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Sanitation: User perceptions and acceptance

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Introduction

Sustainable sanitation facilities and their accessibility to people for sustainable lifestyles have become of critical importance in South Africa (Landman, 2004). The Millennium Development Goal 7 (MDG7) Target 10 is to halve the number of people who do not have access to basic water and sanitation by 2015 (UN, 2000). The South African government in response to the global sanitation related challenges set out higher targets and committed itself in ensuring that all buckets in formal established settlements will be eradicated and all households have access to basic sanitation by 2010 (DWAF, 2003). However, due to slow progress in delivering basic sanitation infrastructure, this target of universal access was moved to 2014 (SALGA, 2009).

In support of reaching this target, every poor South African is provided with a subsidy for access to a reliable supply of 6 kilolitres of potable water per month within 200 metres of the household and, at a minimum, a safe and reliable Ventilated Improved Pit toilet (SFWS, 2003). Poor households are defined as those that have a monthly household expenditure below R1100 (DWAF, 2003, dplg, 2005).

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.

Background

The South African government has committed to address water and sanitation services backlogs by 2014 and has made great strides in reaching this target. But almost 700 000 households still do not have access to the basic water and sanitation services and more than 2.3 million households have sanitation services that are below basic sanitation requirements and standards (Wilkinson & Pearce, 2012).

Research showed that many of the households that were provided with basic water and sanitation services have joined the backlog again due to the infrastructure not being used for the purpose it was intended to (Duncker, Wilkinson, Du Toit, Koen, Kimmie, & Dudeni, 2008). This research also showed that in most cases the technology provided seemed to be adequate in providing the sanitation services, however, the use of the technology and its acceptance by the user were key factors that impacted on the sustainability of the technology.

This chapter shows some of the results of assessments that were conducted by the CSIR and draws the attention to the user issues and their impact on providing sustainable sanitation services in addressing the sanitation backlogs in South Africa.

Sanitation

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 thus 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, 2002). The minimum acceptable basic level of sanitation is therefore 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 together with appropriate health and hygiene awareness and behaviour.

A basic sanitation facility is expected to meet policy requirements, as well as adhere to minimum design standards and norms that are applicable to all types of sanitation facilities provided. It therefore has to be a sanitation facility that is safe; reliable; environmentally sound; easy to keep clean; provides privacy; provides protection against the weather; well ventilated; keeps smells to a minimum; prevents the entry and exit of flies and other disease-carrying pests; enable safe and appropriate treatment and/or removal of human waste (as set out in the Strategic Framework for Water Services); and accompanied by appropriate health and hygiene education.

The Strategic Framework for Water Services (DWAF, 2003) defines basic sanitation services as the provision of a basic sanitation facility, the sustainable operation of this facility and the communication of good sanitation, hygiene and related practices. Safe sanitation, which includes ventilated improved pit (VIP) toilets, ecological sanitation (such as urine diversion toilets), pour-flush and flush toilets, is about offering people dignity and health. Without it, people (mostly children) suffer from incidence of disease and death, women and children remain at risk of attacks, school days and work days are lost to the economy, and the environment is increasingly polluted with human waste (Van Vuuren, 2008).

Some research results

In 2006/07, the then National Department of Water Affairs and Forestry (DWAF), as the regulator of water services in the country that was responsible for monitoring water sector performance, developed a Strategy and Theoretical Framework for Monitoring, Evaluation and Reporting of water supply and sanitation projects (Scheepers, Duncker & Wilkinson, 2006). A key element of this Strategy and Theoretical Framework is a spot check assessment process (research methodology and data gathering tools), which was developed and piloted by the Council for Scientific and Industrial Research (CSIR) from 2006 to 2008.

The spot check assessments entailed the gathering of data/information through direct objective observations and short interviews with beneficiaries and maintenance personnel at project sites across the country (see Figure 1), to obtain a general view of a situation at a certain point in time at a project.

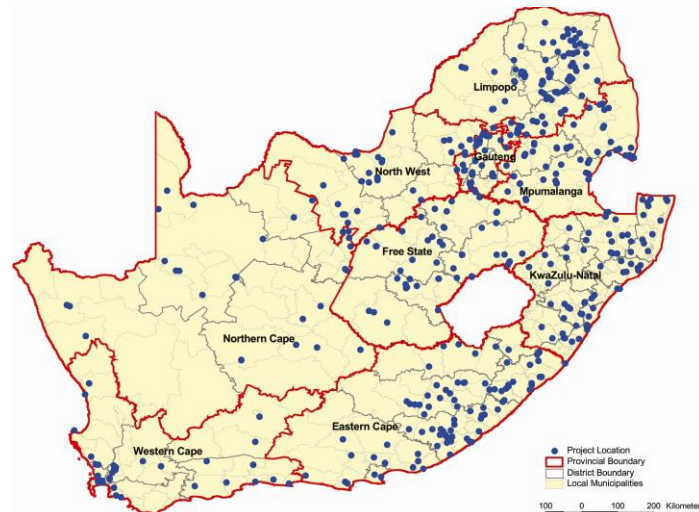


Figure 1: Location of projects assessed during the spot check assessments (Duncker, et.al. 2008).

The responses to observations and interview questions were captured on checklists. The checklists were designed specific to a project type (household, subsidised housing, clinics and schools) and assessed the compliance of rural water and sanitation services to policy requirements (appropriateness and reliability of the water or sanitation facility, as well as the training/awareness raising received by beneficiaries) and to technical design norms and standards (as set out in various SANS documents and technical standards documents and guidelines, such as the Red Book), the quality of the physical structure, its design and its construction.

Data captured from checklists were analysed and distilled into specific models pertaining to project types (household, subsidised housing, clinic, school). Each project was assigned a compliance score, which was reflected as a point between 0 and 100. A threshold of 95 points for compliance/non-compliance of a project was selected based on in-depth discussions with a number of scientists, statisticians, water and sanitation specialists and relevant role players. This meant that:

- A project that scored between 95 and 100 points was considered as a ‘compliant’ project (i.e. complied with the standards and norms as set by government). The deviation of 5 points was considered small enough to not have a significant impact on the sustainability of the services.
- A project that scored below 95 points was considered as ‘non-compliant’ (i.e. did not comply with the standards and norms as set by government) and in danger of not being sustainable.

The scoring system was developed to illustrate the different levels of compliance/non-compliance of sanitation infrastructure. Seven categories (from A⁺ to F) and the colour coding (from green, yellow, orange, dark orange and brown to red) were used to identify and depict the compliance ratings of projects and entities (taps and toilets) to policy requirements, norms and standards (see Table 1 below).

Compliant	Letter of the alphabet	Points	Category	Description
	Non-compliant	A+	100	Compliant
A		95 - 99	Acceptable compliance	Small but acceptable deviation from policy requirements and/or norms and standards - projects functional.
B		81 - 94	Partially non-compliant	Deviation from policy requirements and/or norms and standards - could impact on daily functioning/operation. Investigation required.
C		66 - 80	Non-compliant	Deviation from policy requirements and/or norms and standards that has a major impact on functioning/operation. Intervention required.
D		51 - 65	Very non-compliant	Larger deviation from policy requirements and/or norms and standards - projects functional only part time. Restoration required.
Non-compliant	E	26 - 50	Strongly non-compliant	Minimal compliance to policy requirements and/or norms and standards - projects not operational most of the time. Rehabilitation required.
	F	0 - 25	Extremely non-compliant	Unacceptable deviation from policy requirements and/or norms and standards - projects are not operational. Rehabilitation urgently required to restore functionality.

Table 1: Compliance scoring system for spot check assessments.

The following definitions were used in the scoring system to describe the actions required at project level:

- *Investigation*: refers to the need for a close or systematic study, detailed examination or inquiry to uncover facts and information related to the project in order to solve a problem or resolve an issue. This may include the re-visiting of a project to collect, process, report, store, record, analyse, evaluate, produce, and disseminate information related to the project or entities within a project, and thus inform corrective action or intercession.
- *Intervention*: refers to an orchestrated attempt to compel a project to get help for a problem – an action that produces an effect, on a project or entities within a project, intended to alter the course of an incorrect process or activity.
- *Restoration*: refers to the act of making new again, a process of carrying on alterations and repairs to a project or entities within a project with the intention of restoring it to its original form, often involving reinstatement of missing or badly damaged parts.
- *Rehabilitation*: The process of returning a project to its original functional state, by means of reconstruction, repair or alteration that makes efficient use of the system possible.

This compliance scoring system illustrated the nuances of the levels of compliance/non-compliance of water and sanitation projects, making it easy to identify where the challenges are and what should be addressed first to improve the chances of sustainability of sanitation services provision.

The data captured from about 400 checklists for rural sanitation infrastructure provided at rural households, housing projects, clinics and schools (covering 6 725 toilets) are discussed below with specific reference to the differences between the technology itself, which is reflected by the ‘Standards’ component, and the user issues, which are reflected by the ‘Policy’ component, in order to extract the issues pertaining to the use and acceptance of the sanitation technology.

Rural household sanitation

The data analysis highlighted a range of components for rural household sanitation projects that were non-compliant (C rating). As the colour-coding in Figure 2 indicates under the ‘Standards’ component, the technology in general seems adequate and compliant, or close to compliant, with norms and standards (green and yellow), apart from the pits of VIP toilets that scored a D (orange) mainly because these pits were full and could not be accessed to be emptied.

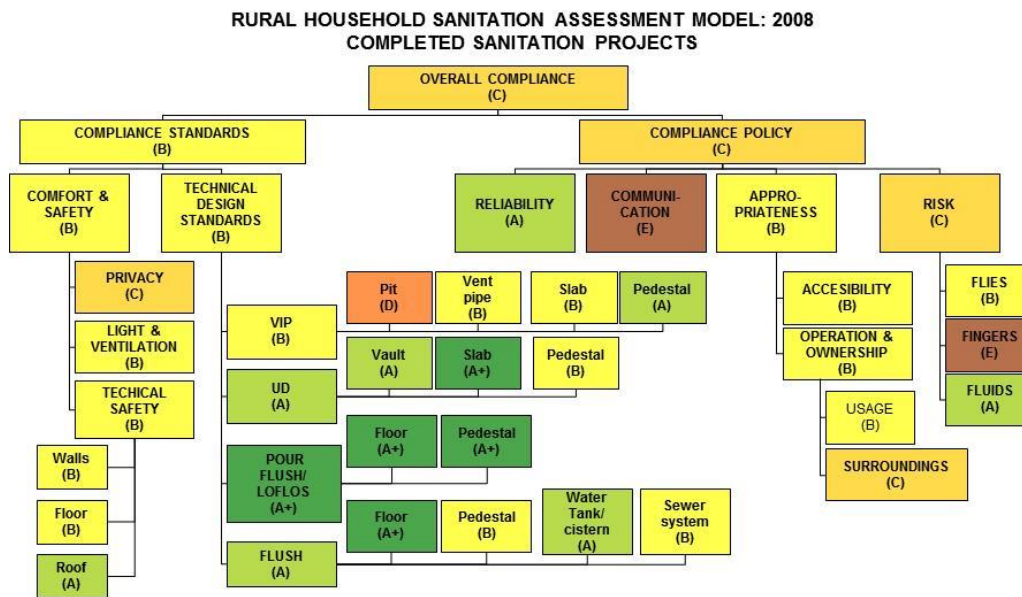


Figure 2: Assessment of rural household sanitation, 2007/08.

However, the results under the ‘Policy’ component, which encompass the user aspects, show a different picture (amber and brown). The data indicated that there was a lack of communication (awareness raising, training, information sessions and information posters) with beneficiaries of sanitation facilities on sanitation, hygiene and the operation and maintenance of their newly built toilets. This means that the use of the technology was usually incorrect and the maintenance was poor.

Linked to the lack of communication was that hand washing facilities (soap and water) were not available at, or close to, the toilet and therefore hand washing was not practised by those households. The risk of spreading waterborne diseases were thus not minimised, which negated the provision of sanitation services in order to minimise the spread of waterborne diseases.

Clinic sanitation

In general, sanitation services at rural clinics were partially non-compliant (**B**-rating) for the ‘Standards’ component and non-compliant (**C**-rating) for the ‘Policy’ component. The colour-coding again indicates that the technology was mostly compliant, or close to compliant, with norms and standards (green and yellow depicted in Figure 3).

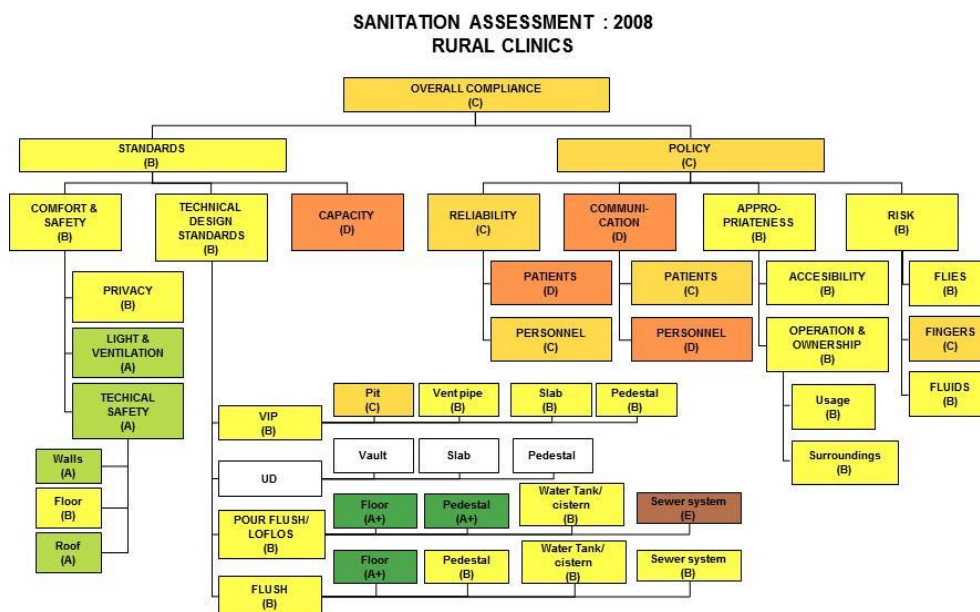


Figure 3. Assessment of sanitation at rural clinics, 2007/08

The non-compliance with norms and standards underlined the user aspects again - toilets without doors, toilet doors that were damaged or could not be locked, pits of VIP toilets that were full and pedestals, cisterns and slabs of toilets that were broken and not repaired or replaced, i.e. poor maintenance and lack of ownership.

The colour-coding for the 'Policy' component (amber and orange) highlights the areas of concern and again it is about the use of the technology. Communication about sanitation practices and hygiene, as well as training on the operations and maintenance of sanitation facilities at rural clinics, was the least compliant. Almost half of the staff at the rural clinics said they had not received any sanitation or hygiene training about the specific toilet facilities that were installed at the clinic. About 10% of toilets at clinics were not used for sanitation purposes, they were locked or were used as storage areas - a situation that contributed to the inadequate toilet/patient/staff ratio - too few toilets were available at rural clinics for either the patients or the staff. Some clinics also did not have the required hand washing facilities per toilet for patients at, or close to, the toilets. In most cases water and soap were not available to patients visiting rural clinics, which is a major concern in terms of the possible risk of spreading waterborne diseases within these health centres through physical contamination.

School sanitation

Sanitation services at rural schools were generally non-compliant (C) on both the 'Standards' and the 'Policy' components. The colour-coding in Figure 4 shows that the sanitation facilities were under severe strain (amber, orange, brown and red), especially VIP toilets of which most pits were full, pedestals were broken or not there and a generally unhealthy environment existed around the toilet buildings.

The colour-coding shows that the 'Policy' component, which is the user aspect, was very non-compliant (amber, orange, brown). An urgent need was identified in terms of communication and training at rural schools of learners and educators on sanitation practices, health and hygiene aspects at the school to prevent the spread of waterborne diseases.

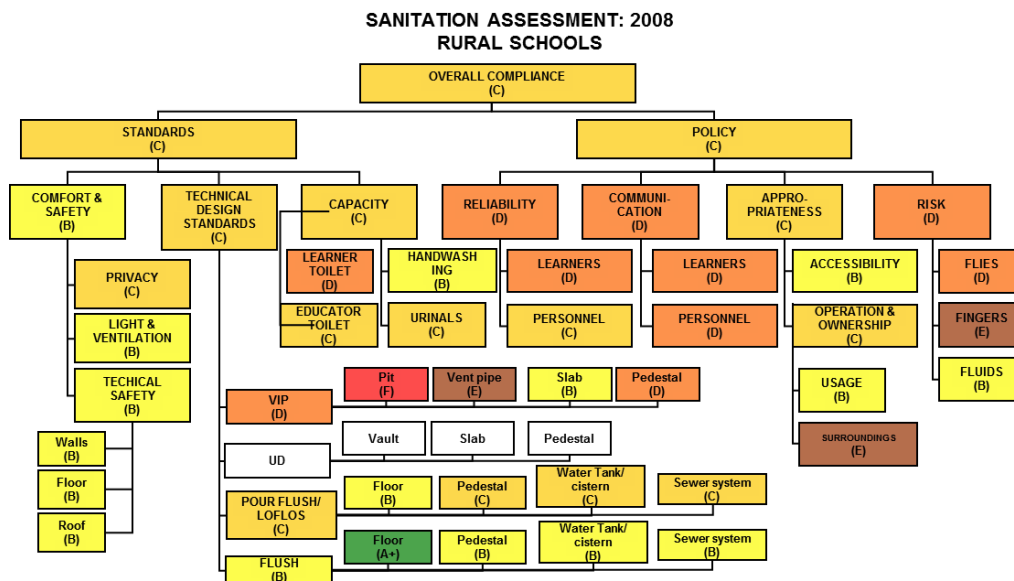


Figure 4. Assessment of sanitation at rural schools, 2007/08

In view of the lack of relevant sanitation and hygiene communication (toilets for male learners were in general much dirtier and in a poorer condition than the toilets for female learners), the spread of waterborne diseases through fluids (especially the seepage or leakage outside toilets), flies (broken and open pits, toilets and vent pipes) and fingers (inadequate hand washing facilities) is very high. Urgent attention needs to be paid to the proper maintenance and cleaning of toilets (inside and outside) at rural schools, as well as the provision of water and soap at the hand washing facilities of these toilets.

The non-compliance rating for the capacity (C-rating), highlighted that most rural schools did not have enough toilets for female and male learners. The inadequate numbers of toilets that did exist were not used by learners due to the condition and non-reliability of the facility. Many female learners opted to go home to use the toilet (or the veld) and were absent from school for long periods of time.

Factors influencing sustainability of sanitation facilities

The discussions above showed that a sanitation facility was generally present and in a usable state – green and yellow colours – 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. The discussion also showed that the sustainable use of the technology/facility is a big challenge – brown to red colours. Sanitation facilities were generally subject to incorrect maintenance, misuse and/or non-use; therefore the sustainability of sanitation services is in question.

Research over the last few decades by Drangert, et.al. (2006), Duncker, et.al. (2008, 2007, 2006), Duncker, Matsebe & Moilwa (2007), Duncker & Matsebe (2006, 2004), Matsebe (2012) and Wilkinson & Pearce (2012) have shown that certain critical elements need to be considered for sanitation facilities to be sustainable. The technology should be well designed, constructed to specifications using the correct materials, comply with policy requirements, norms and standards and should have technical support for repairs and maintenance. 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 users of a technology or facility affects the sustainability of sanitation services. These aspects were distilled from a number of research projects and are summarised below:

User expectations and needs

Users have certain expectations, sometimes very high expectations, usually due to sanitation being used as leverage for obtaining political votes. False promises were made by many politicians, promising water-borne sanitation to all, even in arid parts, or very mountainous parts, of the country. Users expect to receive water-borne sanitation and regard anything else as being sub-standard or below par. This resulted in a negative attitude towards the technology provided and, in some cases, the toilets were vandalised to prove that they were not appropriate to their situation and culture.

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. 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.

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.

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.

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.

Users' level of knowledge about different technologies and services

Users are generally not aware of the advantages and disadvantages of different sanitation technologies. A plethora of toilet technology types are available and used in South Africa, such as 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.

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. Information regarding sanitation technologies is not always successfully communicated to the end-users; reports are normally aimed at technical practitioners, not decision-makers or community members who may not always have sufficient understanding of the reality of the technology and its potential benefits and shortfalls in different contexts.

Many users are unaware of existing subsidy streams and/or the processes involved in applying for sanitation facilities.

Users' perceptions and attitudes

Due to the lack of knowledge, ownership and the sense of responsibility regarding sanitation is not present, especially at household level.

Many 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 households status in their communities, especially in remote rural areas, which means that any sanitation technology that is not water-borne will not be regarded as adequate.

Traditional taboos play a major role – in some instances a household needs two toilets as, for example, the daughter-in-law is not allowed to use the same toilet as her husband's father when she is menstruating, which forces her to use the veld again (Duncker & Matsebe, 2004).

Social beliefs based on incorrect information play a 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.

Operation and maintenance

Ease of operation and inexpensive or no maintenance are key factors for the successful operation and maintenance of a toilet. A flush toilet is 'out of sight – out of mind', the same as using the veld. No more consideration is required by an individual after using either a flush toilet or the veld. Any sanitation technology in-between requires effort, money and responsibility.

Availability of spares and the willingness/ability of households to pay for operation, maintenance and repairs are stumbling blocks for the longevity of a sanitation facility. 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.

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.

Health and hygiene issues:

The importance of sanitation and awareness of sanitation and hygiene issues, i.e. practising good sanitation, are still not being paid enough attention in a household. Other issues, such as having a house with electricity, a cell phone, a job and access to drinking water, are more important for households than practicing good sanitation and hygiene.

Conclusion

The spot check assessments highlighted the fact that the technologies provided for water and sanitation are generally adequate for the provision of sanitation services (with the proviso that these technologies were constructed adhering to the relevant specifications, standards and building code), but that these technologies are under strain due to their incorrect use, abuse and lack of proper maintenance by their users. 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, which includes the context they live in. Eradicating the sanitation backlog with each household having a toilet will become a reality once users have enough knowledge, can make informed choices and decisions, implementation is context-specific with participative decision-making and regular hygiene promotion and support for maintenance are provided.

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