



## Introduction of urine diversion in South Africa

*R.D. Holden and L.M. Austin, South Africa*

IN RURAL SOUTH Africa people defecate in the fields, bushes adjacent to the house or in a pit latrine. Even if squatting in the fields was the normal practice, when a pit latrine is constructed it will have a pedestal or bench seat rather than a squatting hole as is commonly found in many parts of Africa.

Constructing a pit has major problems in areas of rock, high water table and collapsing sand which makes the cost, or effort, of a digging a pit exorbitant. Also the problem of emptying pits has not been solved. The result is that when pits are full the top structure is collapsed on top of the pit (if brick or mud) or moved to a new site (if tin).

In South Africa the objective of the National Sanitation Programme is to ensure that everyone has access to adequate sanitation. This is defined as a minimum of a Ventilated Improved Pit (VIP) Toilet. Although people were supposed to be offered choice of technologies in reality this has not happened and only a Ventilated Improved Pit was offered. In difficult areas people were offered the option of a Double-Pit VIP. This proved to be socially unacceptable when it was found that the floor of the toilet was 1-1.5 m above ground level. This exposes the user to the world when going to the toilet (For most people the going to the toilet is a private matter).

The matter of emptying pits has also lead to resistance to the building of improved superstructures and lining of pits. Unless the pit can be economically emptied the investment will be lost. This has been the result in Zimbabwe<sup>1</sup>. Pits provided through the sanitation programme are now full, there is no mechanism in place to empty them and new pits are not being built.

Urine diversion (or ecological sanitation as it is called in other areas) was perceived as providing some of the answers to this problem. The urine is kept separate from the faeces at source and diverted into a french drain or stored for use as fertiliser. The faeces drop into a vault below the pedestal and dehydrates. After being stored for sufficient time to ensure destruction of pathogens it can be disposed of in a pit or used as soil conditioner. Secondary composting is sometimes required to ensure that this occurs.

The potential of this system to provide an alternative to VIPs was first seen by the Council for Scientific and Industrial Research (CSIR) in 1996 in published articles. The CSIR then approached the Eastern Cape Appropriate Technology Unit (ECATU) to fund a pilot programme outside Umtata to find out if the technology was acceptable in the South African context.

In August 1997 during the implementation phase of the pilot project the CSIR and the Mvula Trust were invited by

the Swedish International Development Agency (Sida) to participate in a workshop in Stockholm, Sweden to promote urine diversion. The workshop brought together over 30 experts in the sanitation sector from South East Asia and Central America had extensive experience in urine diversion whilst others from Africa (apart from Ethiopia) had little or none.

The main focus of the workshop was on the ecological benefits of using urine as fertiliser and faeces as soil conditioner. Although this has been common practice in countries such as Vietnam, it would have to demonstrate clear benefits for the practice to be accepted in other countries.

The appeal for the Southern African delegation was the demonstration of a viable alternative to the VIP and a cost-effective solution to areas with difficult geological conditions. Given the requirement for a pedestal in South Africa a cost-effective way was required to keep the faeces and urine separate. This was demonstrated to us by a delegate from Mexico where a pedestal is manufactured using a fibreglass mould and a cement mortar mix.

The CSIR had solved the problem of the pedestal, on their pilot project, by commissioning a blow moulded plastic pedestal from a local manufacturer. The initial order cost R260 (US\$42) per pedestal. Even with bulk production this was not expected to come below R180 (US\$29) compared to the cement mortar pedestal cost of R60 (US\$10).

### The problems of importing this technology to South Africa

Having seen the technology the problem was now how to get it introduced into South Africa. Although e-mail allows instant communication unfortunately only software not hardware can be transported through cyberspace. It was not until March 1998 that the first mould was imported into South Africa as hand luggage of a trainer commissioned by the Mvula Trust to teach Participatory Health and Sanitation Transformation (PHAST). Although an NGO was commissioned to introduce the technology into a community the mould sat unused until May 1998 when the Trust visited the area and bought the mould back into use. Even then pedestals were only produced in fits and starts and the demand from other organisations was not met.

Permission was not granted to reproduce the mould in South Africa and a further five moulds were ordered from Mexico. Whilst waiting for these moulds an attempt was

made to improvise using cut down plastic containers for the urine diversion receptacle. This did not offer a sufficient enough improvement over the existing systems (normally the bucket system) and was rejected by the communities.

In the meantime the moulds were completed in Mexico and now came the problem of trying to transport them to South Africa. If you have a container load of anything it is the easiest thing in the world to transport from one country to another (if you have the money that is). If you want to transport five objects weighing only 75 kg from one developing country to another, think again.

There are no shipping organisations in South Africa and Mexico, which make up container shipments. We were told if we could get it from Mexico City to Houston, USA they could help. The South African Embassy, Sida and the Department for International Development were all approached for help but none was forthcoming. Finally after eight months and funding provided by AusAid, the moulds were bought to South Africa.

Because at one stage it looked unlikely to be able to import the moulds, the designer of the pedestal Cesar Anorve agreed to the reproduction of the mould in South Africa.

By being able to reproduce the mould in South Africa a number of different people could experiment and rapidly a body of knowledge has been gathered and further improvements made to the mould. This knowledge has been shared with Mexico and some of the improvements were incorporated in the five moulds received from Mexico.

### **The social problems around the introduction of urine diversion**

When introducing a new technology, especially something as personal as a new way of going to the toilet and the handling of faeces and urine, social and cultural considerations must be uppermost in ones mind. With urine diversion the main factors in South Africa are:

- A man must sit down when urinating unless a separate urinal is provided;
- Toilet paper does not decompose in the vault (because it is a dehydration process). In Central America the paper is put in a basket alongside the toilet and burnt on a daily basis. Is this acceptable?
- What do you do with the urine? Sida introduced the toilet on the basis that it must be used for fertiliser, is this acceptable?
- What do you do with the faeces? If no one in the community is prepared to empty the vault is urine diversion a sustainable option? Do you insist that the faeces are used as soil conditioner, again as recommended by Sida, or concentrate on the safe disposal of the dried faeces?
- When a new technology is introduced it means that no one else knows about it. What do you do when your guests want to use the toilet?

With regard to men urinating the CSIR built a separate urinal in the toilet. This however adds considerably to the cost of the toilet due to the increased size of the structure. In the Mvula Trust projects the community has converted existing bucket toilets where there is no room for a urinal in the structure. The desire, however, to move away from the bucket system is so strong that the inconvenience to a man of sitting down every time he urinates is tolerated.

With regard to placing toilet paper in a separate basket two practices emerged. In the Umtata project people were quite prepared to put it into a separate plastic container with a lid, and bury it as and when necessary. They did not agree to burn it, as they believe they would get anal infections if they do this. In the Campbell community in the Northern Cape the people drop it down the toilet and occasionally set fire to it in the vault. Not only does this remove the problem but also the heat generated assists in the destruction of pathogens.

When urine diversion was introduced into communities' people were shown the pedestal and asked to comment on it. Most rapidly grasped the concept of the urine diversion and the advantages in reduction of smell and ease of handling of faeces. Although in the communities in which it has been introduced so far has there been no objection to the use of faeces as soil conditioner no one is prepared to use the urine as a fertiliser. Since the objective is to introduce a viable sanitation technology, not a source of fertiliser for the garden this point has not been pushed and the urine is disposed of in a french drain. The hope is that people will eventually realise that good vegetation growth occurs in the vicinity of the drain and experiment further.

The concerns around explaining to guests, especially male to female, have resolved themselves. Once enough people in the community know about the technology it is no longer a problem. If it must be explained to an outsider there is little embarrassment as it is the outsider who lacks knowledge, not the community.

### **Conclusion**

In the two years since the Stockholm conference the Mexican pedestal for urine diversion has been imported into the country and a number of pilot projects established. The difficulties of transferring technology South to South were not comprehended at the beginning and the only help that was received was from AusAid who funded the process and the Mexican Embassy who gave us details of shippers.

On the social side it is apparent that difficulties are easily overcome particularly if the community has strong personal reasons to improve their sanitation system and they are given the space to solve the problems themselves.

### **Reference**

M. JONGA. Operation and Maintenance of Rural Sanitation Facilities in Zimbabwe.

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AUSSIE AUSTIN, CSIR, S. Africa.

RICHARD HOLDEN, Mvula Trust, S. Africa.

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