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Title	Technical and financial implication of on-site sanitation promotion in managing urban faecal sludges
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Technical and financial implication of on-site sanitation promotion in managing urban faecal sludges

On-site sanitation, the way forward?

Two billion+ urban dwellers in developing countries use on-site sanitation facilities such as pit latrines, septic tanks and aqua privies for excreta and wastewater disposal. Because of water scarcity and unreliability of water supply services, and for financial-economic reasons, area-wide, sewerage sanitation is not suitable in the majority of places.

Hence, on-site sanitation installations will serve the majority of the growing urban populations in developing countries for decades to come. As a consequence, growing quantities of faecal sludge will have to be dealt with.

Several international and national programmes have given a strong commitment to the promotion of on-site sanitation in their specific agenda as an important barrier against excreta-related disease. This leads to an increasing number of excreta disposal installations (latrines or septic tanks).

Technical implications

On collection. When the pits are full, they are emptied mechanically by cesspit trucks or manually by labourers. While mechanically emptied sludge can be carried away from the house and be discharged up to several kilometres from people homes, the manually emptied sludge is usually deposited within the family compound, into nearby lanes or open spaces. Surveys realised in selected Western African countries showed that 30-50% of on-site sanitation facilities are emptied manually (Blunier *et al.*, 2004, CREPA Senegal, 2001). Main factors favouring manual emptying are: the non-affordability for households to pay for mechanical emptying, the type of infrastructure and the mode of utilisation. Traditional latrines, which allow for liquid seepage, produced sludges with TS typically > 10% (Bösch and Schertenleib, 1985) and impossible to be pumped. Even though water is used for cleansing, 20 to 50 % of contents in lower part of the latrines cannot be emptied mechanically due to consolidation with time. In comparison, the TS content of a septic tank is

typically < 2 %. Hence, septage can be pumped easily.

In summary, the type of on-site sanitation technology promoted and put in place can directly impact on the share and quantity of sludge collection. In most cases, the sludge production rate of installations in use is not known and this renders estimation of collectable or collected quantities difficult.

On treatment. Sludges collected from septic tanks are, biochemically, partially stabilised and thus conducive to rapid solids-liquid separation. Sludges collected from latrines and unsewered public toilets are often little mineralised, high in solids, organic matters and ammonia. Hence, much more challenging in treating by low-cost options.

Institutional and financial implications

The financial, institutional and regulatory framework determines largely where and how the faecal sludges are deposited. Most on-site sanitation promotion programmes have not taken into account the need of sludges collection and their safe treatment prior to use or landfilling to date. The main criteria for household to choose the specific on-site sanitation technology depend largely on their financial capability to afford the full or the non-subsidised part of the investment. Households are usually not aware of or not informed on the running cost due to emptying, on the right emptying frequency or on the type of service providers to contact if needs arises.

Although private entrepreneurs have developed business in faecal sludge collection and haulage in almost every developing country, their importance, role and responsibilities are, usually, not fully recognised and legalised as yet, as key players.

The paper will elaborate on case studies to show how business opportunities for private truck collectors remain limited when the share of manual emptying is important.

Contribution to the Third International Conference on Ecological Sanitation

The paper puts forwards strategies, financial-economic and institutional measures. It discusses ways how to render excreta management more sustainable, in places where sewerage systems are neither existing nor feasible. It is proposed that a leading role is attributed to the private, local emptiers, and that incentives and regulations be put in place to sustain a competitive market for collecting, treating and reusing treated faecal sludge. A reversed money flux model is proposed, which may serve as strategic planning tool. The benefits derived from such schemes are discussed.