

Reuse.Reduce.Recycle.

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Abstract

The population of Uganda is suffering under environmental pollution, health risks, caused of poor sanitation and dirty drinking water and food insecurity. This situation requires new approaches for a sustainable development. Ecological Sanitation treats human excreta as a valuable source, protects the environment and conserves valuable drinking water. Based on a project in Kisoro, a small municipality in South-western Uganda, the advantages of reusing sanitised human faeces in agriculture are shown. An increase in productivity and at the same time saving expensive fertilisers is an improvement for the living standard of the local population.

Introduction

About 87% of the Ugandan population are living in rural areas, in villages and small trading centres, where only app. 50% have access to safe drinking water and about 48% to adequate sanitation facilities (DWD, 2002). Considerable disparities between and within districts and among towns and rural growth centres reflect a big gap in access to save water and to sanitation facilities even within the country (UNDP, 1998 and UNDP, 2000). To improve this situation the

Government of Uganda designed in the early 1980's an ambitious programme to supply save water for all within reasonable distances by the year 2015 and has included the water and sanitation (WS&S) sector in the countries Poverty Eradication Action Plan.

In the early 1990's the Austrian Development Cooperation (ADC) started to support the WS&S sector and four years later Austria was the first bilateral donor to provide funds for the improvement of water and sanitation under the "Rural Towns Water and Sanitation Programme". However, in 1996 the "South Western Towns Water and Sanitation" (swTws) Programme (1996-2002) was funded by ADC. The project was designed to cover 19 small towns and rural growth centres in the South-west of Uganda with the aim to provide safe drinking water and improved sanitation facilities. Meanwhile the second project phase (2003-2009) is in its starting phase, which will support 30 additional towns within the next six years.

Kisoro Town is one of the municipalities within the first project phase. However, with approximately 13.000 inhabitants, it is a fast growing town situated a few kilometres from the borders to Rwanda and the Democratic Republic of Congo and about 510 km southwest of Kampala City. Apart from the fact that Kisoro District is one of the most densely populated areas in Uganda, the economy of this remote



Figure 1: Location of the project area.

region is one of the least developed in the country due to rough mountainous terrain, poor communication routes as well as low household income which bases on subsistence agricultural activities.



Picture 1: The urban centre of Kisoro Town.

Kisoro was chosen as case study community for implementation of a large-scale EcoSan programme due to the local situation concerning the complex hydro-geological condition, the necessity to safeguard the town's water source against contamination and the poor sanitation coverage with no operating sanitary system. The main purpose of the EcoSan programme was to promote types of toilets for dry sanitation in order to minimise possible contamination of ground water. Over 250 units have been built in the years 1999 and 2000. Composting and Dehydration toilets have been built for public households as well as for large polluters like primary schools, secondary schools, boarding schools, the prison, the old and new market as well as the taxi park and other institutions.



Picture 2: Examples of dehydration toilets in Kisoro.

Methods

To get an insight into the project and to pick up information about the current situation, an austrian - ugandan research team¹ collected and evaluated data in Kisoro from August to October 2001. The research techniques in the field were based on Rapid Rural Appraisal (RRA), the Participatory Rapid Appraisal (PRA) respectively, to work with holistic and flexible tools and to avoid an extensive and time consuming data collection. A semi-structured questionnaire, a checklist to assess the condition and the proper use of the EcoSan facilities as well as qualitative interviews created the basis of the study.

By house to house visits we tried to get answers to our questions as well as a feeling for the acceptance and the opinion of the users. This main part of our fieldwork was principally influenced by the life rhythm of the people. Mondays and Thursdays are market days in Kisoro and from the early morning hours everybody (especially women) is active. People are coming from the surrounding villages and the town is busy and full of life. During these days it was very difficult as well as time-consuming to reach a respondent. But also on other days we often had problems to find an informed and responsible user of dry sanitation facilities. In some cases we had to rely on answers of workers, housemaids and children. However, after nearly 5 weeks and 56 respondents, we finished our fieldwork in Kisoro.



Picture 3: Data collection by house to house visits

¹ The study for the diploma thesis "Reuse.Reduce.Recycle" is based on a co-operation between the „University of Agriculture Sciences, Vienna/Austria“ and the „Makerere University, Kampala/Uganda“. The Ugandan team was composed of two students, Felix Twinomucunguzi, studying Civil Engineering, and for the social impact of our research, Anet Nuwagaba was responsible. The Austrian partner was represented by Elke Müllegger, studying landscape architecture.

A further instrument, especially for coming scenarios, the “household-centre approach for environmental sanitation” (HCES) helped to establish a decentralised sanitation system in Kisoro which is based on the Bellagio-Principles² (Schertenleib, 2000): (i) People at the centre, (ii) Closing cycles, (iii) stakeholder involvement and (iv) decentralised solutions. The five possible measures, which are worked out in the thesis have the HCES approach in mind, which “takes as its fundamental premise the need to put people and their quality of live at the centre of any environmental sanitation system, and it suggests that the first steps to solve problems should be taken at the lowest possible level (e.g. by the household)” (Coad, 2000).

Evaluation of field findings

We were using 2 different questionnaires for 2 groups of respondents: (i) who uses EcoSan units (48 respondents) and (ii) who do not have or have but do not use EcoSan facilities (8 respondents). Furthermore we distinguished between units on public and on household level. To the category of public toilets belong institutions or schools, units at public places as well as units from bars or restaurants.

Generally it can be stated that EcoSan facilities are an appropriate technology to improve the poor sanitation situation in Kisoro Town. Most of the respondents using EcoSan units mentioned as advantages over the former system (mainly pit latrines) that the EcoSan unites prevent bad smell and flies that the facility is easy to clean, that the structure is permanent and/or better and that the sanitised products can be reused as manure. Likewise additional problems have been of interest, to get an idea what people are complaining about and they were asked for suggestions to improve further systems. Whereas one of the repeatedly mentioned points referred to the size of the substructure, that the defecation hole was built too close to the door/wall and above all owners of public toilets complained about improper use by various guests, most likely caused by a lack of information.

Above all, the asking and talking with people focused mainly on potentials for reusing sanitised faeces and urine as manure in agriculture because the amount of plots and houses without space for agricultural activities for growing food for subsistence is constantly increasing. The pressure for a higher yield is increasing, the fields are getting smaller and the soil is losing fertility. Heavy rainfalls and agricultural activities on the steep slopes of the surrounding hills are the reasons for a dramatically loss of valuable soil.

Based on this actual situation it was tried to identify the users approach to the possibility of recycling the final products on their own agricultural fields (if existing), their willingness of hiring somebody to remove the products as well as their general knowledge. On one hand the main focus was questioning whether there is a difference between public and household units and on the other hand whether the existence of gardens and fields shows a significant distinction.

In general it could be ascertain that the users are more interested in a proper use of the facility and also in recycling the dry material, if the units are in private hands. The interest in reusing further depends on agricultural activities. The people from households with fields and gardens in the majority of cases show interest in closing the nutrient cycle.³ Due to house to house visits to

² Bellagio Expert Consultation 1-4 February, 2000. Bellagio, Italy.

³ For fertilising food plants the use of organic material, like peelings, is very common. A lot of farmers know about the advantages of using organic fertiliser.

inform the people about the harmlessness of dried and sanitised human excrements, likewise about favourable effects of reusing the material, the acceptance of recycling is slowly increasing.

The possibility to hire somebody to remove the products from the chambers is required in any case. On the one hand, the absence of fields and gardens and, on the other hand, the absence of responsibility and interest is accountable for this necessity. Especially owners of public units more or less rely on hiring somebody. In this connection at all events the charged rates for emptying the EcoSan facilities are important. The charges have to be moderate and affordable.

Possible measures for a recycling strategy

The swTws project practices decentralisation in the water supply and sanitation sector. Geselbracht and Van Riper (1998) argued: “Decentralised urban sanitation (DUS) systems are in principle much less vulnerable, because their operation is independent of complex infrastructure such as energy and water supply; they are simple and robust.”

Combining the decentralisation approach with users’ perceptions, demands and local conditions, five possible solutions have been worked out. These options⁴ can be summarised as follows:

- (1) The owners of dehydration or composting units are responsible for reusing the products. How to handle the material is everyone’s own decision.
- (2) Reuse of the material is the responsibility of the Town Council. A public company has to collect the sanitised products, has to guarantee a sufficient secondary treatment and has to recycle the material.
- (3) Emptying the chambers becomes a private business, which should be self-sustaining.
- (4) Farmers, who are interested in reusing sanitised human faeces as manure, are collecting the material from the units.
- (5) The owners of a toilet are selling the products to farmers.

After long discussions with users and possible reusers/farmers, decision makers and with employees from KITOWASO⁵, as most likely concept option (4) has been chosen, where farmers should be responsible for the recycling component. For future developments other concepts should be taken in consideration, but they require an intensive and wide information campaign: for the households and private solutions (option 1 and 5) directly at family and user level, for Town Council, private business (option 2 and 3) ones for the workers and employers.

The main responsibility, when we are talking about EcoSan facilities, should lie on household (HH) level. Figure 2 visualises the above mentioned five possible solutions of how to deal with the dried material. In solution 1 the owners are responsible for operation, maintenance and the reuse of the sanitised products. The nutrient cycle closes at the source of origin – the household. Users, which are not interested in recycling, submit the problem to the following level, their neighbourhood or to “recycling farmers” in the region (solution 4 + 5). The last feasible zone involves Kisoro Town or a private company to empty the chambers (solution 2 + 3).

⁴ The options are valid for sanitised faeces, respectively composted urine and faeces and omit separated human urine. The separated liquid from dehydration units, flow via a pipe directly into the soil. The concept of reusing urine has to be kept in mind for the future.

⁵ The “Kisoro Town Council Water and Sanitation Office” (KITOWASO) is responsible for the operation and maintenance work for the water supply and sanitation system.

Nevertheless, no matter which level functions for recycling, the returned nutrients close the cycle in the surrounding and the problem is stopped on regional level.

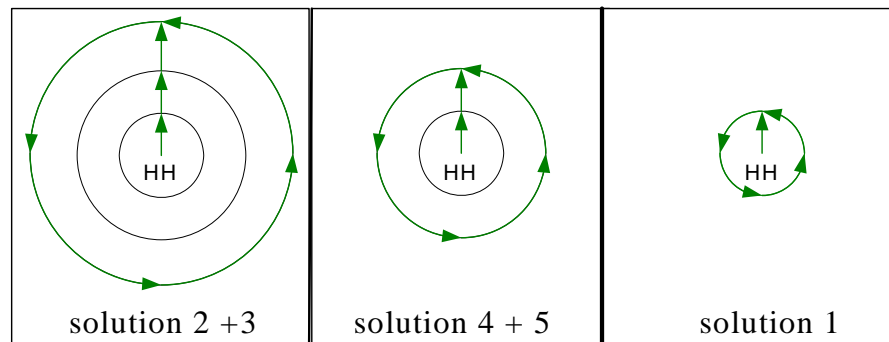


Figure 2: 5 solutions based on the Household-centre Approach.

Steps forward

Some of the main features of the project have been intensive promotion campaigns right at the beginning, which accompanied the whole project cycle. Sensitisation as well as information of the population in general and the users particularly were the overall target.

Participation of stakeholders is one of the key elements in a working project. Community involvement strengthens the identification as well as the acceptance of improvements. Further information of the population in Kisoro by house to house visits is still important - on the one hand for users of EcoSan facilities and on the other hand for the whole community. For users, how the system works, information about the proper use of the units, about dealing with the sanitised products, to guarantee a safe reuse. For the local community to support an improved Water Supply and Sanitation System, that they share the understanding and commitment.

Furthermore schools have a key position in the community and are the most important place of learning for children after the family. Adequate sanitary facilities and also well informed teachers should act as a model to transfer knowledge for a long-term change. Also women are of particular importance due to their role in the households - for water, sanitation, hygiene and food preparation. Therefore both groups, children and women, have to be more involved in promotion campaigns and education programmes.

Furthermore the promotion of reusing sanitised human excrements is still one of the main parts of the project. Demonstration plots, like the urine demonstration plot next to the KITOWASO Office⁶, can be helpful to illustrate advantages of fertilising with urine or faeces. People can see an obvious difference between fertilised and non-fertilised crops. Public places, like the new market or the taxi park, next to the public EcoSan facilities, can be favourable as a location. On market days many people are



Picture 4: Demonstration plot in Kisoro at KITOWASO Office.

⁶ KITOWASO is collecting the separated urine for fertilizing the soil of a maize demonstration plot next the office.

passing these places or using the public units, and the fields can not be ignored.

Currently most owners of dehydration or composting facilities in Kisoro have middle to high-income status but the vast majorities are poor subsistence farmers, without a regular income. Promoting dry toilets for everybody can only work with a financial consideration, how to support families with initial subsidies. A further step is the construction of appropriate toilets by using available local material to reduce costs. EcoSan facilities must be affordable for everybody with the goal of safeguarding public health and to increase living conditions for the people.

Conclusions

1. EcoSan facilities can be characterised as being an appropriate technology to improve the poor sanitation situation in Kisoro Town.
2. Recycling of sanitised human excreta can help to prevent agricultural fields from soil erosion as well as from a decrease of soil fertility, by improving the soil structure and increasing the water holding capacity. Concepts for a sustainable recycling system depend primarily on the willingness of the toilet owners to handle the material and their knowledge about EcoSan systems. The users are more interested in a proper use of the facility and in recycling the dry material, if the units are private property. Furthermore, agricultural activities influence the interest of recycling. The majority of EcoSan system users and owners of fields and gardens are interested in the use of sanitised products.
3. Hiring somebody to empty the toilet chambers is a most likely solution for recycling the sanitised material in an effective way in the future. Currently two farmers are interested to fertilise their fields with the sanitised human excrements.
4. The HCA should guarantee a sustainable decentralised sanitation project in Kisoro Town. Based on the principle “people at the centre”, the household is first responsible for operation, maintenance and the reuse of the sanitised urine and faeces.
5. A further information and promotion campaign about the use of EcoSan facilities and the possibility of reusing the sanitised material is still necessary. Demonstration plots can be a helpful and additional step.

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