



Title: Prospects and Challenges in the reuse of human excreta in Nakuru Municipality, Kenya

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Abstract

Direct reuse of excreta, human faeces and urine, results in the beneficial use of plant nutrients by agricultural crops. The main components of urine and faeces are nitrogen (N), phosphorus (P) and potassium (K). In many parts of the world, it is a tradition to keep the urine and faeces apart. The old Japanese practice of light soil recovery from urban areas separated urine from faeces, with the urine regarded as a valuable fertilizer. There are some benefits of keeping the fractions separate that are still valid and can be refined in today's ecological sanitation system. These include less volume as the collection system fills up much slower and through decomposition, less smell by keeping the faeces and urine apart, prevention of dispersal of pathogen-containing materials due to the dryness of the faeces and safe & easier handling and reuse of excreta. These practical and hygienic benefits of keeping urine and faeces apart have led to the conclusion that we should aim for urine diversion in all dry sanitation systems. One of the key obstacles that a new ecosan programme must overcome is the understandable and in some ways rational fear of human excreta which we might refer to as 'faecophobia' which is a personal or cultural response to the fact that human faeces are malodorous and potentially dangerous. In most cultures this response has been codified into concepts of 'clean' and 'unclean'. Even today this is a reality in both traditional villages and major cities such as Nakuru. A study was conducted in Nakuru municipality, Kenya using structured questionnaires. Results were analyzed and compared using SPSS for windows statistical package release 11.5. Descriptive statistics were used to summarize codes and finally the results were presented using tables, graphs and pie charts. The results indicated that majority of the respondents, 62% would be willing to use dry toilets if they were not responsible for their operation and maintenance particularly handling of the excreta. There is however, a bright future for dry toilets in Nakuru. From the study majority of the respondents, over 60% were willing and ready to use human excreta as manure for crops. Further an overwhelming 68% of the respondents had no problem consuming crops grown from sanitized human excreta. After a thorough awareness creation campaign that has been conducted and the pilot demonstration sites by the ROSA team, a recent survey indicated that the level of acceptance to the dry toilets has arisen to over 70%. Despite various challenges mainly to do with culture, some progress has been made in Nakuru. So far the team has managed to construct more than fifteen dry toilets scattered in three different sites. The author would want to point out that the secret to achieving the MDGs targets in as far as dry sanitation is concerned is by having thorough community awareness creation.

Key words: dry toilets, ecosan, faecophobia.

Introduction

Nakuru is the fourth largest town in Kenya located 160Km North-West of the capital city Nairobi. Nakuru's population has been growing rapidly and is currently estimated to be above 500,000 persons (MCN, 1999). This rapid growth has exerted strain on existing water and sanitation facilities. Due to the high costs of conventional sewerage system, the municipality has not been able to expand the network to match the rate of population growth. It is also not able to meet its daily water demand and the sewer network serves only 40% of the population (Odhiambo, 2008). The alternative methods used in the unsewered areas lead to environmental and sanitary challenges.

Ecological Sanitation

Ecological sanitation is a system that makes use of human excreta and turns it into something useful, where the available nutrients; nitrogen (N), phosphorus (P) and potassium (K) can be recycled in agriculture to enhance food production, with minimal risk of pollution of the environment and with minimal threat to human health (Morgan, 2004). A sanitation system that provides ecological sanitation is a cycle of a sustainable, closed loop system, which closes the gap between sanitation and agriculture.

The technology involves the designing of either waterless urinals or urine diversion dehydrating toilets (UDD). This toilet serves to separate the two waste components that are, faeces and urine. This ensures no mixing of the two and as a result smell from the facility is greatly reduced. The reduced pathogens ensure improved health to societies.

The collected urine and faeces are stored for sometimes before they are reused in the farm (Esrey S. et al, 2001). Urine is generally sterile and therefore, do not undergo any treatment. It is just diluted at the ratio of 1 part of urine to 5 parts of water and the applied directly onto the crop field.

Human faeces however, have to undergo some treatment to kill the bacteria and helminth eggs. Treatment involves natural processes that include dehydration by adding materials such as ash, lime, sawdust or soil into the faeces; increasing the pH; high temperatures and adequate storage period of at least six months (pre-treatment). The final product is then applied in the crop field as manure to improve soil structure, soil fertility, and water holding capacity and neutralize soil toxins and reduce pests and diseases among other functions.

Challenges and Prospects of reuse

One of the key obstacles that a new ecosan programme must overcome is the understandable and in some ways rational fear of human excreta which we might refer to as 'faecophobia' which is a personal or cultural response to the fact that human faeces are malodorous and potentially dangerous (Morgan, 2004). In most cultures this response has been codified into concepts of 'clean' and 'unclean'. Even today this is a reality in both traditional villages and major cities such as Nakuru.

The ROSA project has been working in Nakuru to promote ecological sanitation with an aim of reusing human excreta as fertilizer in crop production besides other benefits. The project has

been since its inception in 2007 conducting research in the socio-cultural aspects of human excreta reuse in agriculture. The major obstacle however has been the rational fear of human excreta especially the faeces.

Following a study which was conducted in Nakuru municipality, Kenya on the reuse aspect of human excreta, very interesting findings came out of the study. The results indicated that majority of the respondents, 62% were willing to use dry toilets if they were not responsible for their operation and maintenance particularly those involved with the handling of human excreta. The study however indicated that there is some future prospects in as far as promotion of dry sanitation and subsequent reuse of the by-products such as faeces and urine to fertilize crops. A good number of respondents, 60% were found to be ready and willing to use the treated human excreta as fertilizer in their farms, see figure 1. This at first was attributed to the global rising costs of conventional fertilizer which was experienced in the year 2007/2008. Further probing on the same confirmed that most farmers were convinced the treated human excreta were safe.

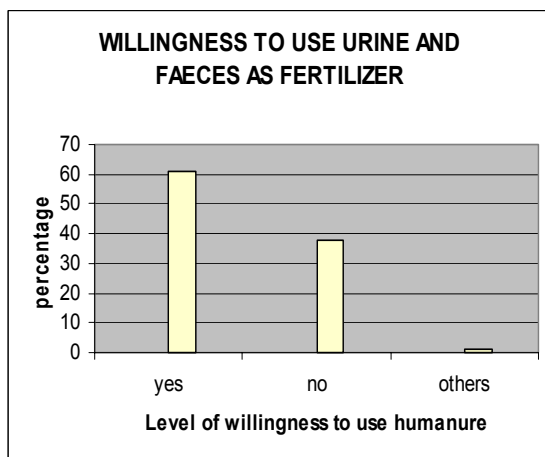


Figure 1: Level of Willingness to use human excreta as fertilizer

Source: Odhiambo, 2008

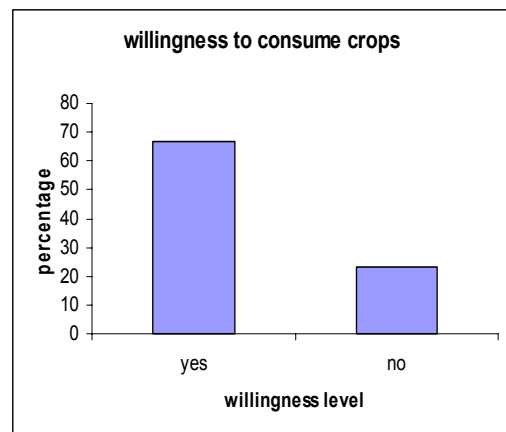


Figure 2: Willingness to consume crops grown with sanitized human excreta

The study further revealed that an overwhelming 68% of the respondents had no problem consuming crops grown using sanitized human excreta, figure 2 above. It was even alleged that some farmers were using untreated sewage water to grow vegetables consumed locally, though this is illegal and posed a health risk to consumers.

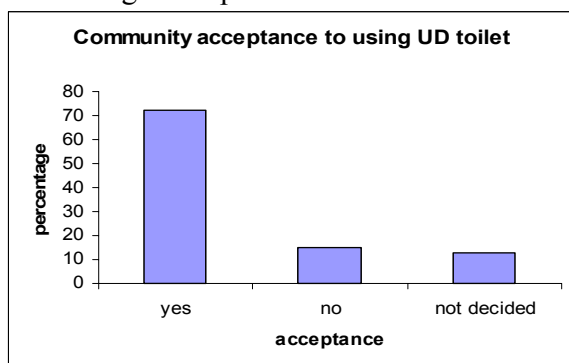


Figure 3: Community acceptance level of dry sanitation

ROSA realized the secret behind the full acceptance of dry sanitation in Nakuru. The project therefore invested a substantial amount of resources in awareness creation and social marketing of the new sanitation concept. As expected the results were positive, a recent study conducted indicated that the acceptance level to the dry toilet by Nakuru residents have arisen to 70% (figure 3). This was also attributed to a number of pilot demonstration units that were put up by ROSA.

Conclusion

Despite many challenges associated with dry sanitation concepts in Nakuru municipality, a number of achievements have been made through ROSA efforts. The author would further want to point out that the secret to achieving the MDG target in as far as sanitation is concerned is to invest more resources in awareness creation and social marketing. The dry sanitation is the way to go, but the concept is still new in most developing world, where conventional sanitation has miserably failed. The author would further want to point out that there needs to be political will from local, regional and international levels in addressing sanitation matters. May be the International Year of Sanitation (IYS) would have been there for at least half a decade to realize greater impact as opposed to one year.

Acknowledgement

The work is carried out within the project ROSA (*Resource-Oriented Sanitation concepts for peri-urban areas in Africa*; Contract No. 037025-GOCE; duration: 1.10.2006 – 31.3.2010), a Specific Target REsearch Project (STREP) funded within the EU 6th Framework Programme, Sub-priority "Global Change and Ecosystems". The ROSA team is grateful for the support.

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