INCORPORATION OF WATER, SANITATION, HEALTH AND HYGIENE ISSUES INTO SOUL CITY, A MULTI-MEDIA EDUTAINMENT VEHICLE

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WRC Report No 981/1/00

Water Research Commission

Incorporation of Water, Sanitation, Health and Hygiene Issues into Soul City, a Multi-media Edutainment Vehicle

Report to the Water Research Commission

by

Sally Ward, Katharine Hall & Alastair Clacherty

Soul City

WRC Report No.: 981/1/00
ISBN No. : 1 86845 759 1

June 2001

ACKNOWLEDGEMENTS

The research in this report emanated from two projects commissioned by Soul City and the Health and Hygiene Awareness Task Team. The projects were funded by the Water Research Commission, and entitled:

"WATER AND SANITATION SURVEY"
&
"REVIEW OF KEY ISSUES RELATING TO WATER, SANITATION AND HEALTH"

The Steering Committee over the project period involved the following individuals:

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The financing of the project and the contribution of the Steering Committee is gratefully acknowledged.

The project was only possible with the co-operation of many individuals and institutions. Soul City therefore wish to record their thanks to all at Social Surveys and Clacherty & Associates who contributed to the research.

EXECUTIVE SUMMARY

Background and Motivation

Soul City is a multi-media health education and entertainment strategy, which uses the mass media as a vehicle to communicate health and development messages to South African audiences. In 1997, Soul City was approached by the Health Education and Awareness Task Team (HEATT) with a request to include water and sanitation messages in their television, radio and print materials.

For Soul City, research is the foundation for the development of educational messages conveyed through its programmes, as this helps to ensure that materials are popular, messages are appropriate, and that audiences remain loyal. Soul City therefore commissioned research to identify key messages for the fourth series and to examine how the electronic media (radio and television) could best be applied to education around water and sanitation issues.

The research, funded by the Water Research Commission (WRC), comprised:

- primary research conducted by Social Surveys; and
- a literature review compiled by Clacherty and Associates.

This report provides a synthesis of the major findings from the literature review and the primary research, and discusses the application of the research findings to the Soul City vehicle.

Aim and Objectives:

The aim of the project was to develop educational material for the water and sanitation aspect of the Soul City materials through (a) a literature review and (b) qualitative research within the target audience. The second aim of the project was to pre-test all material for appropriateness, understanding of messages, misreading of messages, cultural acceptability and entertainment value.

The specific objectives of the literature review were:

- to provide a broad background to the water and sanitation sector; and
- to point to key issues for message development.

The specific objectives of the qualitative study were:

- to gain insight into common knowledge of, as well as attitudes and practices relating to water and sanitation, and the problems (both health and social) that are associated with the lack of basic services;

- to understand how people perceive the connection between the transmission of disease, and water and sanitation;
- to identify positive practices under difficult conditions, especially with regard to maintaining health and hygiene;
- to explore attitudes towards and possibilities for community involvement in accessing water and sanitation services;
- to explore the roles and attitudes of community leaders and government authorities with regards to the provision of, and education around, water and sanitation.

Methodology

The primary research took a qualitative approach, combining focus group interviews and one-on-one interviews with key informants. Discussion guides and semi-structured interviewing schedules were drawn up. This approach allowed for qualitative reporting on experiences, thoughts and perceptions of people at a community level. The research serves as a basis on which to design health messages which resonate with people's real life experiences, and which encourage individuals and communities to feel empowered to make chances to their water and sanitation attitudes and practices.

Major Findings

1. Services and Infrastructure: Water and Sanitation

- The collection of water from taps or pumps or natural sources in unserviced areas remains primarily the task of women and children. The cost of this task is significant in terms of time, effort and risk to personal safety, and bears a direct relation to the distance from which water is transported.
- Low access to water has a direct and negative impact on personal hygiene.
- Communal taps and pumps can pose a health hazard when they are used for multiple purposes and there is insufficient drainage.
- There is a problem of people "free-riding" by illegally tapping into water pipes. This jeopardises supply levels to other households and also contributes to non-payment for services.
- Water from taps is widely seen as cleaner and safer than water from other sources. People also tend to judge the quality of water on the basis of its taste and appearance.
- Waterborne sanitation is the preferred sanitation option, but is not realistic as a minimum service standard in the short term due to its cost, while bucket systems are unpopular and frequently unhygienic.

- Ventilated Improved Pit toilets (VIP's) are appropriate, adequate and feasible; adequate sanitation is therefore defined by government as one well-constructed VIP toilet per household.
- In unserviced rural areas, use of the open veld has been the predominant form of sanitation. Here, as in unserviced urban areas, unimproved pit latrines have become a necessary alternative. Both methods pose serious health risks through the spread of disease (for example, contamination of ground water), as well as creating an environment which is unpleasant to look at and to smell.
- People's sanitation problems reflected the forms of infrastructure to which they had access:
  - those who had flushing toilets had problems with blockages and repairs;
  - those who had buckets had problems with disposal and smells and hygiene;
  - those who had pit latrines had problems with smells, fires, contamination of ground water, and the danger they presented to children.
- Infrastructure design had not taken full cognisance of health issues. This contributed to unsanitary conditions.
- A basic requirement from participants was that each house should have an individual toilet. There is great aversion to communal sanitation, which is seen as unhygienic and unacceptable.
- Decisions made at the household level (for example to construct a VIP) are simpler than those requiring community-wide agreement (for a communal latrine or demarcated area of open ground).
- Non-payment for services is frequently linked to poor quality of services (real or perceived), or to suspicion of metering and tariff systems. Non-payment in turn adversely affects service provision and is detrimental to relationships between communities and local authorities.

2. Health, Hygiene and Disease

- Most faecal-oral infection is food-borne or directly transmitted from unwashed hands and utensils used in the cooking of food. Safe hygiene practices can help to break the cycle of re-infection, thus reducing the incidence of disease.
- Handwashing, particularly before food preparation, is often not sufficiently recognised or practiced as an element in maintaining hygiene and health. This is particularly the case where adequate services are not available, pointing to a connection between service delivery and safe hygiene practice.
- There are four major household uses of water: for drinking, for the preparation of food, for washing of clothes and utensils, and for personal hygiene.
- When water is scarce, people prioritise the use of water for drinking and the preparation of food, to the detriment or even exclusion of personal hygiene.

- Erratic water supplies result in a "hoarding mentality": excess water supplies are stored, but after about two days, this water is seen as unfit for consumption and is then available for personal hygiene purposes.
- Both scarcity and irregularity in water supplies jeopardise personal hygiene practices, and contribute to faecal-oral re-infection through the use of unwashed utensils and through not washing hands after using the toilet.
- Cultural beliefs and practices are enduring, and often represent traditional wisdom regarding personal safety and resource management. Beliefs and practices sometimes have to be compromised or abandoned altogether when water and sanitation infrastructure (or the lack thereof) disallows such practices.

3. Health Promotion

- Recent policy approaches (for example the National Sanitation White Paper and the Department of Water Affairs and Forestry's guidelines for capacity building and training) emphasise the need to:
  - link the promotion of health and hygiene to issues of sanitation; and
  - integrate health promotion into the project cycle.
- Educational programmes around health promotion need to adopt participatory strategies which are both sustained and dynamic in order to contribute to changed attitudes and behaviour.
- Water supply and sanitation programmes should not exist in isolation, but need to be integrated into the development of physical, social, economic and institutional infrastructure.
- The roles and needs of women are crucial to any health promotion strategy, as women have particular health needs and are also traditionally responsible for child and family health. Women are also repositories of traditional knowledge about hygiene and health and therefore represent an important entry-point in community health promotion.

Conclusions

- It is important to distinguish between universal messages which are applicable to a wide target audience, from those which are specific to people living under similar conditions or engaging in similar health practices. Whereas the latter are most effectively conveyed through localised health promotion initiatives, the former may also be popularised as educational messages via the mass media.
- Both the specificity (as opposed to universality) of many water and sanitation issues, and the fact that people's health and hygiene behaviour depends on water and sanitation infrastructure, imply a supportive, rather than leading, role for the mass media in terms of health promotion.

- The role of the mass media at a national level needs to be conceptualised as an auxilliary strategy to "back up" local level initiatives which are better geared to address health and hygiene issues in the local context. The mass media's contribution should therefore be to raise awareness about those water and sanitation issues which have wide relevance.
- The mass media are well placed to augment the work of local government and NGO's through the widespread dissemination of basic and universally applicable information relating to health practices.
- The work of health promotion should fall to local government and non-governmental organisations (NGO's) through the agency of community health workers (CHW's) and the primary health care teams, including environmental health officers (EHO's). These agents are well placed to embark on health promotion programmes which need to be both intensive and sustained at a local and community level, and in conjunction with infrastructure development.

Recommendations

Health messages for the mass electronic media need to be concise, clear and simple. They also need to be messages that have general relevance, and that do not patronise or criticise any specific beliefs or practices. Messages need to encourage and support constructive interventions for water and sanitation development.

The work of health promotion should fall to local structures so that education is appropriately contextualised. The mass media should function in such a way as to support and augment localised health promotion and development strategies by promoting broad awareness and generic messages.

One of the recommendations arising from the Review of Water and Sanitation Related Health Education and Promotion Activities in South Africa, commissioned by HEATT in 1997, was the need to develop useful and accessible guidelines for those working in health promotion at community level:

> "HEATT should publish guidelines for implementing health education and promotion in a document that is accessible to project managers, training agencies, health workers and others who may be involved in this sector. These guildelines should present the range of possibilities from the narrow 'bolt-on' approach to the development-oriented approach. It should present the latter as the ideal and deal with strategies for achieving this". (Clacherty et al, 1997: 105)

The key outcome of the research was the decision not to use the electronic media to carry national water and sanitation messages. This decision was taken in the light of the finding that information needs are dependent on a number of factors, and differ from area to area. Needs cannot be generalised, but are linked to contextual factors such as infrastructure, cultural beliefs and practices, and human and other resources.

Subsequent to the decision not to design water and sanitation materials for the electronic media, it has been agreed to use the research to inform the development of a reference manual for environmental health officers (EHO's) and community health workers (CHW's). This has been undertaken by Soul City in a consultative process with key players, including the HEATT task team.

The decision meant that funding originally allocated by the WRC for pre-testing the mass-media materials was instead utilised for the planning and workshopping of the print materials. This decision was taken in consultation with the WRC Steering Committee.

The manual, currently in its final draft phase, is entitled: *"Breaking the Rules : New Approaches to Promoting Health through Water and Sanitation in South Africa"*

The manual is designed to support the work of people who are implementing improvements to water and sanitation at a household level, and geared for use by environmental health officers, NGO workers, community health workers, activitists, and any other people who are involved in local health promotion. It is designed as a user-friendly reference book, written in clear, accessible English, and comprises 16 distinct sections, as follows:

1. Which rules do we want to break to promote health through water and sanitation?
2. The burden of water and sanitation disease in South Africa
3. Diarrhoea
4. Worms
5. Parasites
6. Skin and eye diseases
7. Outbreak diseases
8. Provincial profiles of water and sanitation disease
9. Hygiene promotion
10. Sanitation promotion
11. Water supply
12. Water quality
13. Advocacy work for water and sanitation
14. Community actions to support water and sanitation
15. Women, the disabled and the elderly
16. Payment, subsidies and income generation

It is envisaged that the manual will be distributed through the provincial departments of Health, Environmental Health, Water Affairs and Forestry, as well as NGO's, technikons and academic training institutions. The manual should be available for distribution in mid-2000.

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APPENDICES

1. INTRODUCTION

Soul City is a multi-media health education and entertainment strategy which uses the mass media as a vehicle to communicate health and development messages to South African audiences. In 1997, Soul City was approached by the Health Education Awareness Task Team (HEATT) with a request to include water and sanitation messages into their television, radio and print materials.

For Soul City, thorough research is the foundation for the development of appropriate and accessible electronic and print materials. Research helps to ensure that materials are popular, that messages are appropriate and well contextualised, and that audiences remain loyal. Soul City therefore commissioned research to identify key messages for the fourth series and to examine how the electronic media (radio and television) could best be applied to education around water and sanitation issues.

The research, which was funded by the WRC, comprised two components:

1. a qualitative study to investigate people's attitudes towards and practices related to water and sanitation, as well as exploring the problems – both health and social – that people associate with a lack of these services. Primary research was conducted by Social Surveys.
2. a literature review to provide a broad background to the water and sanitation sector, to contextualise the qualitative findings and point to key issues for message development for Soul City. The review was compiled by Clacherty and Associates.

This report provides a synthesis of the major findings from the literature review and the primary research, and discusses the application of the research findings to the Soul City vehicle. This will be followed by recommendations and conclusions emanating from the research and the literature overview. Finally, it describes the educational product which is being developed by Soul City as a direct outcome of the research.

2. AIMS

The aims of the project, as outlined in the original research proposal, were as follows:

1. To develop educational material for the water and sanitation aspect of the Soul City education pack through:
   - a literature review
   - focus group research within the target audience

2. To pre-test all material developed for:
   - appropriateness
   - understanding of messages
   - misreading of messages
   - cultural acceptability
   - entertainment value

3. LITERATURE REVIEW

The Review of Key Issues Relating to Water, Sanitation and Health, compiled by Clacherty and Associates, provides a broad background to the sector and points to key issues for message development. It should be noted that a formal literature review was not required or commissioned. The review takes the form of an "issues review" drawn from a variety of sources, rather than a "literature review".

The body of this report represents a synthesis of the review and the primary research, and the main findings of the literature survey can therefore be found under the section: Main Findings. The entire review report is attached as Appendix 5.

4. PRIMARY RESEARCH METHODOLOGY

4.1 Research design

The primary research, conducted by Social Surveys, took a qualitative approach, combining focus group interviews and one-on-one interviews with key informants. Soul City supports the design of health messages that reflect real life experience and which encourage individuals and communities to feel empowered to make a difference to their environment and their quality of life. To do this effectively, it is essential to listen to the voices of people at a community level, and to report qualitatively on experience, thoughts and perceptions.

The purpose of the qualitative research was to investigate various aspects of water and sanitation from a social and a health perspective – that is, how water and sanitation issues affect people's daily lives. Discussion guides and semi-structured interviewing schedules were drawn up for the group discussions and depth interviews (see Appendices 1-3).

4.2 Research objectives

The objectives of the qualitative study were:

- to gain insight into common knowledge of, as well as attitudes and practices relating to water and sanitation, and the problems (both health and social) that are associated with the lack of basic services;
- to understand how people perceive the connection between the transmission of disease and water & sanitation;
- to look at what can be done, and what is being done to prevent disease-related problems;
- to find positive practices (often under difficult conditions), especially with regard to maintaining health and hygiene;
- to identify obstacles to desirable health and hygiene practices (eg. knowledge gaps, particular beliefs, cultural or environmental issues);
- to explore attitudes towards and possibilities for community involvement in accessing water and sanitation services;
- to explore the roles and attitudes of community leaders and government / formal authorities with regards to the provision of, and education around, water and sanitation.

4.3 Sample

Focus group interviews

The focus group participants were broadly representative of the main target audience for Soul City materials in that they were black people of low income, spread across urban, peri-urban and rural areas. The research was therefore able to explore the experiences and perceptions of people with different levels of access to water. The groups were spread across five provinces: Gauteng, Western Cape, KwaZulu Natal, North West and Mpumalanga. It should be noted, however, that the research did not aim to distinguish between different geographical regions, and qualitative findings from the groups cannot in any way be construed as representative of those provinces. A breakdown of the composition of focus groups can be found in Table 1 below.

Groups comprised 8-10 participants and were facilitated by experienced moderators. Given the potentially sensitive nature of the topic, it was decided to conduct separate gender groups only. Nine of the groups were conducted with adults of 18 years upwards, while three were with children around the age of puberty. Parental consent was obtained for children to participate in the group discussions.

Composition and location of focus groups

	MALE	FEMALE
URBAN FORMAL **Serviced stands** **[4]**	1 Adults KwaZulu Natal (Clermont)	2 Adults Gauteng (Wattville)
	3 Youth (12-14 yrs) Gauteng (Katlehong)	4 Youth (11-13 yrs) W Cape (Khayelitsha Site B)
FORMAL SHACK SETTLEMENT **Site & Service [2]**	5 Adults Gauteng (Stanza Bopane)	6 Adults KwaZulu Natal
INFORMAL SHACK SETTLEMENT **No services [2]**	7 Adults Gauteng (Mandela Village)	8 Adults W Cape (Khayelitsha Site C)
RURAL **Serviced** **[3]**	9 Adults North West (Boitekong)	10 Adults North West (Boitekong)
		11 Youth (13-16 yrs) KwaZulu Natal (Botha's Hill)
RURAL **Unserviced [1]**		12 Adults Mpumalanga (private farm – Ermelo district)

Qualitative interviews with key informants

Qualitative interviews were conducted with six individuals, of whom three were leaders within communities (1 tribal Induna and 2 civic leaders) and were employed by authorities involved in providing water and sanitation services (environmental heath officer / public works education programme / local authority).

MAJOR FINDINGS

5. SERVICES AND INFRASTRUCTURE

A key finding which emerged from both the literature review and the primary research, is that there is a direct link between service provision and health practices related to water and sanitation. The first section of this report therefore deals with issues around access to resources.

5.1 WATER

5.1.1 Basic adequate supply

The 1994 White Paper on Water Supply and Sanitation defined basic adequate water supply as follows:

Quantity: 25 litres per person per day. This is considered to be the minimum required for direct consumption, for the preparation of food and for personal hygiene. It is not considered to be adequate for a full, healthy and productive life which is why it is considered as a minimum.

Cartage: The maximum distance which a person should have to cart water to their dwelling is 200 m. In steep terrain this distance may have to be reduced to take account of the extra effort required to cart water up steep slopes.

Availability: The flow 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.

Assurance of supply: The supply should provide water security for the community. Two factors are important in this regard. First, schemes for domestic water supply should ensure the availability of "raw" water for 98% of the time. This means that the service should not fail due to drought more than one year in fifty, on average. Second, the operation and maintenance of the system must be effective. The aim should be to have no more than one week's interruption in supply per year.

Quality: Once the minimum quantity of water is available, its health-related quality is as important in achieving the goal of a water supply adequate for health. 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. It should also be acceptable to consumers in terms of its potability (taste, odour and appearance).

Upgradability: The desire of many communities to upgrade a basic service to provide for household connections should be taken into account during planning. If this is not done the system could either fail due to illegal connections or have to be expensively upgraded when there is a demand for house connections. Any additional infrastructure required to provide upgraded services will not be considered as part of the basic needs infrastructure.

These components of a "basic adequate water supply" as contained in the White Paper raise important questions in terms of people's experiences, particularly the uneven manner in which the costs of inadequate water supply are experienced by different types of communities, and by different community members.

5.1.2 Unserviced areas

Water collection

Fetching water is usually regarded as women's work, and its costs are well documented:

- endless hours lost for possible other productive activity;
- the cost of physical effort in terms of exhaustion as well as back, neck and pelvic deformities;
- threats to personal safety en route (including reported cases of sexual assault, accidents when crossing roads, etc.)
- *exposure to danger at watering holes (attacks by crocodiles, hippopotami,* snakes, etc.)

Group discussions in rural areas referred to water collection being the sole and undisputed responsibility of women and children. With the exception of a very few who had taps on their properties, women used buckets to collect water from a public access point (usually a communal tap or borehole pipe). The most common bucket capacity is 25 litres, while smaller children often carry 5 litre buckets. Individually, full buckets are balanced on the head; those who have more than one bucket use any available transport – usually wheelbarrows or trolleys – to transport the water.

Distances vary from a walk down the road, to a cross-country trek; the latter can involve crossing major roads, sometimes resulting in fatalities – especially amongst women and children who are returning from the water source heavily laden.

The positive effects of water collection, identified in the literature review, centre on the social function of communal water collecting. Conversely, a higher incidence of individual water supply implies a loss of this important social function. Focus group participants in rural areas alluded to water collection points as places of social gathering where "you get time to know one another". However, female participants also pointed out that queues at water access points are often very long – particularly at those where water is only available between certain hours. While the long wait in the queue may be an opportunity to socialise, women reported that fights often break out, and most would prefer not to wait:

"We don't want to go to the street, because we are fighting on the street."

"This queue is killing us!"

Low access to water has direct impact on personal hygiene

Where people have low levels of access to water, it is used mainly for drinking and food preparation. This is exacerbated by the effort that women have to put into collecting it, which inflates its value. The result is that that rural people tend to prioritise essential consumption over hygiene uses when there is a need to conserve water. The more limited the supply of water possible through manual collection, the less water is available for personal hygiene - the most dispensable of the three main uses. Reduced amounts of water for personal hygiene lead to water-washed diseases – eye infections, skin infections, bacterial re-infections from hands.

The advocated minimum water supply per person is 25 litres per day for direct consumption, for the preparation of food and for personal hygiene. However, discussion of water collection and use in the groups indicated that households without basic services may tend to use considerably less than the basic minimum – sometimes the whole family survives on a single 25 litre bucket.

"We are using 25 litre bucket and we store it in that bucket. After one day, we go back to collect water."

Insecure supplies reduce water usage

Some rural people experience unanticipated, and sometimes lengthy, interruptions in the water supply. The effect of this is to create a hoarding mentality, so that even where water is collected in "bulk" and there is a surplus of water in the home, it is kept in storage as emergency supply.

"I'm staying with my family at home. I've got four 25 litre buckets. For going to collect water, I usually take all my buckets on a trolley at the same time. The next day I might only go to collect one bucket, and I'm using the other three buckets for washing clothes. But if they cut the water, I am depending on the three buckets."

Of course, storing water has its own unique health implications. Storage methods are discussed under the next section: Health & Hygiene Practices.

5.1.3 Serviced areas

Access to adequate supply of water is the critical health factor in serviced as well as unserviced areas. As a minimum, this equates to access to a stand

pipe within 20-30 metres of home. Beyond this distance, access to water has reduced health improvement potential.

In an informal settlement in Gauteng, a previous study found that 72% of households use less than 20 litres per person per day.

People from high density areas with communal taps have long waits to collect water. Sometimes people simply do their washing and ablutions at the water access points, rather than collecting and carrying water away – and this prolongs the queues. People from an informal shack settlement with communal services complained:

> *"There is a shortage of taps... if we go to collect water, we have to stand in the queue... people are washing their clothes... it can take up to 30 minutes because of the queue."*

Health-related design criteria

A finding of the literature review is that engineering considerations have a tendency to dominate in the design and construction of water supply projects, and that health-related design criteria need greater recognition in the design phase. For instance, stand pipes are often installed without paving around them, nor with adequate drainage away from them. The health hazards represented by multiple uses of water from a single stand pipe (eg. clothes washing, food washing and preparation, personal hygiene and water collection) where surplus water does not drain away are a frightening cocktail!

The review also raises the issue of individuals illegally tapping into water pipes using readily available plumbing devices, and gaining a free individual service. This "free-rider" phenomenon can cause problems with flow rates, and may also result in capacity problems – particularly since some systems are designed to supply a certain number of outlets without a comfortable surplus potential. Where individuals tap off water in an unauthorised way, the supply capacity of a system becomes overstretched, leading to further technical problems and attendant health and social difficulties.

It became clear in the focus groups, whatever the level of services, that interruptions in the water supply were a common problem. In some areas, water was regularly cut off without notification.

> *"We usually go and collect in the morning before 11 o'clock, because after that they cut the water off until the afternoon around 2 o'clock."*
>
> *"We use our buckets to store water because sometimes they cut off water for the whole week."*

The effects of an unreliable or restricted supply are to force people to store water in case of need, and this again inflates its value – thus reducing freedom of use for personal hygiene.

5.1.4 Options and costs

In all cases, access to a household tap is preferred. In urban areas pressure exists to for at least one tap inside every home. From a health perspective, anything less than a tap very close to the home, if not a private tap, begins to lose its value as a contributor to improved health and hygiene standards. The state's commitment is to provide every person with a daily minimum of 25 litres of high quality water within 200m of their home. Individuals are free to supplement this with other sources of supply – either by fetching it, or by paying for a higher level of service. There are financing systems to assist with this, but there is no subsidy beyond the basic level. Thereafter it is a strictly "user-pays" policy.

The groups regarded tap water as the best water source not only because of its convenience, but also because it is regarded as the cleanest and safest water for drinking (as opposed to water from boreholes and wells, which was described as "flat" in the groups). Another advantage of taps was that children can use them easily and safely.

The main disadvantage of taps is the cost – not only is one required to pay for water supplied to the stand, but there appears to be widespread distrust of metering systems. One group suggested a pre-paid card system for water.

An overview of the relative advantages of various water supply systems is provided in the Clacherty review, and can be found under Appendix 5.

5.2 SANITATION

5.2.1 Basic adequate services

Policy and practice regarding sanitation provision is relatively undeveloped. Because of the strong linkage between sanitation services and public health, the health sector must play a significant role in all aspects of sanitation policy creation, planning, implementation, and monitoring. Details of this remain to be established. In the interim, the following guidelines will be followed by the Department.

Adequate sanitation: The immediate priority is to provide sanitation services to all; which meet basic health and functional requirements, including the protection of the quality of both surface and underground water. Higher levels of service will only be achievable if incomes in poor communities rise substantially. Conventional waterborne sanitation is in most cases not a realistic, viable and achievable minimum service standard in the short term due to its cost. The Ventilated Improved Pit toilet (VIP), if constructed to

agreed standards and maintained properly, provides an appropriate and adequate basic level of sanitation service. Adequate basic provision is therefore defined as one well-constructed VIP toilet per household.

Bucket systems: These are not considered to be adequate from either a health perspective or in terms of community acceptability. They should be phased out over a period of five years throughout the country.

5.2.2 Unserviced areas

Traditionally, use of the open veld has been the basic form of sanitation in rural areas. With changes in rural populations – mainly in terms of increased density – traditional sanitation practices have become more difficult. Flies and domestic animals have always been sources of infection from faeces that have been poorly covered. Faeces disposed of on the ground are washed into water bodies when it rains, and direct infection of the communal water supply in this way is common.

Although in many rural areas this form of sanitation is still fairly common, the use of pit latrines is also becoming fairly widespread. Unfortunately, many of these are unimproved pit latrines, and even where VIP's are apparently in use, one often finds that they are inadequately constructed. (This may be due to lack of knowledge, inadequate financial resources, use of inappropriate materials, etc.)

One group was conducted in a peri-urban shack settlement where no sanitation services were provided; residents used buckets, or dug their own shallow pit latrines. People who lived in these conditions were conscious of the filth around them, yet powerless change the situation.

> *"We do everything next to us – that is toilet, garbage is just next to our shacks…. The place is dirty."*

>From a health perspective, conditions are appalling, and the effect on human dignity is equally significant.

> *"If you do not have enough toilets like us, if you wake up in the morning you can find waste all over."*
>
> *"People are using any place for urinating, others are using the passage here… you can find old people urinating on the street in front of children."*
>
> *"It is hard not to have a toilet; our children suffer when their stomachs are running."*
>
> *"People dig their own pits in the backyard. Maybe on the other side you are eating… you often smell bad odour, but you just eat because you can't do anything."*

Focus groups in site-and-service areas raised the issue of surrounding informal areas which are illegally occupied and completely unserviced. Even if services are adequate for the population in demarcated areas, environmental pollution from adjacent "illegal" populations without services poses a problem, as does the increased pressure on the existing services.

> *"There are sides which don't have services. This one they are already finished... the others and the illegals like Shoshumela, don't have services."*
>
> *"Toilets are too few – there can be 5 people in the queue waiting for the one who is in the toilet... especially after 4 in the afternoons and on weekends when people are at home."*

5.2.3 Serviced areas

Generally, pit latrines are not suitable for high density areas because the soil capacity for absorbing the volumes of liquid and for bacterial decomposition to take place is exceeded. In areas where pit latrines are used, they are often placed too near to water sources. Ground water pollution is another associated risk – particularly in arid areas and more densely populated informal settlements. Nitrate enrichment of ground water, for instance, can lead to the so-called "blue-baby syndrome".

Most group participants from urban areas had flush toilets. Here, blockages and leaks were sources of dissatisfaction, compounded by anger at local councils for poor service response when problems are reported. Participants pointed out that while flush toilets are the desirable form of sanitation, it is important that systems be properly installed – "up to standard" – and that they work well, flushing strongly and not blocking up or overflowing.

5.2.4 Options and costs

Although water-borne sewerage is held out as the ideal in rural areas, the VIP latrine is the minimum standard being promoted in South Africa. Unlike the water-borne system, VIP toilets are low-tech, individual and localised structures. They are ideally suited to self-build approaches and are not overly expensive. Policy in South Africa at the time of research was for rural households to receive R600 each towards constructing a VIP (this amounts to about half the cost of a properly constructed VIP).

The VIP does not require much in the way of communal decision-making about construction, nor about financing and fee collection systems. This means that constructing VIP's is less complex than installing a water-borne system, but often more difficult in that it requires a decision to be made at household level, rather than at community level.

The focus groups compared various types of sanitation. For people at low income, there doesn't appear to be an ideal solution:

- pit latrines can be smelly and attract flies; they are dangerous for children, who sometimes fall into the hole
- bucket systems rely on regular municipal services, and are generally unhygienic and smelly
- some kinds of toilets, like chemical toilets, need to be rented and serviced regularly – so there is an ongoing cost implication
- flush toilets are ideal, but initial construction costs are high, as are subsequent and ongoing water costs. For many communities the high cost of water-borne sewerage is not an option.

The basic requirement expressed by participants was that whatever the type of sanitation, each house should have an individual toilet. Communal sanitation facilities are perceived as unhygienic and unacceptable.

An overview of various sewerage systems and their relative advantages is provided in the Clacherty review, and can be found under Appendix 5.

5.3 FINANCING AND COST RECOVERY

The current government policy is that services should be self-financing at a local and regional level. The only exception is that, where poor communities are not able to afford basic services, government may subsidise the cost of construction of basic minimum services – but not the operating, maintenance or replacement costs.

From the consumer's perspective, as articulated in the groups, one should pay only for services received. If the service is perceived as inadequate, a common recourse is to withhold payment. Many of the group participants were not paying for services – in some cases because they were dissatisfied with the level of services (for instance the quality of the water, or blockages in the sewerage system which remain unrepaired) or because they distrusted the metering system.

However, the main reason for non-payment discussed in the groups was simple affordability. For example, it was felt that a pensioner who receives a pension of R400 per month cannot be expected to pay over a quarter of that amount for basic services. People who are unemployed find themselves situations of spiralling debt, which makes it difficult to restart payment unless the debt is written off or reduced substantially.

Frustration around the inability to negotiate with the local authority about service payments was expressed in a group from an informal settlement in North West:

"The money is too much – it just goes up and up. We have tried to meet them, but to no avail; they only come to deliver service payment letters, and we are no longer paying."

A local health inspector interviewed expressed similar frustration at non-payment:

"The municipality is financing the project, but with the low rate of payment, it really constrains our budget. People do not understand that we cannot provide services if they do not pay. We get money to spend money – that's how it should be, but it's not the case."

Where there is a lack of trust and communication between service-providers and service-users, this can lead to a spiralling process of deteriorating service provision. This reinforcing process can be extremely destructive, both in terms of relations between communities and local authorities, and in terms of infrastructure and associated health considerations. Because of payment and the particular South African history of service payments, this is a highly volatile issue,

6. HEALTH, HYGIENE & DISEASE

6.1 HEALTH RISKS AND WATER-RELATED DISEASE

In discussing diseases which result from unsanitary conditions, respondents made the connection between disease and poor living conditions. Groups referred to diarrhoea / upset stomachs and cholera, as well as skin rashes, sore throats and eye infections. Children were perceived as particularly susceptible to diarrhoea and vomiting – and this was linked both to unhygienic sanitation and to impure drinking water.

Diarrhoea is the single largest cause of childhood mortality in South Africa, and the review stresses the need for strategies to address the broader issues of nutrition and diarrhoeal management through diet, as well as infection avoidance.

The review provides a summary of water-related diseases and their main transmission routes, based on work done by Genthe and Seager et al, (1996) and von Schirnding, Yach and Mathee, (1993). This summary is included in Appendix 2.

6.2 CAUSAL RELATIONSHIPS & PERCEPTIONS

6.2.1 Low levels of access to water

As discussed previously, where people have low levels of access to water (and particularly where water is not readily or easily accessible), it is used primarily for drinking and food preparation. Reduced amounts of water for other purposes such as washing, can lead to water washed diseases such as diarrhoea as well as eye infections, skin infections, etc.

In the groups, these types of infections were usually attributed to the quality of water, rather than to insufficient quantities of water. This illustrated the popular belief in a direct causal link between water quality and disease, which is identified in the review as a possible misconception if it excludes other contributing factors like access to adequate quantities of water.

An important finding of the review is that most diarrhoeal disease is not water-borne but is, in reality, probably transmitted on the hands and utensils, either directly or by contamination of food which provides an excellent culture for many pathogens. This strongly indicates that access to adequate quantities of water is more important in the first instance than access to high quality water.

6.2.2 Water quality

In discussing quality of water, group participants referred to boiling as an ideal way to purify water, though this was not generally practiced. In areas with services, there was frequent reference to "purified" tap water which had an opaque white colour which was attributed to chemicals. The usual response to this was to allow the water to sit until the chemicals settled and the water became clear. Similarly, even if dirt was visible in the water, some participants felt that allowing the water to stand until the dirt settled at the bottom would be an adequate purification process. A common rule-of-thumb was that if the water looks clear and tastes fine (not "flat" and not salty), then it is safe for consumption.

Of significance is the finding that while there is widespread understanding of the dangers of polluted water (*"Unsafe water can be hazardous to our lives"*), and although most people appear to know that boiling water is an effective means of purification, it seems there is a crucial area where knowledge is lacking. Groups displayed relatively low awareness of ways to determine whether or not water is safe, and tended to refer to taste or visual evidence of impurity:

> *"If we see soil in the water, we think that makes the water unsafe."*
>
> *"We pour the water in a bucket and wait for a while. All the dirt will sink down and one is free to drink the water and use it for anything."*

"When you boil the water and there is rust, you'll know that this water is unsafe."

The review refers to a study conducted in Swaziland, (E Green, 1982) where it was found that taste is generally the dominant criterion for selecting water sources. Relying on taste means not only that in some instances, polluted water is not identified as such, but also that a "safe" source, such as a borehole, is sometimes regarded poorly because of its taste. An anthropological study conducted in the former Transkei (R Palmer, 1996) showed that people know the various qualities of their water sources, and that people use multiple sources of water for differing purposes. The study showed that women especially were aware of water quality and health, and were restricted in their ability to avoid health problems mainly by their physical and financial capacities to secure pure water.

6.2.3 Communal & substandard toilets

In focus groups, bucket toilets and pit latrines were singled out as breeding grounds for germs, causing sickness in children in particular.

"We are not sure whether is it because of toilet shortage that the diseases are spreading so quickly. Children are getting sick. They are coughing, vomiting – and diarrhoea is the order of the day."

Discussion in the groups tended to reveal high levels of awareness and concern about hygiene issues, together with helpless resignation when inadequate infrastructure meant there was nothing people could do to improve their health situation.

"The truck which is responsible to clean the toilet can't get in as the streets are too small. As a person who is having a toilet in the yard, I am supposed to take the bucket out of my toilet and put it on the corner where the truck can see it. I'm saying that by doing so, I am causing diseases to other people, although we might not see it right now…. people of Mandela are always sick."

6.3 HYGIENE PRACTICES

6.3.1 Handwashing, defecation and food handling

Access to a water source close to a latrine, or even an easily accessible bowl of water for washing hands, appears to be one of the single most effective measures to reduce faecal-oral re-infection. It is likely that the direct connection between defecation and health is more clearly known than that between defecation and food preparation. The review refers to a study in an informal settlement in Gauteng, which found that women tend to wash their hands more often after using a toilet than they do before preparing food (Westaway, 1997). Health education efforts tend to emphasise water purity (boiling, etc.), and yet food is a far more nutrient rich culture medium for bacteria. Important domestic

hygiene issues include hand-washing before preparing food, implement-washing, raw food storage and covering to prevent infection from flies.

It appeared from frequent references in the groups that flies are widely associated with unhygienic conditions. Not only do they carry germs from one place to another, but unlike germs, they can be easily seen and therefore also alert people to the presence of germs. Bucket toilets and pit latrines were often described as "buzzing with flies". Participants who used these forms of sanitation described their attempts to keep flies out of the house where they would contaminate food.

The review finds that there is a tendency for people not to make a direct link between lack of handwashing and the fact that they have diarrhoea. A more common response is to attribute diarrhoea to something which was eaten. The review points out that strictly speaking, the assumption of a causal relationship between food and diarrhoea is probably correct, since faecal re-infection occurs in the process of contact with food (although it may well have been a second person handling the food who had not washed their hands). The point made is that the "germ theory" of health education may be working against this indirect link.

6.3.2 Water storage

The review found that infection of stored water is a common occurrence through dirty storage containers, dirty scoops, direct human contact or lack of adequate covering for water containers. Sterlization with Jik is possibly the most convenient way of properly cleaning a water container. Women in focus groups reported use of Jik, Handy Andy, soap and chemicals to clean storage containers. There were differing opinions on how long water could be stored safely, but a common belief was that after two days it is no longer safe for drinking – water standing in the sun was perceived to "go off" more quickly. A "flat taste" indicated that water was no longer pure, after which women said they would use the water for personal hygiene or washing clothes, but not for drinking or food preparation.

6.3.3 Water purification

Most natural sources of water are polluted in some way, which can lead to potential bacterial or parasitic infections. However, the review finds that on the whole, the importance of water quality has frequently been over-emphasised in water supply programmes, at the expense of stressing the usage of adequate quantities of water for hygienic practices. Groups referred to boiling water as an ideal, but this was not common practice. In one of the focus groups (with school-going girls), it was reported that the household used Jik to clean the drinking water.

6.3.4 Toilet usage and hygiene

Children tend not to use pit latrines. This is encouraged by a widespread belief that children's faeces are not harmful, and they are therefore often left uncovered. It is also widely asserted that children are frightened of the dark hole below the toilet seat, and fear falling in. This was a very real worry for parents in areas where participants used pit latrines, and one group reported that a number of children had lost their lives falling into the pits. The only alternative is for children to defecate outside. The review found that in many cases – in both informal settlements and more formal areas where pit latrines are used – a large percentage of children do not use the toilet, but often go behind it or at the side of the house. In the groups, reported shortages of toilet facilities at schools meant that children were sometimes forced to go in "open spaces".

A variety of mechanisms were reported for keeping toilets clean, depending largely on the type of toilet. Jeyes Fluid was a common cleaning agent for a variety of toilets, as were unspecified "chemicals". Regular layers of either ash or sand were reported to reduce bad smells in pit latrines. Women living on farmland in rural Mpumalanga reported that they poured cattle dip down their pit toilets to kill the germs.

6.3.5 Personal hygiene

People at low income have fairly limited ablution facilities – the main form of bathing described by participants is with a cloth and a bowl of water, and in areas where water has to be carried, mothers described washing all their children in the same water.

Both the review and the primary research found that hand-washing is far more likely to take place after using the toilet if water is immediately at hand.

> *"My tap is next to the toilet's door, so if I come out of the toilet, I think of washing hands."*

A lack of available water was frequently identified in the groups as the main reason why people neglected to wash hands after using the toilets – despite high levels of awareness. Again, infrastructural shortcomings are identified as the main barrier to desirable practice.

> *"They do it if there is water next to them, but in rural areas it is very difficult for doing that because there is no water next to them."*
>
> *"Here if I leave my toilet there is no water. I walk a long distance to get to my home. By the time I reach my house, I've already forgotten that I didn't wash my hands."*

Amongst women, a problem experienced with regard to menstruation was the disposal of sanitary pads. If pit toilets are available, these are regarded as the

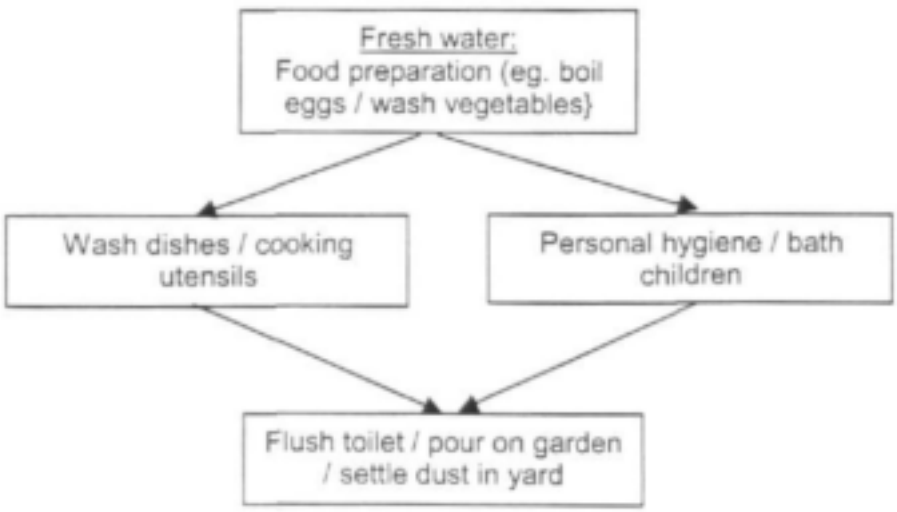
best option for disposal – they do not cause blockages (as with flush toilets), and they do not "reappear" in public places or rubbish dumps. (The latter was of particular concern to groups where refuse removal services were inadequate, and residents either dumped or buried their own refuse.) Another common practice referred to was incineration of sanitary pads inside stoves, although this also created smoke and odours which tended to be regarded as unhygienic, or at least unpleasant – particularly when food was being cooked on the stove top. Some traditional beliefs prohibit the burning of blood belonging to a person who is still alive.

6.3.6 Schools

Children's groups all referred to some form of personal hygiene and health education at school, and talked with confidence about the hazards of unwashed hands, unsanitary conditions and flies on food. The main issue which arose with regard to sanitation in schools was poor maintenance of facilities. Vandalism is a problem, and can range from graffiti to broken toilets, to deliberate smearing of faeces on toilet walls. A common concern amongst the school groups was that sanitation facilities in schools were very unhygienic. Toilet paper was seldom available. The main alternative was newspaper, which then either blocked the toilets or was simply left on the floor after use. In one school the pupils themselves were required to clean the toilets.

6.3.7 Water recycling

The greater the effort involved in accessing water, the more valuable it becomes. It is not surprising then that women, being the main water carriers, were those who discussed water conservation methods. The common rule which emerged from the groups is that there is a clear order for water usage. The same water could be used three times, as illustrated in this example of a recycling hierarchy:



6.4 SPECIFIC KNOWLEDGE, ATTITUDES AND TRADITIONAL BELIEFS

"Here at Mandela we lose our cultural beliefs..."

A number of group participants referred to a common belief that water should not be collected after sunset, but pointed out that this and other cultural practices often had to be compromised when logistical factors necessitated changing practices. For instance, the regular use of laxatives to "cleanse the stomach" was described as common, but this practice becomes difficult and in some instances is abandoned in areas where residents are dependent on communal toilets, or where toilets are inconveniently situated.

Other beliefs mentioned in the groups were that men and women shouldn't share the same bath water. One explanation for this was that those who shared a bath "would end up hating each other", while another was that men should avoid contamination through contact with women's menstrual blood.

In a Transkei study reviewed (R Palmer, 1996), it was argued that many cultural beliefs and taboos around water can be linked to practical considerations, including effective water resource management practices and personal protection. Traditional beliefs and taboos may be explained in terms of respect for ancestors or water creatures but, the study argues, there is an underlying knowledge in these traditional practices which is shown to be effective in protecting people. For instance, people used the "blanket of the frog" (an algae layer on dams) as a sign that they should leave the frogs undisturbed and go elsewhere for water. Subsequent laboratory tests showed that the quality of this water was indeed below acceptable standards.

7. HEALTH PROMOTION

7.1 POLICY

The 1996 White Paper on Sanitation includes a clear emphasis on health and hygiene education and promotion. It stipulates that health education and promotion are the responsibility of the water and sanitation sector, as indicated in the following excerpt:

Sanitation Is About Health

The major aim of national sanitation policy, and any consequent programme, is to contribute to improving the health and quality of life of the whole population. At present, significant investments are being made in the provision of safe water supplies for all. However, the health benefits that could result from this will be severely limited if adequate attention is not paid to sanitation. Furthermore, experience from national and international water and sanitation programmes has shown how essential it is to link water supply and sanitation with health and hygiene education. Only when all these are in place will real and lasting health benefits follow.

The aim of health and hygiene education and promotion policy is to:

- raise awareness of the diseases caused by unhealthy behaviour and practices;
- support and provide health and hygiene education that will enable people to improve their health through correct hygienic practices;
- lead to an increased demand and willingness to pay for appropriate sanitation facilities.

Health and hygiene education and promotion:

- must be an integral part of all community sanitation projects and community water supply improvement projects;
- strategy will be drafted by various departments dealing in health, hygiene and infrastructure provision. A task team for this purpose will be chaired and co-ordinated by the Directorate of Environmental Health of the Department of Health, and operate under the auspices of the National Sanitation Task Team...;

  (Extracts compiled from page 6 of the National Sanitation White Paper: RSA, 1996).

DWAF's guidelines for capacity building and training

The Department of Water Affairs & Forestry's (DWAF's) "Guidelines for capacity building and training" document refers to the need to incorporate health education more integrally into the project cycle. Regarding capacity building issues, the document adopts a number of sound principles such as sustainability and participatory approaches. It argues that local resources, expertise and

perceptions exist within communities and that capacity building and training need to acknowledge and build from these.

Although the document does not make specific provision for implementing a health promotion approach, in broad perspective the document acknowledges the importance of the health promotion view, as outlined in the following extract:

> Water and sanitation are ultimately primary health care issues and should not be dealt with in isolation of this principle. This includes the concept of health promotion that aims at promoting health through improved access to resources. These include health resources such as clinics, medical personnel and medicines as well as socio-economic resources such as education, water and food supply. Health promotion therefore focuses on creating the enabling and supportive environment that people need to make critical choices for health.

Policy relating to health promotion in the water and sanitation sector refers to the relationship between infrastructure and health practices. In particular, there is an acknowledgement that service delivery alone cannot transform health practices; infrastructure development needs to be supported by education strategies which acknowledge and build on local capacity.

7.2 EDUCATION AND HEALTH PROMOTION

7.2.1 Behaviour change issues

It is now a clear and widely supported position that knowledge, attitudes and practices *are not directly or causally linked*. Though knowledge is important in making decisions about health issues, to provide knowledge as a dominant or sole strategy in the hope of changing practice is close to futile. Nevertheless, so-called KAP (knowledge, attitudes, practice) studies abound. Understanding people's perceptions or their attitudes is arguably important. The point to be made relates to the theoretical framework this fits into, and what assumptions are being made about human behaviour and behaviour change.

Current thinking is that behaviour is determined far more by a complex interaction of local and contextual factors than by attitudes or by knowledge. And behaviour change cannot be an exogenous procedure, but is most effective as an endogenous process that occurs within a participatory and interactive environment – for example: "a socially interactive process within a participatory, facilitated problem-solving process". Further, a supportive environment to change behaviour and to sustain new behaviours is required. The argument is that at the core of any health promotion strategy, there must be a focus on context.

This perspective echoes the views of those engaged in health promotion as well as many in the mass media, who insist that the mass media *on their own* cannot necessarily bring about the desired changes. Numerous barriers and challenges may exist within the environment, and these need to be addressed before

behaviour change can take place. So-called "face-to-face" activities may be necessary, which create the scope to contextualise health promotion strategies.

7.2.2 The role of women

Most child health care is undertaken by women, and mainly by older women. These are the people who make the decisions about health care. Thus the review argues that health care strategies need to target such women and to acknowledge their considerable traditional wisdom. However women do not usually control family finances, and so there is a simultaneous argument in favour of family-based health education. This is also linked to a community-based health-worker model, since such women have been identified as an appropriate and cost effective ideal in this role. International studies show consistently that older women are the best type of people to employ as community-based health workers, due to both their experience and their community status.

7.2.3 Participatory educational strategies

The Review of Water and Sanitation Related Health Education and Promotion Activities in South Africa (Clacherty & Associates 1997), conducted for HEATT, emphasises the need to "devise educational programmes that will contribute to building sustained development in communities and complement these sustained programmes with high energy programmes that make use of mass media or social marketing techniques...."

The review stresses the need for the development of "participatory and empowering educational resources for use in localised situations. Materials also need to be constantly evaluated and updated as contexts and situations change all the time. These education programmes and resources need to be participatory in nature and be implemented by educators who understand participatory methodology. Once these local face-to-face programmes are in place, they can be complemented by local and mass media campaigns."

7.2.4 Integration of infrastructure development

Water supply and sanitation programmes need to be integrated into programmes for the provision of other basic needs – in particular:

- physical infrastructure – such as water supply, sanitation, roads, electricity and communications,
- social infrastructure – including schools, hospitals, clinics and welfare organisations

- economic infrastructure – the employment, production and trading base including access to markets and finance, and
- institutional infrastructure – organisational and civil administration structures at all levels.

8. IMPLICATIONS FOR SOUL CITY

8.1 Suggested key messages for Soul City 4

(Identified in the Review Of Key Issues Relating To Water, Sanitation And Health, conducted by Clacherty & Associates)

1. Sanitation is about health: Water and sanitation are ultimately primary health care issues and should not be dealt with in isolation of this principle.

2. Provision of adequate quantities of water have a greater impact on diarrhoeal disease, and probably skin and eye infections than simple provision of clean water: these are water-related rather than water borne. Water supplies must be ample and accessible. In an urban context, this equates to access to a stand pipe (as minimum) within 20 - 30 metres of the home.

3. Re-infection of stored water is a common occurrence through dirty storage containers, dirty scoops, re-infection of stored water through direct human contact or lack of adequate covering of water containers. Stored water is unlikely to be used freely for washing where access to water is a problem, therefore, again, access to quantity is a greater priority than access to quality water. We did not find any research from a health perspective promoting a particular kind of water cartage/storage container and recommended (i.e. practicable and sustainable) methods of cleaning containers.

4. There is an increasingly strong and persuasive health promotion perspective, that health will not be necessarily be achieved through either infrastructure improvement or health education or both, and that the **contextual and structural issues** (e.g. factors causing poverty, power relations within the family and beyond, foreign debt, lack of local solutions and a reliance on a medical model) that promote poor health are an integral and essential part of a meaningful and sustainable solution.

5. Most successes come when water and sanitation programmes include health and hygiene education, improvements in hygiene behaviour and general environmental improvements.

6. Those interventions that have been classified by the WHO as having strong evidence for being effective and feasible and are relevant to Zimbabwe's experience include the following:

- promotion of breast-feeding
- improving of weaning practices (to maintain nutritional status of the child)
- measles immunisation
- promoting personal and domestic hygiene
- improving water supply and sanitation facilities.

7. Water and sanitation projects should be tackled through a programmatic or area approach. This lays the foundation for inter-sectoral collaboration within a region or area, and hence for a health promotion approach.

8. Collecting water is "women's work": the burden of water collecting has large physical, economic and social costs.

9. Children who get sick with diarrhoea on average suffer 5 episodes per annum. This represents a major setback in terms of physiological and cognitive development, and reduces energy and concentration levels at school. The overall impact of this on society's well-being and a developing country's economy must be enormous considering the huge numbers of children who are "diarrhoea statistics".

10. Health-related design criteria, although well documented, tend to be ignored by engineers, whose task is to provide high quality water within a minimum of 200m of the home (the RDP minimum standard).

11. Children tend not to use pit latrines: This is reinforced by a widespread belief that children's faeces are not harmful. Thus children's faeces are commonly not covered. It is also widely asserted that children are frightened of the dark hole of the toilet seat, and fear falling in. This is probably correct, but other issues such as the lack of concern for ensuring that children use toilets probably play a role.

12. It is now a quite clear and widely supported position that knowledge, attitudes and practices *are not directly or causally linked*, but regrettably, most health education efforts are based (usually unwittingly) on behaviourist assumptions emanating from the belief that there is a causal relationship between these factors.

13. It appears, except in remote areas, that most people have adopted a composite approach to accessing appropriate health care. Traditional healers, home-based remedies and clinics all play a role in this matrix.

14. The incorrect understandings related to worm infestations in children reported above are based on the observation that fruit often has worms, so eating fruit could give one worms.

15. Traditional beliefs about water should not be undermined: In a Transkei study, people used the "blanket of the frog" (an algae layer on the dams) as a sign

that they should leave the frogs undisturbed and go elsewhere for water.

16. The close association between water and the ancestors means that people regard the larger bodies water in particular, with great respect, especially where the *Typha capensis* reed grows, as this hides the home of the ancestors. This leads to a range of practices that all have a positive environmental and water conservation effect.

17. Standardised education material can create misunderstandings because it does not take local perceptions and contexts into account.

18. A Swaziland study suggests that attitudes towards water does not distinguish between "safe" water and the taste of the water. Taste is generally the dominant criterion for selecting water sources.

19. In the Swaziland study, the most reliable predictor of "correct" responses was level of education of *anyone* in the home, followed by level of education of respondents themselves, which tended to be greatest in the younger age group. There was a negative correlation between "correct" response and being head of household.

20. In the Swaziland study, almost 84% replied "No, never" in response to a question about whether they boiled water. This in spite of the fact that the "expected" answer might have been given.

21. The study showed that women especially were aware of water quality and health and were restricted in their ability to avoid problems mainly by their physical and financial capacities to secure pure water.

22. Diarrhoea, nutrition and diet: Diarrhoea can bring about heavier loss of nutrients and essential vitamins from the body so it is paramount the child gets an even more nutritious diet than normal. The single most effective and important intervention which directly impacts on diarrhoea and nutrition, is breastfeeding. This is linked to the increased risk of infection caused by bottle feeding, use of dirty bottles and contaminated water. The linkages between the nourished state of the child and its susceptibility to both frequency and severity of diarrhoea are well documented.

23. Experience in Lesotho also showed that communal latrines are not appropriate and that it is better to *lend* money for latrine construction than to give it away; training for self-building was far more effective than building for people; it was better to try and standardise on VIP design being promoted by various agencies.

24. Another widespread lesson is that water is demand-driven, but sanitation generally is not. There is little interest in sanitation where the water supply is poor.

25. Much contamination of drinking water stored in the home occurred through poor handling. Key messages here include:
    - keeping containers clean
    - using clean scoops
    - covering storage containers
    - using a separate containers of water for washing purposes and for drinking water
    - washing hands after defecting and before preparing food.

26. The poorest families cannot afford improved sanitation and are also at risk from other poverty related factors such as poor nutrition. Yet these families are possibly benefiting least from water and sanitation programmes as they cannot afford to participate in them effectively.

8.2 Application of the research findings to Soul City

Soul City is a health education strategy best known for its television and radio series "Soul City". Utilising health promotion, education and entertainment together, the project puts key national health messages into dramatic formats with mass appeal. The project has been highly successful. The television series had consistently held the number one and two ratings slot when flighted. Estimated to reach 12 million people, at an average estimated cost of R2 per head, the Soul City vehicle is in fact not limited to the use of electronic media, but creatively uses print media – especially newspaper inserts – to popularise key messages.

The project also has an adult education programme which develops the key messages from the electronic media in greater detail, to facilitate better understanding of issues and help support and sustain behaviour change. Earlier series of Soul City covered mother and child health, TB, HIV/AIDS, violence, energy, alcohol, smoking, housing and land issues.

Water and sanitation were identified as one of the priority issues for the 4th series. Initially, it was felt that water and sanitation should form part of the television and radio drama series, but the findings of the WRC-funded research and developments in the water and sanitation sector raised issues which challenged this.

Firstly, the research findings did not identify simple messages that could be uniformly used in South Africa. This is partly because developments in the water and sanitation sector are very complex and have not been standard throughout the country. For instance, too an great an emphasis on water purity could be misguided when access to adequate quantities is a prior requirement for basic health and hygiene. Where there is adequate access, however, the issue of quality takes on greater priority.

The problems and solutions for each community are often unique, depending on many social factors such as unemployment levels, payment for services, the beliefs and values of local people, and the physical environment.

Secondly, the provision of adequate sanitation has lagged behind that of water, and there have been several re-thinks by the National Sanitation Co-ordinating Office (NaSCO) about the way forwards, including the possible withdrawal of the government household sanitation subsidy. NaSCO's main role, as the executive arm of the National Sanitation Task Team, is to support the implementation of sanitation policy. This has included a number of initiatives in various provinces – for instance:

- pilot projects for farm dwellers in the Northern Cape, Western Cape and the Free State;
- investigations into alternative approaches to sanitation in peri-urban areas in Western Cape;
- the development (in collaboration with the Department of Education) of technical guidelines around sanitation in schools;
- provision of support to metropolitan councils around infrastructure development and "software" issues;
- the establishment of provincial sanitation task teams comprising governmental and non-governmental structures

The wide and varied scope of sanitation-related initiatives reinforces the finding that it would be both difficult and inappropriate for Soul City to design generic messages that support the implementation of national infrastructure programmes.

Furthermore, findings from previous evaluations of the Soul City series 2 and 3, show that the public do not easily recall elaborate messages about the technical details of infrastructure developments. The housing messages carried in Soul City 3, for example, were not remembered in detail, except that people learned that communities needed to work together to get housing. Other key messages about who to get help from and the relative economics of communities providing their own labour for building, were not generally remembered. This suggested that complex or technical water and sanitation messages would not be carried well on the electronic media.

9. CONCLUSIONS & RECOMMENDATIONS

9.1 Main findings : Services and Infrastructure

- The collection of water from taps or pumps or natural sources in unserviced areas remains primarily the task of women and children. The cost of this task is significant in terms of time, effort and risk to personal safety, and bears a direct relation to the distance from which water is transported.
- Low access to water has a direct and negative impact on personal hygiene.
- Communal taps and pumps can pose a health hazard when they are used for multiple purposes and there is insufficient drainage.
- There is a problem of people "free-riding" by illegally tapping into water pipes. This jeopardises supply levels to other households in serviced areas and also contributes to non-payment.
- Water from taps is widely seen as cleaner and safer than water from other sources. People also tend to judge the quality of water on the basis of its taste and appearance.
- Waterborne sanitation is the preferred option, but is not realistic as a minimum service standard in the short term due to its cost, while bucket systems are unpopular and frequently unhygienic. Ventilated Improved Pit toilets (VIP's) are appropriate, adequate and feasible; adequate sanitation is therefore defined as one well-constructed VIP toilet per household.
- In unserviced rural areas, use of the open veld has been the predominant form of sanitation. Here, as in unserviced urban areas, unimproved pit latrines have become a necessary alternative. Both methods pose serious health risks through the spread of disease (for example, contamination of ground water), as well as creating an environment which is unpleasant to look at and to smell.
- Among people who had flush toilets there were complaints about service and plumbing standards.
- Planning and delivery of infrastructure is closely linked to water and sanitation. People's sanitation problems reflected the forms of infrastructure to which they had access:
  - those who had flushing toilets had problems with blockages and repairs;
  - those who had buckets had problems with disposal and smells and hygiene;
  - those who had pit latrines had problems with smells, fires, contamination of ground water, and the danger they presented to children.
- Infrastructure design had not taken full cognisance of health issues. This contributed to unsanitary conditions.

- A basic requirement from participants was that each house should have an individual toilet. There is great aversion to communal sanitation, which is seen as unhygienic and unacceptable.
- Decisions made at the household level (for example to construct a VIP) are simpler than those requiring community-wide agreement (for a communal latrine or demarcated area of open ground).

9.2 Main findings : Health, Hygiene and Disease

- Much faecal-oral re-infection, for example diarrhoea, is food-borne or directly transmitted from unwashed hands and utensils used in the cooking of food. This contradicts a widespread belief that diarrhoea is only water-borne.
- Handwashing is not sufficiently recognised and/or practiced as an element in maintaining hygiene and health.
- There are four major household uses of water: for drinking, for the preparation of food, for washing of clothes and utensils, and for personal hygiene.
- When water is scarce, people prioritise the use of water for drinking and the preparation of food, to the exclusion of personal hygiene.
- Erratic water supplies result in a "hoarding mentality": excess water supplies are stored but, after about two days, this water is seen as unfit for consumption and is then available for personal hygiene purposes.
- Both scarcity and irregularity in water supplies jeopardise personal hygiene practices, and contribute to faecal-oral reinfection through the use of unwashed utensils.
- Cultural beliefs and practices are enduring, and often represent traditional wisdom regarding personal safety and resource management. Beliefs and practices sometimes have to be compromised or abandoned altogether when water and sanitation infrastructure (or the lack thereof) disallows such practices.

9.3 Main findings : Health Promotion

- It is important to distinguish between universal messages which are applicable to a wide target audience, from those which are specific to people living under similar conditions or engaging in specific health practices which may be informed by the local environment or belief systems. Whereas the latter are most effectively conveyed through localised health promotion initiatives, the mass media are a better suited to disseminating educational messages with broad applicability.
- Changed behaviour can be achieved most effectively through ongoing engagement with communities at local level through intensive and participatory practices. This requires a sensitivity to the local context in order to avoid victim blaming, and needs to be undertaken in conjunction with infrastructure development.

- Both the specificity (as opposed to universality) of many water and sanitation issues, and the low susceptibility of people to change their behaviour, imply a supportive, rather than leading, role for the mass media in terms of health promotion.
- The work of health promotion should fall to local government and non-governmental organisations (NGO's) through the agency of community health workers (CHW's) and the primary health care teams, including environmental health officers (EHO's). These agents are well placed to embark on health promotion programmes which need to be both intensive and sustained.
- The mass media are well placed to augment the work of local government and NGO's through the widespread dissemination of basic and universally applicable information relating to health practices, and to raise awareness about those water and sanitation issues which have wide relevance.

9.4 Recommendations

Health messages for the electronic media need to be concise, clear and simple. They also need to be messages that have general relevance, and that do not patronise or criticise any specific beliefs or practices. Messages need to encourage and support constructive interventions for water and sanitation.

The work of health promotion at community level should be addressed to local structures so that education is appropriately contextualised – particularly in the light of available of infrastructure. The mass media are well placed to support and augment localised health promotion and infrastructure development strategies by promoting broad awareness and generic messages.

One of the recommendations arising from the Review of Water and Sanitation Related Health Education and Promotion Activities in South Africa, commissioned by HEATT in 1997, was the need for the development of useful and accessible guidelines for those working in health promotion at community level:

> "HEATT should publish guidelines for implementing health education and promotion in a document that is accessible to project managers, training agencies, health workers and others who may be involved in this sector. These guidelines should present the range of possibilities from the narrow 'bolt-on' approach to the development-oriented approach. It should present the latter as the ideal and deal with strategies for achieving this". (Clacherty et al, 1997: 105)

The key outcome of the research was the decision not to use the electronic media to carry national water and sanitation messages. This decision was taken in the light of the finding that information needs are dependent on a number of factors, and differ from area to area. Needs cannot be generalised, but are linked to contextual factors such as infrastructure, cultural beliefs and practices, and human and other resources. Also, it is believed that to concentrate on

hygiene messages could amount to "victim blaming" in the absence of adequate infrastructure.

Subsequent to the decision not to design water and sanitation materials for the electronic media, it has been agreed to use the research to inform the development of a reference manual for environmental health officers and community health workers. This has been undertaken by Soul City in a consultative process with key players.

The decision meant that funding originally allocated by the WRC for pre-testing the mass-media materials was instead utilised for the planning and workshopping of the print materials. This decision was taken in consultation with the WRC Steering Committee.

The manual, currently in its final draft phase, is entitled:
"Breaking the Rules : New Approaches to Promoting Health through Water and Sanitation in South Africa"

The manual is designed to support the work of people who are implementing improvements to water and sanitation at a household level, and geared for use by environmental health officers, community health nurses, NGO workers, community health workers, activitists, and any other people who are involved in local health promotion. It is designed as a user-friendly reference book, written in clear, accessible English and comprising 16 distinct sections, as follows:

1. Which rules do we want to break to promote health through water and sanitation?
2. The burden of water and sanitation disease in South Africa
3. Diarrhoea
4. Worms
5. Parasites
6. Skin and eye diseases
7. Outbreak diseases
8. Provincial profiles of water and sanitation disease
9. Hygiene promotion
10. Sanitation promotion
11. Water supply
12. Water quality
13. Advocacy work for water and sanitation
14. Community actions to support water and sanitation
15. Women, the disabled and the elderly
16. Payment, subsidies and income generation

It is envisaged that the manual will be distributed through existing structures, including the provincial health departments, the Department of Water Affairs and Forestry, the Department of Environmental Health, NGO's, Technikons and academic training institutions. The manual should be available for distribution in mid-2000.

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APPENDICES

APPENDIX 1: INTERVIEWING SCHEDULE – ADULT GROUPS

INTRODUCTIONS

- *Facilitator & participants introduce themselves*
- **Please tell what type of homes you live in and what type of services you have**
- **What are your feelings about the services you get in this area – let us focus n particular on water and sanitation**

  Probe : Ask about water supplies, toilets, waste removal

- **Let us talk about your daily use and experience with water**

  Probe: How do you go about getting your water
  What is it used for?
  Time spent getting water
  Who collects the water and with what (storage containers)
  Problems experienced
  Positive experiences (e.g. time to socialize at the river or tap);
  What do you do with water when you've finished with it, safety
  Are there times when you re-use water;

Strict 15 minutes

EXERCISE:

Ask respondents to list all the water supplies and types of toilets they know of.

Write these on a flip chart and add any they left out

Split group into two giving half the items on the list to one side and the other half to the other side.

Each side now have to pretend they are a salesman selling that water / toilet type to the community leaders i.e. explain to the other side what is good about the system while the other side debates the negatives. (Groups must consider issues like affordability, availability of water, proximity of water, availability of the system, cost of maintenance etc.)

Put everyone back together and ask them to write down which two systems would best suit their community situation. Each to read out their answer and explain why.

Probe : feelings on different levels of services, what goes into making their decision (practical issues and affordability)

15 minutes (30 min in total)

- **What are your experiences with toilets in your area?**

  Probe : positive/negative, safety, washing of hands to prevent diseases (when and how), personal hygiene (body washing, teeth, hair, etc.), getting rid of human and household waste, used to clean toilets

- **Are there problems that women and children experience if you have to go some distance from where you live to fetch water or go to the toilet**

  Probe : safety issues

10 minutes (40 min in tot)

.....

- **People say that lack of safe water and safe toilet facilities can cause problems. What do you think they mean by this?**

  EXERCISE:

  Go round the table and ask people to tell you the first thing that comes to their mind when you say "lack of safe water" Respondents must not think but just say the first thing they associate with that sentence. Do the same for unsafe toilet facilities. Discuss in general group

  Probe: what diseases (and how) are spread through dirty water and faeces; how does it make people sick

  Probe: How do people manage to keep healthy under these circumstances (NB):
  Washing and drying hands (how and when);
  Keeping water and containers clean during collection and storage;
  Getting rid of human and household waste;
  When do you feel water isn't safe?
  What makes water unsafe and what are the solutions?

- **You have mentioned things we can do to keep healthy (e.g. washing hands after toilet, before preparing food) / (if not mentioned then: people say things like washing of hands can help prevent these sicknesses) but many people in other groups we have talked to have said they don't actually get to do these things (e.g.. Wash their hands) very often. Can you explain why this could be?**

  What we are trying to find out here is:

1. *Do people know what they should be doing to stay health and clean*
2. *Are they doing what they know they should be doing 3*
3. *If they are not doing what they should be doing – why are they not?*

15 minutes (55 min in tot)

.....

- **What special problems are faced by women and girls**

  Probe : privacy, menstruation, how are "sanitary towels" disposed of, how can this be improved

- **Are there any cultural beliefs and practices (new and traditional) around things like using water, bathing, and going to the toilet (i.e. things that should/should not be done)?**

  Probe : What is the positive and negative implication on people's lives.

10 minutes (65 min in tot)

STRUCTURAL / ORGANISATIONAL

THOSE WITH SERVICES:

- **How did your community go about getting your current level of toilets and water services?**

  Probe: What was successful and what was difficult about the process.
  Who are the stakeholders involved (experiences with local government.
  Including Local Water Committees and traditional leaders/authorities)
  If rural area, civic or other community organisations?
  Would they do it differently next time?

  We are trying to understand the community dynamics – how organised they are,
  How representative, how effective.
  Are they communication to the rest of the community effectively?

- **Why did you choose the level of services (toilet and water supply) (tap in house, tap on stand, communal tap outside yard) (pit latrines, water borne sewerage etc.)**

  Probe: What issues were considered (are cost and other practicalities taken into account);
  Who made final decision?

- **How have these new services affected your lives, what have the advantages and disadvantages been**

  Probe : Issues of health and quality of life

15 minutes (80 min in tot)

THOSE WITH NO SERVICES:

- **How can your community go about improving the services in your community?**

  Probe: Experiences with local government (including Local Water Committees), Civic or other community organisations and traditional leaders (if in rural area). How would decisions on levels of service be taken (is cost taken into account)

- **Is the community currently in the process of getting services?**

  Probe: What services will you get
  What are the issues are bring considered in the decision making process
  Who is organising it (local government, civic, water committee, traditional leaders authorities etc.
  How effective are they
  What problems are they experiencing

15 minutes (80 min in tot)

ALL

- **What do you feel about paying for these services (water supply and toilets) in your community?**

Probe : What is the money used for (e.g. getting water from its source to their tap etc) If people paying, how, how much, to whom. What are the problems involved. What is affordable?

- **If not covered: which kind of things would help with your water and sanitation issues?**

10 minutes (90 min in tot)

THANK YOU FOR YOUR TIME AND INPUT
IT HAS BEEN VERY USEFUL

APPENDIX 2: INTERVIEWING SCHEDULE – SCHOOL GROUPS

INTRODUCTIONS – facilitator and group

- Lets talk about your school here! Can you tell me what you like about school and what you don't like about school?

- What problems do you have here at school

- Let us talk about water, here at school and in your community etc.

Probe : where, describe, good/bad things

Exercise – spray diagram, where is the water found, who uses, for what, what look like, smell like, why are people not using as supposed to, how does the water feel?

- What do you think about the toilets in your school? Describe them to me.

Probe : what is good / bad about them, problems related to gangs, gender issues, cleanliness etc. Probe: feelings about toilets in their community

- What problems are do you think happen if there is bad water and toilets, and how do you cope with these? (look for positives)

Probe : diseases (transmitted through water and faeces – eye, skin, gastro etc.), how this happens, personal hygiene efforts to keep clean, positive behaviours

- What does it mean to be healthy? (moderator to write up on a large piece of paper)

Probe : what are good/bad health practices

Exercise – show Soul City pictures: what is the problem, how did it happen, why, how can we stop this happening

- Let us talk about how these things are taught to us at school vs home.

Probe : what things are you taught about on keeping healthy (related to water and sanitation), how youths feel about this, what do their parents say

- *Many people in other schools have said they do not always do these things (eg. Washing hands after toilet, before preparing food etc.) Can you try and explain to me why this could be?*

- What possible solutions do you think would help these problems? What kinds of things can help us keep healthy?

- What is being done at your school to improve the water and toilets (keep them clean)? How can things be improved?

Probe : who is responsible/involved – teachers, students, community (explore whether school is working together with community). If improvement noted, what was it like before and now, how have the changes affected them?

THANKS & CLOSURE

APPENDIX 3: INTERVIEWING SCHEDULE – KEY INFORMANTS

INTRODUCTION

- Can you please tell me a bit about you, the community/s you are involved with, and your job – briefly?

- Can you please tell me what are the main problems faced by this community?

- In your opinion, can you please tell me what the main problems faced by your community are concerning water and sanitation.

Probe : illnesses, access etc.

- Can you please tell me about health concerns in the community?

Probe : what people in the community do with regard water and sanitation practices

- Can you tell me about the role you play with regards water and sanitation?

- What processes are planned or currently underway in this area around water and sanitation? Please explain them to me in detail.

Probe : when started, who initiated etc.

- Which stakeholders are participating (community/civic, women, government, local authorities, water boards, local water committees, traditional leaders/structures, professional organisations/consultants etc.) and how?

Probe : the role and experience of community input, how participative the process is, how the process is encouraged, possible improvements etc.

- Do all the different interest groups agree on the approach?

Probe : what approach is supported by whom, how is consensus achieved etc.

- How effective have these processes been?

Probe : strengths and weaknesses, problems

- What possible solutions are these to problems that have risen?

- What level of services do you think your community wants?

Probe : the considerations communities/individuals take into account, is payment an issue

- What are your experiences of community's feelings around the issue of payment for services?

- What do you think are the most important things for people to know with regard to accessing and using services?

Probe : service delivery, maintenance etc.

- What form of health promotion, education and support ***has been/is/should be/will be*** accompanying water and sanitation initiatives in your area?

Probe : strengths, weaknesses, solutions, community's role (current, future, perceived) in process, what should people know

- How does your work involve schools in your area?

Probe : success stories, problems and solutions

HEALTHY SCHOOLS INITIATIVE

- What is your vision for a healthy schools initiative?
- How is the initiative being operationalised in schools nationally? What are the timelines?
- How do you perceive water and sanitation issues to fit into this healthy schools initiative?
- How will education on keeping healthy with regard to water and sanitation be built into the curriculum?
- How can these issues be integrated into the Soul City series?
- What kind of materials would be needed in schools? (water and sanitation as part of broader set of materials – what would the value of materials focussing on this only)

APPENDIX 4: SOCIAL SURVEYS' CAPACITY BUILDING STRATEGIES

INTERNAL CAPACITY BUILDING

Internship programme:

Internships provide training and practical experience for historically disadvantaged people with school leaver or basic university qualifications, who are interested in research but are struggling to enter the job market. Initiated in 1996, the programme allows for the employment of two new interns every 6 months, and aims to equip them with research skills, as well as basic computer literacy, typing and driving skills. Training takes the form of knowledge transfer through mentorship – each intern is allocated to, and supervised by, an experienced Social Surveys researcher, who works closely with the intern, setting manageable tasks and undertaking regular critical review. During the course of the 6-month period, interns are allocated responsibility for specific and varied project components, and therefore also gain experience in working with project teams. To date all interns have been absorbed into the company on completion of their internship. One subsequently accepted a permanent position within the educational research department of the SABC.

Internal training & staff development:

- Fieldworker training: the Johannesburg office has a field force of over 40 interviewers, and employs a full time field co-ordinator who is responsible for the design and facilitation of formal training workshops. These usually take place twice a year, and provide general skills training in interviewing and fieldwork techniques. On occasion, specialists in fieldwork methods are contracted in to conduct training sessions. In addition, fieldworkers are intensively trained by researchers for specific projects. Routine debriefing sessions focus on lessons learnt, and also provide fieldworkers with an overview of project findings, thereby engendering a holistic understanding of the research process. (As a direct result of ongoing training and feedback, six fieldworkers have developed the skills to become supervisors, one has become the field co-ordinator, and - over a period of nine years - one has become a senior researcher in the company.)

- External training programmes: where relevant training workshops are offered by external organisations, the company has paid for researchers & field supervisors to attend. These have included a number of training sessions on qualitative research design and methodology, hosted by SAMRA, as well as various software training programmes (MS Office, SPSS). Feedback sessions allow for broader dissemination of knowledge within the company.

- Skills training: fieldworkers are encouraged to acquire a multitude of skills. Social Surveys has purchased a self-taught touchtyping package and has a designated computer on which fieldworkers can practise their typing and computer skills. A company-owned vehicle is made available for driving lessons, and driving tests are subsidised by the company.

- Interactive development: researchers and field supervisors convene weekly meetings to discuss current projects. While researchers are responsible for specific, individual projects, these meetings provide a forum for sharing, consultation and debate, and are an important learning process for all involved.

CAPACITY BUILDING IN COMMUNITIES

In field training:

It is Social Surveys' policy, wherever possible, to use interviewers who are local to the area in which the fieldwork is being conducted.

- This approach benefits communities through skills transfer and capacity building: Social Surveys has developed a sophisticated methodology for recruiting and training local residents, after which they are issued with a completion certificate to assist them in finding subsequent work.
- The approach also enriches the research: local interviewers have the advantage of a stronger local understanding and sensitivity, and are able to communicate fluently in local dialects.

Although this method is preferred, it is not always feasible: the intensive nature of the training and the need for stringent supervision to ensure high quality interviews, make it more expensive on small, individual projects. However, it has frequently been possible to re-employ trained local fieldworkers for subsequent projects in their areas, and in this way Social Surveys has developed permanent field teams in Port Elizabeth, Cape Town and Durban, and in six localities in Mpumalanga.

Consultation with local leaders:

Research is a sensitive process and can be perceived as invasive. It is Social Surveys' policy to bring local leadership on board before embarking on the fieldwork process within communities. Workshops with local leaders and civics help to eliminate potential political issues, inform the research process, and make leaders partners in the research. Local leaders play an important role in the recruitment and selection of local interviews, in enlisting the involvement of community stakeholders and arranging related income-generating opportunities within the community - such as local taxi drivers for transportation, venues for focus groups, etc.

APPENDIX 5

REVIEW OF KEY ISSUES RELATING TO WATER, SANITATION AND HEALTH

TABLE OF CONTENTS

REVIEW OF KEY ISSUES RELATING TO WATER, SANITATION AND HEALTH

1 INTRODUCTION

This review was requested by Soul City as part of the HEATT/Soul City collaboration on developing materials for a future water and sanitation-related health programme. The review draws on articles and resources gathered during HEATT's initial review of the field as well as additional materials gathered for the purpose. A list of references used for this review is attached. However, it should be noted that this is an 'issues' review rather than a literature review.

The review covers key issues in the following areas:

- Main messages that Soul City 4 could carry
- Policy
- Summary of general issues
- Infrastructure provision, available options and relative costs
- Knowledge, perceptions and attitudes about water, sanitation and health issues
- Lessons from international experience, including programmes in neighbouring states.

1 SUMMARY OF KEY MESSAGES FOR SOUL CITY 4 *(See Appendix A)*

This summary of key messages that appear throughout this review is contained in Appendix 1. It is mentioned here to improve access to the summary.

1 POLICY

There are three main policy documents that apply:

- The 1994 White Paper on Water Supply and Sanitation
- The 1996 White Paper in Sanitation
- The 1997 White Paper on Water Policy (30 April)

In addition there are several guidelines documents that are in preparation. The guidelines pertaining to capacity building and training in community water supply and sanitation projects will be covered here.

1.1 The 1994 White Paper on Water Supply and Sanitation

This is a summary of key principles that this White Paper has adopted. It is based on the RDP principles:

- Development should be demand driven and community based
- Basic services are a human right
- "Some for all" rather than "all for some"
- Equitable regional allocation of development resources
- Water has economic value
- The user pays

- Integrated development
- Environmental integrity.

1.1.1 Development approach

The development approach which guides the policy proposed for water supply and sanitation is derived directly from the principles which underpin the Reconstruction and Development Programme. The need for development to be a people driven process is fundamental to this.

1.1.1 Basic adequate services

Water supply: Basic water supply is defined as:

Quantity: 25 litres per person per day. This is considered to be the minimum required for direct consumption, for the preparation of food and for personal hygiene. It is not considered to be adequate for a full, healthy and productive life which is why it is considered as a minimum.

Cartage: The maximum distance which a person should have to cart water to their dwelling is 200 m. In steep terrain this distance may have to be reduced to take account of the extra effort required to cart water up steep slopes.

Availability: The flow 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.

Assurance of supply: The supply should provide water security for the community. Two factors are important here. First, schemes for domestic water supply should ensure the availability of "raw" water for 98% of the time. This means that the service should not fail due to drought more than one year in fifty, on average. Second, the operation and maintenance of the system must be effective. The aim should be to have no more than one week's interruption in supply per year.

Quality: Once the minimum quantity of water is available, its health-related quality is as important in achieving the goal of a water supply adequate for health. 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. It should also be acceptable to consumers in terms of its potability (taste, odour and appearance).

Upgradability: The desire of many communities to upgrade a basic service to provide for household connections should be taken into account during planning. If this is not done the system could either fail due to illegal connections or have to be expensively upgraded when there is a demand for house connections. Any additional infrastructure required to provide upgraded services will not be considered as part of the basic needs infrastructure.

Sanitation: Policy and practice regarding sanitation provision is relatively undeveloped. Because of the strong linkage between sanitation services and public health, the health sector must play a significant role in all aspects of sanitation policy creation, planning, implementation, and monitoring. Details of this remain to be established.
In the interim, the following guidelines will be followed by the Department.

Adequate sanitation: The immediate priority is to provide sanitation services to all which meet basic health and functional requirements including the protection of the quality of both surface and underground water. Higher levels of service will only be achievable if incomes in poor communities rise substantially. Conventional waterborne sanitation is in most cases not a realistic, viable and achievable minimum service standard in the short term due to its cost. The Ventilated Improved Pit toilet (VIP), if constructed to agreed standards and maintained properly, provides an appropriate and adequate basic level of sanitation service. Adequate basic provision is therefore defined as one well-constructed VIP toilet (in various forms, to agreed standards) per household.

Bucket systems are not considered as adequate from either a health perspective or in terms of community acceptability. They should be phased out over a period of five years throughout the country.

1.1.1 Other infrastructure development programmes

Water supply and sanitation should be integrated into programmes for the provision of other basic needs, in particular, *physical infrastructure* such as water supply, sanitation, roads, electricity and communications, *social infrastructure* including schools, hospitals, clinics and welfare organisations, *economic infrastructure* which is the employment, production and trading base including access to markets and finance and *institutional infrastructure* being organisational and civil administration structures at all levels.

1.1.1 Equity

A fundamental issue to be addressed in the water sector is that of equity, in terms of distribution and access, including financing.

1.1.1 Financing and cost recovery

Until recently, cost recovery policies in the water supply sector world-wide were dominated by a view that is now recognised as outdated. The thrust of the programmes was based on the premise that neither rural nor peri-urban communities could afford to pay for services. An insistence that disadvantaged people should pay for improved water services may seem harsh but the evidence indicates that the worst possible approach is to regard poor people as having no resources.

The policy of Government is thus that services should be self-financing at a local and regional level. The only exception to this is that, where poor communities are not able to afford basic services, Government may subsidise the cost of construction of basic minimum services but not the operating, maintenance or replacement costs. Such basic service grants will be provided, as far as possible directly to the local authorities or Local Water Committees.

Financing and tariff structures must ensure viability, efficiency and sustainability.

Sliding tariff scales: In accordance with the principle that water has an economic value, the policy of sliding tariff scales is endorsed by the Department of Water Affairs and Forestry.

The basic approach identifies three separate tariffs:

A life-line or social tariff: This is to cover basic human needs. The quantity shall not exceed 25 litres per capita per day. The tariff shall be set so as to cover only the operation and maintenance costs.

Normal tariff: This is for normal use. The quantity shall not exceed 250 litres per capita per day and shall be provided at cost (operation and maintenance plus capital) including the losses incurred through the life-line tariff.

Marginal tariff: Water consumption exceeding 250 litres per capita per day will be charged for at marginal cost defined as the present day cost of the latest or next augmentation scheme.

1.1.1 Household and individual responsibility

Sanitation is a very private matter. Unless the individual and the household are committed to the success of a health and sanitation programme, little will be achieved. Communities seeking public subsidies for the capital costs of household sanitation need to demonstrate widespread individual household support which will have to include a contribution to the cost of service provision.

1.1.1 Labour based approach

Sanitation improvement programmes, especially those promoting on-site systems, have considerable job creation potential through the use of local materials, products, suppliers, and contractors, and the use of labour-intensive techniques. Such programmes will be supported by the Department in conjunction with the National Public Works Programme.

1.1 The 1996 White Paper on Sanitation

This White Paper includes a clear emphasis on health and hygiene education and promotion and makes the inclusion of health education and promotion a clear requirement in the water and sanitation sector, as the following shows:

> **Sanitation Is About Health**
>
> The major aim of national sanitation policy, and any consequent programme, is to contribute to improving the health and quality of life of the whole population. At present, significant investments are being made in the provision of safe water supplies for all. However, the health benefits that could result from this will be severely limited if adequate attention is not paid to sanitation.
>
> Furthermore, experience from national and international water and sanitation programmes has shown how essential it is to link water supply and sanitation with health and hygiene education. Only when all these are in place will real and lasting health benefits follow.
>
> The aim of health and hygiene education and promotion policy is to:

- raise awareness of the diseases caused by unhealthy behaviour and practices;
- support and provide health and hygiene education that will enable people to improve their health through correct hygienic practices;
- lead to an increased demand and willingness to pay for appropriate sanitation facilities.

Health and hygiene education and promotion:

- must be an integral part of all community sanitation projects and community water supply improvement projects;
- strategy will be drafted by various departments dealing in health, hygiene and infrastructure provision. A task team for this purpose will be chaired and co-ordinated by the Directorate of Environmental Health of the Department of Health, and operate under the auspices of the National Sanitation Task Team...;

(Extracts compiled from page 6 of the National Sanitation White Paper: RSA, 1996)

1.1 The 1997 White Paper on Water Policy

1.1.1 Key proposals

The 1997 White Paper on Water Policy makes it clear that the objective is not just to promote equity in access to and benefit from the nation's water resources for all South Africans, but to make sure that the needs and challenges of South Africa in the 21st century can be addressed.

The essence of the key proposals made is a restriction of the widespread general rights to water that people have enjoyed until now, towards a more equitable distribution of water rights, including environmental rights. Extracts from a lengthy list of key proposals which will guide water management in South Africa in the future follow (important amongst these are new financial arrangements):

- The status of the nation's water resources as an indivisible national asset will be confirmed and formalised.
- Only that water required to meet basic human needs and maintain environmental sustainability will be guaranteed as a right. This will be known as the Reserve. All other water uses will be recognised only if they are beneficial in the public interest.
- These other water uses will be subject to a system of allocation that promotes use which is optimal for the achievement of equitable and sustainable economic and social development.
- The riparian system of allocation, in which the right to use water is tied to the ownership of land along rivers, will effectively be abolished.

- To promote the efficient use of water, the policy will be to charge users for the full financial costs of providing access to water, including infrastructure development and catchment management activities. This will be done on an equitable basis and according to the realistic reasonable programme which has already been begun.
- To promote equitable access to water for basic human needs, provision will also be made for some or all of these charges to be waived.
- All major water user sectors must develop a water use, conservation and protection

policy, and regulations will be introduced to ensure compliance with the policy in key areas.

1.1 DWAF's guidelines for capacity building and training

This document (DWAF, Draft: April 1996b) is still in process, and it covers only water supply projects. A document covering sanitation projects is still to be developed. The central issue that this document covers that relates to this review is an attempt to incorporate health education more integrally into the project cycle. Regarding capacity building issues, the document adopts a number of sound principles such as sustainability, participatory approaches, and accepting that local resources, expertise and perceptions exist within communities and that capacity building and training need to acknowledge and build from these.

Although in broad perspective the document acknowledges the health promotion view (see extract below), current thinking is that this draft of the document, in order to be effective within the existing constraints and perceptions, should be kept narrow for the time being. In this regard it does not make provision for implementing a health promotion approach, in practice, nor does it promote an intersectoral approach regarding health.

The major new development in this document is the move away from a project-based approach to a programmatic or area approach. This lays the foundation for an inter-sectoral approach within a region or area, which is now an accepted principle within DWAF.

The health promotion comment above refers to the following extract which is included near the beginning of the document as a "principle underpinning capacity building":

> Water and sanitation are ultimately primary health care issues and should not be dealt with in isolation of this principle. This includes the concept of health promotion that aims at promoting health through improved access to resources. These include health resources such as clinics, medical personnel and medicines as well as socio-economic resources such as education, water and food supply. Health promotion therefore focuses on creating the enabling and supportive environment that people need to make critical choices for health.

1 SUMMARY OF WATER-RELATED DISEASES *(See Appendix B)*

This summary of water-related diseases and their main transmission routes is based on work done by Genthe and Seager et al. (1996) and von Schirnding, Yach and Mathee, (1993). It is contained in Appendix 2. It is mentioned here to improve access to the summary.

1 IMPACT OF WATER AND SANITATION-RELATED HEALTH PROBLEMS

Statistics of mortality and morbidity resulting from water and sanitation-related disease do not adequately reflect the full impact of these diseases. The following list attempts to give this fuller picture of impact:

- Collecting water is "women's work". Women can walk between and hour and two hours everyday expending great physical energy in the task of collecting 60 - 80 litres of water per day. This is time lost to other productive activities. This is also exhausting, physically damaging, and has to continue regardless of sickness, weather,

having young children to care for or being pregnant.

- Collecting water can be dangerous - human and other animals are known to attack women in isolated places while collecting water.

- Children who are sick from diarrhoea are less able to contribute to household chores (schoolchildren have been measured in one study to collect 36% of household water during the week and 48% on week-ends). Sick children also need care themselves - extra work for women, and additional time and financial cost.

- Children who get sick with diarrhoea on average suffer 5 episodes per annum. This represents a major setback in terms of physiological and cognitive development, and reduces energy and concentration levels at school. The overall impact of this on society's well-being and a developing country's economy must be enormous considering the huge numbers of children who are "diarrhoea statistics".

- Water and sanitation-related parasitic infections are also prevalent and while these generally do not cause death, are responsible for major impacts on development and energy levels as mentioned above.

1 WATER

1.1 Rural areas

Fetching water - This is women's work, and its costs are well-documented: hours lost for possible other productive activity, the physical effort causes exhaustion as well as back, neck and pelvic deformities. There are other threats: dangerous animals such as crocodiles, hippopotami, helminths, schistosomes; also sexual harassment, rape. Positive effects of water collection relate to the social function of communal water collecting. A higher incidence of individual water supply implies a loss of this important social function.

Low levels of access to water, water quality vs quantity: Where people have low levels of access to water it is used mainly for drinking and food preparation only. This is exacerbated by the effort that women have to put into collecting it - they are not likely to allow that water to be used for much more than drinking and food preparation purposes. Reduced amounts of water for other purposes leads to water washed diseases in the main - eye infections, skin infections, bacterial re-infection from hands. An important lesson learned is that ***most diarrhoeal disease is not water-borne;*** *the corollary is that provision of clean water alone has little impact on the prevalence of diarrhoea.* In reality, diarrhoea is probably transmitted on the hands and utensils, either directly (e.g. rotavirus) or by contamination of food, which provides an excellent culture medium for many pathogens.

The importance of water quality has been and still is over-emphasised in water supply programmes. This fails to take into account the realities of water use and is often at the expense of a stress on water quality and the need to encourage hygienic practices. Too much significance is placed on the finding of (usually relatively low numbers) faecal indicator bacteria in small water supplies. These bacteria are not themselves necessarily pathogenic, and should rather be recognised as markers of environmental faecal contamination. In the

case of water becoming contaminated during storage. this is because of faecal contamination of hands and utensils.

Water purity: Most natural sources of water are polluted in some way. This leads to potential bacterial or parasitic infections. Proper sanitation management could reduce one source of water pollution. Water source protection (e.g. fencing wells or springs) keeps livestock out and attendant pollution of various sorts. However, an emphasis on water purity could be misplaced effort when many people have developed certain levels of immunity and where having access to adequate quantities is a prior requirement. However, where there is adequate access, then the quality issue begins to take on greater priority.

An interesting case study describing responses to the typhoid epidemic that broke out amongst Rwandan refugees is that while so much WHO and other aid went into supplying Oral Rehydration Solution (ORS), in fact, if local level training around home remedies had been adequate, people could have reduced mortality considerably by making cereal based gruel from the local lake water, contaminated as it certainly was (Werner, D and Sanders, D. 1997).

In spite of the above, water purity is important for young children, so child health is a special case. See sections below on nutrition and dietary management.

Priority issues regarding water: Access to adequate quantities is more important than access to adequate quality.

1.1 Urban areas

Access to adequate supplies of water is the critical health related factor. This equates to access to a stand pipe (as minimum) within 20 - 30 metres of home). Beyond this distance, access to water has reduced health improvement potential. In an informal settlement in Gauteng one study found that 72% of households use less than 20 litres per person per day. (Average = 18 litres pppd in an informal settlement). In particular, access to water close to the latrine (e.g. a tap attached to the outside of a latrine); or access to a source of water for washing hands easily (e.g. a large bowl of water outside the classroom or in the home) appears to be one of the single most effective measures to reduce faecal-oral re-infection. A drawback of the communal bowl option is cross-infection, but this risk is preferable to not having easy access to water for handwashing at all. This relates to the next point.

Handwashing, defecation and food handling: It was found in a study in an informal settlement in Gauteng, South Africa that women tend to wash their hands more often after using the toilet than they do before preparing food (Westaway, 1997). (This directly contradicts a study conducted in rural Zimbabwe, possibly because in the South African case, women had easier access to a tap.) The connection between defecation and health is more clearly known than between defecation and food preparation. In this country and others, much energy is put into emphasising water purity, boiling etc., but water as such as is not nearly as nutrient rich a culture medium for bacteria as food. Yet this connection is not emphasised in many health education efforts.

Water handling: High quality water is no guarantee of health unless it is available freely

within the home, in which case it is also available in adequate quantities. Re-infection of stored water is a common occurrence through dirty storage containers, dirty scoops, re-infection of stored water through direct human contact or lack of adequate covering of water containers. Stored water is unlikely to be used freely for washing where access to water is a problem, therefore, again, access to quantity is a greater priority than access to quality water. At the time of writing no information had been sourced about recommended types of containers and methods of cleaning them.

While there is awareness about not using containers that had previously contained hazardous substances, there is apparently little awareness about microbial contamination during water cartage and storage. Containers that are robust and have screw tops are preferred over bucket containers whose lids can pop off during rough handling (e.g. transport in a wheel barrow), but cleaning a screw top container is not as easy. At this point it can be stated that sterilisation with Jik is the most convenient way of properly cleaning a water container, but that this is not likely to be taken up for cost reasons as well as the low levels of awareness of microbial contamination. This is an area requiring its own research.

Health-related design criteria: Water supply projects tend to be dominated by engineering considerations - reticulated water supply systems in particular require a fairly high level of engineering design to ensure pipe diameters, flow rates, water pressure etc. is adequate. This is emphasised because a water system is one complex entity. Thus engineering considerations tend to dominate. Regrettably, health-related design criteria, although well documented, tend to be ignored by engineers, whose task is to provide high quality water within a minimum of 200m of the home (the RDP minimum standard). It is a common experience that engineers regard health issues as someone else's domain. Thus, for example, stand pipes are not provided with adequate paving around them nor with adequate drainage away from them. The health hazards represented by multiple uses of water from a single stand-pipe (e.g. clothes washing, food washing and preparation, personal hygiene and water collection) where surplus water does not drain away are a frightening cocktail.

Financial considerations: A rural village system tends to be based on an independent, village-based source, e.g. a diesel pump from a river to a reservoir to a piped distribution system. This allows for a sense of ownership of the resource as well as the operations and maintenance of such a system, including setting a household levy and collecting the levy.

Where water is provided by a local authority from a more distant source, the situation changes enormously. Ideally, each person should pay for their water. However, many water supply schemes do not charge each user according to consumption, but often according to a flat rate, if at all.
Thus a particular community becomes a monolithic consumer - supply and payment is a communal matter. This makes it difficult to provide an individual service and to charge the individual according to consumption. It also means that each individual is tied into the communally agreed level of supply. For example, one stand-pipe for eight homes. This situation lends itself to individuals tapping into water pipes using readily available plumbing devices, and thereby gaining themselves a free individual service. And from the individual's perspective, isn't a stand-pipe in my yard a bare minimum, a basic right? From the health perspective, one cannot disagree.

Supply capacity of a water supply system: A further implication of the above is that a system may have been designed to supply a certain number of outlets with even a

comfortable surplus potential designed in. Where individuals tap off water in an unauthorised way, the supply capacity of a system is overstretched, leading to further technical problems and attendant social difficulties. Many water supply schemes that are designed on communal assumptions have fallen foul of these problems.

A centrally-planned water supply system should, in fact, always be planned for greater off-take than is required in the immediate term, but individualised supply, whether legal or not, regularly causes problems with flow rates. Much work is presently being done to address this, for example installing header tanks in homes that can trickle-fill over time, yet still provide adequate pressure and flow rates.

Summary for rural and urban: Access to adequate quantity of water is more important than access to quality water. Where water is not available directly from a tap, storage is needed and washing (personal hygiene) is jeopardised. Re-infection of water thus becomes an issue. Keeping water clean after it has been collected is a key focus (clean containers, covering water containers, using clean scoops etc. Not directly water-related, but relevant, especially as food is a far more nutrient rich medium for bacterial growth, is food management. This illustrates that high quality drinking water is not actually a major issue in its own right and that the strong emphasis in this country on boiling water before it is consumed is possibly misguided, except in the case of babies. Hand-washing before preparing food, implement-washing, raw food storage and covering are important domestic hygiene issues (food covering to prevent faecal coliform infection from flies).

1.1 Water supply options

House connection:

- Piped water supply to taps inside the house
- Metered water use

Advantages:

- Taps are inside the house
- More than one tap can be connected
- Appliances can be connected
- Personal and domestic hygiene not restricted by water supply

Disadvantages:

- High initial and ongoing costs
- Requires wastewater disposal system
- Greater water use increases impact on environment

Yard tap:

- Piped water supply to a tap standing outside the house
- Metered water use

Advantages:

- Generally uses less water than house connection
- Less water use reduces environmental impact

Disadvantages:

- Water has to be carried in from outside
- Requires wastewater disposal system
- Increased barriers for personal and domestic hygiene.

Yard tank:

- Water tank on site which is filled by a piped network or rainwater from gutters

Advantages:

- Generally uses less water than house connection
- Less water use reduces environmental impact
- Can reduce water demand during peak hours

Disadvantages:

- Health risk if tan stands open for periods of time
- Inconvenient if tank is not filled regularly
- Water use is partially constrained
- Increased barriers for personal and domestic hygiene.

Public water tanker:

- Delivery of water by tanker
- Water delivered to on-site containers or collection points

Advantages:

- Option in case where there is no piped water network

Disadvantages:

- Ongoing costs high
- Water can be expensive for people to buy
- Water has to be carried into the house from outside or from a collection point
- Greatly increased barriers for personal and domestic hygiene.

Public standpipe:

- Piped water supply to a street tap which is shared by a number of users
- Non-metered water use.

Advantages:

- Low initial cost per household
- Easy to operate and maintain
- Less water use reduces environmental impact

Disadvantages:

- Inconvenient as water has to be carried over long distances at times
- Time-consuming if queuing is required
- Lack of individual ownership can lead to water wastage and difficulty in collecting tariffs.
- Greatly increased barriers for personal and domestic hygiene to a point where this intervention *may* have no direct health benefits.

Natural water source:

- Spring, river, dam, well, depression etc.

Advantages:

- Can provide high quality water within short walking distance

Disadvantages:

- Usually low quality, polluted water
- Usually requires long walk and effort to fetch
- Can pose health risk and exposure to potential sexual harassment.

1.1.1 Preferences and suitability of options

In all cases, access to a household tap is preferred. In urban areas pressure exists for at least one tap inside every home that is the subject of upgrading. From a health perspective, anything less than a tap very close to the home, if not a private tap begins to lose its value. Balanced against cost realities, the RDP *minimum* standard of piped water within 200m of every home (which means that most homes around that tap will be closer) is a fair compromise, given the great distances involved in collecting water for many. But the health perspective regarding access to adequate quantities as the priority cannot be overlooked. The state's commitment is to provide all with 25 litres of high quality water within 200 metres of their home. Individuals are free to supplement this with other sources of supply either by fetching it, or by paying for a higher level of service. There are financing systems in place to assist with this, but there is no subsidy beyond the basic level. Thereafter it is a strictly "user-pays" policy.

1 SANITATION

Sanitation refers to all forms of waste management, including waste water, refuse removal, street cleaning and the like. It has tended to be taken as referring to sewage removal and management, as well as toilet facilities. In this instance we will perpetuate the error and restrict ourselves to matters regarding human faecal waste and its removal.

1.1 Rural areas

Traditionally, use of the open veld has been the accepted and acceptable form of sanitation in rural areas. Given low population densities, as well as various social taboos, this has been adequate. With major changes in rural population in terms of increased densities mainly, traditional sanitation practices have become less adequate from a health point of view. However, even in the past, flies and domestic animals were still sources of infection from faeces that had been poorly covered and this is still a problem. Further, faeces disposed of on the ground are washed into water bodies when it rains - direct infection of communal water supply in this way is common.

Although in many rural areas this form of sanitation is still fairly common, the use of pit latrines is also becoming more widespread. Unfortunately, many of these are **unimproved pit latrines**, and even where VIPs are apparently in use, one finds that they are inadequately constructed. In addition, pits are not always located appropriately, so pollution of underground water is also a problem.

Financing and construction issues: Although water borne sewerage is held out as the ideal, the VIP latrine is the minimum standard being promoted for South Africa. Unlike water supply, VIP toilets are low tech, individual and localised structures. They are ideally suited to self-build approaches and not wildly out of reach of many families financially, although there is much debate about how large a family subsidy should be. Current policy in South Africa is for rural households to receive R600 towards constructing a VIP. (A VIP latrine can be constructed properly for between R1000 and R1500.) Again, unlike water supply, a VIP does not require much in the way of communal decision-making about construction, nor about financing and fee collection systems. All of these mean that constructing VIPs is both less complex, but more difficult because it requires a decision to be made at household level, rather than at community level. This is separate from the issue of water being far more demand-driven than sanitation.

Ground water pollution in this context takes two main forms. Faecal coliform pollution is less common than imagined as, depending on flow rates and distances to ground water, bacteria often die before infection takes place. However, nitrate enrichment of ground water is more common, leading to the so-called "blue baby syndrome". In many parts of the country (mainly the arid areas), this is a far greater concern. It is also a concern in built-up areas that still rely on pit latrines (e.g. informal settlements.)
A further problem relating to **unimproved versus VIP latrines** is that across the country, a corrugated iron structure for an unimproved pit latrine can be bought as a kit or ready made. This mitigates against the adoption of VIP technology. This issue raises strong feelings amongst those promoting VIPs and various suggestions of an economic mechanism to discourage shop owners from selling such structures have been suggested.

1.1 Urban areas

Some urban issues, mainly relating to increased density in areas using pit latrines have already been made. Additional issues follow:

Children tend not to use pit latrines: This is reinforced by a widespread belief that children's faeces are not harmful. Thus children's faeces are commonly not covered. It is also widely asserted that children are frightened of the dark hole of the toilet seat, and fear falling in. This is probably correct, but other issues such as the lack of concern for ensuring that children use toilets probably play a role.

In many cases in both informal settlements and more formal areas where pit latrines are used, a large percentage of children do not use the toilet, but often go behind it or at the side of the house.

In areas where pit latrines are used, they are often placed too near to water sources.

1.1 Sanitation options

Full-flush toilet:

- Toilet connected to sewer network
- Toilet flushes by cistern

Advantages:

- Low health risks
- Water seal reduces smell
- No concern for waste after flushing

Disadvantages:

- High initial and ongoing costs
- Requires piped water supply
- Increases water use
- Environmental impact is serious if waste water is not properly treated.

Intermediate flush toilet:

- Toilet connected to sewer network
- Toilet flushed by a cistern using less water

Advantages:

- Low health risks

- Less water used in flushing
- Water seal reduces smell
- No concern for waste after flushing

Disadvantages:

- High initial and ongoing costs
- Requires piped water supply
- Increases water use
- Environmental impact is serious if waste water is not properly treated.

Aqua-privy:

- Toilet connected to an on-site septic tank and either a soakaway or sewer
- Toilet flushed by a cistern using little water.

Advantages:

- Piped water supply not necessary
- Moderately low health risks
- Water seal reduces smell
- Uses little water

Disadvantages:

- Requires piped water supply or supply has to be carried
- Regular septic tank emptying is required
- Soakaway blockage can pollute groundwater and be a health risk.

Pour-flush toilet

- Toilet connected to a covered on-site pit
- Toilet flushed by bucket

Advantages:

- Low initial cost
- No piped water required
- Water seal reduces smell
- No off-site sewers required

Disadvantages:

- Flush water has to be carried
- Regular pit emptying is necessary
- Soakage from pit can pollute groundwater and be a heath risk.

VIP latrine:

- Toilet is directly over an on-site pit
- Toilet is not flushed
- Air flow is up vent pipe with a fly screen on top.

Advantages:

- Low initial and ongoing cost
- Better ventilation and fly control than conventional pit latrines
- No off-site sewers required
- Should not smell
- Has health benefits over unimproved pit latrine - fly control and greater usage
- Can be the preferred option in arid areas even in urban settings.

Disadvantages:

- Toilet has to be outside the house
- Regular pit emptying is necessary (3-5 year intervals)

- Soakage from pit can pollute groundwater and be a health risk
- Difficult to upgrade to flush toilet.

Unimproved pit latrine:

- Toilet is directly over an on-site pit
- Toilet is not flushed

Advantages:

- Low initial and ongoing cost
- No off-site sewers required

Disadvantages:

- Toilet has to be outside the house
- Regular pit emptying is necessary (3-5 year intervals)
- Soakage from pit can pollute groundwater and be a health risk
- Difficult to upgrade to flush toilet
- Strong smell

Bucket collection:

- Removable bucket placed below a toilet seat
- Buckets emptied into collection trucks.

Advantages:

- Low initial cost

Disadvantages:

- High ongoing cost
- Requires frequent and regular truck collection
- Potential health hazard to users and collectors
- Has no control of smell or flies
- Cannot cope when numbers of people gather for a function.

No facility - open veld:

Advantages:

- No financial cost
- Accessible to all

Disadvantages:

- Unsafe
- Unhygienic
- Can cause direct pollution of surface and groundwater
- Major source of re-infection (flies, dogs, pigs, children's faeces)

1.1.1 Preferences and suitability of options

Urban:

Where piped water is available, then some form of flush toilet is always the preferred and recommended option in urban areas. The demand for this option is usually very strong, even where it may not be a viable option. The only real occasion when an alternative would be considered is when affordability becomes an issue, or in some cases where environmental conditions dictate alternatives.

Arid environments - low water-use toilets or VIPs are recommended, although not always

found acceptable, because in some cases piped water *is* available (e.g. in some Northern Cape towns), but in insufficient quantity.

Population density - generally, pit latrines are not suitable for high density areas because the soil capacity for absorbing the volumes of liquid and for bacterial decomposition to take place is exceeded. In most urban areas VIPs are, in fact, technically acceptable but not from a social point of view. For these reasons, the standard for urban areas is flush toilets of some form wherever possible.

It should be noted for both rural and urban conditions that septic tank systems are acceptable from a technical perspective and should be considered as a viable alternative where on-line sewerage systems are not available.

Groundwater pollution: Where VIPs will cause groundwater pollution they become unacceptable in urban (and rural) areas.

Cost restrictions - Inside flush toilets are expensive. Slightly lower cost urban options are outside flush toilets built on a site-and-service basis, VIPs or aqua-privies. However, aqua-privies are generally not recommended. The key criterion here is that the technology should be robust and require as little maintenance and servicing as possible.

Rural:
Flush toilet systems are generally not feasible for rural areas and the recommended minimum standard is the VIP toilet, except where environmental conditions prevent this. As stated before, septic tank systems are also viable options and are robust and reliable, given certain minimum conditions of use.

High water table: Pit latrines can create major problems, so sealed tank systems or aqua-privies are recommended if piped sewage systems are not available.
Cost restrictions: If environmental conditions permit, then VIPs are by far the recommended option and these are the minimum and promoted standard in most rural sanitation projects.

Financing issues
The current policy on subsidies for sanitation is that each household in a community sanitation project qualifies for a subsidy of R600 for sanitation. This can be used for a variety of options as long as they are considered viable (e.g. VIP toilet, septic tank system).

This applies mainly to rural areas, as the Department of Housing's subsidy applies to urban areas, where a maximum of R15000 is made available to each household for housing, of which R3500 can be used according to the individual household's decisions, the rest often being pooled and used communally for bulk infrastructure.

1 KNOWLEDGE, ATTITUDES AND BEHAVIOUR

First, not a lot of research exists about beliefs, perceptions and practices in the water and sanitation sector. This is an identified gap in the HEATT national review and is beginning to influence subsequent work, although on a limited scale as yet (e.g. UWC's Public Health

Programme's school sanitation focus (Dr Khalipha Bility) that is now being conducted from a number of universities in the country; and the Gauteng Integrated Schools Sanitation Improvement Programme that is conducting perceptions research before developing an educational programme.

1.1 Behaviour change issues

The HEATT report goes into this issue at some length, and the point is implied strongly enough earlier in this review. However, the behaviourist logic informing much behaviour change work in this sector is so ubiquitous that it is necessary to make a separate case. **It is now a quite clear and widely supported position that knowledge, attitudes and practices *are not directly or causally linked.*** Therefore, to provide knowledge in the hope of changing practice is close to futile if that is the *dominant* strategy (of course knowledge is important in making decisions about health issues). Nevertheless, so-called KAP (knowledge, attitudes, practice) studies abound. There is nothing wrong with understanding people's perceptions or their attitudes. The point to be made relates to the theoretical framework this fits into and what assumptions are being made about human behaviour and behaviour change.

Current thinking is that behaviour is far more contextually determined than attitudinally or by knowledge. And behaviour change cannot be an outside-in procedure, but an inside-out process that occurs within a participatory and interactive environment. "A socially interactive process within a participatory, facilitated problem-solving process". Further, a supportive environment for behaviour change and to sustain new behaviours is required. Again, a contextual argument.

This echoes the health promotion perspective as well as many in the mass media who insist that the mass media *on their own* are unable to bring about the desired changes, but that so-called "face-to-face" activities are necessary.

1.1 Specific knowledge, attitude, perceptions and practices findings

This review is permeated with understanding gained from such studies. However, a summary of more specifically identified issues is presented here.

The role of women: Most child health care is undertaken by women, mainly older women. They make the decisions about health care. Thus health care strategies need to target such women and to acknowledge their considerable traditional wisdom. However, usually women, even matriarchs, do not hold the purse-strings, so gender relations need to be included. This is an argument in favour of family-based health education. It is also an argument, ahead of its time in South Africa, for a community-based health worker model, as such women were identified as a cost effective ideal in such a role. International studies show consistently that older women are the best type of person to employ as a community-based health worker: "What weight do the words of a young man carry when he tells women they should chase the chickens out of the kitchen and empty and clean their water jugs daily?"

Recourse to traditional and western healing: It appears, except in remote areas, that most people have adopted a composite (not dualistic) approach to their recourse to sources of health care when it relates to "natural" illness. In such cases a combination of home herbal

remedies, an inyanga or herbalist and/or a western source of help (often a clinic) will be consulted. If there is a spiritual dimension to a problem, then a diviner or traditional spiritual healer will be consulted and western sources of health care are far less likely to play a role. In many cases this is not a problem. However, where a spiritual cause of a health problem is identified for a directly "medical" problem, this becomes an area of concern. In this case, "inyoni" is a major issue (see below).

Inyoni: When a child is born, if the mother hasn't followed certain practices or has perhaps been promiscuous during child-bearing, then the child may be cursed and the spirit/inyoni can enter the child through the fontanelle. Evidence of inyoni is poorly formed stools: diarrhoea. The child must be taken to a sangoma who will perform a ceremony to chase away the inyoni. Treatment by the sangoma focuses around the head. Follow-up care is to de-toxify the body by refusing liquids. A westerner would regard inyoni as diarrhoea whereas from a traditional African perspective, there is a distinction between the two, and inyoni has to be treated by traditional methods. Often recourse to clinics occurs at a very late stage, and if a child in such a situation dies it can be taken that western methods caused the death.
Just as inyoni enters through the fontanelle, so too can royalty. Apparently it is a good sign if a certain kind of snake coils itself around the head of a baby born into a royal family. It is interpreted as the ancestors entering and imbuing the child with royalty. (See "Water snakes", below).

Use of enemas: In addition to refusing liquids, a common practice is to flush out the child by administering enemas. This adds to the loss of fluids from the child's body, but it is consistent with the idea of de-toxifying the body.

An important point here is that throughout the world de-toxification through fasting or starving is common and practised even by thorough westerners.

Instead of rejecting the traditional healers' involvement in treatment of inyoni through de-toxification through administering enemas and refusing liquid, a recommendation is to show that the body is in fact already trying to de-toxify itself and the traditional healer should prescribe additional liquids to assist the body in its process of flushing away the inyoni. This works *with* traditional practice rather than aggressively against it.

Sources and cure of helminth infections: In a study of worm infections (Kvalsvig, JD; Preston-Whyte, EM and Mtshali, T, 1990) women had some correct and some alternate conceptions about how people get worms. Mostly, the incorrect understandings related to the fact that fruit often has worms, so eating fruit could give one worms. An understanding of the parasite/host relationship is put forward as a possible solution to this alternate conception.

Women in this study knew that accurate dosage was required and that some herbal remedies were potentially dangerous. However, based on lack of knowledge of the parasitic nature of worms, they did not distinguish between herbal remedies which at an empirical level certainly were observed to remove worms from children, and western treatments that are able to eradicate worms effectively.

Standardised educational material/generalised messages: There is substantial evidence that standardised materials can create misunderstandings because they do not take local

perceptions and contexts into account. In one study (Kvalsvig *et. al.*, 1990), although two communities were only 50 km apart and belonged to the same language and cultural group, they showed significant differences in knowledge about and perceptions towards health issues.

Rural attitudes towards water sources: A Swaziland study (Green, E. 1982) suggests that attitudes towards water does not distinguish between "safe" water and the taste of the water. Taste is generally the dominant criterion for selecting water sources. However, borehole water, which is a "safe" source, was regarded poorly because of its taste. Only where it is easily accessible is it preferred over other sources. Apart from tap or standpipe water (42%), river water (16%) and unprotected springs (16%) in Swaziland were regarded as the healthiest sources of water. Contamination with animal faeces was readily recognised as a problem, far more than contamination with human faeces.

A detailed anthropological study in the former Transkei (Palmer, R. 1996) shows that people use multiple sources of water, and know the various qualities of the sources, eg sweet water for drinking and beer making, sour water from groundwater sources (as in the Swaziland case) was avoided as far as possible, dirty water was from dams and unprotected springs was used for washing where adequate supplies of (visually) cleaner water was not available.

In one village, during a severe water shortage, some people were prepared to walk the 15 km round trip to buy sweet water for drinking purposes rather than rely only on local sour and dirty water. For other purposes women required only that the water was "clean".

The study showed that women especially were aware of water quality and health and were restricted in their ability to avoid problems mainly by their physical and financial capacities to secure pure water.

Respecting the water source: In a story about the life of Katie Makhanya it is reported that it is disrespectful to drink directly from the river. Instead a hole should be dug in the river sand at least a body-length from the water's edge, and water that filters into the hole can be drunk. This suggests a very practical means of filtering water. It was observed that people who followed this custom were sick far less frequently than others.

Seasons and water quality: In the Transkei study seasons were related to when water of various qualities was available, rather than the passage of time. There were three seasons: summer, winter and drought. Those with the resources to obtain sweet water from elsewhere could enjoy "summer" all year round. Others endured their own poverty-induced year-round 'drought'.

Traditional beliefs about water: In the Transkei study, people used the "blanket of the frog" (an algae layer on the dams) as a sign that they should leave the frogs undisturbed and go elsewhere for water.

The close association between water and the ancestors means that people regard the larger bodies of water in particular, with great respect, especially where the *Typha capensis* reed grows, as this hides the home of the ancestors. (Reeds also hide predators and potential human aggressors). Water creatures too are given great respect and are not removed or

harmed for fear of retribution from the ancestors. Thus women or children prefer to collect water in groups and greatly fear collecting water after dark. No one with a sore or open wound should go near such water sources and many diseases such as scabies which are prevalent in the area are believed to be a punishment from the ancestors for some transgression of water-related observances. Groups of water collectors also prefer not to spend too long at the water source and will leave the area directly.
All of the above taboos can easily be linked to practical and effective water resource management practices. It has been found that such beliefs persisted into apartheid betterment villages and informal peri-urban settlements.

The concluding comments to the Transkei study, having shown from laboratory tests that the water was generally far below acceptable standards, was that the practices in place were effective in protecting people and that "biologically, as well as metaphysically-speaking, their ancestors have been protecting them".
Water snakes: There is no single belief about snakes in water. The Transkei study reported above refers to many of the issues here without invoking snake creatures at all. However, generally, snakes seem to play a role with regard to the ancestors or the spirit world. Most water bodies are believed to have spirit snakes in them, mainly deeper pools (note the similarity in the Transkei study), so fear of such places is common, especially when it is known that a large snake lives there. A practical result of this is that people would avoid dangerous places and thus avoid drowning. However, a more important issue is that people also respect all life in that part of the river and tend to avoid the area, because catching fish or squashing frogs etc. would anger the snake, inviting retaliation. This may be interpreted as a form of traditional belief that has sound environmental management as a consequence.

People who become traditional healers are often called to rivers by voices that they hear. They disappear sometimes for many months. There is well-documented evidence reported from some such healers that they go under the water and live with "water people" who are serpentine in nature and train them. It appears that these creatures are probably not the ancestors themselves. When the healers return they have the gift of traditional healing.

Boiling water: In the Swaziland study, almost 84% replied "No, never" in response to a question about whether they boiled water. This in spite of the fact that the "expected" answer might have been given. Reasons given were the "flat" taste of boiled water and the inconvenience. It was clear too, that many were unconvinced by the arguments for boiling water
. The only significant compliance was during a cholera epidemic, but the practice dropped off soon after concern about cholera waned.

Linking handwashing to diarrhoea: It appears that most people do not make a direct link between handwashing and the fact that they have diarrhoea. A more common response is "What have I eaten", which is probably correct, but it may well have been the person who handled the food who had not washed their hands. The point to be made is that the "germ theory" of health education may be working against this indirect link.

Water handling and consumption: Most water is fetched by women or girls, most do not walk more than 15 minutes away (42.6 < 15 minutes; 27.7% walk 16 - 30 minutes), and most use plastic containers - closed 20 litre drums (45.8%) or open buckets (35.6%). Water consumption per person per day was estimated at 6.6 litres, which is very close to the rural Lesotho figure of 6.5 litres (Blackett, I. 1988).

Most people covered open storage containers, used scoops to remove water from the container and claimed to clean them on occasions. In Lesotho, fieldworkers observed scrupulous levels of cleanliness, including regular sweeping of homes and yards, covering of water containers and food with various materials, including lace doilies with beads around the edge. This may be taken as a positive practice that could be built upon in the Soul City materials.

Predictors for "correct" responses: In the Swaziland study, the most reliable predictor of "correct" responses was level of education of *anyone* in the home, followed by level of education of respondents themselves, which tended to be greatest in the younger age group. There was a negative correlation between "correct" response and being head of household.

Gender and water fetching: It is well known that fetching water is women's work. In particular, though, the responsibility for supplying the *household* with water falls to the eldest woman. Responsibility for supplying the village or community falls to the headman. This responsibility is focused mainly in ensuring that livestock receive water. In the Transkei study it was found that few measures had been taken to conserve or manage water supplies, the reason being probably that women, for whom water is the main interest, were not the main decision-makers as far as community-water supply is concerned. This goes further to explaining perhaps why dam or pump maintenance is a low priority, why livestock contamination of dams continues and why protection of access paths to the dam and the erosion surfaces around dams is neglected. ("I cannot tell the men how to herd the stock").

Children's faeces: It is well-known that children's faeces are widely not regarded as being harmful. Accordingly, the inclination to ensure adequate sanitation practices amongst children is reduced.

1 HEALTH AND NUTRITION IN RELATION TO CHILDHOOD DIARRHOEA

The point needs to be made more explicitly that in terms of water and sanitation, diarrhoea is the single largest cause of childhood mortality in South Africa (as in most parts of the developing world)
. Helminthic infestations (worms!) is also a major issue, but not a leading cause of death. In some areas where helminths are endemic, such infestations may be a greater cause of morbidity than diarrhoea, but otherwise, diarrhoea is the major concern in both respects. For this reason, nutrition and diarrhoeal management through diet become significant issues.

Although contextual and structural conditions are ultimately the cause of these problems, within a strategy to address these broader issues, disease management and infection avoidance are critical.

Dietary management during and after diarrhoea: Diarrhoea can bring about heavier loss of nutrients and essential vitamins from the body so it is paramount the child gets an even more nutritious diet than normal. Furthermore, there is less intake or absorption into the system, of the food that is actually consumed.

Often the main constraint to child feeding during diarrhoea is the accompanying anorexia and lack of appetite. Food intake is therefore reduced for a variety of reasons. Mothers and care

providers (including some health practitioners) believe they should rest the gut, or the child should only eat when it has the urge, or the child throws up after eating, etc. Unfortunately, this widespread belief, that it is necessary to starve children with diarrhoea, is a double blow, because on top of dehydration and other debilitating effects of the diarrhoea, they also suffer reduced nutrient intake.

A whole protocol exists for sick child feeding, ie. special care and attention to ensure the diet is even more nutrient dense, use of alternative foods, more frequent feeds, and the hygienic and sanitary health of the foods is especially important at this stage. In addition to special care during illness, the best time to compensate for lost nutrition is during convalescence, when the anorexia disappears.

Breastfeeding: The single most effective and important intervention which directly impacts on diarrhoea and nutrition, is breastfeeding. This is linked to the increased risk of infection caused by bottle feeding, use of dirty bottles and contaminated water. The tendency towards bottle feeding is sustained by strong marketing of infant formula, socio-economic factors that make it difficult for mothers to be available to breastfeed their children for enough time during the day beyond the first few weeks and social pressures against what is perceived as old fashioned.

Assuming that the broader (mainly socio-economic) forces are also addressed, exclusive breastfeeding (ideally means the exclusion of water, juices and other fluids) until the infant is 4-6 months should be strongly encouraged, after which appropriate weaning foods should be introduced, while breastfeeding is continued through 2 years of age.

Nutritional status: The linkages between the nourished state of the child and its susceptibility to both frequency and severity of diarrhoea are well documented. Water and sanitation interventions can, by reducing diarrhoea, improve nutritional status. The reverse is also true, ie. nutrition education can bring about a reduction in diarrhoea morbidity (sickness) and mortality (deaths).

Likewise, by applying Control of Diarrhoeal Diseases (CDD) principles, mortality and the severe complications due to dehydration from diarrhoea, can be reduced.

1 SOME (SELECTED) INTERNATIONAL LESSONS

1.1 General points

Much of this is well known in the South African context, but these are points that have emerged from country specific studies or international reviews.

There is now ample evidence in the international literature that **provision of adequate quantities of water** have a greater impact on diarrhoeal disease, and probably skin and eye infections than simple provision of clean water. Water supplies must be ample and accessible.

It is also clear that successful water and sanitation-related disease prevention measures are not necessarily associated with improvements in water or sanitation technology at all. Alternatively, that the provision of water and sanitation facilities without following safer hygiene practices will not necessarily break the re-infection cycle.

> The mere material improvement of water supplies and sanitation facilities would doubtless prove to be less effective than if the people were advised by means of health education of the sources of their particular disease problems and how to avoid them. It is, therefore, essential that an intensive education programme should form an integral part of any sanitation or water supply project. (Genthe, Seager *et al*, 1996)

Broader than this, though, is the increasingly strong and persuasive health promotion perspective, that health will not be necessarily be achieved through either infrastructure improvement or health education or both, and that the **contextual and structural issues** (e.g. factors causing poverty, power relations within the family and beyond, foreign debt, lack of local solutions and a reliance on a medical model) that promote poor health are an integral and essential part of a meaningful and sustainable solution. Within this context, providing information and improved access to water and sanitation begin to make sense.

Health care in relation to general development: Although the health promotion perspective has been emphasised adequately, the following quote from a south African study cannot go unrecorded in a review of literature such as this:

> While it is recognised that a health programme can hardly be expected to solve the problems of local poverty, its integration into a broadly based *community* development programme which incorporates the provision of local women with skills to make money, and so increase the financial resources of their families, would go some way in this direction. ... Other writers have commented that breakthroughs in community health care come with a general increase in the overall quality of life of the community (Kvalsvig, JD; Preston-Whyte, EM and Mtshali, T, 1991).

1.1 Lesotho

In response to the International Drinking Water Supply and Sanitation Decade, Lesotho formed a national steering committee to prepare a plan for the water and sanitation sector. This included the Urban Sanitation Improvement Team (USIT) - one can understand why the acronym did not begin with the word "Lesotho" - and the Rural Sanitation Programme (RSP).

USIT began work on pilot-testing of various types of latrine and delivery systems and RSP drew on this two years' later (Hubley, J., Jackson, B. and Khaketla, T. (undated), Blackett, 1988) .

The main functions of the two, through the steering committee *included*:

- ensuring consistency of policy
- promoting a common VIP design to avoid different pit and slab sizes
- to coordinate efforts in health, hygiene and user education.

The Lesotho experience echoes the wider experience, that sanitation alone does little to improve health: it needs to go side by side with improved water supplies, user and health education with improvements in the broader health context such as child health care, maternal health care and education regarding these.

Experience also showed that communal latrines are not appropriate and that it is better to *lend* money for latrine construction than to give it away. Also that training for self-building was

far more effective than building for people. It was also found that it was better to try and standardise on VIP design being promoted by various agencies.

Another widespread lesson is that there is little interest in sanitation in a town where the water supply is poor. Current policy in South Africa reflects this by advocating that initiatives should begin with water supply projects and use this time to create demand for sanitation so that sanitation improvement projects can follow, all the while dealing with health education issues.

Regarding water, sanitation and health programmes, the most successes seem to result from those where a coordinated approach is taken - intersectoral collaboration, including health, education, water affairs etc. and across levels from national to local.

1.1 Zimbabwe

Twelve years after independence in Zimbabwe there had been considerable progress towards the goal of providing adequate water supplies and sanitation for the entire population. It was at this point that a national review of the health aspects of rural water supply and sanitation was conducted (Bassett, M., Sanders, D., Todd, C. and Laver, S., 1992). With much of the initial impetus having by then gone out of the rural water supply and sanitation programme; with new economic directions beginning to take effect, particularly in re-orienting the economy away from central government provision toward community responsibility and cost recovery; and with the effects of a major drought being felt, it was felt that the national survey being reported here was rather timely.

Findings of the review

- The first finding, reported above is that there are vast hidden costs of water and sanitation-related disease.
- Most faecal-oral disease is not water-borne, but is food-borne or directly transmitted from hands. Thus diarrhoeal disease and most skin and eye infections can be classified as water-washed rather than water-borne. Therefore, access to adequate quantities of water is more important in the first instance than access to high quality water.
- Much contamination of drinking water stored in the home occurred through poor handling.
- There are multiple routes in faecal-oral transmission, of which waterborne infection is only one.
- Washing hands after going to the toilet was not a deep-seated behaviour, but washing hands before preparing food was.
- The social impacts of water and sanitation-related disease are enormous.
- The provision of better water sources closer to the home did not initially result in the

drawing of greater volumes of water, perhaps the result of a deep-seated "culture of scarcity".

- Those interventions that have been classified by the WHO as having strong evidence for being effective and feasible and are relevant to Zimbabwe's experience include the following:
  - promotion of breast-feeding
  - improving of weaning practices (to maintain nutritional status of the child)
  - measles immunisation
  - promoting personal and domestic hygiene
  - improving water supply and sanitation facilities.
- VIP construction in Zimbabwe was widespread. It was subsidised by about 40% of the total direct cost (not labour) of Z$250 (1991 prices). Notably, subsidies consist of free provision of certain materials, not cash.
- The Integrated Rural Water Supply and Sanitation Programme (IRWSSP) was found to have poor levels of health and hygiene education in spite of policy commitment to an integrated approach.
- Results of four studies on the health impacts of water and sanitation interventions showed that, apart from access to greater quantities of water reducing frequency of diarrhoea attacks, water and sanitation interventions *per se* had apparently little impact on reported diarrhoea frequency in children. This effect was demonstrable at both the household and community levels. Instead, reductions in frequency of reported childhood diarrhoea was found to be more closely linked to general environmental improvements and possibly to increased use of Oral Rehydration Therapy (ORT). The finding that water and sanitation interventions as such have low impacts on health is supported by evidence from across the world. The reason is quite simply that diarrhoea is not primarily a water-borne disease.
- The poorest families cannot afford improved sanitation and are also at risk from other poverty related factors such as nutrition. Yet these families are possibly benefiting least from water and sanitation programmes as they cannot afford to participate in them effectively.
- Most success come when water and sanitation programmes include health and hygiene education, improvements in hygiene behaviour and general environmental improvements.
- The review also recommends that research should be directed at sociological and anthropological aspects of behaviour so that health education is more appropriate.
- It is noted that the major impacts of improved water supply may be social and psychological rather than on health.

APPENDIX A: SUMMARY OF KEY MESSAGES FOR SOUL CITY 4

1. Sanitation is about health: Water and sanitation are ultimately primary health care issues and should not be dealt with in isolation of this principle.

2. Provision of adequate quantities of water have a greater impact on diarrhoeal disease, and probably skin and eye infections than simple provision of clean water: these are water-related rather than water borne. Water supplies must be ample and accessible. In an urban context, this equates to access to a stand pipe (as minimum) within 20 - 30 metres of the home.

3. Re-infection of stored water is a common occurrence through dirty storage containers, dirty scoops, re-infection of stored water through direct human contact or lack of adequate covering of water containers. Stored water is unlikely to be used freely for washing where access to water is a problem, therefore, again, access to quantity is a greater priority than access to quality water. We did not find any research from a health perspective promoting a particular kind of water cartage/storage container and recommended (i.e. practicable and sustainable) methods of cleaning containers.

4. There is an increasingly strong and persuasive health promotion perspective, that health will not be necessarily be achieved through either infrastructure improvement or health education or both, and that the **contextual and structural issues** (e.g. factors causing poverty, power relations within the family and beyond, foreign debt, lack of local solutions and a reliance on a medical model) that promote poor health are an integral and essential part of a meaningful and sustainable solution.

5. Most successes come when water and sanitation programmes include health and hygiene education, improvements in hygiene behaviour and general environmental improvements.

6. Those interventions that have been classified by the WHO as having strong evidence for being effective and feasible and are relevant to Zimbabwe's experience include the following:
   - promotion of breast-feeding
   - improving of weaning practices (to maintain nutritional status of the child)
   - measles immunisation
   - promoting personal and domestic hygiene
   - improving water supply and sanitation facilities.

7. Water and sanitation projects should be tackled through a programmatic or area approach. This lays the foundation for inter-sectoral collaboration within a region or area, and hence for a health promotion approach.

8. Collecting water is "women's work": the burden of water collecting has large physical, economic and social costs.

9. Children who get sick with diarrhoea on average suffer 5 episodes per annum. This represents a major setback in terms of physiological and cognitive development, and reduces energy and concentration levels at school.

The overall impact of this on society's well-being and a developing country's economy must be enormous considering the huge numbers of children who are "diarrhoea statistics".

10. Health-related design criteria, although well documented, tend to be ignored by engineers, whose task is to provide high quality water within a minimum of 200m of the home (the RDP minimum standard).

11. Children tend not to use pit latrines: This is reinforced by a widespread belief that children's faeces are not harmful. Thus children's faeces are commonly not covered. It is also widely asserted that children are frightened of the dark hole of the toilet seat, and fear falling in. This is probably correct, but other issues such as the lack of concern for ensuring that children use toilets probably play a role.

12. It is now a quite clear and widely supported position that knowledge, attitudes and practices *are not directly or causally linked*, but regrettably, most health education efforts are based (usually unwittingly) on behaviourist assumptions emanating from the belief that there is a causal relationship between these factors.

13. It appears, except in remote areas, that most people have adopted a composite approach to accessing appropriate health care. Traditional healers, home-based remedies and clinics all play a role in this matrix.

14. The incorrect understandings related to worm infestations in children reported above are based on the observation that fruit often has worms, so eating fruit could give one worms.

15. Traditional beliefs about water: In the Transkei study, people used the "blanket of the frog" (an algae layer on the dams) as a sign that they should leave the frogs undisturbed and go elsewhere for water.

16. The close association between water and the ancestors means that people regard the larger bodies water in particular, with great respect, especially where the *Typha capensis* reed grows, as this hides the home of the ancestors. This leads to a range of practices that all have a positive environmental and water conservation effect.

17. Standardised education material can create misunderstandings because it does not take local perceptions and contexts into account.

18. The Swaziland study suggests that attitudes towards water does not distinguish between "safe" water and the taste of the water. Taste is generally the dominant criterion for selecting water sources.

19. In the Swaziland study, the most reliable predictor of "correct" responses was level of education of *anyone* in the home, followed by level of education of respondents themselves, which tended to be greatest in the younger age group. There was a negative correlation between "correct" response and being head of household.

20. In the Swaziland study, almost 84% replied "No, never" in response to a question about whether they boiled water. This in spite of the fact that the "expected" answer might have been given.

21. The study showed that women especially were aware of water quality and health and were restricted in their ability to avoid problems mainly by their physical and financial capacities to secure pure water.

22. Diarrhoea, nutrition and diet: Diarrhoea can bring about heavier loss of nutrients and essential vitamins from the body so it is paramount the child gets an even more nutritious diet than normal. The single most effective and important intervention which directly impacts on diarrhoea and nutrition, is breastfeeding. This is linked to the increased risk of infection caused by bottle feeding, use of dirty bottles and contaminated water. The linkages between the nourished state of the child and its susceptibility to both frequency and severity of diarrhoea are well documented.

23. Experience in Lesotho also showed that communal latrines are not appropriate and that it is better to *lend* money for latrine construction than to give it away; training for self-building was far more effective than building for people: it was better to try and standardise on VIP design being promoted by various agencies.

24. Another widespread lesson is that water is demand-driven, but sanitation generally is not. There is little interest in sanitation where the water supply is poor.

25. Much contamination of drinking water stored in the home occurred through poor handling. Key messages here include:
- keeping containers clean
- using clean scoops
- covering storage containers
- using separate containers for washing purposes and for drinking water
- washing hands after defecting and before preparing food.

26. The poorest families cannot afford improved sanitation and are also at risk from other poverty related factors such as nutrition. Yet these families are possibly benefiting least from water and sanitation programmes as they cannot afford to participate in them effectively.

APPENDIX B: SUMMARY OF WATER-RELATED DISEASES

[This information is based on work done by Genthe and Seager et al. (1996) and von Schirnding, Yach and Mathee. (1993).]

There are four types of water-related diseases, generally classified according to how the pathogens are transmitted within the water environment. The information below summarises the main types, and gives an indication of their relative incidence in South Africa.

It is important to note that there is a lack of reliable data on the incidence of infectious diseases in South Africa. The sources that currently exist are fragmented. Such data is necessary in order to determine the effectiveness of health intervention/promotion programmes. However, this is something that the Department of Health is addressing.

1.1 Water-borne diseases

The water acts as a passive carrier for the bacteria, virus or other pathogen.

Examples: Diarrhoeal diseases caused by bacteria (e.g. Shigellosis, cholera, typhoid), protozoa (e.g. amoebic dysentery); viral diseases (e.g. poliomyelitis, hepatitis).

Routes of transmission: drinking contaminated water, eating food that has been washed in contaminated water. Re-infection is through the faecal-oral route.

Preventive measures: improve water quality by boiling water, or using chemical purifying treatment; avoid re-infection by safe disposal of faeces, adopting safer hygiene practices, preventing pollution of water supplies.

Incidence of notifiable diseases in South Africa:

- **Polio:** few cases are now reported in South Africa, and vaccination is helping to reduce incidence.
- **Cholera:** the last cholera outbreak in South Africa was in 1987 when there were in excess of 20,000 cases. However, there has been a steady increase in cases in neighbouring countries, in line with a global pandemic. Increased movement of people from such countries means that there is always a chance of outbreak. Overcrowding in urban areas, linked with inadequate water and sanitation increase the risk of spread and epidemics.
    - **Typhoid:** a problem in certain areas of South Africa - former Gazankulu, Transkei, Lebowa, KwaZulu. Linked to poor quality of rural sanitation and water supply. Recent reported declines in incidence.

      But as with cholera, increased migration from endemic areas to cities will increase the risk of incidence in urban areas, and overcrowded living conditions with inadequate water and sanitation facilities increase the risk of epidemic disease.

1.1 Water-washed diseases

These include diseases that are ingested and affect the gastrointestinal tract, often leading to diarrhoea, and those that affect the body surface, causing skin and eye infections.

Examples: scabies, trachoma, conjunctivitis

Preventive measures: improved domestic and personal hygiene through increased washing. It is the availability of water that is important here rather than quality.

1.1 **Water-based diseases**

In these diseases, the pathogen spends part of its life in an aquatic animal (e.g. snail).

Examples: Bilharzia (schistosomiasis), penetration through skin; guinea worm (ingested).

Preventive measures: avoidance of infected water bodies - measures rely on cultural/social behaviour.

Incidence in South Africa: It has been estimated that two million people in South Africa are infected with schistosomes (intestinal helminths) of which less than 10% experience morbidity or disability. Endemic areas mainly in Durban/Pinetown and northern cities.

1.1 Water-vectored diseases

These are diseases transmitted by insects which either breed in water (e.g. malaria- carrying mosquitos) or which bite near water (tsetse fly).

Preventive measures: avoiding unnecessary pools of standing water, e.g. around stand pipes, and drainage channels.

1.1 **Excreta-related diseases**

Tapeworms, contamination from animal faeces, e.g. pig.

Preventive measures: as for other faecal-oral re-infection routes.

It is the water-borne and water-washed diseases leading to gastrointestinal disorders such as diarrhoea and dysentery that are the most widespread in South Africa and which give the most cause for concern. In addition to their long-term debilitating effect, such diseases are one of the main causes of death in children under 5 years of age. In South Africa, it is estimated that there are 1.5 million cases of diarrhoea in children under the age of 5 annually. Statistics from 1984 indicate that diarrhoea accounted for 27.7% of all deaths of children under 5. The HEATT review shows that most health impact assessments of water and sanitation interventions and most existing education programmes focus on water-borne diseases. It is important to keep in mind the need for localised education programmes where other water-related diseases may need more focus.

1.1 **Breaking the cycle of infection**

The best way to lower the incidence of water-borne, and water-washed diseases, and other

excreta related diseases, is through breaking the cycle of re-infection. The main route for re-infection is faecal-oral. There are three important ways to break this transmission route:

1. Safe disposal of excreta (to prevent contact from flies which can carry the pathogens to food, hands, eating utensils; and to avoid pollution of water sources). "Safe" disposal methods can vary from the simple burial of faeces to use of VIP latrines, or flush toilets.

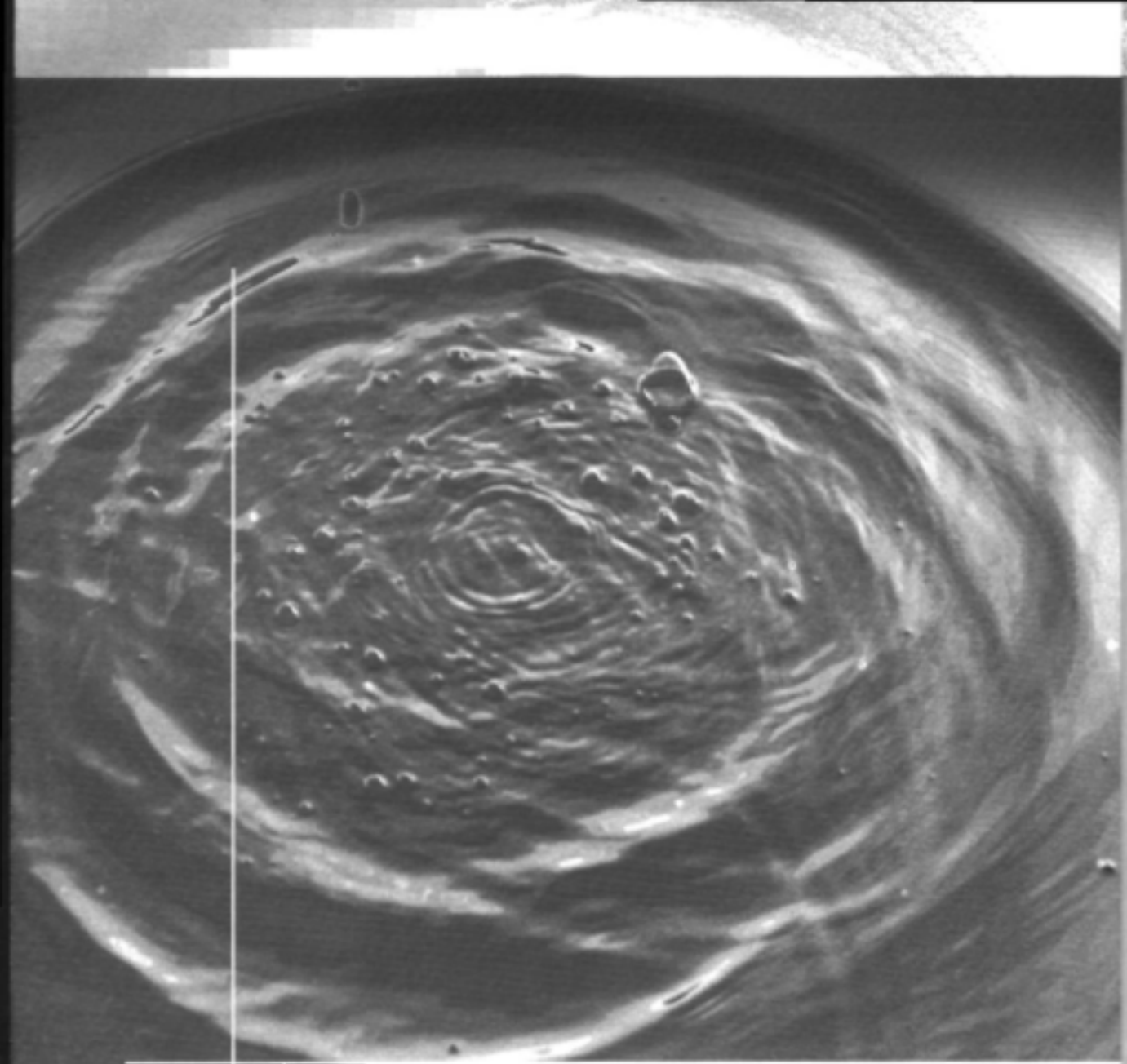
2. Personal and domestic hygiene measures, especially washing hands after defecating and before preparing food. This relies on the availability of water in sufficient quantities.

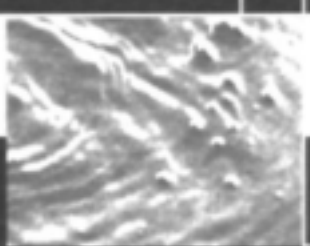
3. Improving quality of water and preventing its recontamination. Methods include:
   - boiling or chemical treatment of water that is used from rivers/dams/springs/wells;
   - provision of piped water of "adequate" quality;
   - ensuring water storage containers are clean and avoiding re-contamination by covering them so flies cannot get in;
   - using clean scoop/cup to take water out of container.

>From the above it is clear that many of the preventive measures are not necessarily associated with improvements in water or sanitation technology at all. Rather, they are based on an understanding of the disease cycle and adopting appropriate hygiene practices to reduce the chance of re-infection.

It is also clear that the provision of water and sanitation facilities without following safer hygiene practices will not necessarily break the re-infection cycle.

> "The mere material improvement of water supplies and sanitation facilities would doubtless prove to be less effective than if the people were advised by means of health education of the sources of their particular disease problems and how to avoid them. It is, therefore, essential that an intensive education programme should form an integral part of any sanitation or water supply project." (Genthe, Seager *et al*, 1996)





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