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Socio-economic dynamics in slums and implications for sanitation sustainability in Kisumu, Kenya

Sheillah Simiyu*

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Lack of sanitation facilities is a major challenge in slum areas, and this has implications on the health and well-being of residents. Sanitation in slums is complex due to slum living conditions, and a detailed understanding of dynamics in slums and how they impact sanitation is required. This study sought to understand the relationship between socio-economic dynamics, and sanitation provision and management in the slums of Kisumu, Kenya. The results indicate a mix of social, cultural, economic, tenancy, and relationship dynamics, all of which influence sanitation provision and management. The article calls for collaboration among various stakeholders and the use of local knowledge dissemination approaches.

Le manque d'installations d'assainissement constitue un défi d'envergure dans les bidonvilles, ce qui a des implications pour la santé et le bien-être des résidents. L'assainissement des bidonvilles est complexe du fait des conditions de vie en ces lieux. Il requiert une compréhension approfondie des dynamiques au sein des bidonvilles et de l'incidence qu'elles ont sur l'assainissement. Cette étude a cherché à comprendre le rapport entre les dynamiques socio-économiques et la fourniture et la gestion de l'assainissement dans les bidonvilles de Kisumu. au Kenya. Les résultats indiquent un mélange de dynamiques sociales, culturelles, économiques, relationnelles et liées au régime locatif, qui influent toutes sur la fourniture et la gestion de l'assainissement. L'article lance un appel à la collaboration entre les diverses parties prenantes et l'utilisation d'approches locales pour la diffusion des connaissances.

La falta de obras de saneamiento es una de las principales carencias existentes en los barrios pobres, en tanto conlleva implicaciones para la salud y el bienestar de los habitantes. En dichos barrios, el desarrollo de obras de saneamiento resulta complejo debido a las condiciones de vida que allí se manifiestan. Ello significa que es necesario comprender de manera detallada las dinámicas presentes en éstos y cómo las mismas afectan el saneamiento. El presente estudio se dirigió a entender la relación entre las dinámicas socioeconómicas y el abastecimiento de saneamiento, así como la forma en que éste es administrado en los barrios bajos de Kisumu, Kenia. Los resultados al respecto dan cuenta de la existencia de una abigarrada dinámica social, cultural, económica, de tenencia y de relaciones, que influye tanto en el suministro de saneamiento como en su administración. La autora hace un llamado a que los actores involucrados en este proceso colaboren entre sí y a que se haga uso de varios enfoques para la difusión de los conocimientos locales.

Keywords: Social sector – Water and sanitation; Labour and livelihoods – Economics; Sub-Saharan Africa

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Introduction

The benefits of sanitation are varied, cutting across various sectors. From a public health perspective, sanitation interventions have a huge role to play in the prevention of child mortality from water and excreta-related diseases. Sanitation is important for girls and women as well. When girls reach the age of puberty, they are affected by a lack of sanitation facilities at schools, as they are forced to stay at home for a few days each month during their menstrual cycle. Women are also affected when there are inadequate sanitation facilities at home, since they risk harassment or attacks when they have to wait for nightfall to relieve themselves in secluded areas.

Access to improved sanitation also has economic benefits. It is estimated that for every US$1 invested in sanitation, at least US$9 is returned to national economies through increased productivity and reduced health care burden (Hutton, Haller, and Bartram 2006).

Unfortunately, there are populations in some regions of the world that lack access to improved sanitation facilities.[1] The Joint Monitoring Programme (JMP) of the World Health Organisation 2014 update report on water and sanitation indicates that in South Asia, 1001 million people lack access to improved sanitation facilities, while in sub-Saharan Africa and Eastern Asia, the numbers are 644 and 485 million people, respectively (WHO and UNICEF 2014). Progress towards access to improved sanitation has been especially slow in sub-Saharan Africa, where large portions of the populations of many countries are without access to improved sanitation, such as South Sudan (91%), Malawi (90%), Ghana (86%), Liberia (83%), Guinea and Burkina Faso (81%), and Mozambique (79%) (WHO and UNICEF 2014).

The JMP further recognises the disparities in access to sanitation between urban and rural areas of countries, noting that the population without sanitation in urban areas increased significantly to 756 million in 2012 (an increase of 215 million since 1990), and this is attributed to population growth in urban areas, particularly slum settlements.

This population growth has resulted in, among other effects, the expansion of slum settlements in urban areas, which have housed the urban poor. Globally, it is estimated that there are over one billion people living in slums, and this number is expected to increase to 1.4 billion by 2020 (WaterAid 2008). Such slum settlements are faced with various challenges, including high population density, insecure tenure, and lack of basic services such as water and sanitation. Sanitation in these settlements is particularly poor and more complex than water supply (NCWSC and AWSB 2009).

This complexity is brought about by the various challenges in slum settlements, which together interact to affect the residents within the settlements. In the urban slums of Bangladesh, for instance, studies show some evidence that improved latrine use led to a reduction in diarrhoea and an improvement in the nutritional status of children under 5 years old (Buttenheim 2008).

The negative effects of sanitation have called for intensified efforts to increase access to sanitation in slum settings. However, as previously mentioned, sanitation in these areas is complex, and a successful intervention requires an in-depth understanding of the social, economic, and cultural complexities that impact on sanitation provision and management. These complex dynamics and interactions in the slums of Kisumu, Kenya are the focus of this article.

Sanitation in the slums of Kenya and Kisumu

After the 2009 census, the Kenyan population was estimated to be 38.6 million people. It is now projected to be 42 million, and is expected to reach 60 million in 2030, a population growth rate of 2.9% (NCPD 2013). It is estimated that 67% of the population lives in urban areas, which is an increase from 19.3% in 1999. Nairobi, the capital city, has an estimated population of 3.1 million people, two million of whom live in slum settlements within the city (Syrjänen 2008). The JMP report estimates that 70% of the Kenyan population lacks access to improved sanitation, and in

urban areas, 69% of the population lacks access to improved sanitation facilities (WHO and UNICEF 2014). In Nairobi's slum settlements, only 24% of residents have access to household sanitation facilities (NCWSC and AWSB 2009).

Kisumu is the main city in the western region of the country, and yet it is among the poorest cities in the country, with more than half of its population characterised as poor. The city has faced high population growth, which has led to urbanisation challenges including slum growth (UN-Habitat 2005). The main slum settlements are Bandani, Obunga, Nyalenda A, Nyalenda B, Manyatta A, Manyatta B, Manyatta Arab, Kaloleni, Kibos, and Nyamasaria.

These slum settlements have similar characteristics to other slums in the country, including lack of water and sanitation facilities, dense populations, and high levels of poverty (UN-Habitat 2005). Syrjänen (2008) estimates that 60% of the population in Kisumu city live in these slums, and half of these slum residents lack sanitation facilities within their dwelling.

Studies in the slums have concentrated on aspects such as slum upgrading interventions and accessibility to water supply systems (UN-Habitat 2005), and local community organisations for development (Cage 2014). There is a dearth of studies linking socio-economic and cultural dynamics within these slums and how these interact to influence accessibility, use, and management of sanitation facilities. It is this gap that forms the basis for this research.

Data collection methods

This study involved combining a number of qualitative methods, these being transect walks, observations, in-depth interviews, and group discussions. All stakeholders in Kisumu that were involved in sanitation interventions were identified and interviewed, leading to a total of 15 stakeholders (see Appendix 1). These interviews focused on sanitation interventions that had been implemented and the challenges faced in their implementation. The stakeholders gave information on sites where sanitation interventions have been implemented within the slums. These sites were visited and attendants at these sites were interviewed on maintenance practices.

Transect walks were then taken through the slums, and it was noted that some plots lacked sanitation facilities.[2] During these walks, household heads from randomly selected plots were interviewed. These in-depth interviews covered issues on use of sanitation facilities, cost of housing, and challenges faced with operations and maintenance of sanitation facilities within the plot. If available, sanitation facilities were inspected for cleanliness. This process of random selection and interviewing of respondents continued until it was felt that new information was not forthcoming, by which time 36 in-depth interviews had been conducted.

To complement this data, focus group discussions (FGDs) were conducted with resident landlords, tenants, caretakers (employed by a landlord to be in charge of a plot), and non-adopters (residents without sanitation facilities within their plots). Two groups of FGDs were conducted for each of these groups (one separately with women, and another separately with men), and a further two FGDs were conducted with young men who manually emptied pit latrines. By the end of these eight FGDs, it was felt that new information was not emerging; hence there was no need for more discussion. The summary of respondents is attached in Appendix 1.

Data analysis began with the first set of data to map out emergent themes and follow-up on issues that needed clarification. Nvivo (version 9) software was used in qualitative data management and analysis was based on the main emergent themes that answered the research question.

Results

Results are presented under the main themes that emerged from the data: sanitation interventions; access to, use, and management of sanitation interventions; and socio-economic dynamics in sanitation use and management.

Table 1. Sanitation interventions from stakeholders in Kisumu's slums.

Stakeholder	Sanitation interventions
Municipal Council	Construction of public toilets, upgrade to sewer system, law enforcement
Ministry of Public Health and Sanitation	Law enforcement
Local area chiefs	Law enforcement
Umande Trust	Communal sanitation facilities, ecological sanitation (Eco-san) facilities
Sustainable Environment and Community Development (SECODE) project	Communal sanitation facilities
Urban matters/Catholic Organisation for Relief and Development Aid (Cordaid)	Collaboration with other partners, funding sanitation projects
Practical Action	Communal sanitation facilities, household Ventilated Improved Pit (VIP) latrines, Eco-san facilities
Sustainable Aid in Africa International (SANA)	Communal facilities, VIP latrines

Sanitation interventions

The main stakeholders involved in sanitation interventions in the slums of Kisumu were governmental and non-governmental organisations, whose specific activities are summarised in Table 1.

Access to, use, and management of sanitation interventions

Communal facilities

Each slum settlement had at least one communal sanitation facility. Financing for the construction of these facilities was through the various stakeholders detailed in Table 1. After construction of these facilities, the community took over operations and management through community self-help groups. Members of these self-help groups volunteered to be attendants at these communal facilities, where they were in charge of cleaning the facility, as well as receiving payments from facility users. Users paid to use these facilities, and proceeds were used for repair and maintenance of the facilities.

Observations of use at the communal facilities, interviews with attendants, and discussion with residents suggested that most communal facility users were passers-by, and local traders. Slum residents living farther from the facilities preferred to use other alternatives such as neighbours' toilets, especially when there was urgent need to use a sanitation facility. Some household respondents expressed dislike for paying to use the facilities, since they felt that they had other alternatives that they could use without paying:

> "Why walk all the way … why pay … I can cross the road and use the toilets at Nakumat."[3]

Scrutiny of records of proceeds and interviews with attendants at the communal facilities indicated that use of sanitation facilities generated the least, while the use of bathrooms contributed more to the proceeds. For instance, in one of the facilities, the highest proceeds during the week amounted to KES 420 (approximately US$5.60). Out of this, KES 50 was from the use of toilets, KES 230 from the use of bathrooms, and KES 140 from the sale of water (US$1 = KES 83).

Household sanitation interventions

Five eco-san facilities had been constructed in some plots, to be used by the plot residents and (sometimes) by residents of neighbouring plots. They worked best in plots inhabited by owners, who had space and were willing to participate in urban agriculture. During the transect

walks, three eco-san facilities were observed, and only one was found to be in use. The other eco-san facilities were seemingly not in use, as discovered from in-depth interviews with residents. This issue was further investigated in the FGDs, and respondents expressed their attachment to cultural beliefs that discourage contact with adult human faeces, or consumption of produce from gardens/farms grown using human manure.

> "We cannot use the eco san … it cannot work in our culture … "

Residents further expressed that because they lacked space for urban agriculture, they did not prefer eco-san toilets as the manure would not have good use.

Socio-economic dynamics influencing sanitation

Household sanitation facilities

Most of the sanitation facilities were pit latrines shared by between two and 10 households. From visual inspection, some of these facilities were either dirty, had spaces through the superstructure, and some were filled up, or almost filling up. Residents who lacked, or had unhygienic sanitation facilities within their plots, used their neighbours' latrines, flying toilets (human faeces deposited in plastic bags and flung away), and a few used communal latrines.

> "This is not a toilet … we are equal to people without [a toilet] … I ask my neighbour to allow me to use their toilet … Sometimes they do not allow me."

It was clear, from both in-depth interviews and FGDs, that lack of, or unusable sanitation facilities was a major concern among slum residents.

Household sanitation management

The poor state of latrines was partly attributed to environmental conditions in some areas of the slums that had a high water table and weak soils that could not support the weight of latrines. During the rainy season, some latrines caved in, while in others, the rising water levels raised the contents of the pit to the toilet floor slab.

In addition to environmental conditions, inadequate sanitation management contributed to the poor state of household sanitation facilities. Since they were shared, management responsibilities were divided among the users. Typical with any shared arrangements, some users did not keep the facilities clean, leading to conflicts among tenants and between tenants and landlords. This was a contentious issue between landlords and tenants.

> "Some members do not cooperate [in cleaning] … Some do not use the toilet properly."

A recurrent theme contributing to the poor state of the facilities was filled up pit latrines. Slum residents had two options for latrine emptying: using exhaust trucks from the municipality, or using local young men, who manually emptied the latrines. The characteristics of each are detailed in Table 2 as summarised from group discussions and in-depth interviews.

Tenancy, sanitation decision-making, and management

Given the various sanitation options, tenants were asked about their preferred sanitation technologies. They felt they had little control over sanitation investments, because they did not own the land (and consequently the sanitation facilities) they lived on. They indicated that if they got better

Table 2. Characteristics of pit latrine emptying services in the slums of Kisumu.

	Exhaust trucks	Manual emptiers
Equipment	Truck	Buckets, spade
Cost[a]	From $60	From $72
Availability	Not always available	Readily available
Advantage	Recognised by law	• Local young men known in the community • Cheaper, price can be negotiated • Empty everything from the pit • Easily available
Disadvantage	• Cannot access all areas • Expensive • Do not empty everything	Their work is considered illegal
Frequency of use	Hardly used	Frequently used

Notes: [a] These are costs based on a single 20-foot pit latrine. The exhaust truck made at least two trips for each pit latrine. Oftentimes, because of negotiation, the costs for manual emptying were lower than the indicated price.

housing, they would relocate; rendering it meaningless to invest in sanitation facilities in the slums.

> "Why should I invest in a toilet? … This is not my piece of land … It is the landlord's responsibility." (A tenant)

However, tenants were more confident in talking about sanitation facilities that they own/might own (some have homes in rural areas, while others wish to own a piece of land in the future), and it was clear that they preferred private, well-constructed household sanitation facilities. On the other hand, land owners confidently expressed their preferences, oftentimes making it clear that they preferred not to share sanitation facilities with tenants.

> "I would like separate toilets for tenants … I cannot share a toilet with them … they should manage their toilet without involving me." (A landlord)

Tenancy, sanitation, and relationships

Land tenure and sanitation matters are intermingled, further affecting relationships between landlords and tenants. Where owner occupiers lived in the same plots as their tenants, it was evident that sanitation was an issue that led to conflicts and disagreements: among tenants, and between tenants and landlords. Landlords confessed that if tenants were responsible for sanitation matters within the plot, there was less conflict.

> "We are always having disagreements about the toilet." (A landlord)

Conflicts further affected payment for sanitation services. Tenants paid for service costs if they had good relationships with their landlord (whether live-in or absentee). The landlord determined the type of sanitation facility that was constructed, the subsequent landlord–tenant relationships, and maintenance of the facility. Absentee landlords were not directly involved in daily sanitation conflicts of their tenants compared to their live-in counterparts, and were therefore more likely to take longer (if they did at all) to respond to sanitation demands from their tenants such as filled up or caved in latrines.

Table 3. Rent and sanitation availability.

	Toilet		
Rent	No	Yes	Total
Low (< KES 700)	8 (47%)	9 (53%)	**17 (100)**
High (> KES 700)	2 (14%)	12 (86%)	**14 (100)**
Total	**10**	**21**	**31**[a]

Notes: [a] Out of the total 36 respondents, 31 were rent-paying tenants.

"The landlord is aware … we told him about it [the toilet], but all he cares about is rent."

Such delays led to use of unimproved sanitation.

Housing and sanitation

During the household interviews, tenants were asked about the amount of rent that they paid. These amounts were cross-tabulated with having or lacking a sanitation facility in the plot. Most tenants who paid a higher amount of rent had sanitation facilities, as illustrated in Table 3.

Discussions with landlords and tenants revealed that housing in plots with sanitation facilities was in high demand. Landlords took advantage of this to increase rent prices with new tenants, while tenants were willing to move into and pay rent for housing with sanitation facilities.

"New tenants look out for a toilet in the plot … With new tenants, I increase the rent." (A landlord)

Development partners confirmed that landlords chose to invest in sanitation facilities to minimise the rate at which tenants moved out of plots because of lack of sanitation facilities.

Discussion

The results highlighted a number of dynamics related to sanitation technologies, sanitation maintenance, payment for sanitation, tenancy in informal settlements, and how relationships affect sanitation sustainability. Communal sanitation facilities have been introduced in the slums of Kisumu but the study noted that usage among residents was low. In Ghana's slum areas, unlike Kisumu, it has been noted that there is high use of communal or public sanitation facilities (Arku, Angmor, and Seddoh 2013). Findings from Kisumu slums suggest low usage of communal facilities, with the main barriers being accessibility and cost/economic factors. Accessibility to these communal facilities at night is a major challenge, especially for women, and in such slums where communal facilities are not open at night, women's and girls' security is questionable. Arku, Angmor, and Seddoh (2013) further note that despite the high use of public facilities in Ghana, users preferred it if the toilets were close to their homes. This suggests that communal sanitation facilities ought to be as close as possible to users' dwellings.

Economically, the urban poor find it irrational to pay for sanitation services, especially at communal sanitation facilities. It makes economic sense for a poor person to find an alternative at his neighbour/friend/relative's dwelling, use open defecation, or use flying toilets, rather than using the meagre resources he has to pay for use of communal facilities. Unlike water, a sanitation service is not a "tangible commodity" that can be bought. Therefore, as long as the urban poor have other alternatives where they do not have to walk for a distance to access and use a

sanitation facility and/or pay for use of sanitation facilities, it may take a while before there is behavioural change from the use of unimproved sanitation facilities to the use of communal facilities.

Pit latrines are a common sanitation technology in most slum areas. However, as this, and other similar studies (Isunju et al. 2013) indicate, they have difficulties in management, especially emptying, and collapse during the rainy season. Slum residents in Kisumu, like those in in Uganda and Tanzania (Isunju et al. 2013), employed the services of manual pit emptiers, since they offered more advantages. Such challenges associated with pit latrine emptying are core reasons for the promotion of other sanitation technologies. In Kisumu's slums, ecological sanitation had not been fully accepted because of cultural barriers. The situation was different in Kabale Municipality in Uganda, where Tumwebaze et al. (2011) found that ecological sanitation made up a quarter of the total sanitation coverage. Cultural beliefs did not hinder its uptake and its popularity was attributed to factors such as radio promotions, availability of local masons, and the unfavourable geo-physical structure that hindered the construction of pit latrines. Media promotions were particularly useful in dispelling any cultural barriers and promoting the use of ecological sanitation. Such lessons from Uganda highlight the importance of understanding socio-cultural factors and preferences since they determine the success of sanitation interventions. Even with such findings, it is indicative that adoption of alternative technologies may not happen instantaneously, and as such, pit latrine emptying is a business opportunity for the young men who provide a cost-effective solution to slum residents.

According to the JMP classification, any shared facilities are not considered improved facilities. Nevertheless, it is unrealistic to have household sanitation facilities in slum areas due to high population density. It thus becomes more practical to share sanitation facilities with a number of households in a plot. This may address the accessibility and cost challenges associated with communal facilities. However, sharing may lead to difficulties in keeping sanitation facilities clean and this partly explains why some sanitation facilities were not clean or were in poor condition. These findings suggest that accessibility to sanitation facilities does not always guarantee their use; the facilities need to be properly constructed and well maintained. Maintenance responsibilities also need to be clearly spelt out, as failure to do so may lead to users reverting to unimproved sanitation facilities.

Renting is a common practice in urban areas, but in slums, it is complex because of insecurity of tenure. The findings have pointed to tenants' and landlords' decision-making as it relates to sanitation, highlighting the differences in decision-making between landlords and tenants, which need to be clearly understood. Results of tenants' sanitation preferences suggest that they may underestimate or overestimate amounts they are willing and/or able to pay for sanitation investment, since final investment decisions are made by land owners. Stated preference methods for determining the willingness to pay for sanitation may thus be vague for tenants, because of their tenure status. Investing in sanitation is similar to investing in a fixed asset, which tenants may not recover should they relocate from their dwellings. These sentiments have been corroborated by studies from the slums of Uganda (Kulabako et al. 2010) and Tanzania (Isunju et al. 2013), where slum residents were not willing to invest in sanitation facilities as they felt it was the landowners' responsibility. Findings from this study show that tenants confidently mentioned costs of sanitation services such as pit latrine emptying, and they further expressed their willingness to pay for these costs in the plots they lived on, since they were users of the sanitation facilities. Other slum settlements in Senegal (Scott, Cotton, and Sohail Khan 2013) and Uganda (Kulabako et al. 2010; Isunju et al. 2013) indicate a similar trend. This is an indication that tenants may not be willing to invest in sanitation construction (since it is the landowners' responsibility), but they may pay for sanitation maintenance services. Therefore, differences in payment responsibilities need to be clearly defined between landlords and tenants.

The results further show a high demand for housing in plots with sanitation facilities and an indication of higher rent prices for such housing. The situation might be so because other areas in Kisumu city are not as sanitation-disadvantaged as the slums. This high demand for housing in plots with sanitation facilities is indicative of ability to pay for sanitation (through rent). A similar trend is noted in the slums of Uganda where residents were not willing to pay any extra fees for sanitation service, but they indirectly paid when these charges were included in rent prices (Kulabako et al. 2010). This sheds light on the need to involve landlords in ensuring that housing units have sanitation facilities, a sentiment that is also shared by Arku and colleagues (Arku, Angmor, and Seddoh 2013).

This complex mix of land tenure, sanitation decision-making, and payment for sanitation highlights the need to further study these relationships and identify ways in which they can be avenues for sustainable sanitation. The need to clearly define responsibilities of sanitation investment and maintenance among landlords and tenants, and also among tenants as users of shared sanitation facilities, cannot be over-emphasised. Where good relationships are maintained by landlords (whether live in or absentee) and tenants, sanitation matters may be handled better, thus ensuring the sustainability of sanitation facilities.

Conclusions

This study has highlighted a number of socio-economic factors that have an impact on sanitation sustainability in slums. Despite efforts from stakeholders, there is more than meets the eye in these areas. For the urban poor, communal sanitation facilities have economic and social limitations: specifically accessibility and payment for use; indicating that sanitation facilities ought to be as close to the dwellings as possible. At the household level, socio-economic dynamics come into play in interwoven ways. Tenants do not show willingness to invest in sanitation, but they may be willing to participate in sanitation service payments such as latrine repair and emptying. Landlords are responsible for sanitation provision and they benefit by constructing housing that has usable sanitation facilities, especially in areas with high demand for housing and sanitation. However, clear-cut responsibilities of maintenance need to be spelt out to ensure proper management. Sanitation affects relationships and positive relationships may be the ingredient that determines proper use, responsibilities, and payment for sanitation. It is palpable that the urban poor can, and are willing to, pay for sanitation services, and it is important to differentiate responsibilities of sanitation investment and payment for sanitation services. This study shows that efforts should be based on approaches that lead to social and economic gains to both landlords (as suppliers) and tenants (as buyers). These socio-economic dynamics further highlight that sanitation interventions need to graduate from myopic interventions of what urban dwellers "would wish for" and focus on visionary strategies that can accommodate these dynamics to ensure sustainable sanitation in slums.

Policy implications and opportunities for further research

This study has highlighted various areas that influence policy-making. Sanitation provision is important in slums, and interventions should understand the interplay of conditions within the slums that influence sanitation sustainability. This means that any interventions should therefore include stakeholders from various disciplines such as public health, planning, community development, education, and engineering. Local avenues of behaviour change communication (including local leaders) should be used for community sensitisation and knowledge transmission. Such messages should cover areas such as alternative sanitation technologies, cultural barriers, and the importance of proper management of sanitation facilities. Housing

policies need to be strengthened, and in particular landlords should be required to construct sanitation facilities alongside rental houses. Local pit latrine emptiers need to be recognised, trained, equipped with protective gear, and linked to waste disposal sites. This is one way of empowering the local community.

Further research should focus on understanding differences in sanitation decision-making, determinants of communal sanitation facility use, factors that promote adoption of alternative sanitation technologies, and business opportunities in sanitation service delivery.

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Notes on contributor

Sheillah Simiyu is a PhD candidate at the School of Public Leadership, Faculty of Economics and Management Science, Stellenbosch University, South Africa. Her research interests are in water and sanitation, and general community development, especially in urban slum/informal settlement areas.

Notes

1. Improved sanitation, as defined by the Joint Monitoring Programme (JMP) of the World Health Organisation (WHO) and the United Nations Children's Fund (UNICEF), is sanitation that hygienically separates human excreta from human contact.
2. A plot, as used throughout this article, is a group of housing units, under one landlord, and sharing a common yard, sanitation facilities and sometimes, a common water point within the yard.
3. Nakumatt is a shopping mall, with public sanitation facilities which can be used by members of the public, at no cost.

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Appendix 1. Summary of respondents and methods of data collection.

Population	Method	Number
Sanitation partners: Government and NGO		
Councillors	Structured interviews	3
Kisumu Water and Sewerage Company (KIWASCO)	Structured interview	1
Ministry of Public Health and Sanitation (Public Health Officer)	Structured interview	1
Councillor	Oral history narration /interview	1
Local Area Chiefs	Structured interview	3
Umande Trust (NGO)	Structured interview	1
SECODE (NGO)	Structured interview	1
Urban Matters/Cordaid (NGO)	Structured interview	1
Practical Action (NGO)	Structured interview	1
SANA (NGO)	Structured interview	2
Communal latrine attendants	Structured interview	7
Pit latrine emptiers	FGD/ structured interview	2
Adult household heads	In-depth interviews	36
Male landlords	FGD	1
Female landlords	FGD	1
Male tenants	FGD	1
Female tenants	FGD	1
Male land agents	FGD	1
Female land agents	FGD	1
Male "non-adopters"	FGD	1
Female "non-adopters"	FGD	1