35th WEDC International Conference, Loughborough, UK, 2011

THE FUTURE OF WATER, SANITATION AND HYGIENE:
INNOVATION, ADAPTATION AND ENGAGEMENT IN A CHANGING WORLD

Up-scaling lessons from the EU-Sida-GTZ Ecosan promotion project in Kenya

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REFEREED PAPER 1259

This paper analyses the requirements for up-scaling of sustainable sanitation systems based on the lessons learnt from the EU-Sida-GTZ EcoSan Promotion Project (EPP) in Kenya. The EPP reached 50,000 users with reuse oriented sanitation systems (ecosan). The project areas for urine diversion dehydration toilets (UDDTs) were villages in rural and peri-urban areas of Kenya where farming is practiced and cholera is common during the rainy season. The total number of installed UDDTs in households and schools was 984 with an estimated 20,000 users. The UDDTs were implemented either directly through Community Based Organisations (CBOs), or via the pro-poor basket fund called Water Services Trust Fund (WSTF) together with the regional Water Services Boards (WSBs) and CBOs. Future strategies for up-scaling must provide a comprehensive strategy to bundle resources and create synergies of the sanitation related sectors in Kenya with a focus on behaviour change and sanitation market development that can provide sustained demand and trigger community investment in sanitation.

Introduction

Sanitation coverage in Kenya is estimated to be only 50%, and 11% of Kenyans (6 million) do not have access to any kind of toilet and practice open defecation (MWI, 2009). The Ministry of Water and Irrigation (MWI) has committed itself through the water sector reform to improve water supply, resource management and sanitation. The MWI used to concentrate on sewage systems and wastewater treatment plants, but also started now to move into public and household sanitation. The German Development Cooperation, GTZ, is supporting the MWI through the Water Sector Reform Program which has five components. The fifth component was the EU-Sida-GTZ EcoSan Promotion Project (EPP) which was implemented from 2006 to mid 2010 with the MWI and its water sector institutions as the local partners. The EPP was funded by the ACP-EU Water Facility (EUR 1.7 million) and was co-financed by the Swedish government (Sida) with EUR 816,000 and GTZ with EUR 200,000.

The EPP reached a total of 50,000 users with reuse oriented sanitation systems (ecosan - ecological sanitation) and capacity building at macro, meso and micro level. It piloted projects through two intervention lines: (1) household and school toilets in rural and peri-urban areas with urine diversion dehydration toilets (UDDTs) and (2) institutional and public toilets at schools, prisons, markets, bus stops and recreation areas with low flush toilets and decentralised wastewater treatment systems (for details see Onyango and Rieck (2010), Rieck (2010), Kraft (2010a)). This paper describes key experiences from the first intervention line with UDDTs, and derives recommendations for up-scaling of sustainable sanitation systems in the Kenyan context.

Description of Ecosan promotion project (2006 to 2010)

Location and conditions

The project areas for UDDTs were villages in rural and peri-urban areas of Kenya where farming is practiced and cholera and other water related diseases like diarrhoea, typhoid and infections with intestinal helminths are frequently reported especially during the rainy season. These diseases are attributed to seasonal flooding and

heavy rains that flood pit latrines and open defecation areas and thus pollute water resources like rivers, ponds and wells.

The UDDTs were built throughout the country covering a number of regions with diverse cultures and social backgrounds (see Figure 1). The provinces with the highest number of implemented UDDTs were Nyanza and Western Provinces near Lake Victoria (see Figure 2), which are "cholera hotspots". Most people in the target areas use simple pit latrines and many communities experience challenges with pit latrines because of flooding or collapsing of pits, high groundwater table and rocky soils.

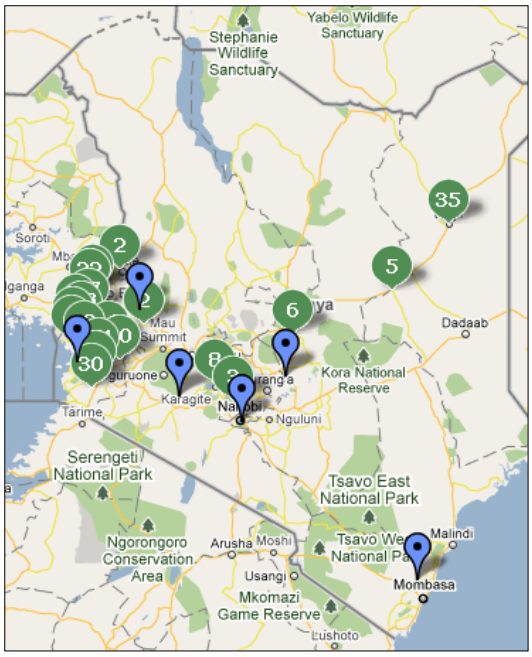

Figure 1. Overview of UDDT clusters in Kenya built by EPP

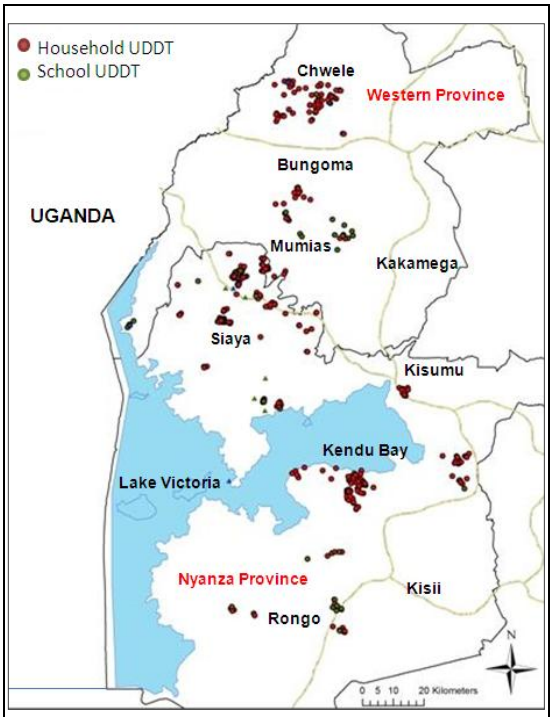

Figure 2. UDDTs in Nyanza and Western province (framed section from Figure 1)

The total number of installed UDDTs in households and schools is shown in Table 1 below. The UDDTs were implemented either directly through Community Based Organisations (CBOs), or via the pro-poor basket fund called Water Services Trust Fund (WSTF) together with the regional Water Services Boards (WSBs) and CBOs. The EPP team contributed expertise and funds for hardware and software components of ecosan systems. In addition the project team provided awareness raising, training and capacity building on ecosan as an alternative sanitation option to local communities, artisans, private sector, NGOs, water sector institutions and to the MWI as well as other sanitation related stakeholders. A wider awareness creation was done through TV, radio and newspaper (see for example TV documentary on www.youtube.com/user/susanavideos). It is estimated that about 500,000 Kenyans were covered by this multi-media awareness creation.

Process and partners for implementation of UDDTs

Sanitation officers were assigned to coordinate the implementation of the UDDTs in a participatory way with the communities. The first batch of UDDT was implemented in mid 2008 directly with the communities in collaboration with two Kenyan NGOs, namely the Water for Health Organisation (KWAHO) and Arid Land Development Focus (ALDEF). The approach used was to set up clusters of double vault UDDTs for 10 households and one local primary school. One household UDDT is shared by 15 people, which is the average size of the "extended family" in the rural areas. Each primary school received four UDDTs: one block of two UDDTs for boys and one separate block of two UDDTs for girls. One UDDT was designed for 30 students and the average size of the school was 500 pupils. The school UDDTs were built primarily for demonstration purposes, not to cater for the *entire* toilet needs of the school.

Table 1. Number of UDDTs installed and users in households and schools (15 people per household UDDT; 30 students per school UDDT)

Implementing agency	UDDTs constructed in		Beneficiaries (users)
	Households	Schools	
CBOs	541	263	16,005
WSTF, WSBs and CBOs	117	63	3,645
Sub-total	658	326	
Total	**984**		**19,650**

The strategy was to target the households and primary schools as they form the core of a community. The schools are also useful for spreading the hygiene awareness and sanitation knowledge through the pupils to the parents. The EPP staff also trained 150 local artisans/masons in the construction of UDDTs and handed out certificates. This was done to ensure that artisans are available to build UDDTs for those people who wanted to construct their toilets at community level. This training created the possibility of income generation for local artisans in local and regional sanitation markets.

The same process was applied for UDDT projects that were implemented through the structures of the water sector institutions. For this purpose the existing funding scheme of the Water Services Trust Fund (WSTF) called "Community Project Cycle" (WSTF, 2009a) was utilised and adjusted accordingly. Other activities of EPP in urban areas with public sanitation facilities were funded through the other funding scheme called "Urban Project Concept" (WSTF, 2009b). In general a number of challenges were noticed with regard to limited capacities for sanitation and slow speed in processing funds. These challenges can be partly attributed to the new and still inexperienced sector institutions which were only recently established following the sector reforms based on the Water Act of 2002.

Community participation

The project worked with communities based on a demand-responsive approach with strong participatory elements that create ownership within the community. The communities were represented by Community Based Organisations (CBOs) as legitimate groups at the grass-root level. In the process the communities were first taken through problem identification on their current sanitation practices and awareness creation for the ecosan approach. Interested CBOs were then assigned with various tasks. This involved sourcing of suppliers (such as artisans, hardware shops, brick merchants etc.), selecting the future toilet owners and taking charge of the inventory and quality control under the guidance of the EPP sanitation officer.

A Memorandum of Agreement specifying the roles and responsibilities of the different actors was developed and signed by the parties of each cluster as a commitment to roll out the process. The future toilet owners were required to provide a financial or in-kind contribution in an attempt to build ownership (see cost section below for details). A variety of trainings were carried out *prior to* the toilet construction (such as awareness creation, project planning) and *afterwards* (correct use of toilets, reuse of urine and dried faeces as fertiliser). The future toilet owners were mostly relatively well-off members and opinion leaders of the community as the CBOs selected the future toilet owners based on their own criteria.

In many cases the sanitation officers organised exchange visits for members of the community to other communities where UDDTs had already been built to see firsthand how the UDDTs work and how beneficial the produced fertiliser can be. The approach of "*Seeing – and not smelling – is believing*" has worked well.

Technologies applied

The toilet technology used under this project in rural and peri-urban areas was the double vault UDDT with a plastic urine diversion squatting pan produced locally by the company Kentainer (see Photograph 1 and 2; more photos here: http://www.flickr.com/photos/gtzecosan/collections/72157616752316076/). The storage and drying time of faecal matter (covered with ash) is about six months, after which the second vault is used. One UDDT is used on average by about 15 family members and thus fills in six months. The urine is collected in 20 litre containers for immediate use as fertiliser in subsistence agriculture and gardening activities (see below for

details). The analysis of Kraft (2010b) on samples of urine and dried faeces from the UDDTs showed sufficient treatment for safe handling in line with the guidelines of WHO (2006). A rainwater harvesting systems was installed to collect rainwater for hand washing (this was done more for demonstration purposes since it is not providing much water from the small roofs; it only contributed 2% of the total costs).

This toilet type was chosen to showcase an alternative to the widely used pit latrines which are often flooded during the rainy season and lead to environmental pollution and health risks. The future toilet owners were not given a choice of toilet design other than the UDDT type because the EPP team regarded this type of toilet to be the most suitable for Kenyans in the rural and peri-urban project areas. However the design of the UDDTs was adapted to cover specific demands based on gender, age, disability, possible flooding and school pupils (for example with regards to the waterless urinals for boys, steepness of the access stairs, ramps, building higher in flood prone areas).

In those urban settings which were more suitable for water-flushed toilets, the EPP implemented low flush toilets with DEWATS (decentralised wastewater treatment systems) or biogas reactors (see Onyango et al. (2010) and Kraft (2010a)).

Photograph 1. Household double vault UDDT with rain water harvesting and hand washing facility to the right.

Photograph 2. Inside of household double vault UDDT with urine diversion squatting pan (with two faeces outlets) and ash bucket.

Reuse of treated excreta

The toilet owners, who are mostly subsistence farmers, were trained on how to safely use urine and faeces – after drying and prolonged storage – as fertiliser and soil conditioner according to WHO (2006). The urine is directly used in the farms of the respective households and schools once the 2-3 jerry cans per toilet are full. Urine was widely used by the toilet owners to fertilise crops like cabbage, spinach, maize, mangos and bananas. According to their informal feedback the crop production increased greatly as compared to their previous harvests. In case of excess urine the users are advised to infiltrate the urine as a fall-back option. The dried faeces are used directly in the farm after a drying and storage period of six months. No further treatment such as external composting was promoted as it was not regarded as necessary.

The users were advised to bury the dried faeces in the soil for growing fruit trees like bananas and mangos. The project distributed cultured mangos and tissue culture bananas to some users to initiate the commercial production of fruits with urine fertiliser. In most cases the farmers had either never or rarely used commercial fertilisers previously because of prohibitive costs.

Cost of the UDDTs

The capital cost of one double vault UDDT built within the EPP was on average EUR 522. The project's software costs for awareness creation, trainings and initial monitoring was estimated to be an additional EUR 10 per person. Generally, a subsidy of approx. EUR 400 was allocated per UDDT for purchase of construction materials and skilled labour costs equalling about 80% of the total capital costs. The future toilet owners (beneficiaries) had to provide a minimum contribution of 20% with locally available materials, unskilled labour and/or cash. Further follow up activities such as re-trainings at a later stage were not included in the project budget. Operating costs are negligible since it is the owner who collects the products from the toilet and maintains it. The ash, which is added after each defecation event, is available for free since wood and charcoal is commonly used for cooking.

The costs of the UDDTs built under the EPP could have been approx. 50% lower if cheaper materials and other simplifications were used such as sun-dried mudstones (adobe) for the vaults and walls, iron sheets for walls, no rainwater harvesting nor separate urine chamber, less painting and downsizing of certain dimensions (Blume, 2009).

There is a widely held view that UDDTs are too expensive. We argue that UDDTs can be cheap *or* expensive, depending on user preferences, budget requirements and construction materials. Figure 3 provides a comparison of construction costs of UDDTs for seven countries: A wide range of costs, from EUR 107 (for a large ecosan project in China) to EUR 522 (for the EPP in Kenya) can be seen. The UDDTs built in the EPP were not built in the cheapest possible way but rather with high quality materials and an appealing modern character to make them seem "desirable" and to give them a long life span. The cost for a conventional pit latrine in the project area is EUR 50-250 depending on soil condition, depth of pit, required lining and design. However, costs for emptying the pits or rebuilding pit latrines are adding to their life-cycle costs which is often forgotten about.

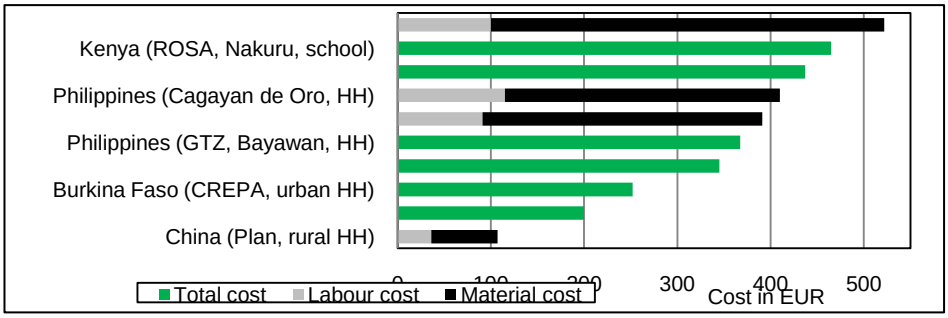

Figure 3. Comparison of construction costs of double vault UDDTs (details for each project in SuSanA case studies (http://www.susana.org/case-studies), except for Peru data which is from company Rotaria). The break-down for labour and material costs is provided where available. HH stands for households

Reasons for lack of replication of UDDTs in target areas

The constructed UDDTs were in general well accepted and used by the toilet owners, school pupils and communities. However the targeted communities as a whole did not widely adopt and replicate the technology despite the efforts made by the EPP team to create awareness and demand, and to train local artisans for delivery of UDDTs. A few private ecosan entrepreneurs and trained masons have started to promote and sell UDDTs to interested institutions and households. The reasons why adoption of UDDTs in the target areas is low are given below:

Communities were not sufficiently triggered for behaviour change

People did not fully understand the risk of disease transmission caused by open defecation or unsanitary pit latrines despite the hygiene awareness campaigns conducted by the EPP. Most of the targeted communities are still practicing open defecation or are using inappropriate sanitation like pit latrines in flood prone areas. Their interest in sanitation remained low. Behaviour change is the most crucial process to overcome this complacency and to raise the demand for sanitation services.

Dependence on subsidies

Subsidies as well as high costs and limited choice of offered sanitation options have led to a culture of dependence on subsidies amongst the communities. Neighbours of UDDT owners and close-by villages or schools are now waiting for the next round of subsidies to build or repair UDDTs instead of adopting the technology as per their own context, requirement, budget and resources. Hence a stronger focus on activation of local resources is necessary to encourage community investments in sanitation and enable people to use their creativity to adapt the technology to their local context and available budget.

Reuse aspect is attractive for rural people but not enough of an incentive

In the rare cases of spontaneous replication of UDDTs the owners primarily envisaged the economic benefits from improved crop production and less the other benefits like health, convenience or status. Productive sanitation did attract a lot of general interest among the rural and peri-urban population who largely depends on agriculture for income and subsistence and has no or limited resources to purchase fertilisers. But the reuse aspect did not create sufficient incentive for the *entire* community to construct their own toilets.

Short project duration without follow-up activities in the project budget

The EPP was initially designed to last three years but in the end operated for four years (with a cost-neutral extension of one year). But even four years was too short, given that many of the UDDTs were only built in the fourth year, after a prolonged and participative planning process in the beginning. Moreover the large geographical spread of toilet construction throughout the country and limited human resources of the EPP for awareness creation and supervision resulted in slow construction rates.

After the four years, no follow-up support was possible from the project budget and hence all users and artisans were suddenly left on their own, apart from some basic support from GTZ. The project end often occurred just after the UDDT was built and even before the first faeces vault was full. Sanitation projects with UDDTs need to be planned with longer follow-up phases of at least two to three years in order to accompany the entire recycling and harvesting cycle. To provide some basic follow-up support, GTZ has recently started an "Ecosan Kenya Network" (http://ecosankenya.blogspot.com/), conducted workshops and contracted local consultants to provide follow-up, documentation and support, especially to the schools.

Current lack of capacities in the water sector for sanitation issues

Positive experiences were made during joint implementation of ecosan facilities with the water sector institutions (WSTF, WSBs and WSPs). The inclusion of ecosan in running funding schemes of the WSTF and in government concepts of the MWI is very promising with regard to up-scaling. However the capacity of the sector for sanitation in terms of human resources, demand creation, supply of services and processing of funds are still limited and need more support, development and funding in the future.

Up-scaling of sustainable sanitation in Kenya

Current situation of sanitation sector

Government focus on sanitation is Kenya is generally low. Household sanitation is considered a household decision and receives little attention. The national ministry mainly responsible for sanitation is the Ministry of Public Health and Sanitation, which published a national policy for sanitation in 2009. It has not yet led to a drastic improvement of cross sectoral cooperation. Overlaps in roles and responsibilities of the various sanitation related sectors limit an effective coordination to date. The water sector has started to put more focus on sanitation with the publishing of the water sector sanitation concept (MWI, 2009) which includes basic principles of ecosan. Moreover the pro-poor basket fund WSTF has also started to fund sustainable sanitation projects for public, institutional and household sanitation (www.wstfkenya.org). All activities are supported by the GTZ water program. However institutional capacities and the national budget allocation for sanitation are low and concentrated mostly on centralised wastewater management.

Sanitation options currently include conventional flush based sewer and wastewater treatment systems, public toilets and decentralised wastewater treatment systems as well as increasingly household and ecosan facilities based partly on EPP experience. Supporting tool kits and manuals are being prepared and capacity building is under way. The MWI plans to increase coverage for sanitation by over 800,000 people per year (MWI, 2009).

Currently about half of the population in Kenya has access to improved household sanitation which mainly results from investments from homeowners with no subsidies. It must be noted here that improved sanitation does not always equal to sustainable sanitation since environmental pollution can be caused by conventional sanitation options like pit latrines or flush toilet systems with insufficient waste management. The other half of the population lacks the ability to pay for a latrine, the right choices, demand or is limited to act due to tenancy issues particularly in illegal urban settlements.

Requirements for effective up-scaling

The EPP showed that a project with a high level of hardware subsidies has a limited impact on the targeted communities with minimal replication effect. Similar experiences were made in other subsidy driven toilet construction programs and conventional hygiene campaigns in the last decades which have not resulted in the

desired impact and instead led to stagnation in the sector: Research from a range of countries indicates that common assumptions surrounding sanitation programs are misleading and hence are unsuitable for up-scaling of sanitation (USAID, 2010). For example, the health aspect is usually not the key motivational driver for households when installing a household latrine as presumed in the past (although it is still an important driver for government programs with an emphasis on public health). Most of these lessons learnt including those from the EPP suggest that with the necessary behavior change having taken place, and provided with the right choices and an enabling environment, most households would in fact pay for their own sanitation system (see for example the Total Sanitation and Sanitation Marketing Project in Indonesia (WSP, 2009)).

The following requirements for up-scaling of sustainable sanitation options are needed in Kenya:

Focus on behavioural change to encourage community investment

Sanitation strategies, programs and campaigns must first and foremost aim at behavioural change of communities in order to create effective and sustained demand for sanitation. A clear understanding of why people behave as they do is essential to achieve behavioural change. If achieved it increases people's priority for sanitation and sparks community investments for sanitation improvements as shown in projects using the community-led total sanitation (CLTS) approach (see under www.communityledtotalsanitation.org). CLTS has proven to be very effective for triggering a community-wide desire and efforts to be free of open defecation on the basis of shame and disgust, resulting in a community empowerment that leads to immediate toilet construction without any external hardware subsidies. It is assumed that it can also facilitate the triggering of communities with unimproved and other existing unsafe sanitation systems since the same principles of shame and disgust are applicable.

Supply of affordable toilet designs and sanitation services (sanitation market)

Toilets implemented by the communities after triggering through CLTS may not be sustainable for example if pit latrines are used in areas not suitable for pit latrines (due to seasonal flooding, sandy soils, hilly areas and so forth). If people have access to sanitation markets with a variety of sanitation and financing options, the initial structures are likely to be upgraded to more permanent kinds of facilities and other key hygiene improvements over time (WSP, 2009). This conforms to the so-called "sanitation ladder". Hence created demand must be coupled with a supply of sanitation products and services at a wide range of designs and prices, hence offering affordable and safe toilet designs for all income levels.

Design catalogues are useful to describe options for consumers with basic information on materials, prices, pros and cons and additional desirable components. It is therefore a crucial task to develop a sanitation market that can supply such services adequately. Members of such a market must be informed in terms of training and information services through permanent support structures provided by the local, regional and national governmental. They include the private sector with artisans, construction companies, product suppliers and producers. Effective sanitation marketing strategies are also important, such as information supply through multi-media channels like TV, radio, newspaper, internet and mobile phones; sanitation awards and branding sustainable sanitation as affordable.

Availability of financing options

Affordability is often determined by the mode of payment. High initial payments as lump sum are frequently a barrier investments in sanitation (WSP, 2009). Hence a range of financing options such as instalment payments, micro credits and revolving funds must be made available and promoted for customers. The necessary working capital must be provided by the government and financing institutions. Excessive interest rates as currently experienced in the micro finance sector must be avoided. Other financing tools are already available like the popular group savings called "*chama*" in Kenya.

National sanitation strategy with sustainable sanitation approach

The relevant sanitation sectors of health, water, agriculture, education, environment and local government need to streamline and coordinate their actions such as funding, subsidies, campaigns, and clearly define their roles and responsibilities in order to create synergies of resources and outreach as well as build sector wide capacities for an effective up-scaling of sanitation. Overlapping tasks should be clarified and sustainable sanitation standards incorporated into policies, programs and institutions. Sustainable sanitation approaches are likely to focus on sanitation software activities and less on hardware subsidies. Sufficient funds must be allocated for this process through government budget and appropriate tariff structures, for example by providing cross-subsidisation for sanitation via water and sewerage tariffs as already introduced in the Kenyan water sector (GTZ, 2009). Accordingly the national budget allocation for sanitation needs to be drastically increased.

Conclusions

Lessons learnt from the EU-Sida-GTZ EcoSan Promotion Project (EPP) in Kenya have shown that hardware subsidies and expensive UDDT designs have created dependencies amongst users which limit crucial community investments for replication. The focus must therefore be placed on behavioural change as the prime requirement for demand creation (such as with community-led total sanitation, CLTS). The created demand requires in turn a sanitation market that can supply this demand with affordable and sustainable sanitation options as well as with appropriate financing tools. The UDDT technology is one of the available sustainable sanitation options as shown in Kenya with the EPP. The Kenyan water sector offers formalised structures for up-scaling but does not provide sufficient levels of outreach to fully support and facilitate the entire process. Therefore the role of government should be increasingly to create synergies and mobilise necessary resources amongst the sanitation related government sectors through well-directed cooperation.

Acknowledgements

The authors wish to thank the Kenyan consultants Moses Wakala and Wycliffe Osumba for valuable inputs.

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