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A household food garden in Madombidza, Limpopo, with a ventilated improved pit toilet in the background. Communities which had little or no exposure to ecological sanitation were found to have less knowledge of the fertiliser value of human excreta.

Recycling Human Waste Still Taboo in SA

Despite the increased supply of urine diversion (UD) toilets as basic sanitation facilities in peri-urban and rural areas in South Africa, the use of human excreta especially for food production is not gaining ground. This is one of the main findings of a new report published by the Water Research Commission (WRC). Lani van Vuuren reports.

The report, *Social/Cultural Acceptability of Using Human Excreta (Faeces and Urine) for Food Production in Rural Settlements in South Africa*, follows years of research by the CSIR's Built Environment Unit (BEU). The study was aimed at determining the acceptability of using human excreta as fertiliser for food production in rural settlements.

The UD toilet, also known as a dry toilet, is a form of ecological sanitation (ecosan). Ecosan is not so much a technology than a sanitation philosophy. It can be viewed as a three-step process: containment, sanitation and recycling

of human excreta. The ecosan approach to sanitation promotes a cycle or 'closed loop' system. Human excreta is treated as a resource and processed (usually dried and/or composted) until it is completely free of disease organisms. The nutrients contained in the excreta are then recycled by using them as fertiliser in agriculture.

The UD toilet basically operates as follows: waste is deposited in the chamber and dry absorbent material, such as wood, ash, straw or vegetable matter is added after each use to control moisture, control odours and flies, and facilitate biological breakdown

(i.e. composting). Urine is separated from the faeces through a specially adapted pedestal. While the urine may be collected and used as fertiliser, in South Africa it is usually diverted to a soakaway. About 4% of households in the country make use of dry toilets.

The desiccated faeces make a good soil conditioner, while urine is an excellent source of fertiliser, being rich in nitrogen, phosphorus and potassium. Despite these benefits, and the need to improve food production, especially in the rural areas, the handling of human excreta is still a very foreign idea in South Africa.

HUMAN EXCRETA REUSE – AN OLD PRACTICE

The recovery and use of human excreta for food production is not a new practice. The best known example of the collection and use of human excreta is that of China. It is reported that the Chinese were aware of the benefits of using excreta in crop production before 500 BC enabling them to sustain more people at a higher density than any other system of agriculture. The value of night soil as a fertiliser was clearly recognised with well developed systems in place to enable the collection of excreta from cities and its transportation to fields. Farmers even owned outhouses where they invited visitors to leave behind their 'valuable' excreta.

Early Europe, Greek and Roman societies collected human excreta and used it as fertiliser. The Romans also realised the cleaning power of urine and used it to wash clothing. Collecting it actually became a good business. So-called 'fullers', who worked in laundries, would install amphorae in streets and alleyways as public urinals passing regularly to collect the urine, and transporting it back to the laundry for washing.

The Japanese too practiced a disciplined use of excreta in agriculture, applying at rate of up to 4 t/ha on fields. Statistics from the Japanese Bureau of Agriculture for 1908 state that almost 24 million tons of excreta had been used on around 13,5 million hectares of arable land. Like the Romans, the Japanese provided public toilets with the express aim of collecting excreta for use.

In Mexico and Peru, both the great Aztec and Inca cultures collected human excreta for agricultural use. In Peru, the Incas had a high regard for excreta as a fertiliser, and would store it, dried and pulverised, to be used when planting maize.

MISCONCEPTIONS

The WRC study, which took the form of a qualitative survey, was undertaken in settlements in four provinces, namely the Northern Cape, Eastern Cape, Limpopo and KwaZulu-Natal. Both households who had UD toilets and those who had other forms of sanitation, such as ventilated improved pit toilets, were included in the study.

The research showed that most of the users accepted the UD toilet as a toilet only (mainly because they did not have a choice or the money to buy a flush toilet), and their expectations were still to eventually have flush toilets.

While people were generally aware of the fertiliser value of human excreta and did not ascribe any cultural beliefs, values or taboos to human faeces or urine, it was generally considered totally unacceptable for people to handle human faeces, especially concerning food production. "Food and human faeces are not supposed to be even mentioned in the same breath," Louiza Duncker of the BEU told delegates at the Second Dry Toilet Conference in Finland in 2006.

She said that, in many cases, users were not aware of the correct transmission routes of excreta-related diseases, for example, many households focused on keeping the floors clean in the UD toilet as a prevention method for disease instead of keeping the pedestal clean and washing their hands. Some believed that a person could be infected by



Courtesy of CSIR

Interviewees in Augrabies, in the Northern Cape

handling human faeces and even by inhaling the smell of it. A number of chest infections, such as influenza and colds, were said to have been caused by the smell of human faeces. Other respondents believed they were at risk of contracting HIV/AIDS if they handled human faeces.

"Food and human faeces are not supposed to be even mentioned in the same breath."

"In South Africa the perceptions and beliefs of the users represent a major stumbling block to the use of the products from dry toilets," said Duncker. "The general norm of not touching human excreta is also strengthened by programmes and interventions such as the WASH campaign and other hygiene awareness programmes." The messages from these campaigns are in direct opposition to the purpose and objective of the closed loop strategy of ecosan.



Courtesy of CSIR

A hand-washing facility outside a urine diversion toilet in Mthatha, in the Eastern Cape.

THE IMPORTANCE OF TRAINING

The only area where significant numbers of households could be found who reuse human excreta was Mthatha, in the Eastern Cape. Here, 88% of respondents said they used human faeces in their vegetable gardens and maize fields. These households have been using UD toilets for eight years and have accepted the technology completely.

In Mthatha area the communities were involved in the implementation of the projects and received extensive training on the operation and maintenance of the UD toilets. Follow-up and support after implementation of the projects and retraining were conducted to ensure the sustainability of the toilets. This is said to have had a major impact on the view and perception of the respondents.

In other areas which had UD toilets, the contents of the vaults were mostly burnt or buried. No cases were found where the urine was collected, and all of the UD toilets had soakaway pits. Those that did not have UD toilets were generally unwilling to use excreta in their gardens, citing it as being 'unhygienic', 'smelly', 'unacceptable' and 'repulsive'.

The quality of construction of the UD toilets also had a major impact on perceptions. In Augrabies, in the Northern Cape, many of the UD toilets had been constructed by 'fly-by-night' contractors using inferior materials, which had a major impact on the sustainability of the systems. Because the UD toilets had been constructed badly the contents of the vaults were wet and smelly making the task of emptying the vaults unpleasant and unhygienic.

A WOMEN'S ISSUE

In general the female respondents had a higher level of knowledge regarding the fertiliser value of human excreta and the medicinal value of human urine. Nearly

Mthatha, in the Eastern Cape, was the only area where a significant number of respondents could be found who use human excreta in their gardens.



Courtesy of CSIR

50% of women interviewed were aware of the fertiliser value of human excreta compared to 25% of men. The traditional gender role in the communities were still observed, with sanitation regarded mostly as a 'women's issue'.

“Respondents believed they were at risk of contracting HIV/AIDS if they handled human faeces.”

Many users felt it was unhealthy to eat vegetables grown in dry human faeces, especially leafy vegetables that are in contact with the soil. Vegetables such as tomatoes and anything that could be picked off of the plant itself and does not touch the soil are perceived relatively clean and edible, but not lettuce, spinach, cabbage or any vegetable that grows underground (such as potatoes, beetroot, onions and carrots).

LEADING BY EXAMPLE

The respondents were asked what they thought might work to change the minds of people towards using human excreta as fertiliser and soil conditioner in their gardens. Those respondents who were already using UD toilets thought that demonstration gardens, leading by example (i.e. councillors and people with high standing seen using human excreta) and educational workshops would be the best way to inform people

and change their attitudes towards using human excreta for food production.

“The use of products from dry toilets will not happen automatically in South Africa,” noted Duncker. “Constant intervention and awareness raising will be needed to address the general norm of not handling faeces. A strategy needs to be developed to facilitate attitude change and a mind shift with the users.”

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HISTORIC USE OF HUMAN EXCRETA IN SOUTH AFRICA

While human excreta is generally perceived in South Africa as 'dirty' and unusable, studies by CSIR revealed a number of ways in which human waste was used in earlier times. Wet faeces was used to heal wounds. It was also applied to snakebites to remove the poison.

Women who used cow dung to plaster the floors of their huts used to apply babies' first urine of the day to wash their hands prior to working with the cow dung. This practice was believed to 'cast a spell' on one's hands to avoid it being handicapped. Urine was also used for medicinal purposes, for example, to treat eye infections.