



# INNOVATIVE SANITATION TECHNOLOGY FOR RURAL DEVELOPMENT: LOW POUR FLUSH LATRINES

## 1. INTRODUCTION

In South Africa waterborne sanitation is often perceived as the standard sanitation solution. However, in view of the scarcity of water resources as well as the extreme financial constraints under which local government operates, waterborne sanitation for all remains a challenge and not an easily attainable goal. In South Africa, in many of the un served and mainly rural areas, the sanitation norm which is being recommended is the Ventilated Improved Pit-latrines (VIP) or its derivatives due to costs and logistics. The Pour Flush Sanitation or Latrine concept was funded and developed by the Water Research Commission (WRC), with the aim of providing an alternative that bridges the gap between waterborne sanitation and pit latrine. The technology, while affording all the conveniences of waterborne toilets, has a water seal and

requires up to one litre of pour or manual flush using water or grey water. The Department of Science and Technology (DST), through its Innovative Partnership for Rural Development programme (IPRDP) provided financial support for the demonstration of this technology in some of the 23 prioritised district municipalities in Amajuba and Amathole District Municipalities (Kwa-Zulu Natal and Eastern Cape Provinces).

## 2. OBJECTIVE AND SCOPE OF THIS POLICY BRIEF

The main objective of this policy brief is to contextualise the uptake of Pour Flush alternative sanitation technology and how it could be implemented in the rural municipalities in South Africa. It also looks into fundamental policy legislative perspective on water and sanitation.

### 3. LEGISLATIVE AND POLICY FRAMEWORK FOR BASIC SANITATION IN SOUTH AFRICA

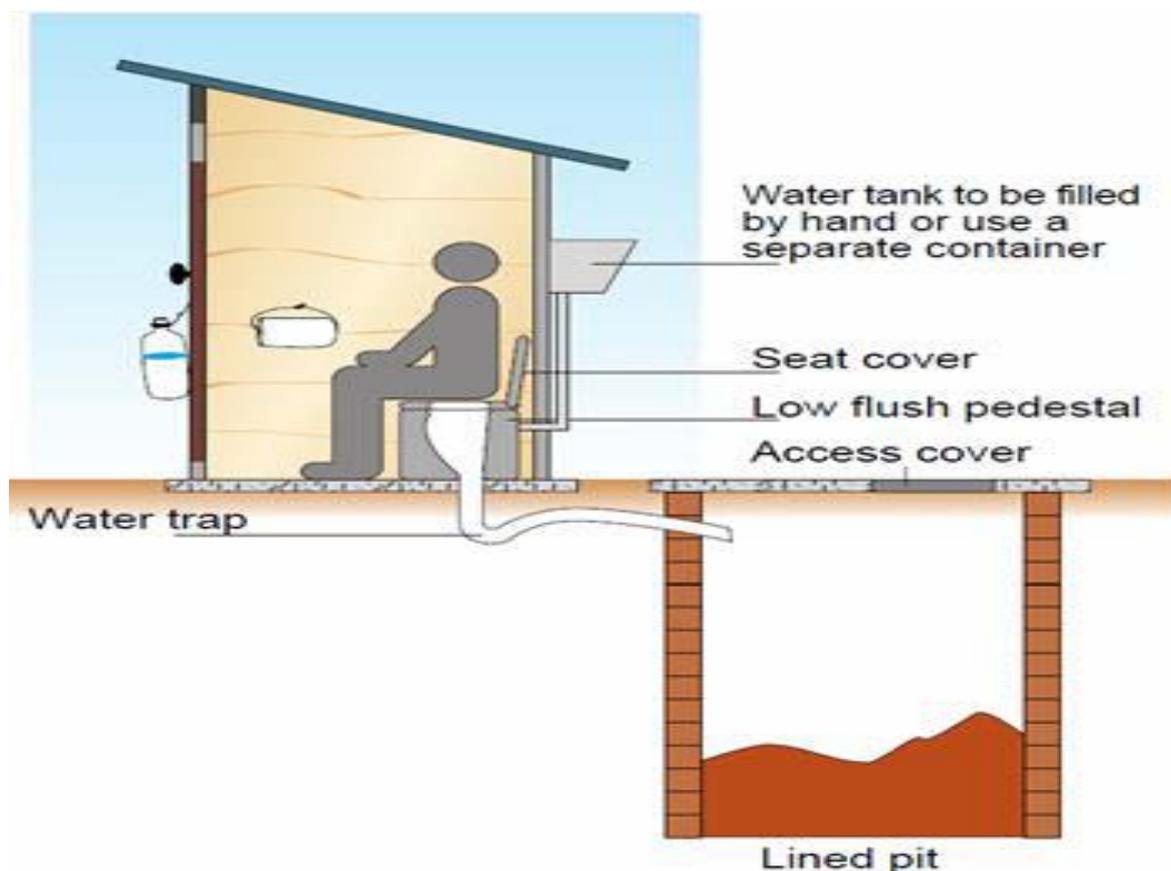
The Strategic Framework for Water Services: Water is Life, Sanitation is Dignity was approved by Cabinet in 2003, and is a national umbrella framework for the water services sector. The Strategic Framework defines a basic sanitation facility as the infrastructure necessary to provide a sanitation facility which is safe, reliable, private, protected from the weather and ventilated, keeps smells to the minimum, is easy to keep clean, minimises the risk of the spread of sanitation related diseases by facilitating the appropriate control of disease carrying flies and pests, and enables safe and appropriate treatment and/or removal of human waste and waste water in an environmentally sound manner. The 2001 White Paper on Basic Household Sanitation differentiates between sanitation in less densely settled or rural areas, and in urban areas. In rural areas, waste disposal can usually be managed with on-site latrines e.g. VIPs, desiccating (drying) toilets or septic tanks and local government implement rural sanitation programmes based on VIPs and health and hygiene promotion.

Among the 12 policy principles adopted in the 2001 White Paper on Basic Household Sanitation is:

- The *Economic value of water which says, the way in which sanitation services are provided must take into account the growing scarcity of good quality water in South Africa; and*
- *Sanitation is about the environment and health: Sanitation improvement is more than just the provision of toilets; it is a process of sustained environment and health improvement.*

The Local Government: Municipal Systems Act 32 of 2000 provides the machinery and procedures to enable municipalities to uplift their communities socially and economically, and guarantee affordable universal access to basic services. Furthermore, The Municipal Systems Act Section 73(2) states that municipal services must:

- a) be equitable and accessible;
- b) be provided in a manner that is conducive to –
  - i. the prudent, economic, efficient and effective use of available resources; and
  - ii. the improvement of standards of quality over time.



**Figure 1: Illustration of the low pour flush latrine technology**

#### **4. INFRASTRUCTURAL AND TECHNICAL PROBLEMS**

A finding from a 2009 WRC report on basic sanitation services is that across case studies of sanitation types in different provinces in South Africa, “there was no single type of sanitation that fared uniformly well”. These are some of the problems identified:

- some sanitation facilities are not compliant with appropriate technical design standards and are built in a manner susceptible to quick failure and extreme maintenance difficulties;
- lack of clarity with regard to sanitation standards and appropriate technical options at the local level;
- lack of buy-in and use of infrastructure from communities, especially with regard to the use of alternative technologies;
- neglect of health and hygiene education, which negates the impact of sanitation provision on improved health outcomes;
- lack of privacy and security issues at sanitation facilities, which causes people not to use them;

- poor or non-existent sanitation facilities in many rural clinics and schools throughout the country,
- insufficient O/M of existing infrastructure, particularly around the emptying of VIPs in rural areas; and
- lack of clarity around responsibilities for the emptying of full VIPs.

## **5. PILOTING THE POUR FLUSH SANITATION**

Pour Flush sanitation has been proven successful and appropriate over a considerable period of time in the Asian context. It looks like a flush toilet because the user sees the bowl not human waste. It can be built inside and outside the house and is cost comparable to VIP. It is feasible for both rural and high density areas. Over 225 units were initially demonstrated in 4 KZN municipalities, 3 WC municipalities and 2 Limpopo municipalities.

The project has since been up scaled to 2 District Municipalities of Amathole and Amajuba with about 250 units built. The objective of this project was to demonstrate that there exists an alternative to dry onsite sanitation and full waterborne sanitation that can meet user acceptance and affordability. This project demonstrated and evaluated the suitability

of an innovative technology that addresses key infrastructure needs in the priority District Municipalities.

The strong desire on the part of many South Africans to have a flush toilet rather than a pit latrine motivates the search for an option which requires little water and does not require sewers, large amounts of water and waste water treatment plants. Innovation is the creation or adaptation of new or existing knowledge, technologies, and techniques to solve social, environment or economic issues and problems, and involves the transfer, diffusion and implementation of knowledge and techniques. The prototype developed for this project was designed with these principles in mind:

- Eliminating the problems frequently associated with a cistern and unreliable water connection;
- Utilizing a water seal rather than a mechanical seal; and
- Aiming aesthetically to be as similar to a standard flush toilet as possible.

The pour flush latrine introduces a water seal between toilet bowl and sludge with the result that smells and flies are eliminated from user interface.

## 6. CONCLUSION

After 3 months of usage of the 125 units built in EC and KZN, the users expressed the major benefits of a pour-flush toilet over the VIP. An important highlight was the acknowledgement that pour-flush toilets are safe from collapse and safer for small children than VIPs. The resounding response regarding the safety of pour-flush toilets highlights the possibility of reducing anxiety around toilet use, increasing dignity, and reducing open defecation in communities. With the leach pits off-set from the toilet, the risks of falling into the pit immediately go to zero. Other positive points about pour-flush toilets are less smell and being easier to clean than pit toilets. For all of these reasons, it can be assumed that use and overall satisfaction can increase with the introduction of pour-flush toilets.

The arrival of these technologies presents the opportunity of widespread access to flushable toilets, because the low pour flush latrines only uses one to two litres of water per flush. The latrines are suitable in areas where there is limited water supply and can be flushed with grey water. The technology could significantly improve the quality of sanitation in rural areas.

The comparative cost for the implementation of the low pour flush latrines versus the cists for the implementation of the VIP as indicated in Table 1 below demonstrate that the costs of the implementation of the VIPs are

lower than the costs of the implementation of the low pour flush latrines, but the implementation of the low pour flush latrines at scale will reduce the costs.

**Table 1: Comparative costs for the implementation of the low pour flush latrines**

Precast with block leach pits/substructure		Block	
Pour-Flush	VIP	Pour-Flush	VIP
R 9 784.08	R 7 998.55	R 9 640.32	R 8 212.35

## 7. RECOMMENDATIONS

The following recommendations are made with regard to the implementation of the low pour flush latrines:

- Proper assessment of the reliability of water supply must be done prior to implementation and an alternative sources of water such as rainwater harvesting tanks, should be considered in areas that are vulnerable to droughts to ensure that the pour flush system continues to function properly over a long period of time;

- Ongoing health and hygiene education must be provided to the beneficiary community so that they can learn to appreciate the importance of clean, hygiene toilets to the improvement of their health and the protection of the public health.
- Local Authorities must clarify the responsibilities for Operations and Maintenance of the latrines during project planning phase to ensure the long term sustainability of the latrines; and
- The plans for emptying and disposal of sludge from full leach pits should be developed by the Municipalities.