted before reaching the treatment facility to irrigate vegetables. This may adversely affect the sewer network function.

Public disposal sites managed by the sewerage utility

In most municipalities, sludge disposal sites are managed by the utility or municipal sewerage departments, or a public or private firm. These may include special sludge drying beds or sludge tipping points linked to the sewer network. In developing sludge disposal facilities, it is necessary to balance financing with the need to control and regulate indiscriminate dumping. Two examples are of interest:

- In Abidjan, according to the terms of the sanitation lease contract, the utility (SODECI) manages five wastewater treatment facilities to which the truckers have free access. This service is financed through the sanitation tax collected on water consumption (see the discussion on subsidizing household latrines in section 6.1). Since the lease contract was established, the dumping stations have been improved and waiting times reduced.
- In Dar es Salaam, as part of the agreement authorizing private operators to provide pit-emptying services, stakeholders agreed on the conditions of a license, including a dumping permit. The terms include an obligation to discharge organic wastes at the authorized dumping sites on payment of a disposal fee (US\$3.75 per trip) to the Dar es Salaam Sewerage and Sanitation Department, the department responsible for the management of the treatment plant (see Box 26).

Public disposal sites owned and managed by private operators

In Cotonou, the only sludge disposal/pre-treatment facility in the city is owned and managed by a private entrepreneur (SIBEAU). The facility was developed by SIBEAU in its capacity as a pit emptying service after its operations were hampered by the lack of public sludge disposal sites. The terms for the development and management of the facility were provided by the municipality, which established a rigorous sanitation policy and compelled all vacuum truckers (including those belonging to other operators) to discharge at that facility (at a price negotiated between the municipality and SIBEAU). As a result of this policy there is high demand for the service and the disposal facility is already operating above its design capacity.

Public-private partnerships of this nature should be encouraged as a component of a sanitation improvement strategy. In addition to providing an enabling framework for private investment, the municipality also provided a policy and regulatory framework that enabled the benefits of the facility to be extended to others. In this way they were able to meet defined public health and environmental objectives.

