

## Improvement of environmental health and hygiene practices – case study in the Northern Province

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**Abstract** The primary purpose of an improved water supply and sanitation is the achievement of acceptable health and hygiene standards as well as the sustainable improvement of the environment. Many governments recognize this and so they budget for large sums of money to improve these services to the communities. The purpose of this study was to investigate the different gaps in environmental health and hygiene practices with the aim of suggesting a strategy of improving this in the Northern Province of South Africa. To do this, 231 households and 30 schools were surveyed. Workshops and visits to different government departments were also used. This paper reports the results from this study which indicate that the situation in schools was not any better than that in households, with more than 90% of the villages still dependent on the unimproved pit latrines and 56,6% relying on standpipes which were (70% of the time) non-operational. The main problems identified seem to those associated with implementation and maintenance. The study concludes that with proper training of the water committees and their active involvement with the government and NGOs, environmental health and hygiene problems can be minimized or eliminated.

**Keywords** Environment; health and hygiene; South Africa

### Introduction

Rapid growth of urban centres, unsustainable exploitation of natural resources, uncontrolled industrialization, increasing water demand for food production, and expanding populations lacking environmental sanitation have led to progressive depletion and degradation of freshwater resources (Ministerial Conference, Short Reports, 1994:203). Many current patterns of water use are unsustainable. Rising costs of freshwater resources threaten economic development, while both the visible effects of improper waste disposal and inadequate environmental sanitation spread diseases and death.

The governments of the developing countries have failed to ensure that rapid urban growth has been accompanied by investments in services, especially in the poorer areas. Few national governments give priority to increasing the resources available to the city and local governments which are meant to cope with the rapid growth in the urban populations. The result is escalation in the number of people living in very overcrowded conditions and illegal or informal settlements and therefore leading to poor hygiene practices.

South Africa has not been found to be an exception in this regard. This country has been found to be one of contradictions and extremes, in a sense that some people have got a lot of water that they can even afford to waste it, whereas others don't have a drop. It has also been found that the past policies and strategies, particularly the fragmentation created through the homeland policy and unequal service provision on the basis of race, are still visible in terms of the range of basic service provision in South Africa, with an estimated 21 million people with no access to safe water supplies (DWAf, 1994).

One of the results of this widespread inadequacy in water supply and sanitation is the high child mortality and morbidity. In the climate of scarce water resources, like South Africa, the need to understand the health impacts of water supply and sanitation is

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important. The scarcer the resource, the greater the need to know how and why water supply may influence the infections and diseases in the community; and influence the hygiene of the population with regard to the health implications of polluted water (Genthe and Seager, 1996)

Therefore, we have to think of many things when we want to help individuals, families, and communities prevent diseases and promote health. Spreading the word about what people should do to be healthy is important. But this is not enough. We have to understand that, in many situations, it is not only the individual who needs to change. There are other things that influence the way people behave: the way in which they live, the people around them, the work they do, whether they are able to earn enough money, all these things have a great influence, and we must take them into consideration (MacMillan and McGarry, 1986).

### Motivation

Lack of access to safe sanitation facilities is a significant cause of ill health in South Africa. In urban areas, municipal and other authorities are addressing inadequacies in service provision. Although rural sanitation is raised as significant focus and expenditure in the Reconstruction and Development Programme (RDP) (Mvula Trust, 1995), it is not yet receiving the attention it deserves, but with new South African vision focusing on growth, employment and redistribution (GEAR) in place, these issues might be addressed (DWAF, 1997).

Water supply and sanitation are essential elements of primary health care, as recognized by the International Conference convened on the subject at Alma Ata, USSR in September 1978, and jointly sponsored by WHO and UNICEF (Biron, 1981). Water supply and sanitation are among the first tangible services to reach children and their families in unprivileged areas and so they must be given the priority that they deserve. According to WHO findings, 80% of all diseases in developing countries are water related, of which a significant proportion is attributed to inadequate drinking water supplies and sanitation installations, and to the absence of hygiene education (Fresenius and Schneider, 1989).

The Northern Province, Kwazulu Natal, North West Province and the Eastern Cape have large rural populations that are normally the ones displaying signs of poor sanitation and water supply. They are normally lagging behind in terms of service provision which leads to poor hygiene and health practices. The health and economic benefits that are envisaged through the conducting of this study, are the two main driving factors behind it.

Poor sanitation does not exist in isolation from other poverty-related issues. It forms part of the poverty syndrome; it is hence both a cause and a consequence of impoverishment. Illiteracy and poor education result in an ignorance of the consequences of personal and family custom and practice. Whilst the ill effects of certain customary sanitation practices have been less evident in the past, it is clear that, with increasing population densities in rural and urban settings, certain practices and traditional beliefs pose a serious threat to the public health (DWAF, 1994).

It has been realised that in many communities, especially in the under-privileged communities, a basic understanding to the supplying of drinking water is lacking. These communities need information on various sources of drinking water that can be used, the treatment needed and the importance of ensuring the appropriate water quality. Once awareness of these issues is created, the community will be empowered to make their own decisions regarding the level and type of water supply system they would implement in the community (WRC, 1996).

Failure of sanitation systems is also associated with lack of knowledge or ignorance of the users. In most cases the systems are poorly operated and they are not well maintained. Improvements in water supply can start with the protection and improvement of traditional

**Table 1** Water supply and sanitation facilities (Ryneveld, 1995)

Water supply	Sanitation
Water kiosk	Bucket
Stand-pipe at 250 m	Ventilated improved latrine
Yard tap	Aqua-privy with a soakaway
House connections	Water-borne sanitation to sewerage

sources, the installation of hand pumps, piping of the water to yards and houses (house connections). To break the chain of transmission of certain diseases, improved excreta disposal methods must be provided along with improved water supplies. Table 1 shows a few examples.

At least one in four of the rural water supplies in most developing countries is out of order. Very often the reason why a rural water supply has not been repaired is connected with the organisational problems, but there are usually technical reasons why it broke down in the first place (Cairncross and Feacham, 1993). Palmer therefore tried to look into the situation why the sanitation and water supply situation is so poor in this country, and during the investigations the following were found to be the causes for the poor supply of resources (Palmer, undated).

*The complexity of institutional arrangement at national level.* There were about 14 governments functioning in South Africa for the provision of sanitation and water, and each of them had its own policy regarding this provision, even though this is no longer the case.

*Lack of policy at national level.* There was no unified and coherent policy at national level for the provision of sanitation services. This applied more to the funding, as race mattered most, more than the extent of the need for service, but also in this instance, this is no longer the case due to the policies of the New Government of National Unity.

*Disregard for communities.* The views of the communities were often disregarded in the field of sanitation provision. This disregard is evident in the way most engineers have designed the on-site components of sanitation systems. The position and design of toilets and their enclosures (privies) have too often been based on the requirements of local authorities, giving an arrangement that is impractical from the user's point of view.

*Lack of understanding relating to environmental impact of sanitation.* There has not been any quantitative proof as to which system pollutes most, whether is the on-site or off-site one.

*Poor understanding of affordability issues.* It is very important that it is understood what people can afford. Improvement of the sanitation situation does not necessarily imply the construction of new facilities. Where traditional sanitation facilities exist, they reflect local, social and cultural preferences and are an investment of the people who built them. Although they might not all be good from the hygienic point of view, it might be possible to upgrade them to become both hygienic and safe to use.

The philosophy of upgrading is based on the understanding that existing sanitation practices and facilities are a reflection of the social and cultural preferences and local economic and environmental conditions. The possibility of upgrading should be considered before anything else. This means that an assessment has to be made on the viability and options for improvement. Despite the strong links between sanitation and health, there is

little public awareness of this, and sanitation is commonly low on people's priorities for improved services.

### **Objectives**

- To investigate the health and hygiene practices in the Northern Province, and to determine the various deficiency gaps.
- To create awareness of diseases related to water use and sanitation and how those diseases can be prevented.
- To customise training manuals for the water committees, for the training of the rural communities.
- To identify ways of reduction of diseases, related to poor hygiene and directly improve the quality of health education by looking at the role of schools and teachers in the whole process of improvement.

### **Fieldwork**

Surveys were conducted in the Northern Province in order to look at the different environmental health and hygiene practices and find a way of improving them. Two regions were looked at, namely, Lowveld and Northern regions. The criteria used in the selection of the site were as follow:

- current poor status of the water supply and sanitation in the province;
- location, whether the areas were accessible enough for the research team in terms of money and transport.

The Northern Province was chosen as the area of study because of the poor water supply and sanitation state in this area. Mvula Trust (1995) reports that the rural population in South Africa is unevenly distributed in terms of absolute numbers between provinces and terms of the populations in each province. All the other provinces have moderate amounts of rural population with the exception of Northern Province, Kwazulu Natal and the Eastern Cape.

According to a study conducted into the situation of rural sanitation in South Africa, by Mvula Trust, the people who were interviewed complained that the sanitation situation was poor, unsafe and unhealthy. The Northern Province is one of those provinces that faces the largest challenge in improving rural sanitation even though rural sanitation is poor in most provinces.

### **Study site description**

The Northern Province is one of the nine provinces in South Africa. Part of this province formerly fell under the Transvaal, but the present Northern Province has been formed by the former Central area, that was governed by the Transvaal Provincial Administration (TPA), and the three homelands, namely, Lebowa, Venda and Gazankulu. The population density of 33.31 persons per square kilometre in the province is the fourth highest in the country after Gauteng, Kwazulu Natal and Eastern Cape (CSS booklet, 1997).

The two regions (Lowveld and Northern regions) in which the study was conducted are very large regions with a lot of rural areas. They are located on the far north and north-eastern parts of the Northern Province. The two regions have a population of approximately 2.1 million.

### **Data collection methods**

Different government departments (Water Affairs and Forestry, Education, Health and the Premier's office) were visited to seek information on the situation of sanitation, water supply and hygiene in the Northern Province. The main objective of this whole exercise was to

determine all the hygiene and sanitation awareness programmes and initiatives which were conducted by the government, NGOs and other institutions in this province.

Two different questionnaires were prepared, one for the schools and the other for the households. A number of rural areas in the Northern and Lowveld regions were then visited for the distribution of these questionnaires. Different households and schools (lower and higher primaries, and high schools) were visited. Samples drawn in the study were as follows:

- Lowveld:       Households: 125  
                  Schools: 12
- Northern:      Households: 88  
                  Schools: 18

The questionnaires were written in English and it was made sure that contact was made with each and every interviewee so that it could be explained in their mother tongue. The questionnaires sought for information on the following: household's demographics, water supply information, sanitation and hygiene practices. Different water committees in these areas were also contacted for some information on water supply and sanitation situation in these areas.

Self-observations were made on the conditions as in some cases people were not honest enough in the answers that they were giving and so it was necessary for this step to be done. This helped because the real state of the situation could be seen, and questionnaires were not the only thing to rely on. Workshops were also run during this study. The workshops were run in the two villages (Hamutsa and Mohlaba-Cross). Water committees, some health committees and a few members of the community who were interested attended the workshops. During these workshops, questions were asked in order to establish the level of knowledge about environmental health and hygiene issues.

## Analysis of results

### Customisation of the manuals

From the obtained results, manuals were developed by customising the manuals received from the UNDP/World Bank on information and training for low-cost water supply and sanitation. Three manuals were customised and they are

1. Introduction
2. Hygiene education
3. Health aspects of water and sanitation

The three above-mentioned manuals were changed wherever necessary so that they could fit the South African situation. Some of the information in the manuals was left as it was because they were generic (for example, the issue of diseases like cholera, trachoma, typhoid fever, etc., their transmission routes and also their effects). In most cases where photos were required South African photos were used. The final product (i.e. the customised version of the manuals) was handed over to the National Community Water and Sanitation Training Institute for training of the water committees.

**Table 2** Occupation of study population

Occupation	Percentage (%)
Unemployed	20.7
Teachers	17.8
Self-employed	4.2
Pensioners	16.9
Workers/Labours	15.5
Nurses/Medical professions	2.8
Others	0.5

20% of the study population were unemployed, and over 60% of those who were earning a salary did not do professional jobs (see Table 2). Only 17.8% were teachers and 2.8% were nurses and other medical related professions. The Northern Province is one of those provinces that have a very low per capita income of R2569 and by far the lowest in all the provinces. This compares poorly with the national average of R8708 and the Eastern Cape's R4151 (CCS report, 1995). This province has also got the highest unemployment rate of 47% which is by far the highest in the country.

From Table 3 only 56.6% of the population relied on standpipes which according to 71.8% of them had problems ranging from burst pipes, broken machines, blocked pipes and also lack of diesel for running the machine. The conditions around the water point were found to be unhygienic. 62.9% of the people were not even interested in improving the conditions around the water point.

The distance to the water point was found to be an average of 630,88 m. Even after walking for such long distances, people still had to wait in very long queues to get their water. 70.9% of the people said that they had to wait long. They could wait for more than two hours to get water and it was advisable to wake up as early as 4:00 am for them to get water for the day.

The Northern Province, being one of the poorest in terms of water supply and sanitation, has an average of 12.5% people with no sanitation facilities at all. 56.9% of the population still depend on unimproved pit latrines. The areas that were visited showed the poorest state, in terms of sanitation facilities with 90.1% depending on unimproved pit latrines. From the interviewed population, there were no people who were using ventilated improved latrines (VIP), which if constructed to agreed standards and maintained properly provides an appropriate and adequate basic level of sanitation service.

Most people depend on unimproved pit latrines. They built the toilets themselves and in 55.4% of the cases using the local materials. 93.4% of the people said that the government did not subsidise them in any way, unlike in water supply. This is an indication that sanitation is not treated with urgency like water supply. The villagers even made it very clear that their main concern was water. This matter raised a lot of concern as water and sanitation are related, and therefore should be treated together.

Table 4 shows that there are no hand-washing facilities next to the latrines, but this did not stop the villagers from washing their hands. The full health benefits of improving sanitation facilities will only be realised through accompanying behavioural change, in particular washing of hands after using the toilet. The villagers seemed to understand the benefits

**Table 3** Water supply sources and types of toilets used

Water Sources	Percentage (%)	Toilets	Percentage (%)
Standpipes	56.6	None/Bush	8.0
Rivers	8.9	Pit (unimproved)	90.1
Plot connections	18.3	Full water-borne	1.9
Boreholes	8.9		
Others	5.0		

**Table 4** Hand-washing facilities

Item	Percentage (%)
Availability of hand-washing facilities next to the latrine	13.1
Usage of soap/detergents	63.4
Explanation about importance of hand-washing	90.1

of hand-washing, because most of them even explained to their children why is it necessary for them to wash hands before and after eating and also after using the latrine.

92.0% of the villagers said that they were aware that some diseases like cholera, diarrhoea, and malaria are caused by poor hygiene practices. It was impressive how much these people knew about this relation between the diseases and good hygiene practices. The school, clinic and parents accounted for 60.3% of what the villagers knew regarding hygiene and diseases.

From Table 5 it can be said that the water that was provided was not of poor quality. These results cannot be said to be conclusive because no laboratory tests were done, but the villagers claimed that they were encouraged to use the water only from the physical appearance. The physical appearance of the water alone can fool consumers into thinking that the quality is good where as it is not.

The quality of water provided as a basic service should be in accordance with currently accepted minimum standards with respect to health related chemical and microbial contaminants. Some of most harmful microorganisms and toxic chemicals are invisible to the naked eye. Regular tests should be done on the water to see to it that both the physical, chemical and microbial quality is acceptable.

The results of the purification measures showed that the people are well informed about the different methods of purifying water, even though they did not apply these purification measures to their water. The reason being, as before, that the water did not need any further purification. Those who boiled the water before using it were in most cases those who had to feed small babies.

As was found for the households, the regularity was poor (i.e. there was no regular running of water in the pumps, sometimes people have to go for weeks without a drop from the pumps), with 93.3% of the people complaining that regularity was very poor. According to the Government of National Unity, the rate of water from the outlet should not be less than 10 litres a minute and the water should be available on a regular, daily basis.

There were continuous problems with the water supply from burst pipes, difficulty of water reaching the users and also insufficient pumps. The average distance to the water point was found to be 79.0 m which is fine according to the specified (100 m) government requirements. The government was responsible for financing 81.5% of the pumps and saw to it that they were well maintained.

The sanitation situation at schools was found not to be very difficult from those of the households with the majority of the schools still relying mostly on unimproved pit latrines.

**Table 5** Water quality and purification measures

Water quality parameters	Percentage (%)	Purification method	Percentage (%)
Tasteless	66.7	Boil	56.8
Odourless	79.3	Bleach	9.4
Colourless	90.6	Settle	9.4
		Other	24.4

**Table 6** Water supply sources and types of toilets at schools

Water supply sources	Percentage (%)	Types of toilets	Percentage (%)
Public pumps	60.0	Pit (unimproved)	93.3
School connections	26.7	Septic tanks	3.3
Boreholes	6.7	Full water-borne	3.3
Other	6.7		

The conditions in these toilets did not encourage the usage of those toilets. 66.7% of those toilets were very dirty. The seats, walls, floor and everywhere were disgusting. Even the outside appearance of 76.7% of the toilets was not attractive.

In 80% of the visited schools, it was found that health education was offered even though the people who were responsible for offering it did not obtain formal training in this regard. Only 27.6% of them received formal training. The rest of the teachers just taught health education using their own discretion. 53.8% of the teachers complained of not having education materials like books, posters and models. With proper formal training, teachers can be used as powerful tools towards the improvement of environmental health and hygiene practices.

### Conclusions and recommendations

- The fact that most people complained about the regular breakage of the pumps and that they can go for long periods without the pumps being fixed shows that there is a lack trained technical staff. There are TLCs (water committees) which are chosen and they are busy being trained in the sanitation and water supply matters. The government and other organisations such as UNICEF are busy that ensuring that people are trained in that field. Other NGOs and private companies should also be encouraged to contribute financially so that the training process can continue without money being a problem.
- There seems to a lack of coordination between the government, communities and other non-governmental organisations. These should work hand in hand in order to achieve the fast implementation and smooth running of projects.
- Health workers should make it a point that they work closely with the communities, especially on hygiene and health programmes coupled with technical aspects. For example. Toilets need ventilation to prevent smell and insects that are carriers of diseases. People should also be made aware of detergents usage as this not only prevent smell but kills bacteria.
- Hand-washing before and after using toilets should be encouraged because according (Hoque, 1990), hand-washing related hygiene education programmes may have 14–40% impact on diarrhoeal incidents. Posters, models, visual aids and other programmes to help popularise these should be encouraged.
- It would be wise if schools could organise some dramas and hygiene awareness programmes as a means of informing the community about what is happening around them. This could prove to be more effective if it is done in conjunction with the Health Department because this department already has such programmes in place.
- Children should be used to educate other villagers. They tend to listen more to their teachers and if they are taught health education at a young age, they are likely to practice what they have been taught and even encourage other members of the family to do it.

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