Comparing Costs of On-Site Sanitation Infrastructure in Asia & Sub-Saharan Africa

Why are sanitation facilities like dry toilets or septic tanks so much more expensive in sub-Saharan Africa than in Asia? How can costs be reduced to affordable levels? A new Eawag/Sandec research project in collaboration with ETH-Nadel seeks to answer these questions. Lukas Ulrich[1]

Inability to pay, often characterised by a limited up-front investment capacity, is one of the main reasons why access to adequate sanitation infrastructure remains low in both rural and urban areas of low and middle-income countries. In Uganda's capital Kampala, for instance, a ventilated improved pit (VIP) latrine costs around USD 500, which exceeds the average annual income of a slum dweller [1]. The Kampala case is characteristic of the challenges in sub-Saharan Africa, where sanitation hardware is too expensive and unaffordable for many (Photo 1).

Asia, however, reveals a different situation with sanitation infrastructure components often available at relatively low prices and thus within the means of poorer households. The most famous example of low-cost toilets comes from rural Bangladesh: after a social mobilisation campaign in the mid-1990s, the demand for toilets rose considerably. Since then, thousands of small private workshops sell latrines (pan, slab and rings) for USD 6 – 10 [2],[3].

Our project aims at finding answers to the questions of why there are such tremendous cost differences as revealed by the Uganda and Bangladesh comparison, and how the prohibitive costs of household-level sanitation infrastructure in sub-Saharan Africa can be reduced. The answers to these questions are complex as:

Photo 1: Sub-standard double stance pit latrine in Kampala, Uganda.

1. **Apples and oranges cannot be compared.** The conditions underlying the examples above are different and do not allow for a direct comparison of costs (e.g. superstructure not included in Bangladesh, pit lining technique and material not the same as in Uganda). The fact that different materials have different lifetimes also has to be taken into consideration. For costs to be comparable, they have to be related to a specific facility performing during a defined time span for a given number of users. The costs in different contexts can only be compared if the same system boundaries are used.

2. **Local needs demand local designs.** In order for a system to function properly, its technical parameters have to meet the requirements of the specific socio-cultural and physical context (e.g. preference of sitting or squatting user interface, watertight construction for wet and flood-prone areas). Such special requirements have to be taken into account as they can have a significant impact on the costs.

3. **Life cycle cost perspective is necessary.** When analysing the cost reduction potential, not only material costs and expected lifetimes should be taken into consideration but the entire life cycle costs, including costs for operation and maintenance (O&M) as well as disposal and replacement.

4. **Markets are influenced by complex factors.** The factors governing investment costs for sanitation hardware at a certain geographical location are manifold and complicated. Material prices are determined by market structures and regulations (e.g. taxes or monopolies), programmes and policies of governments and donors, as well as properties of supply chains and distribution channels (e.g. production sites and processes, transport).

Sandec's new 3-year project, funded by SDC's Water Initiatives Division, in collaboration with economists from the Centre for Development and Cooperation (Nadel) at the Swiss Federal Institute of Technology in Zurich (ETHZ), aims to identify the factors determining the capital costs of a variety of widespread on-site sanitation options (including VIP, urine-diverting dehydration toilet (UDDT) and pour-flush toilet with septic tank or twin pits). Together with local partners, the cost and influencing factors will be analysed in four countries in sub-Saharan Africa (Uganda, Kenya, Burkina Faso, and Ghana) and in three countries in Asia (India, Bangladesh and Nepal). A comparison of the results from these countries will then help to explain the reasons behind the cost differences outlined above.

Based on the understanding of the current situation, the project will eventually try to find ways to optimise costs and make sanitation hardware more affordable for the poor – particularly in sub-Saharan Africa. This will include an assessment of the potential of non-conventional construction materials, but also the exploration whether some of the good experiences from Asia can be transferred.

[1] Günther, I., Horst, A., Lüthi, C., Mosler, H.-J., Niwagaba, C.B., Tumwebaze K.I. (2011): Where do Kampala's poor "go"? An overview of urban sanitation conditions in Kampala's informal settlement areas. Research Evidence for Policy. Bern, Switzerland: NCCR North-South.

[2] Heierli, U., Münger, F., Walther, P. (Eds.) (2004): Sanitation is a business: Approaches for demand-oriented policies. SDC, WSP and WSSCC.

[3] Sijbesma, C. (2008): Sanitation and hygiene in South Asia: Progress and challenges. In: Beyond Construction – Use By All. London, UK and Delft, The Netherlands: WaterAid and IRC International Water and Sanitation Centre.

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For further information and updates, refer to the project website: www.sandec.ch/costing