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**SUSTAINABLE WATER AND SANITATION SERVICES  
FOR ALL IN A FAST CHANGING WORLD**

**Sanitation technology and user perceptions**

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*Research in South Africa showed that in most cases the sanitation technology implemented in rural and peri-urban areas seemed to be adequate in providing sanitation services, but that these technologies are under strain due to their incorrect use, misuse/non-use and lack of proper maintenance, therefore placing the sustainability of these sanitation systems in question. Even if the technology was designed and built well, the use of the technology and its acceptance by the user proved to be the most critical elements - a technology is only as good as its user. Spot check assessments in South Africa concluded that water sector services and projects should not be viewed one-dimensionally, but **holistically**. The interaction between, and integration of, technical aspects and social dynamics are the cornerstones for the long-term operation of facilities and the sustainability of services delivery. This paper shows some results of spot check assessments and will draw the attention to the user issues and their impact on providing sustainable sanitation services in addressing the sanitation backlogs in South Africa.*

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**Introduction**

Sustainable sanitation facilities and their accessibility to people for sustainable lifestyles has become of critical importance in South Africa (Landman, 2004). Research over the last few decades have shown that certain critical elements need to be considered for sanitation facilities to be sustainable. Firstly, the technology should be well designed, constructed to specifications using the correct materials, comply with policy requirements, norms and standards, should have technical support for repairs and maintenance and should be supported by regular hygiene awareness training. Appropriateness is the key to sustainability - not only the appropriateness of the technology or toilet in its context, but also appropriateness for the users.

A number of aspects regarding users of a sanitation technology or facility affect the sustainability of sanitation interventions. These aspects were extracted from a number of research projects conducted by the CSIR and pertain to users' expectations, understanding, knowledge and needs; their perceptions and attitudes; their social beliefs; operation and maintenance issues; and health and hygiene awareness.

**Background**

The Water Service Act (Act No. 108 of 1997), the principal policy regulating water service provision in South Africa, legitimises the right to basic sanitation by articulating that (Section 3):

- everyone has a right of access to basic water supply and basic sanitation;
- every water services institution must take reasonable measures to realise these rights; and
- every water services authority must, in its water services development plan, provide for measures to realise these rights.

According to the National White Paper on Basic Household Sanitation in South Africa (DWAF, 2001), "sanitation refers to the principles and practices relating to the collection, removal or disposal of human excreta, household waste water and refuse as they impact upon people and the environment. Good sanitation includes appropriate health and hygiene awareness and behaviour, and acceptable, affordable and sustainable sanitation services". Sanitation includes both the 'software' (understanding why health

problems exist and what steps people can take to address these problems) and ‘hardware’ (toilets, sewers and hand-washing facilities). Together, they combine to break the cycle of diseases that spread when human excreta and waste are not properly managed (DWAF, 2003). The minimum acceptable basic level of sanitation is therefore:

- appropriate health and hygiene awareness and behaviour;
- a system for disposing of human excreta, household waste water and refuse, which is acceptable and affordable to the users, safe, hygienic and easily accessible, and which does not have an unacceptable impact on the environment; and
- a toilet facility for each household.

### **Some results from sanitation assessments**

Research conducted by the Council for Scientific and Industrial Research (CSIR) indicated that a sanitation facility was generally present at households, schools and clinics and in a usable state with some technical aspects that needed attention, such as vent pipes that were too short, doors that were attached inadequately, and hand washing facilities that were not provided. However, the research clearly showed that the sustainable use of the technology/facility is a big challenge. Sanitation facilities were generally subject to incorrect maintenance, misuse and/or non-use; therefore the sustainability of sanitation services in the country is in question.

### **Critical elements for sustainable sanitation services**

Research conducted by the CSIR over the last two decades has shown that certain critical elements need to be considered for sanitation facilities to be sustainable. Firstly, the technology should be well designed, constructed to specifications using the correct materials, comply with policy requirements, norms and standards, and secondly, should have technical support for repairs and should be supported by regular hygiene awareness and training. However, even if the technology is designed and built well, the use of the technology is the most important critical element - a technology is only as good as its user.

A number of aspects regarding the users of a sanitation technologies or facilities affects the sustainability of sanitation services. These aspects were distilled from a number of research projects conducted by the author and her team and are summarised below:

### **User expectations and needs**

Expectations of users, coupled with their real and perceived needs, are constructed over many years of their lives, resulting from their daily struggle to overcome challenges and improve their quality of life. Issues around user expectations and needs proved to be the following:

- Users have certain expectations, some very high expectations, sometimes due to sanitation being used as leverage for obtaining political votes. False promises were made by a number of politicians, promising water-borne sanitation to all, even in arid parts, or very mountainous parts, of the country (Drangert, et.al. 2006).
- Users expect to receive water-borne sanitation from the government and regard anything else as being sub-standard or below par (Duncker, Matsebe & Austin, 2006).
- Users may not understand and/or are not aware of context specific challenges, implementation costs and maintenance costs related to their choice of sanitation facilities (Wilkinson & Pearce, 2012).
- Sanitation products are often the subject of aggressive marketing by the manufacturers, particularly at the levels of local government and service providers whose decision-making officials may not always have sufficient technical background to adjudicate the products’ efficacy (Duncker & Mema, 2009).
- Free basic sanitation might mean to some users that all aspects regarding sanitation should be free, even the maintenance and repairs, and that it should be provided by government. Most aspects of sanitation, apart from cleaning the toilet, are not regarded as the responsibility of the household/owner (Wilkinson & Pearce, 2012).
- Some users may not be willing to pay for a toilet they do not want. Everybody wants a flush toilet but many cannot afford this service. Some might be able to pay for a toilet and for its operation and maintenance that is not a flush toilet but still appropriate for their environment, but because it is not the toilet they wanted, they are not willing to pay (Duncker & Matsebe, 2006).

- Many users may not be able to pay for a toilet because of the poverty levels in the country. Even when provided with basic sanitation through a subsidy, the household may still be too poor to buy cleaning materials for maintaining the toilet, or spare parts to repair the toilet (Wilkinson & Pearce, 2012).

### **Users' level of knowledge about different technologies and services**

A plethora of toilet technology types are available and used in South Africa, including buckets, chemical toilets, simple pit toilets, ventilated improved pit toilets, dehydrating and composting toilets, urine diversion toilets, vacuum technology toilet systems, anaerobic toilets, aqua-privies, flush toilets with septic tanks or conservancy tanks, flush toilets that recycle water, flush toilets with small bore solids free sewers, and flush toilets linked to central water treatment works. Informed decision making about sanitation technologies by the users is dependent on access to knowledge and information sources. Issues around user knowledge showed to be the following:

- Users are generally not aware of the different types of sanitation technologies available in South Africa, or the advantages and disadvantages of these different sanitation technologies pertaining to their contexts (Duncker, et.al., 2007).
- Users have limited access to knowledge sources and examples of technologies and have to rely on hearsay and what other users believe the technology does or does not do (Duncker & Mema, 2009).
- Information regarding sanitation technologies is not always successfully communicated to the users; reports are normally aimed at technical practitioners and engineers, not decision-makers and/or community members who may not always have sufficient understanding of the reality of the technology and its potential benefits and shortfalls (Duncker & Mema, 2009).
- Many users are unaware of existing subsidy streams and/or the processes involved in applying for appropriate sanitation facilities (Wilkinson & Pearce, 2012).

### **Users' perceptions and attitudes**

Perceptions and attitudes are the cornerstones of what people would be willing to take responsibility for, especially regarding sanitation technologies and services. Due to the lack of knowledge, perceptions and attitudes are formed from their own experiences and from information obtained from people around them. Issues around users' perceptions and attitudes showed to be the following:

- Users are not proud of the sanitation technology they are provided with by the government, unless it is water-borne sanitation. Having a flush toilet gives them status in their communities, especially in remote rural areas (Drangert, et.al., 2006).
- Ownership and the sense of responsibility regarding sanitation in general is lacking, it is perceived to be the responsibility of the service provider, thus the local government.
- Traditional taboos play a major role – in some instances a household needs two toilets as the daughter-in-law is not allowed to use the same toilet as her husband's father when she is menstruating (Duncker & Matsebe, 2004).
- Social beliefs based on incorrect information play a major role – some users believe that breathing in the smell of the contents of a pit toilet causes tuberculosis. Some believe that using a toilet that has airflow through the pedestal to a vent pipe causes miscarriages and stomach infections (Matsebe, 2012).

### **Operation and maintenance**

Operation and maintenance of a sanitation technology are essential to ensure sustainability of the facility. Issues around operation and maintenance proved to be the following:

- Ease of operation and inexpensive/no maintenance are key factors. A flush toilet has the concept of 'out of sight – out of mind', the same as using the veld. No more attention is needed after using either a flush toilet or the veld. Any sanitation technology in-between requires effort, money and responsibility (Wilkinson & Pearce, 2012).
- Availability of spares and the willingness/ability of households to pay for operation, maintenance and repairs are stumbling blocks for the longevity of the facility (Drangert, et.al., 2006).
- Training and refresher training in operation and maintenance are vital. Many users may be illiterate or may be very old and may not be able to internalise the message after only one training session is the use

and maintenance of the toilet. Refresher training is needed for users to internalise the content of the training session (Duncker, 2000).

- Institutional and technical support for maintenance and repairs are necessary. Users may not know where to get spare parts and may not know how to repair the toilet, especially if they were not trained in the operation and maintenance of the toilet (Duncker & Mema, 2009).

### Health and hygiene issues

The importance of sanitation and awareness of sanitation and hygiene issues, i.e. practising good sanitation, are not being paid enough attention in a household. Issues around health and hygiene proved to be the following:

- Other factors, such as having a house with electricity, a cell phone, a job and access to drinking water, are more important for households than spending money on sanitation and hygiene. Using the veld (open defecation) is much cheaper (Duncker, Matsebe & Moilwa, 2007).
- Having a sanitation facility does not mean that the rest of the yard is hygienic, the way people live together with their domestic animals and livestock in one space, especially in rural areas, prove to be a challenge for a hygienic environment (Duncker & Matsebe, 2006).
- The link between human excreta and diseases is not well understood, in many cases diarrhoea is regarded as a children's illness - every child should have had diarrhoea at some stage of their lives (Duncker, 2000).
- Even though hygiene awareness campaigns have been implemented, lack of repetition and follow-ups negate the effort put in. As with operation and maintenance issues, users need regular repetition to remind them of the correct way of doing things until the new practice has become a habit (Duncker, 2000).
- In rural areas where access to water is problematic and water has to be fetched over long distances, hand washing after using the toilet is not a habit. Water should be used for drinking and cooking, not washing hands. In most cases a hand washing facility is not present close to the toilet. If a hand washing facility was present at a toilet, it mostly did not have soap and sometimes no water (Duncker, et.al. 2008).

### Conclusion

The research over the last two decades showed that sanitation technologies and services were under strain due to their incorrect use, misuse and lack of proper maintenance by their users, thus impacting negatively on the health of the people and the environment. The research showed that water sector services and projects should not be viewed one-dimensionally, but **holistically**. The interaction between, and integration of, technical aspects and social dynamics contribute to the long-term operation of facilities and the sustainability of services delivery.

Appropriateness is the key to sustainability - not only the appropriateness of the technology or toilet in its context, but also appropriateness for the users. Once users have enough knowledge and can make informed choices and decisions, implementation is context-specific with participative decision-making, supported by regular hygiene promotion and maintenance support, eradication of the sanitation backlog in South Africa will become a reality.

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