

## Households' access and use of water and sanitation facilities in poor urban areas of Kampala, Uganda

Innocent Kamara Tumwebaze and Christoph Lüthi

### ABSTRACT

Access to safe drinking water and improved sanitation is a key public health measure to prevent outbreak of diseases such as diarrhoea. We conducted a cross-sectional survey in 50 randomly selected slums of Kampala to assess the sources of water and sanitation facilities used in urban informal settlements. A total of 1,500 household respondents were interviewed. More than half (63.6%) of the respondents were using piped water for their domestic needs. The majority of the respondents (68.3%) had shared sanitation facilities and only 20% of the respondents had private ones. The factors influencing access to sanitation facilities included; household ownership, number of families sharing a toilet stand, cost of the sanitation facilities, stability of the income of household members and cleanliness of the facilities used. This paper thus provides knowledge insights on which more sustainable options for water and sanitation technologies in urban poor settlements can be based.

**Key words** | informal settlements, Kampala, Uganda, urban sanitation, water sources

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### INTRODUCTION

While most developing countries are on track towards attainment of the Millennium Development Goal's (MDG) target on safe drinking water, a lot is still desired for sanitation targets. Inadequate access to safe drinking water and improved sanitation systems is one of the main causes of ill-health and slow socio-economic progress for most developing countries (Mara 2003; UNICEF & WHO 2009; WHO & UNICEF 2010).

The increasing trends in urbanization, combined with poor governance, absence of coherent policies and institutional support structures is leading to the proliferation of informal settlements (commonly known as slums) in most low-income country cities (UN-Habitat 2008). These settlements account for more than half of the population in many developing country cities (Uganda Bureau of Statistics [UBOS] 2005; McFarlane 2008; Penrose *et al.* 2010), with Sub-Saharan Africa having the highest prevalence (United Nations [UN] 2009).

In most of the informal settlements, access to adequate sanitation systems, safe drinking water, roads and proper

housing conditions is still lacking (UN-Habitat 2008; Graf *et al.* 2008; Govender *et al.* 2011). The health and social effects of malnutrition, poor education and diseases are all exacerbated by inadequate sanitation and safe drinking water with children below 5 years of age being the most vulnerable (Bartlett 2008; Bartram & Cairncross 2010; Hubbard *et al.* 2011).

Although there has been an increase in attention and funding for sanitation following the 2008 International Year of Sanitation (IYS) declared by the United Nations, progress has remained low. Previous studies have focussed on demand, hygiene and linkages to disease outbreaks such as diarrhoea (Curtis *et al.* 2000; Emerson *et al.* 2004; Jenkins 2004; Fewtrell *et al.* 2005; Jenkins & Curtis 2005; Jenkins & Scott 2007; Mara *et al.* 2010). While there is increasing documentation on the health benefits that would accrue from having and using safe water and sanitation systems, more evidence-based information is still needed to have better and sustainable services (Harpham 1986; Gutierrez 2007; Keijzer *et al.* 2008; Owusu 2010;

Penrose *et al.* 2010). The knowledge on the existing nature of water and sanitation systems and the factors influencing them are important for slum dwellers and all stakeholders involved as they have an influence on the attainment of improved health. The findings are hoped to aid stakeholders such as governments to establish relevant policies and structures that support prioritization and investment in safe water and sustainable sanitation facilities by the government, development partners and dwellers in informal settlements.

Kampala (Uganda's capital city), has a high rate of informal settlements growth, estimated at 9.6% per annum in some slums (Kulabako *et al.* 2010). While urban water and sanitation coverage in Uganda is estimated to be 91 and 81% according to a sector performance report by the Ministry of Water and Environment (MoWE 2011), the actual sanitation coverage reported for Kampala remains unclear as this figure reduces to less than 50% in most informal settlements communities located within the same urban geographical area (Water Supply and Sanitation Collaborative Council [WSSCC] 2009). The poor state of sanitation in Kampala's informal settlements has been reported to contribute to the contamination of 85% of protected spring water sources (MoWE 2011). In addition, the dominance of pit latrines in these areas which are not lined is a major cause of ground water pollution (Katukiza *et al.* 2010; Kulabako *et al.* 2010).

The objective of this study was to better understand the available water sources and sanitation facilities in Kampala's informal settlements. The findings are of importance to policy makers, researchers, institutions, development partners and slum dwellers themselves to provide a knowledge base for more informed and better targeted interventions for the provision of more sustainable services.

## METHODOLOGY

This was a cross-sectional study carried out in urban informal settlements of Kampala from October to November 2010. Kampala is the capital city of Uganda, located in the central region. It is administratively headed by Kampala Capital City Authority (formally known as Kampala City Council), with five divisions across the city. These include: Central, Makindye, Kawempe, Nakawa and Rubaga.

A total of 1,500 respondents from 50 randomly selected informal settlements across the five divisions of Kampala were interviewed. Out of the 1,500 respondents, more than half (74.2%) were females. The median age of the household heads was 35 years (minimum 18 and maximum 90 years). The median income was between 10,001 and 30,000 Uganda shillings (about US \$ 3.8–11.4). More than half of the respondents (53.7%) reported to have rather unstable income while 25.2% of the respondents considered their income as neither stable nor unstable. Considering their income, the majority of the respondents (61%) reported to live under rather difficult conditions. More information on the socio-demographic characteristics is shown in Table 1.

The data was collected using a semi-structured household questionnaire. An observational checklist was also used to collect additional information or ensure correctness of the responses generated from the household interviews. Research assistants were recruited and trained in data collection techniques prior to data collection. These research assistants were university graduates who had not yet acquired full time employment opportunities. They were taken through two days of training with an extra day for pre-testing and revising the questionnaire together with the principal investigator. This gave them an opportunity for familiarization with the questionnaire and clarification on any concerns prior to the actual data collection. In each zone, 30 household respondents were interviewed, with a sampling interval of three houses before the next household respondent. This was used in order to have a big area covered due to the density and closeness of the housing blocks. Only household respondents that consented to participate in the study and were aged 18 years and above were interviewed.

The variables for which data was collected included socio-demographic factors (age, house ownership status, religion, education level, occupation and income), household's main water source for domestic use, sanitation situation (place of convenience (defecation) for most household members, number of households sharing the sanitation facility, cleanliness of the facility), cost (cost of a sanitation facility such as a ventilated improved pit latrine (VIP)), expensiveness of the facility cost to the household, stability of household's home), intention variable (strength of intention to always have a toilet),

**Table 1** | Characteristics of socio-demographic variables

Variable	Frequency (N)	Percentages (%)
Sex of respondents	<i>n</i> = 1,500	
Females	1113	74.2
Males	387	25.8
Household ownership status	<i>n</i> = 1,500	
Owner	602	40.1
Tenant	898	59.9
Grouped age of household head	<i>n</i> = 1,450	
20 years and below	43	3
21 to 30	523	36.1
31 to 40	432	29.8
41 to 50	250	17.2
51 years and above	202	13.9
Religion of household head	<i>n</i> = 1,383	
Catholic	523	37.8
Anglican	362	26.2
Muslim	484	35
None	14	1
Household head educational level	<i>n</i> = 1,421	
None	99	7
Pre-school	70	4.9
Primary	361	25.4
Secondary	652	45.9
Tertiary/vocational	239	16.8
Household head main occupation	<i>n</i> = 1,438	
Business/trade/unskilled labourers	952	66.2
Civil servants/NGOs/skilled labourers	301	20.9
Farmers/agriculturalists	16	1.1
Unemployed	133	9.2
Others (students and elderly)	36	2.5

commitment variable (perceived importance to have a toilet), cognitive variable (perceived dignity and privacy associated with having a private toilet) and ability variable (perceived access to a toilet).

Data collected on the above variables was reviewed on a daily basis for completeness by the field supervisors before passing it to the principal investigator for further scrutiny. It was analysed using SPSS version 17 Microsoft software for statistical generation of frequencies,

percentages, means, medians, ranges and associations. In the linear regression model, the backward method was preferred to the enter or hierarchical methods. The independent variables based on their relation with the outcome which was the sanitation facility use by most members of the household included: house ownership status, expensiveness of the VIP, stability of household's home, intention to always have a toilet, cleanliness of the sanitation facility household members use, perceived importance to have a toilet, perceived dignity to have a toilet, perceived privacy to have a private toilet and perceived ease of access to a toilet.

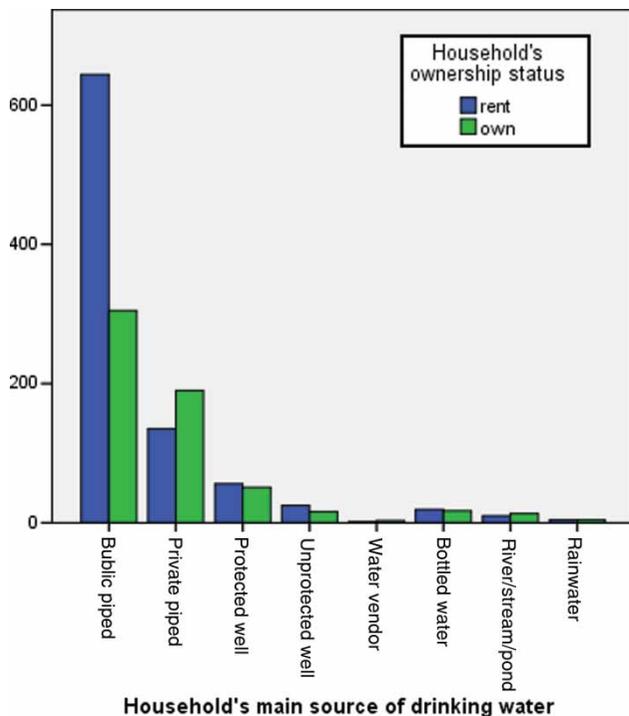
The method of variable entry into the model is important because the regression coefficients are dependent on the predictor variables in the model. The backward method is a stepwise method in which decisions about the order in which predictors are entered into the regression model is based on the mathematical criterion of the computer. In this method, all predictors that are related to the outcome variable are entered in the model and calculated by the computer for their significance, which is compared against the removal criterion. At each level of re-assessment, the predictors with no significant contribution to the model are removed. This method is of merit in situations where researchers have no past research substantial evidence on the ordered importance of each of the interest variables, as is the case for the hierarchical method. In the enter method, the predictors are also entered simultaneously so the researcher makes no decision on the order in which the variables are entered in the model. The enter method also relies heavily on the theoretical reasons for which the variables are included in the model.

## RESULTS

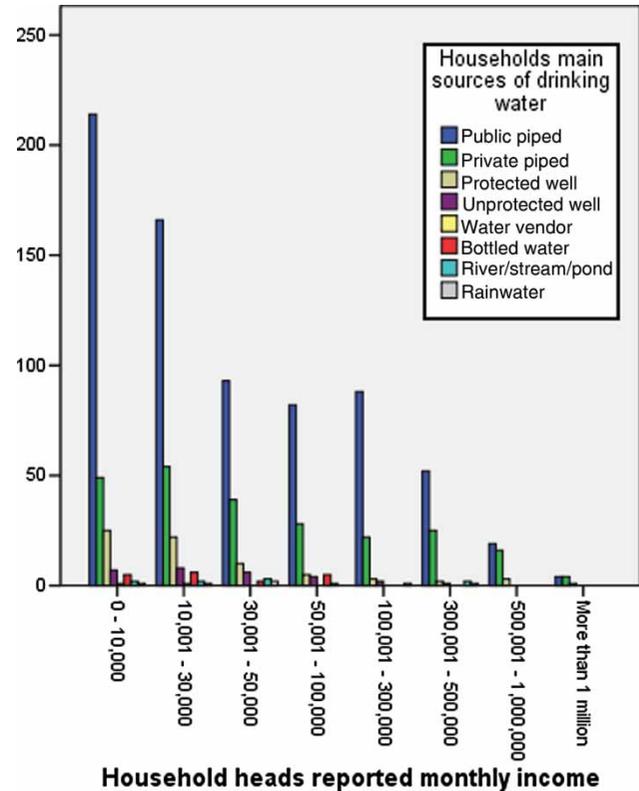
The main source of water for the majority of residents in Kampala's informal settlements is piped water from public tap stands (63.6%). This is followed by private piped connections (21.8%). Protected springs were ranked third (7.2%) by the respondents, with the least source being rain water harvesting (0.5%). The other sources are shown in Table 2. Evidence from Figure 1 shows the

**Table 2** | Household's main source of drinking water

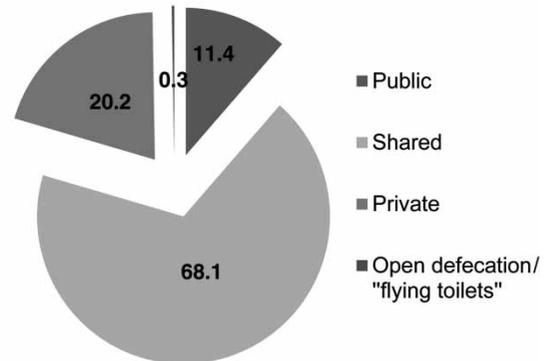
Variable	Frequency (N = 1493)	Percentage
Public piped	949	63.6
Private piped	325	21.8
Protected well	107	7.2
Unprotected well	41	2.7
Water vendor	4	.3
Bottled vendor	36	2.4
River/stream/pond	23	1.5
Rainwater	8	.5

**Figure 1** | Main source of drinking water and respondent's household ownership status compared.

majority of the slum dwellers depending on public piped water are renting the houses in which they live while those with private piped water are mainly household owners. However, there is relatively balanced use of the other water sources such as the protected wells. The results from Figure 2 also show a slanting decline in household's use of public piped water across different income levels.

**Figure 2** | Comparison of household's main source of drinking water with reported monthly income of household heads.

### Toilets used in percentages

**Figure 3** | Sanitation facilities used by households in 50 slums of Kampala.

Regarding access to sanitation facilities: more than half (68.1%) of the respondents use shared toilets, followed by private toilets (20.2%) and public toilets (11.4%) as shown in Figure 3. Most of the toilets were reported to be dirty but usable (45%), followed by respondents of neither clean nor dirty (19.8%) and those that were very dirty/not usable

(18.1%). There were variations in the number of households sharing toilet facilities (stances) with the highest number of respondents sharing them with seven or more households (26.2%), followed by stances used by one household (25.6%), stances used by three to four households (21.6%) and stances shared by two households (17.1%). Generally, the majority of the respondents (28.7%) reported not to know the cost of a VIP, compared to the relatively distributed estimates of respondents mentioning the cost to range between Uganda shillings 1,000,001 to 1,500,000 (approximates to US \$ 402.41–603.62) (17.1%), 500,001 to 1,000,000 (US \$ 201.21–402.41) (15.7%), more than 2,000,000 (approximates to US \$ 804.83) (15.4%), 1,500,001 to 2,000,000 (approximates to US \$ 603.62–804.83) (13.7%) and 500,000 and less (US \$ 201.21–402.41) (9.3%). However, when we remove respondents who mentioned not knowing the cost from the analysis, relatively a big proportion (24%) of the remaining respondents estimated Uganda shillings 1,000,001 to 1,500,000, followed by 500,001 to 1,000,000 (22.1%), more than two million (21.6%), 1,500,001 to 2,000,000 (19.3%), 100,000 to 500,000 (12.6%) and less than 100,000 (0.4%). The majority of the respondents (63.8%) mentioned that the cost of the sanitation facility (VIP) was very expensive, followed by 27.6% of the respondents attributing the cost to be quite expensive.

We used a linear regression model (backward method) to determine the factors influencing accessibility and use of sanitation facilities. The results in Table 3 show the significant factors and the overall explained variance (adjusted  $R^2 = 0.51$ ).

The variables such as ease or difficulty for household members to have access to a toilet, intention to always have a toilet, importance to have a toilet, view of a toilet as a symbol of dignity and provision of privacy to the family were not significant and were consequently excluded by the model.

## DISCUSSION

Contrary to the widely disseminated findings of low quality water services in poor urban areas in sub-Saharan Africa (Montgomery & Elimelech 2007; WHO & UNICEF 2010),

**Table 3** | Linear regression analysis on sanitation facilities used by household members

Variables	Unstandardized coefficients		Standardized coefficients		Significance (P value)
	Beta	Std error	Beta	t	
Constant	2.697	0.088		30.623	0.000
Ownership of household occupied	0.128	0.023	0.144	5.694	0.000
Cost of the sanitation facility	-0.035	0.013	-0.061	-2.604	0.009
Cleanliness	-0.022	0.011	-0.049	-1.923	0.055
Stability of the household income	0.025	0.011	0.058	2.394	0.017
No. of households sharing a toilet stance	-0.173	0.007	-0.604	-23.125	0.000

Adjusted  $R^2 = 0.51$ ,  $N = 937$ .

our study found that eight in every ten household respondents use piped water as their main source for drinking purposes (Table 2). Of these, 64% of the respondents collect their water from public tap stands or water kiosks while 22% have private piped water connections. These findings are in agreement with those reported in other studies. In a study conducted on the privatization of water supply in Kenya, it is stated that 85.6% of the population in informal settlements obtained water from kiosks (K'akumu 2004). A study that was conducted in Bwaise III parish (Kampala) found out that the majority of the households (84%) were collecting water from piped water supplies (Kulabako *et al.* 2010). The management of piped water supply services in Kampala and other big towns in Uganda is carried out by National Water and Sewerage Corporation (NWSC), which is a public corporation owned by the Government of Uganda. The second most common water source used by slum dwellers is protected spring wells. Unlike piped water which is sold, water from spring wells is free. Spring water is commonly used for most household domestic activities or, when there are temporary shortages of piped water supply during rehabilitations. However, most of the spring wells in Kampala slums are contaminated mainly due to poor sanitation and waste management (MoWE 2011). As

such, water from protected springs is not recommended for drinking without adequate point-of-use treatment (Haruna *et al.* 2005). On the other hand, a study conducted in Langas slum in Kenya found that among the 192 household respondents interviewed, close to 90% were using shallow wells while only about 9% were using tap water as their domestic sources (Kimani-Murage & Ngindu 2007). The variation in these results could be an important pointer to differences among different slums in terms of access opportunities to water sources.

In addition, evidence from Table 2 illustrates general preference of safe water sources over unprotected ones. The table shows that inhabitants were 24 times more likely to use public piped water sources, eight times more likely to use private piped water sources and three times more likely to use protected spring wells than fetching water from unprotected wells.

The study findings reveal that the use of public and private piped water sources has a positive relationship with slum dwellers' ownership status of the houses in which they live. This study shows that the majority of public piped water users are tenants while the use of private piped water is dominant among house owners as shown in Figure 1. The slum dwellers who reside in their own houses were two times less likely to draw water from public piped water sources than tenants. However, there is relatively no significant difference among tenants and house owners when it comes to use of other water sources such as protected springs. This could mainly be true during piped water shortages with spring wells used as alternative sources for the inhabitants in the slums (UN-Habitat 2007).

The information from Figure 2 also shows the relationship between water sources and the income of household heads. The more the household's income, the less the households' dependency on public piped water sources or using water from unprotected wells. The results show that there is a significant decrease among users of public piped water sources with increase in the incomes of the household heads. Among households who use public piped water sources, the proportion in dependency reduced from about 30%, for household heads earning around US \$ 3.8, to 0.6% among those earning more than US \$ 402.41 per month. The households using protected wells were 25 times more likely to reduce their dependency if household

head income was more than US \$ 402.41, while an increase in income leads to complete change in the proportion of users of unprotected wells from 25% among minimum income bracket earners to zero for the high income bracket.

Lack of access to improved sanitation facilities is one of the challenges widely affecting people in poor urban informal settlements (UN-Habitat 2008; WHO & UNICEF 2010). However this study shows that the majority of dwellers residing within households in Kampala's urban poor slums had access to sanitation facilities (see Figure 3). The most common sanitation option in Kampala's informal settlements were pit latrines which were poorly constructed, mostly unlined and often located near protected springs or constructed in areas with high water tables. It has been reported in some studies that some households empty their sanitation facilities in flooding water when it rains (Kamara *et al.* 2008; Katukiza *et al.* 2010; Isunju *et al.* 2011). This combined with the state of unlined pit latrines contributes to pollution of underground water sources. Thus, for piped water and that from other sources to be considered safe for drinking further treatment such as boiling is important, as well as cleanliness of the collection and storage containers. By these means, the cycle of disease outbreaks such as cholera, diarrhoea and hepatitis resulting from consumption of unsafe water can be reduced (Tumwine *et al.* 2002; Unger & Riley 2007).

While unlined pit latrines are dominant in Kampala slums, the facilities are also shared amongst families. We found that close to seven of every ten household respondents use shared sanitation facilities. The use and preponderance of shared sanitation facilities in informal settlements has been reported in most other studies of developing countries (Gulyani & Talukdar 2008; More *et al.* 2009; Mikhael 2010; Schouten & Mathenge 2010; Isunju *et al.* 2011). Only two in every ten household respondents were using private facilities. This could be due to the majority of the dwellers being tenants. But even the landlords (owners of built structures) who live in the same areas with their tenants share the few facilities with them as there is no adequate space to have a toilet block where each household uses its own toilet stand. In a study conducted in Freetown in Sierra Leone it was found that the use of shared sanitation facilities was twice as common as exclusive use by just one household (Mikhael 2010). Owing to the increasing

densification of poor informal settlements in sub-Saharan Africa, authors of a study conducted in Kibera slum in Nairobi, Kenya contend that it is not feasible to provide individual sanitation facilities in high density settlements with high poverty levels (Schouten & Mathenge 2010) due to the lack of free space. Thus, more suitable low-cost but re-usable and long-term sanitation options for the limited space may be an appropriate option for informal settlements (Isunju *et al.* 2011).

While a simple pit latrine as a toilet option is classified as improved by the United Nations Joint Monitoring Programme (UN-JMP), the fact that they are shared disqualifies their improved status (WHO & UNICEF 2010). Thus, for improved sanitation to be attained for poor urban informal settlements consideration needs to be given to shared facilities and specifications need to be defined regarding the acceptable number of families to share a toilet stand. Without such consideration, the likelihood is high that as long as informal settlements maintain an exponential increase in growth and densification, halving the number of people without access to improved sanitation will remain a challenge to overcome. As such, a policy is needed to this effect in order to attain improved sanitation in urban informal settlements. Because if we are to base improved sanitation on having a simple pit latrine, then the majority of the poor urban slum dwellers in Kampala, according to our findings, have already attained such status. This argument is further solidified by the factors below that were reported to influence access and use of sanitation facilities.

The tenure status of household ownership shown in Table 1 has an influence on slum dwellers' access and use of sanitation facilities. Most housing units in the slums are occupied by tenants who in this study formed about six of every ten household respondents. This finding is quite different to that in a study conducted in Freetown in Sierra Leone, where it was found that slightly less than half of the respondents interviewed were renting the houses they were living in (Mikhael 2010). In most scenarios, most of the tenants have no rights over the space they rent and are thus not motivated to invest in sanitation facilities. A study on the socio-economic aspects of sanitation in slums points to the importance of understanding the interplay between tenants and landlords. While landlords are the main

sanitation providers to their tenants, they are driven by profit maximization from their rental houses and often do not prioritize investment in adequate sanitation facilities (Isunju *et al.* 2011).

The use of sanitation facilities was closely linked with the number of people sharing the toilet stances (same cubicle or stand). The evidence from the study findings show that more than half (57.3%) of the respondents share toilet stances with three or more households. This is about double the number of respondents using their toilet stances among household members only. The high number of users per toilet stance is a common phenomenon in most informal settlements in sub-Saharan Africa and other developing countries (McFarlane 2008; Isunju *et al.* 2011). The findings from 2006 Multiple Indicator Cluster Surveys (MICS) contained in the 2008 JMP report on progress on drinking water and sanitation, showed that a majority of the respondents in the survey shared toilet facilities with five or fewer households (WHO & UNICEF 2008). When we use MICS classification (WHO & UNICEF 2008) as the 'gold standard' for number of households sharing sanitation facilities (2–5 households and more than 5), it means that a third (30%) of the respondents in Kampala slums share a toilet stand with only one other household while 44.4% use the facilities with five or fewer households. Though the majority of dwellers sharing sanitation facilities were tenants, it is worth pointing out that it is not only limited to them but includes landlords as well. Landlords usually share facilities with their tenants because of limited space and resources to construct facilities for each of their tenants renting their houses. Sharing facilities between the tenants and house owners is not unique only to our findings. It has been equally found in other studies such as the study conducted by Kulabako *et al.* (2010) on environmental health practices, constraints and possible interventions in peri-urban settlements in developing countries, with a review of Kampala.

The cost of sanitation facilities must be considered. In this study, the majority of the respondents reported that the cost of, for example, a VIP was very expensive. About nine out of every ten household respondents mentioned that the cost of the sanitation facility was rather expensive. Close to 90% of the respondents reported the cost to be over Uganda shillings 500,000 (approximately US \$ 201.21).

Comparing the cost of a ventilated improved sanitation facility with the median income of the household heads, most of the households are not in a position to afford such facilities. This is probably why most of them resort to pit latrines, an option which is not sustainable in an increasing-density slum environment with so many users. It is also worth mentioning that in this study, close to three out of every ten household respondents were not knowledgeable about the cost of a VIP facility. This was mainly a common phenomenon amongst tenants. The reason for this could be because the role of providing sanitation facilities is mainly the responsibility of the household owners (Isunju *et al.* 2011).

While the majority of the respondents interviewed reported to be employed (Table 1), most were engaged in petty trade business. Income from such petty trade at times is not sustainable and adequate to meet all the day to day needs of some poor urban slum dwellers let alone enabling them to invest in adequate sustainable sanitation options like a VIP. The median income for the last month (10,001–30,000 Uganda shillings (US \$ 3.8–11.4)) and reported instability of such incomes support this argument. In this study, six out of every ten household respondents reported to live under difficulties mainly due to instability with their income. As reported in most studies, most urban residents in sub-Saharan Africa live in poverty with less than one dollar a day (Isunju *et al.* 2011; Lüthi *et al.* 2011). This leads some slum dwellers into making complex decisions in prioritizing their needs amidst the meagre incomes. Such compromising states resulting from the unstable and meagre earnings lead most dwellers to have sanitation least on their priority needs.

Cleanliness was another significant factor influencing sanitation in the slums of Kampala. Almost five in every ten household respondents were using dirty toilet facilities compared to only 1% whose toilets were considered very clean. These findings are similar to those in a study conducted in three East African countries (Uganda, Kenya and Tanzania) where urban latrines were found to have more contaminated surroundings than in rural areas (Tumwine *et al.* 2003). The issue of cleanliness is an important factor as has been found in previous studies. In a study conducted on why people want latrines in rural Benin, cleanliness and no smell were found to be key factors for family pride or good home environment (Jenkins & Curtis 2005). This is similarly true for

findings from a study in slum settlements in India where women preferred to use open space rather than using toilets that were not clean (McFarlane 2008). Sanitation facilities that are not clean have little or no impact in prevention of sanitation-related diseases, especially for children. If having an improved sanitation facility is complemented with hygiene practices such as proper use and cleaning of the facility and washing of hands with soap at critical times, it would lead to greater effect in prevention of sanitation- and hygiene-related disease outbreaks (Curtis *et al.* 2000; Grimason *et al.* 2000; Bartlett 2003; Biran *et al.* 2005; Cairncross *et al.* 2005).

As mentioned in the last paragraph of the results section, variables such as households' ease of access to a toilet, importance respondents attach to having a toilet and perceptions of having a toilet being a symbol of dignity and privacy were not found to be significant in this study. However, a study by conducted in rural Benin found that respondents attached importance to having a latrine to offer privacy and prestige (Jenkins & Curtis 2005). Thus, since this study was based on a rural context, more studies that are urban based could shed more light on the relevance of the above factors in an urban slum setting.

## CONCLUSION

While the majority of low-income countries are on track to attain safe water coverage, access to improved sanitation continues to remain a challenge. There will be no progress in improved sanitation in poor urban informal settlements in Sub-Saharan African cities if shared facilities that are predominant in these areas are not reviewed to establish a benchmark on the recommended number of families supposed to be using a toilet stand, as well as ensuring better maintenance.

Secondly, any approaches geared towards achieving improved sustainable sanitation should consider not only the issue of technology but also the durability and socio-cultural appropriateness of the technological options.

Lastly, national governments and decision-makers must provide more leadership in establishing appropriate policies, guidelines and institutional structures to stimulate investment in proper sanitation systems, mostly by the landlords. The issues regarding investment in appropriate sanitation

facilities, formulation and implementation of policies and guidelines on construction of more appropriate and sustainable facilities and decree on the recommended number of households to share a toilet stand whilst fostering cleanliness among facility users can best be enforced by people in authority, as well as encouraging self-management.

## ACKNOWLEDGEMENTS

The author acknowledges financial support from the Swiss National Centre of Competence in Research (NCCR) North-South: Research Partnerships for Mitigating Syndromes of Global Change, co-funded by the Swiss National Science Foundation (SNSF) and the Swiss Agency for Development and Cooperation (SDC). The author also acknowledges support from the Swiss Federal Institute of Aquatic Science and Technology's Department of Water and Sanitation in Developing Countries through which the author's PhD study funding comes and study advisers.

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First received 29 March 2012; accepted in revised form 10 July 2012