

## **Socio-cultural Influences and Management that Determine Sanitation Facilities Use in the Informal Settlements**

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### **Abstract**

*Sanitation facilities development in the informal settlements in Kenya is inadequate and facing serious physical, socio-cultural and economic constraints, amidst the increasing population pressure being exerted on these facilities. It is estimated that 60 % of the residents in Kenya's urban areas live in these informal settlements and majority lack adequate access to these facilities. The slum settlements are growing by approximately 11% per year. The rapid growth of towns has led to the mushrooming of informal settlements devoid of basic infrastructure including water and sanitation. Informal settlements have developed haphazardly, without allowing adequate space for installing infrastructure network.*

*A survey of users and sanitation points in 2 and 3 different informal settlements in Kisumu and Nairobi respectively was made with the focus on socio-cultural influences, perceptions and management aspects that determine the choice of use, access, gender and maintenance of sanitation facilities in these environments. A total of 334 users were interviewed and 10 different sanitation points visited during the survey.*

*The survey revealed that acceptability and usage of a sanitation option is dependent on availability, security at night, economic aspects, risks involved and physical capability of the users. Maintenance, on the other hand, was reported as an issue in as far as cleanliness, life expectancy and space was concerned. About 68% of households rely on shared facilities with a high loading factor of about 71 people per facility. 75 % of the surveyed pit latrines are not emptied for reuse, instead the residents abandon them. The recognition of women as important in the running of the facilities has been embraced as 40 % are led by women and 57 % of the sanitation management group members are female. The introduction of bio-digester centres have greatly improved on the overall resource and energy efficiency during operation. While bio-digester centres have been readily accepted because of their additional advantage of biogas production, users are discouraged with the smell emanating from them.*

*The study conclude that it is important to ensure that discouraging and risk factors like unclean facilities, the fear of falling into the pit, smell and attraction of insects and parasites are eliminated and motivational aspects such as comfort, privacy, improved health and hygiene as well as financial benefits are enhanced in implementing sanitation facilities in informal settlements.*

### **Key words**

Informal Settlements; Kisumu; Management; Nairobi; Sanitation Facilities.

## **Introduction**

Worldwide about 2.5 billion people are living without access to safe sanitation which leads to about 200 million tonnes of untreated human excreta annually (UNICEF, 2008). Lack of proper sanitation facilities causes poor health to the urban as well as the rural poor and often leads to diseases such as diarrhoea. Each year, 4 billion cases of diarrhoea are reported, and 2.2 million people in the world die from it (Camdessus, 2003). In Kenya, about 80% of the hospital attendance is due to preventable diseases. 50% of these illnesses are water, sanitation and hygiene related (Kuria, 2005).

The Millennium Development Goal number 7 aims to ensure environmental sustainability. Specifically, target 10 aims at reducing by half, the proportion of people without sustainable access to safe drinking water and sanitation, by the year 2015. Target 11 of the same goal aims to achieve, by 2020, a significant improvement in the lives of at least 100 million slum dwellers. UNICEF estimates that achieving the Millennium Development Goals targets for water and sanitation would reap economic benefits of US \$7.40 per US \$1 invested (UNICEF, 2009).

Increasing urbanization, especially in the developing countries, presents special challenges with respect to sanitation service provision. Access to appropriate sanitation service is uneven. In urban settings, wealthier areas can count on reliable services, whereas many slum and informal settlement dwellers do not have access to acceptable sanitation facilities. The growth of many towns in Kenya exhibits the basic characteristics of conurbation. Rapid growth continues to take place outside planned settlements. For instance, in Nairobi over 60 % of the city's population lives in these areas (Makworo and Mireri, 2009), which unfortunately in most instances end up housing the poor; with the disadvantage of having inadequate sanitation infrastructure.

The Kenyan government has established appropriate legal instruments in an effort to reverse these trends. These legal establishments have been set to improve hygiene behavior and use of appropriate sanitation facilities, in appreciation of the differences, the socio-cultural orientation of its citizenry. Despite these efforts, sanitation infrastructure coverage is still limited and the situation is deplorable especially in the informal settlements. This paper, therefore, explores the adaptive strategies and socio-cultural perspectives within these informal settlements in two

towns in Kenya, Nairobi and Kisumu, in regards to use of various sanitation facilities within these settings in an effort to establish the reasons for preference and acceptability of the existing sanitation facilities.

### **Dependencies and Influences in the Implementation of a Sanitation Facility**

To ease the understanding of the society approach to sanitation, Santosh and Monti (2010) names three cultural aspects that have to be considered, which are psychological deterrents of handling human wastes, social aspects such as gender issues and religious influences. Additionally economic well being of either the individual or the society has an impact on the approach of a sanitation system. Figure 1 tries to explain the correlation of four subsections that influence each other in consideration of a community approach to the sanitation system.

**Figure 1:** *Detailed system structure/model of societal sanitation approach (Source: Santosh and Monti, 2010)*

Additionally, United Nations Educational Scientific and Cultural Organization and the International Hydrological Programme of UNESCO (2006) reports that the promotion of sanitation can be approached from factors that motivate low-income households to invest in sanitation facilities. UNESCO proposes factors such as privacy, safety, dignity and social status as the household point of view of motivation. To investigate these factors in the informal settlement of Nairobi and Kisumu, a survey was carried out specifically to understand the socio-cultural influences, residents' perceptions and management aspects in regards to sanitations facilities in use.

### **Methodology**

The research design was both exploratory and descriptive. Exploratory research involved the walk-through in the informal settlements to collect data from the users and managers of these facilities in an effort to establish the interface in understanding the aspects under investigation. The descriptive research on the other hand was captured through the description of the various

sanitation facilities, environmental and management perspectives. The research was undertaken for 4 weeks during the month of March 2011.

The fieldwork involved the administration of questionnaires to various household members and managers of sanitation points randomly in informal settlements in Kibera, Mukuru kwa Njenga and Kibagare in Nairobi and Obunga and Bandani in Kisumu.

The questionnaires had two key thematic areas of focus i.e. socio-cultural behavior and orientation in the use, management and maintenance of the sanitation facilities. The aim was to investigate what kinds of sanitation facilities were in use, users' perceptions on their use, level of cleanliness and management of these facilities. The question of comfort of the used sanitation facility was approached from three different targets. Firstly, the number of users of the facility and its impact on the cleanliness and hygiene of the facility. Secondly, the question of security for women and children due to experiences in criminal behaviour of the slum dwellers. Finally, the comfort of use for elderly people as a result of their reduced physical capabilities. The awareness of the importance of personal hygiene was questioned by asking the respondent on the use of hand washing facilities and cleansing materials. Often the rising amount of users leads to distresses when it comes to the cleanliness of the visible structure of the facility, but also when it comes to the purity of the output material. Therefore, littering and problems in maintenance as well as means and frequency of extraction of the output were used as indicators to gauge the sustainability of the facilities.

### **The Informal Settlements**

Informal Settlements, also known as "Shanty Towns" and "Slums", are accumulations of improvised dwellings of impoverished people, mostly built from scrap material, lacking standard living conditions and basic infrastructure like water supply, sanitation, sewerage, public transportation and educational facilities (UN-HABITAT, 2006). These settlements are often characterized by high population density and unplanned urban layout (*ibid*).

The genesis of the sudden increase in informal settlements in Kenyan towns can be traced back to the 1960s (Fashoyin, 2001). During the 1960s and 1970s Kenya experienced a gross domestic product growth of an average of 6.6 % *p.a.* However, due to high inflation, economic disasters such as oil shocks and an immense growth of population the newly formed republic was not able to maintain this growth (*ibid*). As a natural follow-up, low employment rate and increasing poverty resulted, a phenomenon that is lasting till this day.

In addition, the poor population of the rural areas continue to flee towards the cities in search for new job opportunities and better payment (UN-HABITAT, 2006; People's Daily Online, 2005), further complicating the situation. This population movement has led to a slum settlement increment of approximately 11 % *p.a.* (Makworo and Mireri, 2009) and has turned out to be another shock for Kenya's economy since the cities can not provide employment for all these immigrants (Fashoyin, 2001). The results of this development are the ever-growing informal settlements in the cities which house approximately 60 % of the cities' populations. Within these settlements poverty, inadequate service infrastructure, hunger, poor health and high crime rates are the major issues that are continuously worsen by constant growth of population. Sanitation, too, has not kept pace with this exploding population and the facilities are in poor state (Figure 2 a - b)

***Figure 2 a – b: Shared single and community-shared multiple pit latrines***

Informal settlements have developed haphazardly, without allowing adequate space for installing infrastructure network. The major physical constraints to construction of better sanitation facilities in informal settlements include difficult sites and terrain and complicated site layouts. Sanitation conditions vary widely in the informal settlements. Nairobi has numerous informal settlements in which the ownership of property is a major problem for the establishment of sanitation facilities (SDI, *et. al.*, 2011). In some locations within the informal settlements there is simply no space to build a public toilet. Lack of public action and easements as well as congested

land use has led to a situation where most residents rely on over-crowded and sub-standard pit latrines—and even open spaces and “flying” toilets. A study conducted by Umande Trust, COHRE and Hakijamii Trust (2007) reported that between 50-90 % of the households in Kibera do not have access to adequate sanitation due to the lack of adequate space to construct new facilities and the failure to exhaust pit latrines that get full. Occasionally people dispose of other wastes in the latrine – some which are not easily biodegradable - and therefore encourage the development of odour, parasites and the filling of the latrine quickly. As a result, when the pit is full, the content is not able to be decomposed and re-used, instead the toilet is abandoned and a new one dug up. The result is a situation where construction of other facilities, for instance, houses has seen excavation of several pit latrines holes in the same locality, in the process endangering the excavators and making foundations of these structures very weak.

### **Acceptability**

Most sanitation facilities encountered during the survey were either community shared or plot shared single pit latrines. The usage of community shared pit latrine facilities as primary source of sanitation is widely spread, especially in Kibera, Obunga and Bandani (Figure 3). About 68% of households rely on shared facilities with a high loading factor (average of 71 people per facility). Pit latrines remain the primary sanitary facility. A comparison of the informal settlements indicates that the sanitation situation is poorest in Bandani.

**Figure 3:** *Proportions of respondents using the various sanitation options as their primary choice*

Open defecation and “flying” toilet phenomenon score lowly due to the shame associated with these practices. A walk-through the informal settlements though attest to the contrary. Faces litter the narrow alleys in the settlements and can be seen in polythene paper bags on the dumpsites.

An emerging sanitation facility that is slowly being embraced is the bio-centre (Figure 4 a – b and 5 a – b). The use of the bio-centre is not yet widely spread, though. The bio-centre is a new

phenomenon in the informal settlements in Nairobi and Kisumu having been piloted in Gitwekera village of Kibera informal settlement in 2007. In Mukuru kwa Njenga as well as in Obunga and Bandani, the bio-centres are either under construction or in the beginning phase of operation. Bio-centres have considerably enhanced the technical performance of sanitation facilities. They are permanent structures, built of concrete, stone and brick. The collection and treatment of the human wastes is undertaken in an underground concrete dome. While bio-centres have been readily accepted because of their additional advantage of biogas production, users are discounted with the smell emanating from them.

*Figure 4 a - b: Construction process of the bio-centre*

*Figure 5 a – b: Ground floor and section of a bio-centre*

### **Usage**

The usage and comfort of a sanitation facility varies between the different users. Women, children and elderly people were questioned regarding their perceptions on the aspect of comfortability in using the sanitation facilities. These 3 target groups were separated because of their unique requirements. It was revealed that women and children are a major target group for crime especially when the toilet facility is not very close to the households. The fear that children might fall into the hole in the latrine and the fact that many households lacked the money to pay for the facility were given as additional reasons for the negative response for acceptability of use for children. It is perceived that children can defecate in the open without undue shame. Low acceptance of the facilities for elder people is due to the fact that they have to squat over the hole which is considerably difficult task in regards to their physical capabilities. Those who do not use any sanitation facility at all either do not have the opportunity to use one or lack the money to pay for the service. Residents pay an estimated fee of Kshs 100 per month for use of communal or on-plot latrines. Most pit latrines are shallow and poorly constructed with no vents

(Figure 2 a) and offer very little privacy to the user. Often, households use the latrines for other purposes such as bathing, washing (Figure 2 b) and in many instances, disposing solid waste.

In terms of acceptance, the bio-centre rates the highest while open defecation rates lowest among the informal settlements surveyed as acceptable choice of sanitation option (Figure 6). The sphere size shows the weighting effect as a relation to the number of users of the facility.

**Figure 6:** *Acceptance of sanitation facility.*

The bio-centres enjoy a 100 % user satisfaction, however only 3 % of the interviewees use the bio-centre. On the other hand the community pit latrine enjoys 55 to 59 % user satisfaction that is represented by 73 % of the interviewees.

**Maintenance**

Since the latrines are used collectively, their maintenance also is done collectively. About 60 % of the respondent managers of sanitation facilities complained about problems concerning the maintenance of the facilities. Their main complaint relates to human excreta on the toilet slab, small space to proceed with the cleaning process and the lack of water. The question of user responsibility featured prominently. The sanitation facilities managers lament that users do not use the facilities responsibly thus considerably affecting cleanliness and overallly their lifespan. The depth of the pit limits the life expectancy of the pit latrines. When the pit is full the users either empty the pits or abandon the toilet. The study revealed that 75 % of the surveyed pit latrines are not emptied for reuse, instead the residents abandon them. However the wastes of the remaining 25 % are exhausted from the pits and disposed off by exhauster trucks. The resource efficiency as well as the energy efficiency is very low as additional energy is used while emptying them. Abandoned pit latrines require space even though they are unused, and their effluents have a certain potential to contaminate water bodies and therefore also drinking water. Since this system is an open loop system the loss of valuable resources and nutrients in the pit, is



a great economical as well as ecological loss. Furthermore, due to improper use of the pit latrines, the maintenance, which consists of frequent cleaning of the toilet, is a burden. Subsequently, any delays in cleaning usually attract rodents, insects and even bad odour.

In as far as re-usability of the facility, 8 % of the interviewed managers extract the waste in the pit manually and allow it to flow into the open channels or use it for small-scale agricultural activities- particularly during the rainy season. 92 % pay specialists to exhaust the wastes and dispose it off. 94 % of these did not care where the waste went to after exhaustion. For the latrines, the duration between subsequent extractions varies between three months and two years, depending on the number of users and the size of the pit.

The maintenance operations at the bio-centre are more time and labour consuming as the facility consists of a set of toilets and showers as well as a methane extraction device (Figure 5 a – b). After the on-site treatment the sludgy wastes is removed and disposed off or used as fertilizer. Therefore the resource and energy efficiency during the operation is high. At bio-centres, the depth of the pit does not limit the timeframe for their operation, since the dome that collects the wastes is emptied continuously as stated by the management teams. Therefore the life expectancy of these buildings is limited by the life expectancy of the construction material. The biogas that is developed during the treatment process is put into use for cooking and lighting. The adoption of this technology seems to be beneficial. Its key disadvantages for the moment are the odour and the adaptation of the Asian-type squatting toilets, which make use by the elderly difficult and dangerous for the children.

### **Management and Gender Issues**

During the fieldwork investigations on the gender distribution in the management groups of the sanitation points were undertaken in 3 out of 5 surveyed informal settlements. Table 1 shows the gender distribution in management groups of sanitation points in Kibera, Kibagare and Bandani informal settlements. Even though 60 % of the sanitation points shown in Table 1 are led by a male gender chairperson, an average of 57 % of the considered group members are female. Women are being more and more incorporated in the running of the sanitation facilities through the realization that they are traditionally the bearers of health, sanitation and hygiene burdens in

their households. These transformations are an appreciation of the Bellagio principles. The Bellagio principles suggest that in line with good governance principles, decision-making should involve participation of all stakeholders, especially the consumers and providers of services.

**Table 1:** *Gender distribution in management groups of sanitation and water supply points in Kibera, Kibagare and Bandani*

## **Conclusion**

The sanitation in the informal settlements is inadequate. There is limitation of space for sanitation facilities in densely populated informal settlements. The findings reveal that safety is the most significant factor in determining the use of community-shared toilet facilities. Privacy ranks lowly among the respondents. Affordability and the responsiveness of the management were apparently no issue to the respondents of this research. The bio-centres represent a remarkable improvement not only considering the sanitation situation but also considering resource issues. However, complains about the smell of the biogas may become an obstacle for the bio-centres. A resource-oriented approach is an important consideration when implementing low technology sanitation options in the informal settlements. Discouraging factors like unclean facilities, the fear of falling into the pit, smell and attraction of insects and parasites must be reduced or even eliminated and replaced with motivational aspects such as comfort, privacy, improved health and hygiene as well as the possibility of financial benefits.

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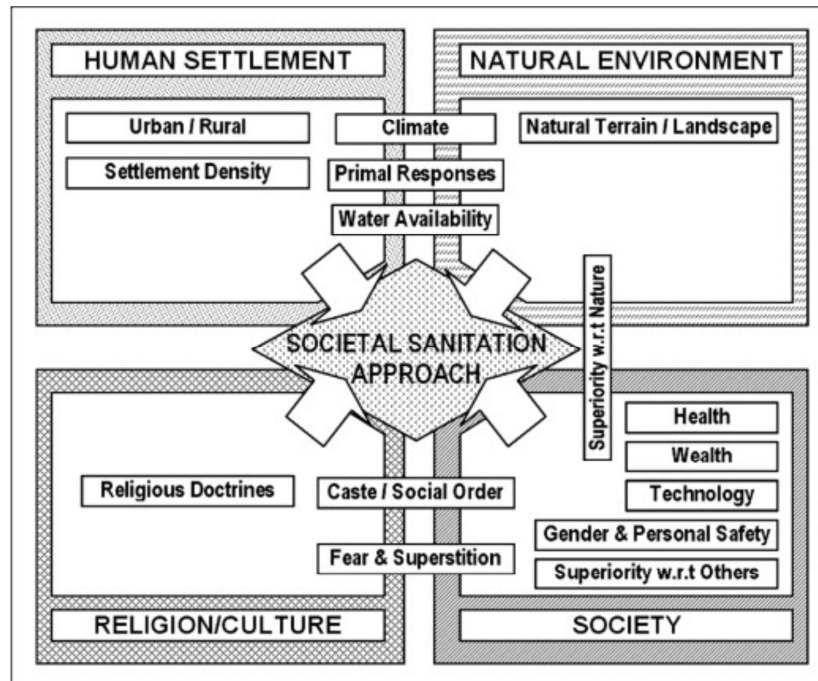
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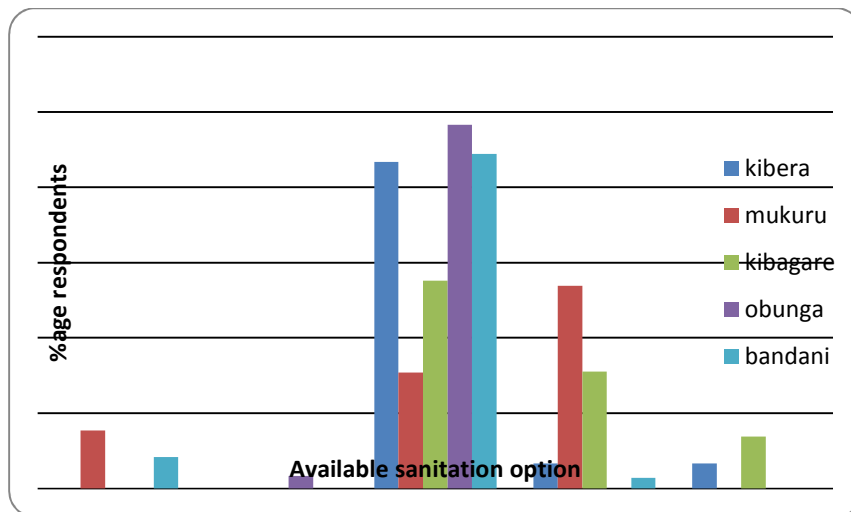
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**Figure 1:** Detailed system structure/model of societal sanitation approach (Source: Santosh and Monti, 2010)



**Figure 2 a – b:** Shared single and community-shared multiple pit latrines



**Figure 3:** Proportions of respondents using the various sanitation options as their primary choice



Figure 4 a - b: Construction process of the bio-centre

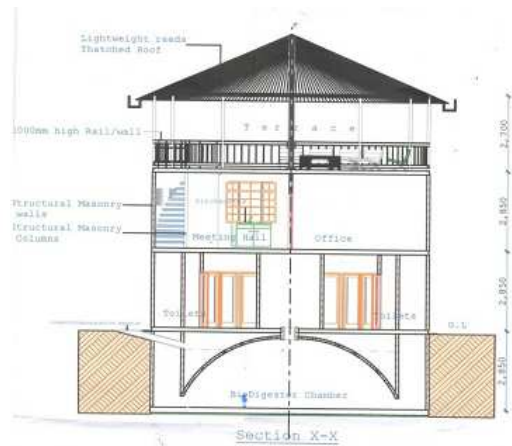
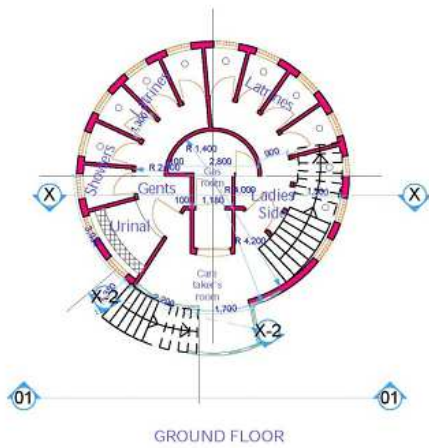


Figure 5 a – b: Ground floor and section of a bio-centre

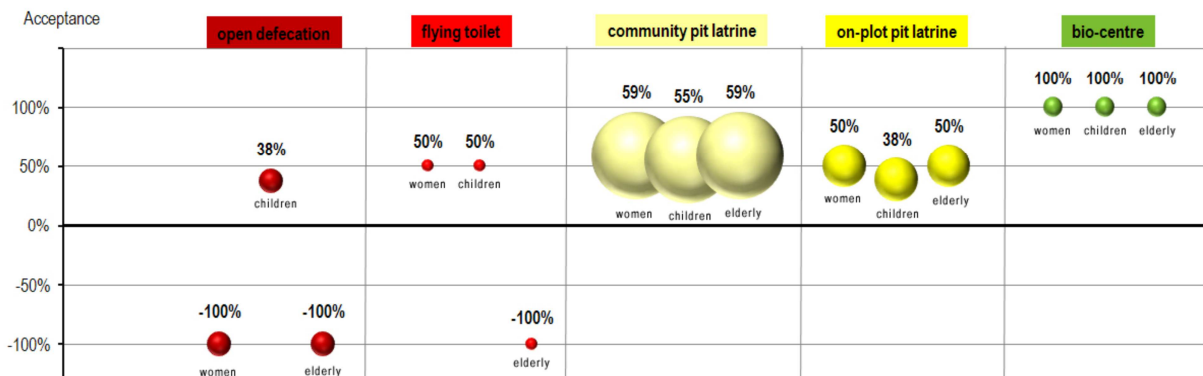


Figure 6: Acceptance of sanitation facility.

**Table 1:** Gender distribution in management groups of sanitation and water supply points in Kibera, Kibagare and Bandani

	Kibera					Kibagare	Bandani
	Sanitation Point	Water & Sanitation Point	Water & Sanitation Point	Water & Sanitation Point	Water & Sanitation Point	Sanitation Point	Water & Sanitation Point
<b>Name of the Management Group</b>	MUVI GOROFANI	TOSHA-2	KIDYOT	LINDI USAFI	JASHO LETU	HAKI ZETU	
<b>Number of Members of the Group</b>	52	80	66	20	70	42	10
<b>Number of Female Group Members</b>	10	80	25	13	45	22	5
<b>Percentage of Female Group Members</b>	19 %	100 %	38 %	65 %	64 %	52 %	50 %
<b>Gender of the Chairperson</b>	male	Female	male	male	male	female	male