



## Sustainable Solutions for Sanitation Challenges in Informal Settlements of Kigali, Rwanda

### Introduction

In Kigali, like in many other cities across the world, rapid population growth and urbanization are often associated with the proliferation of informal settlements. About 62% of the urban population in Sub-Saharan Africa live in informal settlements and this remains one of the greatest challenges for city managers. In Kigali, Rwanda's capital city, like many other cities in developing countries, the most widely used sanitary facilities in the informal settlements are pit latrines, occasionally supplemented with flushing toilets and septic tanks.

However, pit latrines are often poorly maintained and rarely emptied; the pits are generally not lined with bricks and can collapse after a period of use. Unlike in rural areas, there is no space to dig a new pit latrine once the old one is full. Furthermore, there are few suction trucks available to empty full pits and septic tanks, and often sites are not accessible due to narrowed steep roads in the informal settlements. Even if pits are emptied, the sludge is not always disposed of in a hygienic manner.

Therefore, neglecting pit emptying or employing poor quality emptying services can have serious health and environmental effects. This situation might probably be improved if Kigali was equipped with a central sewerage system. There are plans to build a sewage treatment plant at Gitikinyoni and link Nyarugenge district to lower and upper Kiyovu, Kimihurura and Kacyiru, but funding remains a major challenge. Moreover, introducing and maintaining a centralized system in cities like Kigali might be another challenge due to water shortage and/or timely investment and proper maintenance, leading to poor environmental performances and perpetual breakdowns.

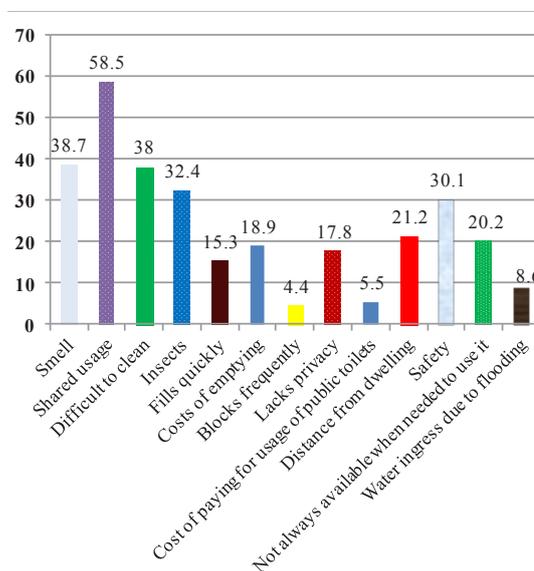
It is against this background that a study based on a mixed method approach was conducted. This included transect walks, a

household survey (n=1794 households) focus groups discussions (FGDs), key informant interviews and deliberative forums (DFs) which provided some collective opinion on this thematic area. The study was carried in two sampled informal settlements of Kigali (namely Gatsata and Kimisagara). These findings are expected to provide evidence for policy makers to make informed decisions on which sanitation systems best fit informal settlements of Kigali and other secondary cities, Rwanda.

### Research Findings

Our findings show that traditional pit latrines are the most common type of excreta management systems that exist in Kigali, Rwanda. However, such systems are not a sustainable sanitation option due to their vulnerability to leakages, collapse during heavy rains and attract flies. These facilities fill up quickly due to small capacity, a high number of users (about 58% of respondents confirmed that most people have to share their uses), and are not regularly and easily emptied. Furthermore, the space available for constructing new traditional pit latrines is continually decreasing as a result of the steady increase in the number of the slum dwellers coupled with the construction of unplanned structures, the space available for constructing new traditional pit latrines is rapidly decreasing.

Fig1: Problems with Existing Sanitation Systems in Informal Settlements of Kigali as Reported by Respondents.



Another problem is the pollution of groundwater under or near pit latrines. This calls for greater attention as it affects the quality of drinking-water. Pits in the informal settlements of Kigali were generally not lined with bricks and vulnerable to collapse. This puts children at risk and most households tend to discourage children from using latrines for fear that they might fall in. The other issues raised by respondents included closeness of the toilet to the house, accessibility during the night, toilet rooms not having lights inside, toilets that are not lockable for privacy when in use, and the propagation of flies (See Figure 1 above).

It was also found that only 18% of households in the informal settlements had access to some form of improved sanitation system if the WHO/UNICEF Joint Monitoring Programme (JMP) definition is used, which excludes shared sanitation as improved. However, this does not genuinely reflect the reality on the ground. This is because access to improved sanitation systems was assessed using physical measures but in most cases this did not capture real access levels since even the flush toilets might not provide hygienic sanitation services if they are poorly maintained.

Some participants in Deliberative Forums (DFs) argued that the establishment of central sewerage systems is part of solutions in addressing some of the challenges identified and in achieving sustainable sanitation in Kigali. However, such systems require high investment which, most developing cities like Kigali find difficult to finance. Costly centralized sanitation systems are not only a problem for developing countries. Because of high maintenance cost and little profit returns, centralized or off-site water and sanitation systems have to be directly cross subsidized and the chances to ever become financially sustainable are low even in developed countries.

There are other problems caused by centralized sanitation systems associated with over exploitation of natural resources. To transport human waste, networks of sewer pipes consume enormous volumes of water, which is often scarce in informal settlements. In comparison with central sewerage systems, decentralized sanitation systems have been promoted by scholars. Some of the decentralized sanitation technologies that have been promoted worldwide include decentralized sanitation and re-use (DeSaR) technologies. These decentralized sanitation and re-use systems were developed partly as alternative to the centralized ones and there have been claims that they are more robust, cheaper and better able to deal effectively with such environmental challenges.

## Policy Implications

To this end, this implies that dwellers of informal settlements are inclined over time to reject these traditional pit latrines for alternative low-cost options that are more sustainable, such as innovative decentralized sanitation and reuse (DeSaR) and water serving sanitation technologies. This is important because these options can play a part in reduction of over exploitation of natural water sources, which continue to be scarce, as a result of population pressure in the country. DeSaR technologies are also appropriate in informal settlements of Kigali because they occupy less space, do not require emptying by vacuum tankers, pre-treatment/composting, provides opportunity for nutrients re-cycling which is environmentally sustainable and, if well maintained, can have minimal harmful effects. Nevertheless, to be able to provide improved sanitation options for these communities, pilot projects are necessary so as to gauge and experiment the acceptability. Meanwhile, since the majority of residents depend yet on shared sanitation facilities to reduce the sanitary-related diseases, more emphasis has to be placed on hygiene education practices, focusing on proper use and cleanness of the facilities.

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## Further Reading

This policy brief is drawn from the peer-reviewed article published in International Journal of Environmental Research and Public Health (ISSN 1660-4601), entitled 'Challenges to Achieving Sustainable Sanitation in Informal Settlements of Kigali, Rwanda', Tsinda A. et al., which can be found at (<http://www.mdpi.com/1660-4601/10/12/6939>).