Evaluation of On-site Sanitation from a Socio-Economic Perspective

Report to the Water Research Commission
by
Bernhardt Dunstan & Associates

WRC Report No KV 114/98

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1. **EVALUATION OF ON-SITE SANITATION FROM A SOCIO-ECONOMIC PERSPECTIVE**

2. **HANDBOOK TO GUIDE COMMUNITIES IN THE CHOICE OF SANITATION SYSTEMS**

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EXECUTIVE SUMMARY

Aim of this research:

This research aims to examine on-site sanitation systems from the perspective of the users in the belief that such systems should be evaluated from a social perspective which is given equal status to a technical assessment. The hoped-for outcome is that sanitation systems installed in communities will be viable and sustainable with the result that a better quality of life and improved health will benefit all members of the community.

Background to the research:

Research was undertaken over a 12 month period (in 1996) in the following 3 areas:

- Soshanguve TT, an Independent Development Trust development of an informal settlement with the same on-site, low flush system installed on every stand.
- Ga Mmotla, a peri-urban settlement about 20 kms north of Soshanguve in the Eastern District of the North West Province. Ga Mmotla, at the time of the research, had unimproved pit latrines but funding had been approved for future upgrade.
- Ivory Park, expanding, formalising settlement in Midrand with a variety of on-site systems, both wet and dry.

In each case, the researchers were tasked to evaluate the existing on-site systems from a socio-economic point of view and to focus on the processes that needed to be followed to ensure the introduction of affordable, sustainable sanitation systems to communities.

A socio-economic approach:

Before this research project was undertaken evaluations of sanitation projects were largely confined to technical assessments. This research had a different focus of which the main aspects were:

- Is the system socially and culturally acceptable to the community?
- Is the system affordable both as regards the initial installation cost and then the ongoing cost of operation and maintenance?
- How does the system affect minority groupings whose opinion is often ignored in such matters, for example, the elderly, blind, disabled, very young, and women?
- Is the operation and maintenance of the system easily understood by all who use it?
- Is the system upgradable?

Methodology:

A variety of methods were used by the researchers including random house-to-house interviews using structured questionnaires, focus groups reflecting the different interest groups, one-on-one interviews and discussions with local authorities, technical people and in some cases, the manufacturers of the systems.

Research findings:

Soshanguve TT highlights:

- In block TT improved sanitation was found to be the first priority issue in the community: it was rated more important than housing.
- The low-flush on-site system was disliked mainly because of the extra work load it imposed, particularly on the women. The community alleged the system did not function correctly with the result that people believed they must drain the toilets themselves. Women's groups felt there was no improvement in their quality of life as a result of the on-site system. Because their expectations were unfulfilled, the women perceived no extra benefit in comparison with their former pit latrines.
- All the toilets faced the street as a result of uniform town planning. The women's focus group denounced this as unsafe and socially embarrassing.
- The high water table in the area suggested a soak-away system not to be compatible with soil conditions. This was a community view, confirmed by Council officials and technical experts.
- Women felt they had been excluded from development decisions including the choice of sanitation systems.
- Health problems were perceived both by the community and health workers to result from the poor sanitation system.
- The local authority had no equipment to drain toilets. The service was privatised and was unaffordable to the community who were not consulted beforehand.
- Less than a quarter of the residents were paying the flat rate for services in the area; hundreds of illegal water connections had been made. Despite the low flat rate, people did not seem to accept the payment principle as a responsibility incumbent upon them.
-
- An upgrade to a small bore system was underway which will include a water connection on each stand. The cost implications both for the Council and the end-users had not been discussed between the parties at the time of the research.

Ga-Mmotla highlights:

- This peri-urban area had over 2 500 stands almost all with rudimentary pit latrines. Water was a scarce commodity with only occasional standpipes on main routes.

- The main problem was that toilets were mostly built by unskilled family members which might result in unsafe structures causing fears, particularly for the elderly, the disabled and children, of falling into the pit below.

- New shacks on the edges of the settlement often had no latrines; occupants used the veld until they could afford a toilet.

- The toilets were characterised by bad smells and flies.

- Personal hygiene was poor with many cases of skin sores being treated at the local clinic. Particularly noticeable were children's faeces on the ground around the toilets. Children were discouraged to use the toilets presumably out of fear they might fall into the pits. Children's faeces were not considered to be harmful as is so in many areas of SA.

- An upgrade to VIP toilets was planned and money for this had been allocated. However the people prioritised electricity as a greater need than improved toilets.

Ivory Park highlights:

- Here the study involved three on-site systems: one dry and two that used water in their flush systems. All three were disliked to varying degrees and were malfunctioning. The malfunction was confirmed by the observation of the researchers.

- The Council did evacuate the tank contents though not always as regularly as the community would have liked. Several sources reported the emptying of the suction tanks into the river which ran through Ivory Park.

- The toilets were mostly poorly kept and foul smelling.

- The residents expected their toilets to be upgraded to waterborne sewerage in the near future. The upgrade had begun in certain areas of the township but this was progressing slowly.

- The level of payment for services was reportedly only 4% despite community leaders reporting on the success of the Masakhane campaign in the area. As in Soshanguve TT, the prevailing culture of non-payment made it impossible to hold realistic discussions on what people would or should be prepared to pay.

Overview of results:

- In all the areas the women said they were severely inconvenienced by the systems and spent hours of work trying to clean their toilets, often unsuccessfully.
- In all 3 areas people felt the local authorities were not doing sufficient to maintain or upgrade the systems.
- There was a strong sense of frustration with malfunctioning on-site systems and a feeling that only a full water-borne flush system would meet the community needs.
- There was inadequate knowledge of the link between sanitation and health and the need to improve this. There is a need to convince people to encourage children to use the toilets.
- There was not enough knowledge among householders on how to operate and maintain their toilets.
- The payment principle had been ignored or neglected with the result that non payment mostly prevailed.
- The communities reported poor or non-existent consultation processes at the time of installation of their systems. Women felt particularly excluded.

Conclusion:

In all three research areas people say they are dissatisfied with their sanitation systems. People believe they have inferior, second rate systems in comparison with those enjoyed by urban people (i.e. water-borne systems). In their view their systems do not work properly and they cause their users great inconvenience. The least criticism came from the area with rudimentary pit latrines where people seemed to be less politicised in their demands. In the other two areas there was no attempt to relate product to affordability and this reflects the need for a massive education campaign before a service like sanitation can become viable.

1. INTRODUCTION

1.1. MOTIVATION

- As social consultants in low-cost housing and related development, Bernhardt Dunstan & Associates (BDA) applied to the Water Research Commission to research on-site sanitation systems from a social perspective.

- It was the belief of the applicants that sanitation systems were usually subject only to technical evaluation and that little or no attention was given to social assessment.

- At its start the Reconstruction and Development Programme (RDP) had put great emphasis on the provision of basic services like water and sewerage to all South Africans. At the same time the RDP had stressed the need for such services to be a direct response to community needs. It is therefore critical for sanitation systems to be cost effective, viable, sustainable and affordable.

- Community participation is key so systems should be assessed according to the appropriateness of the technology to the needs and the way of life of a particular community and the impact on the different sections that make up that community (for example the young, the old, women, the disabled etc).

1.2. RESEARCH OBJECTIVES

To evaluate on-site sanitation systems in the following three areas.

Soshanguve TT (Gauteng)
Ga-Mmotla (North West Province)
Ivory Park (Gauteng)

To concentrate on a socio-economic perspective assessing the systems for their applicability in low-cost housing.

To highlight key points for planning and intervention.

To highlight the processes that need to be followed in order to result in viable and sustainable sanitation.

To identify problems associated with the systems operating in each of the research areas.

1.3. SPECIAL FOCUS ISSUES

- Evaluation of appropriateness of the systems as regards social acceptability and affordability.

- To identify the implications for different sectors of the community: the elderly, the blind, the disabled, the young, women and the professional and business sector including community and health workers.

- To examine the compatibility of the system in terms of the social structure of the household with regard to family size, household head, cultural mores, household understanding of system and income.

- Cost implications for both consumers and local authorities.

- To relate the research findings to national sanitation policy.

2. LITERATURE REVIEW

In preparing for the research, a wide range of literature was consulted. In particular, the study was informed by the seminal discussion in Yacoob, May; Barri Braddy and Lynda Edwards, *Rethinking Sanitation: Adding Behavioural Change to the Project Mix* (WASH Reprint: Technical Report No. 72, July 1992). As the title implies, Yacoob et.al. are concerned to examine the relationship between behavioural patterns and belief systems and the effectivity of sanitation projects. Thus they stress that decisions pertaining to sanitation / water articulation systems can no longer be taken in accordance with purely technical criteria. Whilst it is obviously necessary to consider the technical aspects of sanitation, it is important to ensure that the choice of technology is compatible with existing cultural values and behavioural patterns. For this reason, development studies need to adopt a more inclusive approach, which considers the relationship between behavioural changes and development possibilities.

Thus Yacoob et.al. suggest that " Planners must find ways to bring project technology into balance with community knowledge, attitudes, and behaviours relating to health and sanitation. Thus, the starting point of any sanitation project should be an inventory of community health, knowledge, attitudes, and practices relevant to water supply and sanitation improvements; this data will give planners an idea of technologies the community might accept – although even then the technology must be chosen by the community itself, if there is to be hope of successful implementation and sustainability" (p.5). Moreover, it is equally important to note that technology must be chosen which adapts to rather than simply replaces existing sanitation practices. Not only does this make it easier to implement sanitation projects acceptable to the community, but it facilitates the implementation of widely understood hygiene education programmes which support the sanitation project once in place.

A second source consulted which deserves particular mention is John Pickford's *Low-Cost Sanitation: A Survey of Practical Experience* (London: Intermediate Technology Publications, 1995). Pickford provides a valuable survey of the history of low-cost sanitation in a variety of African and Asian countries, and of the socio-political factors which impact upon sanitation practices. In particular, Pickford's discussion of the relationship between gender and access to sanitation, and between age and access to sanitation, proved particularly valuable in formulating a research agenda.

Our knowledge of the challenges faced by low cost sanitation projects also profited greatly from Brian Pratt and Jo Boyden's The Field Directors' Handbook: *An Oxfam Manual For Development Workers* (Oxford: Oxford University Press, 1985); and – especially as regards subsidies and sanitation – Isabel Blackett's *Low-Cost Urban Sanitation in Lesotho* (UNDP – World Bank Water and Sanitation Program, 1994).

The Water Research Commission's Water and Sanitation Handbook for Community Leaders (urban and peri-urban areas) (1994) proved a useful tool with which to familiarise

our interviewers with the various types of toilets currently in use, and to introduce them to some of the debates on sanitation.

In terms of survey design, the insights in a second WASH field report – William Reinke, Bonita Stanton, Leslie Roberts, and Jeanne Newman's *Rapid Assessment for Decision Making: Efficient Methods for Data Collection and Analysis* (391, 1993) – proved particularly helpful. Renike et. al show how the collection of data in low income communities with little formal education and correspondingly low cognitive skills, confronts particular problems which have to be dealt with particular sensitivity if accurate results are to be obtained. However they also demonstrate that such data can be attained relatively easily and efficiently if a number of standardised procedures are used to "map" community structures, and to sample accordingly.

Finally, the construction of our research project profited from the various Palmer Reports into sanitation, and their numerous – if somewhat overly technical – insights into the type of sanitation available to people in South Africa at present, and into the problems confronting research in this area.

3. METHODOLOGY

3.1. TECHNIQUES EMPLOYED:

The research methodology draws on the following techniques:

- Community interviews (structured questionnaires) as part of a quantitative survey.
- Community interviews as part of a behavioural survey.
- Interviews with officials and technical professionals conducted mainly on a one-to-one basis.
- Community focus groups (averaging 10 participants) to discuss in depth topics, divided into sectoral interest groups, eg. youth (under 14 and over 14), women, health and social workers, teachers, business, disabled, blind etc.
- Community workshops with larger cross section participation to discuss general sanitation issues.

3.2. AIM OF METHODOLOGY:

The above techniques were used to collect social, cultural and economic data. The following issues informed the compilation of the questionnaires and the structuring of the focus groups and workshops.

- What do people think about sanitation in general?
- How does a system impact on quality of life issues in terms of time expended, hard work, privacy, modesty, humiliation, sensibilities such as smell, cleanliness, etc.
- What say did people have in the choice of a system?
- What maintenance and hygiene education took place or continues to take place?
- What cultural practices regulate the use of systems (handling and disposal of excreta, anal cleansing practices, the use of toilets by children?).
- How do people clean themselves and the toilets after use?
- Are there superstitions related to sanitation? Are there links between body excreta and witchcraft? Taboos associated with the female menstrual cycle?
- What improvements are people looking for, if any?
-

3.3. THE SURVEYS:

3.3.1. Quantitative survey

The motivation for the quantitative survey was to gain an accurate set of data on community perceptions of the sanitation system in use. The questions might be grouped into two categories. The first was to examine peoples' perceptions of the toilets, how well they work, and what problems are associated with their usage. Secondly, we were concerned to establish what people would most like to improve, the toilet or the house, and to find out how willing they were to pay for potential upgrades. This information is of use to inform future housing policy.

3.3.2. Behavioural survey

The motivation of the behavioural survey was to try and gain a fairly accurate set of essentially impressionistic data on sanitation systems in use. In the team's opinion, this type of data has proved to be invaluable, giving a good deal of information about the condition of the toilets, problems associated with maintenance, and possible health implications of the toilets.

3.3.3. Sampling

In Soshanguve TT and Ga-Mmotla, random sampling techniques were used. In Ivory Park, quota sampling was employed.

In Soshanguve TT and Ga-Mmotla the communities were of a manageable size, and it was possible to interview a representative sample of households. Moreover, there was only one type of toilet system in operation. In both communities, the quantitative and behavioural surveys were conducted on the same households, but by different interviewers.

In Soshanguve, there are 597 consecutively numbered stands, of which 60 were interviewed. Each tenth house was interviewed, giving a clear sample of 10%. Given the homogeneity of the community, both in terms of social class and settlement patterns, this is more than sufficient.

In Ga-Mmotla it was more difficult to compose a random sample. The houses are either not numbered, or the numbers fail to correspond to the numbers on the map. Moreover, the village is divided into five sections, each with slightly different characteristics. It is unclear exactly how many people live in the community. According to the map, there are 2836 stands (numbered from 1 through to 2903), although not all of them have been allocated, and in some cases people have two stands. It can be assumed that there is a maximum of 2000 households. The team interviewed 196 households, which gives a sample of approximately 9.8%. Again,

this is more than sufficient data on which to base conclusions.
In Ivory park both the size and the heterogenous nature of the community prevented the easy composition of a random sample. Moreover, the interesting aspect of Ivory Park is the three different toilet systems in use. Thus the team assembled a small quota sample on each. As concerns were primarily comparative, the sample, whilst not representative, is sufficient to draw preliminary conclusions. The data is not however sufficient to draw any conclusions about behavioural characteristics of the communities.

3.3.4. Administration of surveys

In all cases, the interviewers were university students. They were clearly briefed about the concerns and aims of the project, as well as techniques of questioning. The quantitative questionnaires were asked in Setswana or Zulu, and where requested, in English. The behavioural questionnaire was administered by a women, as it was felt that she would be given freer access to the toilet than a man. This was born out by experience. In all cases, the senior researcher was present during the surveys, ensuring that the interviewers went to the correct houses and spent an appropriate amount of time at each. Although he tried to keep as low profile as possible while the surveys were being administered, in many cases, he spoke to the household afterwards, to try and supplement the data with general impressions.

3.3.5. Methodological bias

Whilst the questionnaires were administered thoroughly and systematically, the answers were affected by a significant although unavoidable bias. It is highly likely that our respondents associated the survey with delivery, and adjusted their answers to suit their intended purpose (ie. by overstating their objections to the facilities in the hope of getting more attention from the government). Every effort was made to explain carefully that the interviewers were simply trying to find out what people thought, and were not associated directly with the government. Moreover, the team deliberately tried to interview people by themselves, away from other family members present, so as to minimise group pressure. (It is interesting to note that the answers in the individual surveys appear to be less critical than in group discussions).

Such disclaimers aside, this bias must be treated as ever present and possibly substantial.

3.4. FOCUS GROUPS

- The focus groups were conducted by three interviewers, two of them women. All three are conversant in all major African languages as well as English.

- The groups convened at the weekends so the greatest cross-sections of respondents could be accessed. The exceptions were the school children who were interviewed during the week.

  The objective of the focus groups were two-fold

  - An initial meeting was held to get feed-back on the format of the quantitative survey.

  - Subsequent special group meetings were held to gain qualitative information as regards the attitudes of the end-users towards the sanitation system that had been installed.

- In order to access a wide range of views and in particular to access the views of minority groupings such as women, the disabled, the elderly and the blind, the focus groups were held separately so people felt free to air their views without embarrassment. Groups comprised between 8 and 12 people.

The following group discussions were held in each area:

-women
-children under 14
-children over 14
-the disabled, the blind and the elderly
-business and professional people
-health workers
-community leadership

In certain areas the health workers were part of the professional team.

The focus group organisers were consciously gender-sensitive as they feel strongly that women's views are not heard sufficiently in policy planning, and development forums.

- Great care was taken in the setting up of the groups to contact a wide range of organisations to send representatives, rather than just dealing with ward councillors and what could be perceived as politically vested interest groupings like the ANC or SANCO.

- Care was also taken not to raise expectations. It was made clear that the research study in question was not a delivery mechanism. Rather it would be used to inform policy and planning.

This was accepted as valid. However each community asked for a copy of the final report and feedback on any action that might result.

3.5. COMMUNITY WORKSHOPS

The workshops were conducted according to the same principles as the focus groups. However considerably more people were present, on occasion as many as 50. There was also a cross section of the community present. General sanitation issues were discussed and it is interesting to note that issues specific to women for example were not raised in the public forum.

The workshops were used mainly to inform the community about the questionnaires and gain co-operation.

3.6. TECHNICAL INTERVIEWS

These were conducted by the project leader with the aim of discovering the whole story, warts and all, including fears for the future. The interviews were not formally structured and participants were encouraged to discuss whatever sanitation issues they chose to raise.

3.7. STYLE OF WRITING

In order to remain as truthful as possible to the views expressed by the original participants an attempt has been made to report the Focus Groups in a manner more akin to journalism than to orthodox research writing. The team believe this report needs to change both the attitudes and approach to sanitation. In consequence the style of reporting the focus groups is used consciously to involve the reader and hopefully to bring home the impact of sanitation issues on the lives of ordinary people.

4. RESEARCH FINDINGS: SOSHANGUVE TT

4.1. House-to-house survey results

Methodology:

- This section of the research had two components; an on-site behavioural survey and a fairly detailed quantitative survey. A random sampling technique was used.

- The community is of a manageable size so it was possible to interview a representative sample of households. To make matters easy only one type of toilet system is in operation. 60 of the 597 consequently numbered stands were selected (every 10th house), giving a sample of 10%. Given the homogeneity of the community, both in terms of social class and settlement patterns, this is a sufficiently representative sample.

General observations

There is only one toilet system in operation in Soshanguve TT. This is based on a low-flushing anaerobic digester. This system requires people to throw a bucket of water down the toilet after use, which cleans the offset pipe. Although housed in rather small and uncomfortable structures, the toilets are generally well constructed and comparatively clean. Levels of smells were comparatively low (only 27% smelt bad). Approximately a quarter of the toilets surveyed had some evidence of seepage (either visual or reported). Although far lower than the systems in other areas, this is unacceptably high as far as the community is concerned.

It might be argued that the main problem here is that the toilets are installed in an area where the soil and the vicissitudes of the water table mitigate against the use of soakaways. This is true, but the problems facing this system appear to run deeper according to user perceptions.

In general, it might be held that the best system for a particular community is the system that they are most able to maintain. In Soshanguve the biggest problem seems to be maintenance. The community universally report a need to drain their toilets regularly and an inability to be able to afford to employ an outside contractor to perform this service.

The community in profile

The average person interviewed fell between the ages of 30 and 39. Of these, two thirds were female, although in 58% of the households surveyed the man functioned as the household head "most of the time". In terms of income, almost 20% of persons surveyed claimed that their household had an average monthly income of below
R 500.

Problems encountered

The work in Soshanguve proceeded with few hitches. The main problem, which mitigates against the representativeness of the "random sample", is the gender bias, with two female respondents for every male. This was unavoidable, as migrant labour draws many men, especially younger men, away from the area.

A second problem encountered is that some areas of Soshanguve have already been upgraded slightly. In most of Soshanguve, there is a tap per stand. In other areas there is a tap shared between stands.

Sanitation and health

One of the biggest problems encountered in the survey was poor community hygiene practices, because of lack of access to water. Here the biggest threat is the transmission of disease through oral-faeces contact. At no stage did the researchers see any evidence of people washing their hands after flushing the toilets. For most people, this requires an additional trip to the tap to wash, an excursion that is likely to mitigate against health practices in any community, especially at night. Although there was almost no evidence of flies (2%), which is to the credit of the system, flies pose a considerably lower health risk than direct oral-faeces contact.

A related health-risk stems from the bucket used to flush. This has been provided to each household, and is the correct size for one flush. In our initial discussion with community leaders, a concern was raised that these buckets were used for other things as well, including the carrying of vegetables and other produce. Although 93% of people surveyed insisted that they only used the bucket to flush with, the limited financial resources of the community suggest that this is probably not correct. For many people, the bucket provided is not only the best container they have but it is used for a multitude of tasks. This poses a significant health hazard, especially if people wash their hands in the bucket after using the toilet, and before flushing.

Behavioural survey

The results of the behavioural survey for Soshanguve TT are shown in the following table.

What stands out is the low levels of smell and flies, and the significant usage of toilet paper as an anal cleaning material. There was ample evidence of children's faeces around the toilets (34%).

Sanitation – Behavioural Survey: Soshanguve TT

Date of Interviews	July 1996
Number of households surveyed	59
Does household have a toilet? May I see the toilet?	Yes – 59 (100%) No - 0
Are there flies, mosquitos or biting insects inside the toilet?	Yes – 1 (2%) No – 58
Is there a cover on the toilet seat?	Yes – 57 (97%) No – 2
Is there a ventilation pipe with fly screen attached to the toilet?	Yes – 59 (100%) No – 0
Is there a roof on the toilet?	Yes – 59 (100%) No – 0
Is the toilet area clean?	Yes – 35 (59%) No – 24
Is there evidence of toilet paper as an anal cleaning material?	Yes – 49 (83%) No – 10
Is there evidence that the toilets are used for something else besides defecation?	Yes – 0 (0%) No – 59
Is there evidence of cleaning materials (other than water and a brush) being used to keep the toilet clean?	Yes – 37 (63%) No – 22
Does the toilet smell bad?	Yes – 16 (27%) No – 43
Is the toilet close to the side of the house?	Yes – 59 (100%) No – 0
Are there faeces around the toilet?	Yes – 20 (34%) No – 39
Is the toilet dark inside?	Yes – 59 (100%) No – 0
Is the slab made of cement?	Yes – 59 (100%) N0 – 0
Is there some evidence of seepage? (visual or reported)	Yes – 26 (44%) No - 33

4.2. COMMUNITY FOCUS GROUP FINDINGS:

Introduction:

The following workshops were conducted:

- Community workers group including local nurses, teachers, and residents
- Women's Groups
- Business owners including spaza shop owners, shebeen operators, churches and general dealers
- Disabled and elderly people
- Youth

Each workshop lasted for approximately two hours, the first workshops were conducted at the clinic, and the last two workshops were conducted at the home of each convenor.

The workshops were aimed at specific groups within the community to get an indepth understanding of their perceptions of the sanitation system. The choice of the groups was based on the assumption that needs differ from one group to another, and therefore impacts would also show marked differences from group to group. In previous work done by the researchers in Soshanguve it was apparent that the women, the disabled and the blind were able to express themselves more vocally and openly in small focus groups rather than general community workshops, and they were able to speak without embarrassment about their experiences in such a group. The business people and the community workers were chosen because of their dealings with the public as well as their experiences of the sanitation system which is broader than normal household use.

The Soshanguve sanitation experience:

For most poor urban communities the number one priority in their lives is housing. The facilitators were surprised when conducting these workshops, it became clear that housing was not the most urgent priority. In the short term the residents of Soshanguve want a sanitation system that reinforces their right to privacy and human dignity. Water and sanitation were therefore placed on the top of the priority list.

For most women, consultation in the planning and design of their environment remains an unfulfilled dream. While the first group of women who moved from Winterveld informal settlement to Soshanguve TT knew that their "flush" toilets were going to need water from the common standpipe, they did not realize the implications of this with regard to their time and family responsibilities. What struck them as odd was the location of most of the toilets in such a way that they face the street. For women in the workshop the location and

orientation of the toilets is considered unsafe and exposed. Toilets are usually private places, located away from the main dwelling, and affording the family a secluded area for ablutions. In Soshanguve the toilets face the public space, for some households it is impossible to go to the toilet without passerby or neighbours observing you.

The question of safety and security is a concern for most women. The fact that anyone can observe them going to the toilet and can actually accost them disturbs them. At night it is dangerous to use the toilet, especially if the women still has to go to the standpipe for water. Potential rapists and robbers are able to watch the toilet then plan their attacks accordingly. They wait for the women to come to the standpipes to refill their buckets.

The toilet is designed like a normal flush toilet, which means that one cannot flush sanitary pads down the toilet, however the outside toilet lacks the advantage of an inside flush toilet where one can privately dispose of sanitary pads. In this system the women has to go to the toilet to take off the pad, then she has to come back to the house either to wash it or to burn it. In a culture where menstruation is never mentioned in public or in the company of males, this violation of privacy is felt to be a major indignity. Family members can see the woman clutching a plastic bag with the sanitary pad, bringing it from the toilet and thus publicising her menstrual cycle. The women believe that menstruation defines their womanhood, and the struggle with the disposal of the pads makes them feel ashamed, and they come to dread that "time of the month".

Soshanguve garbage men frequently scavenge the garbage bins. If they find a sanitary pad in the bin, they belittle the women of the family, as well as spread rumours about the women's lack of self-respect and disrespect for the men she expects to dispose of her blood. The male garbage collectors have informed women that the municipality prohibits the disposal of pads in garbage bins. All women in the workshop have never questioned this information and are too embarrassed to raise it with the civic organisations and the councillors. There was general agreement from the older women and the men that no decent women would leave their blood to be collected by men.

The issue of disposal of sanitary pads is therefore a major problem that is dreaded by the younger women. Some mentioned that in Winterveld, from where they originated, sanitary pads could be thrown down the pit latrine and be forgotten.

The size of the toilets is also a major concern for the residents. The toilet structure is made up of four pieces of corrugated iron, and a door. Besides the fact that any women who is more than seventy kilograms in weight, finds it difficult to close the door, pregnant women almost find it impossible to squeeze into the toilet. For women accompanying their young ones to the toilet, they have no choice but to keep the toilet open while waiting; to the embarrassment of passerby and neighbours. All residents mentioned that if they had been consulted they may well have paid the difference to allow for a bigger toilet. In most cases where there is only one room and a kitchen in the dwelling, a bigger toilet could have afforded a private area for washing. Women were generally more dissatisfied with the toilet since they tend to use it more, sit on it more, or accompany the young. On the other hand some men were concerned about the size, but they did mention that when urinating they

stand and face away from the door, so for them the problem is minor.

Maintenance problems

When residents moved into Soshanguve TT they were told by the manufacturers what was allowed or not allowed to be put down the toilet. Except for one or two people, there seems to be common understanding of the guidelines for use of the toilet. However all the workshop participants have experienced the following problems with the toilet:-

- Filling up of the toilet – although the toilet is supposed to fill up once every two years, all workshop participants allegedly have had to drain their toilets at least every six months. The toilet overflows and black worms are said to come out onto the seat when it is ready for draining.

- When the toilet is full and the worms are said to come out, it is thought to be impossible to use the toilet and there is general concern about the worms infecting children with diseases.

- It is commonly believed by the community that the visible worms are the digesters. This is of course erroneous as these digesters are invisible to the naked eye. Any worms that can be seen must be human tape worms which have been passed into the excreta. The people who took part in the focus groups do not believe this.

- There is a tendency for some individuals to use other people's toilets to delay their own toilet filling up; or they sneak in to use another toilet when theirs is full. The intruders always leave the toilet dirty because they cannot fetch the water for flushing for fear of discovery.

- The researchers were taken to two different families that were draining their toilets on that particular Sunday. Both families had sent the children away, they felt that the smell was too strong and the contents of the toilet were not meant to be seen by the young.

- In both cases the women were draining the toilets, both of them work during the week, and they felt that draining the toilets at night would expose them to danger.

- Draining involves opening up the storage tanks, scooping all the liquids out, digging a hole in your garden and then disposing of the smelly liquids. The smell impacts on all the neighbours so most draining is done at night time. Some families will not dig the hole but throw the liquid on the streets or on other people's gardens. This causes a lot of tension between neighbours as well as within the household given the undesirability of the task. In most households this is considered a woman's job, including the digging of the disposal hole.
- Those who can afford it have requested the maintenance truck to come and pump out sludge, but the officials of the service provider insist that they need at least twenty families to make it economically viable. Since toilets do not fill up at the

same time it makes it impossible for residents to use this service.

Cost implications:

The major costs attributed to the toilets are associated with women's time, hiring a man to dig the drainage hole for women, and the cost of toilet paper. The major complaint was that irrespective of the kind of paper one uses, the toilets still fill up fast, especially during the rainy season. The toilet rolls cost R1.50 each in the Spaza shops. The design of the toilet forces residents to spend money on toilet paper. One women stated that while the pit latrine was seen as backward and rural, she could use other available paper, and she did not have to take a bucket every time she needed to use the toilet. For women, the time spent fetching water is considerable.

The other cost is that of draining the toilet. Residents either employ a person to drain and dispose or just to dig a hole. The costs are considered high (about R 60) so some families employ a digger and drain themselves. Some women felt that draining was a private business which is better left to the family. For the blind and the disabled, the cost could not be avoided. For both the blind and the disabled there was the added cost of employing children to fetch water from common standpipe to enable them to use the toilet. One disabled man who lives alone waits outside to call on any passerby to fetch him water because the kids run way from him.

Perceptions around health and hygiene:

In general all residents at the workshops perceived the toilets to be unhygienic, dehumanizing and unnatural. One old man stated that he never thought he would live to see the day when he has to fetch water from a tap like a child, and almost make an announcement about his intended use of the toilet. (Most men do not bring water to flush after urinating). Women associated a lot of their vaginal infections to the unclean toilets and their all-prevading smell. The nursing sisters at the workshop confirmed this view.

Some parents do not allow the young to use the toilet, but keep a potty for them to use and then flush the contents down the toilet. It is difficult to tell when the toilet is about to fill except when the worms are said to come out, the fear is therefore that the kids may sit on top of a full toilet and contract diseases. It was not thought important for children to use the toilets. Frequently toddlers just squat in the yard and the faeces are shovelled into the toilet from time to time.

Some residents perceived themselves to be worse off than rural folks. Rural people do not have to sort their own sewerage into liquids and solids for disposal, all they need to do with the pit latrine is to deodorise it. Pit latrines were less costly and in the view of several, less troublesome. It should be understood that the comparison is with unimproved pit latrines. None, or very few of the interviewees had had any experience of the Ventilated Improved Pit (VIP).

Conclusion:

For Soshanguve residents, lots of time is spent on activities associated with using the toilet, maintaining the system or attending to its problems. They say they would be prepared to pay extra to get the toilets upgraded. For women an undesirable responsibility is inflicted. The married women and the middle aged women feel they have become the professional drainers of toilets. They feel they cannot allow their children or their unmarried daughters to do such a task. Some stated that no man would marry a women who has been an official toilet cleaner and drainer for her family, surely that women would be "isinyama" (undesirable to the opposite sex). For these women consultation in the design and introduction of a new technology would have enabled them to make an informed decision. At the moment they feel cheated, they believe they thought they were improving their lives by choosing such a system, but instead it appears to have reduced them to sewerage drainers. Some look back on the pit latrines of Winterveld as more desirable.

The women concluded that the introduction and practice of gender sensitive planning is critical to the creation of sustainable services. The Soshanguve case study is a clear illustration of how consultation can exclude women and thus have results that are detrimental to women's wellbeing. The challenge is for planners and other project implementors to ensure that women are part of the community structures they consult with. In the Soshanguve case both men and women agreed that IDT did consult with the civics and other community structures. The male leadership however was unaware of the gender impact of the sanitation system. Some civic members who were consulted heard about women's problems for the first time as a result of the workshop reported here.

The focus groups confirm previous findings by most gender researchers that male and female perceptions differ, and that their experience of similar events may also differ. The negative impacts of this system are experienced most strongly by women. This may result from the fact that most of the activities associated with the system fall within the woman's domain. In a situation where a disagreeable chore has to be performed, then the power dynamics within a household come to play. The most powerful members of the family are not required to perform the task. In most cases the husbands and the mothers-in-law are able to use their power within the household to dictate that the wife or the daughter-in-law must perform the task. There are known cases of women who have been assaulted by their husbands when they refused to drain the toilets.

Women's nurturing responsibilities makes it impossible for them to ignore an overflowing toilet. In most cases they feel that they have a responsibility to keep their families safe and clean. Some women cannot stand the disintegration of their environment, without taking action. This happens at the family level and also at the community level. The churches rely on women to come and help with sanitation problems. It is therefore critical that planning involves women from the outset.

4.3. The manufacturer's perspective:

The manufacturer put great store by his company's reputation as a socially responsible company, as regards their training programmes for entrepreneurs, their sponsorship of the training of mothers in rural areas (via a christian NGO called EDUTAK) and their training of local communities who are recipients of their products.

He is inclined to blame any malfunctioning of the toilets in TT on misuse by the residents and not the system. If toilets needed desludging within a three year period then the problem must be due to over-usage. When heavy usage is expected (eg. Shebeen or spaza shop) then a larger tank is advised.

The manufacturer provided a five litre bucket and a brush to each household. Also a sticker with large illustrations in colour was stuck onto the inside of the toilet wall to remind people how to clean and maintain their toilet. The interviewer commented that not one of these stickers had survived to be seen by the survey workers. The stickers had presumably been torn off to serve as toilet paper.

The interviewer also commented on the use of bleach which had been observed in TT. The manufacturer said such a substance would destroy the digester which would have to be completely emptied and cleaned in order to function efficiently again. He agreed that people did not always understand this. He said that he welcomed the use of "grey" water for flushing, especially clothes washing water which contained enzyme bearing agents.

Every household had been trained by a woman employed by the company to explain the use of the system. This training might not have been as thorough as the company would have liked. He offered to hold workshops and training sessions at the company's expense where and whenever the community would like.

The manufacturer pointed out the system, even the flushing variety, used considerably less water than a full waterborne system and this was a great saving for local councils who had difficulty recovering the cost of water. He cited other countries in Africa where people do not pay for water, in the belief that it is heaven-sent. He believes this will be the end result in South Africa and water costs will have to be covered by other charges.

As far as the criticisms raised in Block TT during the course of the survey, the manufacturer did not think these were the fault of the system. He did not seem aware of the high water table in the area, nor that this might adversely affect soakaways. He said geotechnical surveys had been done for the IDT and he was merely the contractor for the installation of his system.

As far as the siting of the toilets were concerned, he said the TPA had taken a decision to line up all the toilets facing the street. He agreed this was probably a mistake.

He strongly rejected the possibility of any worms being present in the toilets, other than tape worms. He put the comments made in the focus groups and the survey interviewers down to ignorance and frustration with the delay in the promised upgrade.

The manufacturer did comment on the pressure from ANC councillors to want upgrade to full services ie. waterborne sewerage, in all areas. He considered this ill-advised for the country's resources and believed on-site systems are an affordable and efficient interim product.

4.4. Local authority perspective:

Soshanguve TT falls into the Northern Sub Section of the Pretoria Metropolitan Council and is administered by the Akasia-Soshanguve local authority.

Council officials from the Engineering Department, Maintenance and the Treasury were interviewed for the purposes of this report.

It was made clear by the officials that the Block TT development was different from the rest of Soshanguve where water-borne sanitation had been installed. Block TT was a private development by the Independent Development Trust which had fallen under the old TPA. This appeared to be reason why the officials knew little of TT's history and felt no responsibility for the existing situation other than the upgrade programme.

The Engineering Department agreed the area, like so many in the vicinity (especially Blocks FF and GG) has a very high water table (less than half a metre below the surface) which makes the ground quite unsuitable for soakaway drains.

They did not know how the original geotechnical report could have resulted in the IDT and TPA making the decision in favour of soakaways even for what they thought was a temporary period of not more than two years. It now appeared that all the tanks needed desludging.

The officials explained that Council did not possess any vacuuming equipment to desludge the tanks, nor could they hire any. Such equipment was not included in their budgets for the next two years. Instead the desludging process had been privatised to a company called SANITECH and the TT residents were given Sanitech's number when they called to complain about difficulties with draining their toilets.

The interviewer made it clear that the residents believed Sanitech was a division of the Council and that the charge of R 80 per house for not less than twenty houses was a Council charge. The officials said there was nothing they could do about this misunderstanding.

The officials were asked about their future intentions since the upgrade to the small bore system would improve the present situation by removing liquids. However solids would remain in the tanks which would still require periodic desludging. The reply was that there

were no plans being made to cater for this.

It was explained by the engineers that the upgrade would be a great improvement. The pipes were already being connected and a project committee with community representation met regularly to discuss progress.

However the officials explained some budgetary problems in that the small bore piping is being financed by the IDT. The reservoir needed to supply the water has a different funding source, as does the oxidation dam needed to receive the piped effluent. The co-ordination of this funding was not happening as planned so the promised link-up date of early 1997 would probably not take place.

The officials were negative about the community's use of water. They described a situation in which water taps were left on all day, hoses left running while people went to work and standpipes were rarely turned off. They expected the upgrade system which would deliver water to each stand to at least treble the water consumption.

The officials feel strongly that communities like Block TT appear have no intention of paying for services. They admit that the unemployed cannot pay, but those who are employed don't pay either. To make matters worse, most households in TT have made their own illegal connections into water mains and run hoses to their stands. The officials believe the people have learnt how to do this from being employed on labour-based projects.

During the upgrade process the council workers break the illegal connections as they come across them. There should be no further need for illegal connections once water is available on each stand.

At the time of the research, the new upgrade did not appear to have been costed in terms of what the user will be required to pay on an ongoing basis. Even if this depends on water usage instead of the present "flat" rate it would make sense for water tariffs to have been discussed with Block TT so people have some idea what they must start to include in their household budgets.

All in all the impression gained from the Council officials was rather negative. The "us" and "them" attitude prevails and there was no impression given of joint problem solving between communities and officials. The "us and them" attitude also extends to the relationship between the officials and some of the councillors.

The officials favour waterborne sewerage as the only workable solution from the point of view of long term maintenance. This appears to be a view held regardless of cost to the council or the affordability of the people.

5. RESEARCH FINDINGS: GA-MMOTLA

5.1. House-to-house survey results:

Methodology:

- Sampling in Ga Mmotla was difficult compared to Soshanguve TT. The layout of the community is haphazard and many stands as shown on detailed planning map of the area don't actually exist or are vacant. More-over each dwelling uses several different numbering systems, none of which correspond to the official numbering. The exception is the newest area of Clinton's Gardens.

- Using the official map as a guide, a random selection of houses was chosen at demarcated intervals down the street, alternating from side to side. If the owners were not at home, then the next household would be interviewed. Deliberately concentration was on the older, more established areas as the problems are more developed and the residents more used to operating and maintaining the sanitation systems.

General observations:

- Very high levels of unemployment were recorded (above 70%). However a far wider range of incomes occur than Soshanguve with some earning around R 2 000.

- More men were around in Soshanguve although often quite young or old.

- A wider range of responses to the three main questions (general evaluation, ease of cleaning and ease of maintenance) is recorded compared with Soshanguve TT.

- Electricity seemed a higher priority in the area than improved sanitation, though this may in part have been due to the presence of some Eskom researchers in the area while this survey was being conducted.

- In most cases it appeared that children were prohibited from using the toilets, and would either squat on the soil next to the toilets, or would go into the veld. (the latter option was more viable in some areas than others). The age at which children were first allowed to use the toilets varied, but usually between 5 and 12 years.

  In conversation, the reasons given for this were the same as those given in surveys in other African and undeveloped countries. All people point to a fear that the children might fall into the pit. This is a real danger.

  Secondly, when asked, we were frequently told that the faeces of children are not dangerous. Adults would often take the interviewers to the place in the garden where their children squatted, without feeling any embarrassment. At the end of the

day, the faeces would be picked up, and chucked into the toilet.

Surveys in other African countries, notably Zambia, all points to the close relationship between witchcraft beliefs and sanitation practices. The faeces of adults, it is argued, must be disposed of, for if left alone, they would provide one's enemies with a body part needed to bewitch one. The faeces of children pose no such threat. Research in the Lowveld suggests that these beliefs are extremely common, especially amongst Pedi and Shangaan people. It is impossible to guess to what extent they are present in Ga-Mmotla, which falls outside of the areas currently witnessing a wave of witchcraft accusations. However, in one of the weekends in which the researchers were in the area, three "witches" were burnt in a neighbouring village (Temba).

- Here the major fact affecting health appears to be the unavailability of water. Whilst the toilet system does not require water to flush, water is required to wash one's hands after toilet use. In most cases, the water point is several blocks away, and is shared by many people. On the weekends, large groups of women queue up to fill their containers with water, however the bulk of this appeared to be used for washing (hence the weekend phenomenon) and household usage. Few households appeared to have toilet paper, and used any newspaper or rag they could lay their hands on. It is unlikely that washing ones hands after using the toilet is common practice. This is likely to be a major factor affecting health.

- In 1996, 2.5% of households were said to have septic tanks, 97.5% of households had ordinary pit latrines.

- The construction of the pit latrines is dependent on the individual households' resources and expertise. On the whole better off households have better toilets and visa versa. The toilet structures are most commonly made of galvanised iron, some of earth bricks or blocks, some of wood and the poorer ones of scavenged materials including cardboard and plastic. Newer homes on the edges of Ga Mmotla often have no toilets at all: the owners either have not got around to building them or the proximity of the open veld is thought to suffice.

- Toilets are placed according to individual choice which is usually as far away from the main house as possible. They almost never face the street. However the toilets often look onto and are very close to neighbouring property.

- In general terms the toilets smelt terribly. With a handful of exceptions there were almost no attempts to upgrade the longdrops to a VIP system and very few attempts to just add ventilation pipe to the pit. When the pit is full, the usual practice is to dig another pit and move the top structure.

The community in profile

The average person interviewed fell between the ages of 30 and 39. Of these, just over two-thirds were female, although in almost two thirds of the households surveyed the man functioned as the household head "most of the time". The average respondent had been educated up to standard six, and the vast majority was currently unemployed (73%). In terms of income, almost 20% of persons surveyed claimed that their household had an average monthly income of below R 500.

Problems encountered

The biggest problem in Ga-Mmotla was the size. Although the researchers had a representative sample of both "old" and "new" areas, they concentrated on the former for the simple reason that most of the toilets in Pritchard and Clinton's Garden were newly constructed, and had yet to develop the type of problems anticipated over time.

Sanitation and health

Again, the researchers were concerned at the limited evidence of washing after defecation. In Ga-Mmotla it is usually a lengthy excursion to fetch water, and this makes it less easy to wash one's hands. This suggests a considerable danger of oral-faeces contact, and associated health risk. In the brief discussion with healthcare workers in the community the researchers were told that there was no evidence of health problems stemming from these practices, which is hard to accept.

Behavioural survey of toilets

The results of G-Mmotla overall, and for each of the areas with Ga-Mmotla which we surveyed, are below.

Sanitation – Behavioural Survey: Ga-Mmotla (All sections)

Date of Interviews	July – Sept 1996
Number of households surveyed	137
Does household have a toilet? May I see the toilet?	Yes– 137 (100%) No – 0
Are there flies, mosquitos or biting insects inside the toilet?	Yes – 80 (58%) No – 57
Is there a cover on the toilet seat?	Yes – 43 (31%) No – 94
Is there a ventilation pipe with fly screen attached to the toilet?	Yes – 5 (4%) No – 132
Is there a roof on the toilet?	Yes – 112 (82%) No – 25
Is the toilet area clean?	Yes – 69 (50%) No – 68
Is there evidence of toilet paper as an anal cleaning material?	Yes – 5 (4%) No – 132
Is there evidence that the toilets are used for something else besides defecation?	Yes – 0 (100%) No – 137
Is there evidence of cleaning materials (other than water and a brush) being used to keep the toilet clean?	Yes – 109 (80%) No – 28
Does the toilet smell?	Yes – 131 (42%) No – 6
Is the toilet close to the side of the house?	Yes – 87(42%) No – 50
Are there faeces around the toilet?	Yes – 128 (93%) No – 9
Is the toilet dark?	Yes – 105 (77%) No – 32
Is there visual evidence of seepage?	Yes – 57 (42%) No - 80

5.2. Community Focus groups findings:

The following is a summary of the findings of the various focus groups held in the area over a period of 2 – 3 weeks. The following groupings were convened separately: the women, disabled, youth, leadership, professional and business people.

Present sanitation system

The most common sanitation system currently used in Ga-Mmotla is an unimproved pit latrine system.

The Structure

The following are some of the problems which were identified by people with regard to the structure.

The preferred depth of the pit is between 6 and 7 feet. At this depth a pit may be used by a family of 5 for two years and more.

Some areas in Ga-Mmotla are however underlaid by hard rock from the depth of about three feet. This has forced some residents to dig pits of not more than three feet. Such pits fill up very fast and in some cases families have had to dig twice at one place. Great care is taken not to dig too close to a house.

The depth of a pit sometimes depends on the level of underground water. If underground water is encountered digging becomes difficult.

Digging is done by members of the family or people are employed and paid between R40 and R60 for their services.

It takes an average person about five days to dig a pit. This time can be reduced to about three days if the soil is soft.

The pit is covered by a steel reinforcement and a cement layer on top, forming a slab. The top structure is supported by this slab. It is generally believed that the top structure must be constructed from Aluminium sheets rather than brick because brick is considered to be too heavy. Toilets built from brick often subside due to insufficient foundations.

Subsidence sometimes occurs due to the weakening of the steel reinforcement which is caused by the corrosive nature of the pit environment.

The safety of a pit latrine depends largely on the way the pit cover or slab has been constructed. A well-balanced, reinforced and wide enough cement slab helps distribute the weight evenly on the ground. This type of the structure is too expensive for many households to afford.

One of the church leaders believed that he had one of the safest toilets in Ga-Mmotla. The toilet had two cabins, one for the ladies and the other for men. The toilet was built by a local contractor and it cost the church about R 1 000.

Some families use an aluminium sheet to support the seat. This form of support does not last for long because of corrosion.

A number of factors were identified which explained why some of the toilets in Ga-Mmotla are of a poor quality. These are:

- Lack of resources, especially finances. Some families could not afford to spend about R55 on materials every time they need to build a toilet.
- Lack of relevant skills. Most families build the toilets themselves without necessary skills.
- Use of recycled material. Building material is moved from one toilet to another as the pit is moved.

One of the problems with most latrines is that the hole for the seat is in the centre. This makes the use of the latrine very uncomfortable for women and almost unaccessible to children.

Use of Pit latrines by children

Most families do not allow children to use a toilet until the age of seven. Children under the age of seven use either the back of the toilet or the back of the house. It is the responsibility of the mothers or the older children to clean up after the young ones.

Small shovels are often seen next to the toilets of families with small children which are used to clean up after them.

Children in Ga-Mmotla start going to school from the age of seven. The schools do not have special toilets for the young ones and they are not accompanied by an adult when they need to use the toilet. Because at this age children do not use a toilet even at home, they therefore do not use them at school. They either choose to use the back of the toilets or the floor inside the toilets. The toilets are cleaned by the children with the help of the older pupils under the supervision of a teacher. It must however be noted that there is no water on the school premises.

Hygiene practices at schools:

Toilets in schools are in a very poor condition. Lack of water near the toilets or at least within the school premises makes it impossible to follow the most basic hygiene practices. Children do not wash their hands after using the toilet.

The following two suggestions were made by the focus groups to improve children's health at schools.

- The Department of Education together with the Department of Health should provide schools with chamber-pots for small children. After the use chamber-pots should be emptied into the toilets.

- Schools should be provided with water containers to enable children to wash their hands after using the toilet.

Use of Pit Latrines by the Disabled:

One of the problems facing the disabled people is that the construction of a pit latrine is very difficult for them. In most cases toilets built by disabled people are unstable and not safe to use. The construction requires skills which most disabled people do not have. The alternative is to employ a local contractor to build a toilet for them, but this alternative is usually not affordable.

Use of chemicals:

The biggest concern of the people in Ga-Mmotla is to have a dig a new pit every time the toilet they are using is full. This is worse in areas which have underlying rock because it restricts the depth of the pit.

Chemicals are therefore widely used to slow down the filling up of the pit. Two types of chemicals are used to help speed up the degradation of the solids. No one in the community knows the names of these chemicals or the name of the company that produces them. They are sold by sales people (described by the community as a white lady with a man who drives her) who bring them into Ga-Mmotla.

The pinkish liquid which costs R30 a bottle of about 400ml is the most common of the two. Half the bottle is used at a time and lasts for about six to twelve months.

Once this chemical has been poured into the pit, the toilet may not be used for about 12 hours. The people were warned that the degrading process is accompanied by the release of fumes which can burn human flesh on contact.

Many families use this chemical at night. The same applies to the schools.

The second chemical is a whitish powder which costs R17 for a 5kg packet. This chemical has only recently been introduced in the market and it seems as if few people know about it.

Both chemicals are believed to prolong the life of a single pit by up to five years. The local nurses denied the chemicals were effective.

Risks associated with use of pit latrines

One of the risks associated with the use of pit latrines is the possibility that users may fall inside the pit. A number of such cases have been reported in Ga-Mmotla. This has affected not only the kids but adults as well. The poor quality of the slab and the instability of the pit walls were cited as some of the reasons that have caused people to fall inside the pit.

Some of these accidents have resulted in people getting severely burnt by the sludge. Although many residents are careful with the use of the chemicals whose fumes are believed to cause burns, the residents did not seem to link the burns of someone who has fallen in the pit to the presence of the chemical in the pit. It is not clear whether some of the burns were more severe because of the chemicals or not.
Pit latrines provide a conducive environment for flies to breed. Residents fear that these flies promote disease.

Community expectations of the VIP system:

- People look forward to a great improvement in safety. Properly constructed pits will mean an end to the fears of structures collapsing, children falling in, and people getting burnt by contact with the contents of the pit.

- People are looking forward to having fewer smells and flies and expect improved standards of health.

Comparison with concerns raised in Soshanguve TT:

The smell:

Few people, compared to Soshanguve TT, complained about the smell. This could be because people in Ga-Mmotla are not restricted with regard to cleaning agents they may use for the toilet.

The sizes of stands in Ga-Mmotla are relatively bigger than those in Soshanguve TT. Toilets are therefore situated at a reasonable distance from the houses.

The toilet structure:

Stability

There was no complaint about the stability of the toilet structure in Soshanguve TT. The structures are solid. This is probably because they were built by experienced contractors. On the other hand, structural stability is of greatest concern in Ga-Mmotla.

Position of the toilets in relation to the streets.

A general concern in Soshanguve TT is that almost all the toilets face the streets depriving users any privacy from passers-by.

Very few, if any, toilets in Ga-Mmotla face the streets. This is probably because the family members built the toilets themselves or at least give instructions to those people they employ. It could also be because the toilets are built by local people who understand local traditions and way of life.

Whereas some of the women in Soshanguve TT would not use a toilet at night because of the high crime rate in the area, women in Ga-Mmotla would use a toilet at any time of the day or night. The fact that properties in Ga-Mmotla are fenced could be the contributing factor to the sense of security prevailing in Ga-Mmotla.

The toilet performance:

There was a sense of helplessness among the people in Soshanguve TT because they felt they were unable to do anything about their toilet system. Many people feel that their dignity is destroyed by having to drain the tanks themselves.

Ga-Mmotla people are not frustrated by the pit-latrines and look forward to the proposed new VIP system as an improvement in their lives.

5.3. Technical Interviews

The researchers interviewed the relevant consulting engineers, the Brits Eastern District Council, an official from the Department of Water Affairs and a technical expert responsible for the proposed new VIP design.

The information is summarised as follows:

- Ga-Mmotla is one of more than 30 villages which will be supplied with water from the Moretele Water Supply Scheme under the RDP Rural Water Supply Programme. R 4. 375 million has been approved for the project.

- The Eastern District Council of North West Province will control the project as the implementing agent. As a first stage a structure plan for Ga-Mmotla was completed at the end of June 1996.

- Initially, full yard reticulation is not envisaged. Water will be supplied according to the minimum RDP standard of 200 metres maximum walking distance from a dwelling to a street standpipe.

- Ga-Mmotla has a particularly high water table varying from as little as 100 mm below ground to a depth of 1,5 metres. This has influenced the type of sanitation recommended for the area.

- Technical experts were appointed to come up with a suitable system. The proposed solution is a combination of a VIP and a Vault latrine. The toilet will therefore be raised up with the reception tank on top of the ground to avoid problems caused by the high water table and to prevent possible ground pollution. The tank will be made of brick with a sand filter beneath it. The restricting toilet structures will rise about 2-3 metres above the shacks.

- The community leadership has visited the technical experts and reportedly approved the suggested system. This happened prior to the focus groups described in this report. It is interesting that nowhere in the course of the various group discussions was the height of the new toilets raised or the difficulty this would pose for the elderly and the disabled. The idea of a toilet raised above ground was not understood at all.

- The technical expert confirmed the Vault type VIP had been discussed with the consulting engineers but not with the community. He agreed the community should be aware of the new design as it is very different from the conventional VIP. It might well cause social problems.
- The consulting engineers report hostility from the Council towards Consultants and sense that all their attempts to make headway with the project are being blocked. They are presently awaiting a letter of confirmation from the council to authorise them to proceed with the project. This letter has been held up for months without explanation.

- The Brits Eastern District Council confirmed the Council's reserve over private sector consulting engineers. Consultants were accustomed to calling the tune with the old administration and it is clearly in the consultant's interests to propose the most expensive solution since they are paid a percentage of the total value of the contract. It is made clear that from now on the EDC will decide what is in the best interests of the communities.

- The Council also believes consultants confuse communities with so-called technical expertise that may be inappropriate for the needs or affordability of the community in question.

- The most difficult issue before the EDC is how to balance the choice of technology with people's willingness to pay. This decision has to be taken by communities and their elected representatives. Consultants are probably best excluded from this process once they have supplied the necessary technical information.

6. RESEARCH FINDINGS: IVORY PARK

6.1. Survey results:

Methodology:

- In Ivory Park, both the size and heterogeneous nature of the community presented the easy composition of a random sample. The brief was to examine the three different toilet systems still working in the area. A small number of each were surveyed in a comparative rather than a representative survey. The data gathered is insufficient to draw conclusions about behavioural characteristics of the whole community.

- As part of an urban sanitation evaluation, the Palmer Development Group, in association with the University of Cape Town's Water Research Group, surveyed Ivory Park. The results of this survey are to be found in the Sanitation Working papers, Low Flush On-site Anaerobic Digester Systems, paper B3.1 and B3.2 published by the Water Research Commission in April 1993. Readers are referred to this Palmer Report both for the technical evaluation of the systems at the time of installation and for the social perceptions of the recipient community in assessing their new toilets.

General observations:

There are three toilet systems in operation in Ivory Park:

1. A dry version of the system found in Soshanguve TT (tank volume 1000 litres) (about 1800 units)

2. A very small volume (35 litres) water tank flush tipping tray system (about 7400 units) and

3. A slightly larger capacity digester tank and water tank system (70 litres) with an all-in-one seat pedestal (about 2400 units).

- The dry, non-flush system appears to be almost universally disliked largely due to cleaning difficulties which caused smells and a large number of flies.

  The system is not designed to flush, and a plunger is used to push faeces down the pipe into the digester when necessary. Dirty plungers were often in evidence. However residents reported that they often used water to "clean" the pipe, or because they believed it would help to break down solids in the tank.

  The general construction of the system appeared sound, and there was no evidence of structural damage over time. The main problems concerned the soakaways, where there was clear evidence of seepage and flooding in almost all

of the households surveyed. These contributed to the smell considerably.

- The two "flush" systems were both considerably cleaner than the "dry" system. However the small volume system had the following problems:

  The first concerns the construction of the toilet itself. The flush mechanism was reported to "jam" on regular occasions by most households, whilst all households complained that the tank at the back of the toilet was often damaged by the wind or simply by the weight of the water. In two cases, respondents had wrapped wire around the tanks to hold them in place, as the original brackets had broken. Of all the problems cited, those relating to the tank at the back were clearly the most pressing and commonly experienced.

  The second and biggest problem was the size of the tank, which we were told needed to be drained regularly. These last two problems probably account for the reported maintenance problems.

  Finally, there was evidence of problems with the soakaways in few cases, but significantly less so than in the other two systems.

- The larger volume flush system had significant soak-away problems.

  In nearly all cases, there was evidence of significant seepage. All of the respondents claimed that they had already dug an extra hole which would assist the current soakaway, however these appeared to be simply add-ons to existing soakaways, and it is not clear how effective they were. The Palmer Report (B3.1) notes the addition of soakaways, as well as pits.

  The opening to the tank, which is located behind the toilet, appeared to cause problems. In many cases, there was a significant smell around the opening. This might be the fault of the owners, who had tried to unblock the toilets and had not replaced the lid correctly. This was picked up by the researchers, but was not reported by the respondents.

Community in profile

The average person interviewed fell between the ages of 20 and 29. Of these, just over three-quarters were female, although in almost three-quarters of the households surveyed the man functioned as the household head "most of the time". The average respondent had been educated up to standard seven, and the vast majority was currently unemployed (80%). In terms of income, only 5% of persons surveyed claimed their household had an average monthly income of below R500. The majority of respondents claimed a monthly income of between R1000 and R1999.

Problems encountered

One problem was finding the systems. There is an official map of where each system is installed. This was produced by officials in the TLC responsible for draining the tanks. On inspection, we found that many households were not on this "map", whilst many had systems we could not easily identify and often these did not correspond with the type of system indicated on the official list.

Sanitation and health

Again, there was no evidence of washing after defecation. In the "dry" system, one is not expected to flush, and there is therefore no necessity to fetch water. In the flush systems, access to running water varies, depending on the position of the household in the block, and in the township generally.

6.2. Community Focus Group Results.

General comment:

The perception of the various groups is that sewer connections are presently being installed so that waterborne sewerage will soon be delivered to the township. Most people believe the problems of their present toilet systems will be short-lived.

Drainage of the toilets:

The sanitation systems were first installed in the early 1990's. The toilets with smaller tanks are supposed to be drained once very two weeks. It is however common that they are drained after six weeks. The toilets with bigger tanks (ie. The dry system) only need to be emptied twice a year.

Draining is done by a contractor who is appointed by the council.

The following are some of the main concerns about the draining:

- The contractor's employees at times miss out on some of the properties.

  The reason given for this is that some gates are locked and it is necessary to have access to the property to be able to drain.

  Unlike the system in Soshanguve TT, which is drained through the tank, The Ivory Park toilets are drained through the toilet bowl.

- When draining is done the tanks are never completely emptied.

- Some households are given chemicals after draining and others not. There is a perception that some households get special treatment from the contractor.

- Because draining is done through the toilet bowls, one of the main complaints is that seats are usually left very dirty. There are areas which cannot be drained by the contractor because new residents have built shacks along the route of the truck thus blocking its passage. Affected households have to drain the toilets themselves. They dig holes in their yards for this purpose. Unlike the people in Soshanguve TT most of whom would notify neighbours when they are going to drain, this does not seem to be the practice in Ivory Park. Residents are embarrassed to talk about draining toilets to their neighbours. They would rather drain late at night when neighbours are asleep.

Complaint reporting:

For a long time complaints were reported to security staff at the Ivory Park Council offices. Most of these complaints never reached the relevant council structures which could address them.

It has now been agreed that residents should report complaints to section or street leaders who should report them to Tuesday meetings between councillors and members of the Local Development Forum which represents all sections in Ivory Park.

- **Informal settlement – Mzabalazo**

  There is an informal settlement in Ivory Park called Mzabalazo. The number of households living in Mzabalazo is estimated at 1 500 and the population between 5 000 – 6 000 people.

  There are 15 toilets and 2 taps servicing the 1 500 households. The rent is R20 per month per household including services.

  - The residents of Mzabalazo have not been paying rent for some time now. They gave the following reasons for their rent boycott:

- The toilets are drained only twice a year. They are constantly full and/or blocked. The result is unspeakable.

- There is effectively one tap for the whole settlement at any one time. This is because the one of the taps is always broken.

- After Local Government Elections the community of Mzabalazo was promised some form of refuse collection. A year later this has not happened.

Health issues:

The general perception in Ivory Park is that the present sanitation system is not good for the health of the residents. The toilets are either constantly full or blocked. There is always a very strong smell in the neighbourhood and there are always a lot of flies.

The community could not however say whether the health of the residents has deteriorated due to the toilet system or not. Ill health in Ivory park can be attributed to a number of factors, alcohol abuse being one of them.

The greatest health concern is for the children of Mzabalazo. Most of them have sores and the community believes this could be because of the toilets.

The nurses in Midrand clinic who are responsible for Ivory Park said that diarrhoea and sores are very common among children in Ivory park. They however could not link these to the toilet system without more medical research taking place. There have been typhoid cases as well, but these also could not be linked to the toilets without more evidence. Nevertheless perceptions indicate a strong link between poor toilets and health problems.

Women and Sanitation:

The problems associated with the present systems are considered by most people in Ivory Park to be temporary. The water and sewerage projects currently being implemented have given most residents of Ivory park hope that these problems will be resolved in the near future.

The women who live at Mzabalazo unfortunately do not share this optimism. They are very frustrated with the general conditions of life in their community. They believe they have bitter battles ahead with the council which they are determined to fight.

The following are some of their concerns with regard to the toilet system:

- The toilets are not enough for the residents of Mzabalazo.
- The toilets are constantly full and/or blocked.
- After every draining the inside of the toilets, the seats and the floors are usually very dirty. It is only the women who clean up.
- Because the toilets are communal, it is impossible to keep them clean.
- There are some people who throw used condoms in and around the toilets. Some children have picked these up to play with mistaking them for balloons.
- Some shacks are so close to the toilets that the smell is unbearable to the owners.
- The crime rate is so high in Mzabalazo that not one of the women we talked to uses a toilet at night. They all use chamber pots.
- The biggest concern of the women at Mzabalazo is that they feel neglected by the council.

Disabled and the Toilet System:

The discussion with the disabled focused on the disabled youth. This is because the effort to reach the adults was not successful.

There are not special schools in Ivory Park for the disabled children. They are therefore kept at home.

The Ivory Park community has identified the need for a institution which could cater for the needs of these children. Very little has been done in this regard because of lack of funds.

Most of the children are very young and the family members assist them when they need to use a toilet. Potties are used in most cases with the exception of a 19 year old boy who has had fits since the age of 9.

The boy lives with his family but spends most of his time with his mother. The mother does not work because she has to look after him. The boy said he is scared of using the toilets when they are blocked or full.

The mother said every time the toilets are full the boy spends days avoiding to use them. He refuses to use a bucket and this has at times resulted in him having severe stomach pains. On a number of occasions the mother has had to travel to his aunt with him to use the aunt's toilet. Such trips cost the family R4.80 per trip which the family can ill afford.

Schools and the Toilet System:

The schools and the clinics use septic tanks and not the systems used by the householders. The major problem with these toilets that often they get blocked because of sanitary pads being thrown in them. Containers are provided for these but at times people do not use them.

The toilets at the schools and clinics resemble water-borne toilets. They are therefore easier to maintain.

Children under 14 (Rebone Primary School).

All the children showed good understanding of the need to wash their hands after going to the toilet in order to prevent the spread of disease. However the children admitted the taps are far and in winter the water is too cold. All the children said they drink directly from these taps when they are thirsty.

All the children interviewed talked about people throwing their waste into the river which runs through Ivory Park. When people drain their toilets themselves, they empty their buckets into the river, and the council men also drain into the river.

Toilet paper is used by the adults when it is available. The children are given newspaper or plastic. They know they are supposed to use toilet paper but they don't know why.

The children said they do not use the toilet structure for urinating.

Children over 14 (Umqhele High School)

The older children showed more disregard for hygiene than the young ones.

This group also talked about the pollution of the river saying the Council suction tankers are emptied into the river. A community leader confirmed this. The river is very smelly and unwholesome looking but no-one in authority would confirm this method of waste disposal.

Mothers use bleach to try and lessen the smell of the toilets. No-one knew this was a bad idea.

This group testified to frequently hearing Council employees ridiculing women when sanitary pads are found blocking the toilets.

There was a general belief that any system other than water-borne sewerage causes disease. However housing was rated the number one priority rather than improved sanitation.

6.3. Technical Interviews

- The engineers agreed that a more frequent vacuuming system should be in place to ensure less of a build up on the holding tanks. The contractor was experiencing a problem with some tertiary road access to houses – this led to frequent breakdown of suspension on the vacuuming trucks. The road maintenance plan takes the contractors complaints into consideration.

- The engineers also acknowledged the soakaway failure. This can be attributed to:

    1. The soakaway are blinded.

    2. Too small or no soakaway, or inadequately constructed.

    3. Impermeability or soil conditions due to a high level of ferrocrete average depth of 0.5 m below surface.

    4. High water table due to high ferrocrete layer. This has the result of a vacuum forming once the holding tanks are emptied. Ground water then flows back into the holding tank to create equilibrium.

The sanitation is a pollution disaster and can have a serious effect on ground water in the future.

- The engineers believed the only solution is the upgrade of the whole of Ivory Park to water-borne sewerage as soon as possible. They did not know the cost of this or whether it is feasible within the constraints of Council budget.

- Cost recovery was reported as successful by the local Masakhane committee. However the Star newspaper reported payment at an all-time low of 4% (04.06.96).

- The local ratepayers alliance reported Masakhane as a non-starter in Ivory Park since the local councillors were themselves guilty of non-payment.

7. DEDUCTIONS FROM THE RESEARCH

7.1. Main areas of concern

End-users:

The most concerning aspect of this report relates to the impact of the sanitation system described on the end-users in each of the areas surveyed. In each area there are:
Inadequate toilet facilities:

- Unimproved pit latrines in Ga-Mmotla (unacceptable in terms of government policy)
- Soakaway and drainage problems associated with the low flow on-site system in Soshanguve TT.
- Poor operation of the various systems in Ivory Park.

Inadequate water supplies:

- Far too few standpipes in Ga-Mmotla
- Illegal connections throughout Soshanguve TT.
- Distances too long between standpipes in Ivory Park.

Poor facilities for the safe disposal of water and other domestic waste, including drained toilet effluent:

- Non-existent in Ga-Mmotla; waste is thrown into the veld; another pit is dug once the existing one fills up.
- Drained toilet effluent is emptied into holes dug by residents or poured into the veld in Soshanguve TT.
- Suction tanks are emptied into the Ivory Park river, according to residents.

Poor understanding and practices of basic hygiene:

- Little water to wash after using the toilet in Ga-Mmotla.
- Children often understand hygiene principles from school – but in practice the water is too far, too cold in winter and the children are lazy (all three areas).
- Children drink directly from the standpipe taps.

- Many people still believe children's faeces are harmless with the result they are found all over the yards.

- There is much talk of worms in the toilets with no understanding that these are probably human tape worms and the children particularly need medical attention.

- All areas report bad cases of skin sores which people believe are related to dirty toilets.

- Women present with various vaginal infections due to unsanitary conditions.

Poor knowledge of how sanitation systems work and should be operated and maintained:

- The pit latrine seems to present fewest problems (Ga-Mmotla) and some people who now have aqua privies refer back to their former pit latrines as being preferable to their new toilets.

- Anaerobic digesters are rendered useless by the use of cleaning agents like bleach. The communities are unaware of why bleach should not be used.

- People appear pre-occupied with draining systems which should not need draining, Soshanguve TT.

- Women in particular, are the ones most imposed on by inadequate toilet facilities.

Manufacturers:

Manufacturers of on-site systems perform according to the dictates of their business: they market themselves in order to win tenders and install the systems as quickly as possible in order to get out of the area and start another job. This is common business practice and it is not reasonable to load manufacturers with the problems arising from many of the systems.

This report indicates generally well constructed systems which probably in ideal conditions will all perform as specified. The problem arise when people do not understand the technology, when ground conditions are unsuitable for the system and when there is no adequate maintenance in operation.

Local Authorities

- The onus would appear to lie with the local authority to check geo-technical reports carefully, to ensure manufacturers carry out proper education programmes and finally to ensure there is provision for maintenance. If the maintenance is contracted out, the local authority must first make sure the service to be provided is within the affordability of the community concerned.

- Of the two areas with aqua privies, Soshanguve TT, receives the least acceptable service from the local authority at the present time.

All three areas are to be upgraded in the near future:

1. Ga-Mmotla's water supply will be improved and VIP's provided in the area. Already there is a discrepancy between the toilet type selected by the community and the recommendation by the technical expert to design a vaulted toilet because of adverse soil conditions. The community should know of the implications of this change as soon as possible. Most importantly it looks as if the IDT sanitation problems at TT will be avoided. The funding problems are now delaying the upgrade unreasonably.

2. Soshanguve TT's system is being upgraded to a small bore system which will alleviate the seepage problem, so this needs to be monitored. The evacuation of the tanks will still need attention periodically and the Council should take responsibility for establishing a workable system.

3. Ivory Park is embarking on a change-over to water-borne sewerage. This will be a slow process and will need to be accompanied by a comprehensive education campaign if it is to be successful.

- The researchers of this report are concerned about certain attitudes that prevail in the local authorities interviewed:

  The most obvious difference between the perceptions of these interviewed for the purpose of this report and the White Paper on sanitation is the definition of the term "sanitation".

  The participants in the report defined sanitation, almost universally, as toilets. There was often surprise when the researchers attempted to widen the definition.

  The White Paper makes the wider context very clear: "Sanitation improvement is .. aimed at the individual, the home and the community, which must include health and hygiene education as well as sustainable improved toilet facilities, water supply and methods of removal of dirty water and household refuse".

  It is going to need an education campaign to get everyone up to speed on the definition alone.

Payment principle:

There is no question that government policy is based on the principle of "user pays". The cost of supplying everyone with expensive sanitation systems is not viable: "as a result we must consider approaches which use less government funds".

..."local authorities must aim to receive enough money to pay for operations and maintenance, and for repaying loans used to build services.

Most of the money should come from service charges and local taxes".

"The costs of emptying pits and tanks and disposing of the contents must be included in affordability calculations, alongside the costs of conventional sewage disposal".

" All households should pay at least the full operation and maintenance costs of the services consumed ... failure to ensure this will result in breakdown of the services".

These quotes from the White Paper contrast markedly with the comments from the various councils. It is going to take a complete mind change both on the part of the authorities and the communities to achieve national policy.

Environmental Risks:

This report does not reveal a developed sense of environmental awareness with regard to sanitation. The Ivory Park young people are very conscious of river pollution, but no-one talked of soil pollution in Ga-Mmotla from shallowly-dug pit latrines in an area with very high water table.

The White Paper is very clear: "Sanitation systems should protect the environment and harm it. There are many threats of pollution where there are no sanitation systems or where they do not work properly. The worst risks are to water supplies in rivers, dams and underground. This in turn can cause serious health problems".

7.2. Relation to the White Paper

Socio-Economic aspects central

This report brings out strongly that technical issues are but a small part of sanitation. The most important issues today are social, economic and political: these dominate, but of course need competent technical input.

The White Paper reads:

"In the past, community sanitation has been seen primarily as a technical issue, while other aspects have been given secondary consideration. It is now recognised that other elements of sanitation, particularly social issues and health and hygiene, are of central importance".

Role of women and minority groups

This report stresses the importance of the role of women in sanitation and how the needs of children, the elderly and the disabled should be borne in mind.

The White Paper reads:

"Women are to be involved in the decision making processes at all levels".

"A programme will not succeed unless the whole community is mobilised, particularly women and children. Sanitation programmes should look to the special requirements of the disabled, elderly and young children".

Technologies

This report is strong on bringing out the inadequacy of on-site technologies, either because the system isn't a good one, people don't know how to use it, or there is no appropriate ongoing maintenance.

The White Paper reads:

"Innovative technologies must be subjected to independent evaluation and testing prior to implementation".

"It is extremely important that those households with the least to spend on sanitation are not supplied with unreliable technology".

General:

On the whole this report underlines the substance of the White Paper and provides practical examples of just how important its principles are and how speedily they need to be implemented.

7.3. Conclusions

The research report concludes:

- That the sanitation systems in the three study areas perceived by the users to be inadequate.
- That the systems cause disruption, discomfort and possibly disease in the lives of the people who use them.
- That the environment is threatened in all three areas.
- That health and hygiene education and practices are neglected largely because the link between poor sanitation practices and poor health is just not understood. This is possibly the most urgent of all the needs to be addressed.
- That people have been under-consulted before installation and under-educated about the use of the system they possess.
- That the payment principle is not properly understood by residents and not

communicated or properly enforced by the authorities.

- That the needs of women, young children, the old and the disabled are overlooked.
- That women's views, in particular, are not heard and taken seriously.
- That local authorities all too often try to make the easy way out and forget affordability and sustainability as important principles.
- That developers and authorities sometimes ignore geo-technical reports.
- That consulting engineers, while they provide the technical expertise should not drive the process.
- That local authorities (politicians and officials) and other professionals are sometimes prejudiced against VIP systems on the grounds that they are not sufficiently modern for the new SA. The report in fact suggests the VIP to be the most suitable system in so far as, if properly constructed, the VIP is the most robust system, there is little to malfunction, it is the most affordable and the most easily understood by the users.
- That the vital importance of adequate sanitation in the lives of communities is not really understood, nor its impact on quality of life.
- That too much emphasis is put on formal housing, sometimes at the expense of life sustaining infrastructure, particularly sanitation.
- That the on-site sanitation systems researched in this study are not appropriate for low-cost housing developments unless top priority is given to maintenance of the system. This does not seem possible given the pressures on local authority resources.

In all three research areas people say they are dissatisfied with their sanitation systems. People believe they have inferior, second rate systems in comparison with those enjoyed by urban people (ie. water-borne systems). In their view their systems do not work properly and they cause their users great inconvenience. The least criticism came from the area with rudimentary pit latrines where people seemed to be less politicised in their demands. In the other two areas there was no attempt to relate product to affordability and this reflects the need for a massive education campaign before a service like sanitation can become viable.

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9. APPENDICES

9.1. ENGLISH QUESTIONNAIRE
(Questionnaires were also produced in Zulu and Setswana).

9.2. BEHAVIOURAL SURVEY QUESTIONNAIRE

Questionnaire **{ENGLISH}**

Interviewers' name: _____

House/Stand interviewed: _____

Type of toilet: |__1__|__2__|__3__|__4__|__5__|__6__|__7__|

Other: _____

(1: Waterborne) (2: Septic tank) (3: LOFLOS) (4: VIP Offset) (5: VIP Twin) (6: Std. VIP) (7: Bucket).

_____

1) Age: |__1__|__2__|__3__|__4__|__5__|__6__|__7__|__8__|__9__|

(1: <15) (2: 15-20) (3: 20 - 30) (4: 30 - 40) (5: 40 - 50) (6: 50 - 60) (7: 60 - 70) (8: 70 - 80) (9: 80)

2) Gender: |__1__|__2__|

(1: male) (2: female)

3) Educational qualification: |__1__|__2__|__3__|__4__|__5__|__6__|__7__|__8__|__9__|

(1: < std 4) (2: std 4) (3: std 5) (4: std 6) (5: std 7) (6: std 8) (7: std 9) (8: matric) (9: post-matric)

4) Language most often spoken: |__1__|__2__|__3__|__4__|__5__|__6__|__7__|

Other: _____

(1: Tswana) (2: Zulu) (3: Afrikaans) (4: English) (5: Sotho) (6: Pedi) (7: Xhosa)

5) Are you currently employed in something you earn an income for: |__1__|__2__|__3__|__4__|

(1: yes) (2: no) (3: unsure) (4: wont answer)

If yes, then:

6) What do you do: _____

7) Are all of the people in your yard members of your family, or are some of them tenants
|__1__|__2__|__3__|__4__|

(1: all family members) (2: some tenants) (3: unsure) (4: wont answer)

8) How many people live in your house: |__1__|__2__|__3__|__4__|__5__|

(1: <2) (2: 2-5) (3: 6-10) (4: 10-15) (5: >15)

9) Is the person who is in charge of your household most of the time a man or a women:
|__1__|__2__|

(1: man) (2: women)

respondents asked to react to the question, indicating levels of support, and evaluate on a scale of 1 (very good) to 5 (very bad).

10) I have spoken to some people, and they think that the toilets are good. I have spoken to other people, and they think that the toilets are bad. Where do you stand:
|__1__|__2__|__3__|__4__|__5__|

respondents asked to react to the question, indicating levels of agreement, and evaluate on a scale of 1 (very easy to clean) to 5 (very difficult to clean).

11) I have spoken to some people, and they think that the toilets are easy to clean. I have spoken to other people, and they think that the toilets are difficult to clean. Where do you stand: |__1__|__2__|__3__|__4__|__5__|

respondents asked to react to the question, indicating levels of agreement, and evaluate on a scale of 1 (very easy to fix) to 5 (very difficult to fix).

12) I have spoken to some people, and they think that when the toilets break down they are easy to fix. I have spoken to other people, and they think that when the toilets break down they are difficult to fix. Where do you stand: |__1__|__2__|__3__|__4__|__5__|

13) Does the toilet door face the street: |__1__|__2__|

(1: yes) (2: no)

If yes, then:

respondents asked to react to the question, indicating levels of agreement, and evaluate on a scale of 1 (very safe) to 5 (very dangerous).

14) I have spoken to some people, and they think that because the toilets face the street they are dangerous to use. Other people think that they are not dangerous to use. What do you think: |__1__|__2__|__3__|__4__|__5__|

15) Do all the people in your household use the toilet, or just the adults |__1__|__2__|__3__|__4__|

(1: all people) (2: only adults) (3: unsure) (4: wont answer)

If no, then:

16) At what age are children first allowed to use the toilets: _____

17) Did someone talk to you about the best type of toilet that you were able to afford before the toilets were installed in your community: |__1__|__2__|__3__|__4__|

(1: yes) (2: no) (3: unsure) (4: wont answer)

If yes, then:

18) Who:

_____

19) Is it easy to flush the toilet, or do you think that it is hard work: |__1__|__2__|__3__|__4__|

(1: yes-easy) (2: no-hard work) (3: unsure) (4: wont answer)

20) Did someone talk to you, or to someone in the yard, about how to use the toilets: |__1__|__2__|__3__|__4__|

(1: yes) (2: no) (3: unsure) (4: wont answer)

21) Do you usually smell the toilet from your house: |__1__|__2__|__3__|

(1: no) (2: yes-sometimes) (3: yes- always)

22) How far do you have to walk to fetch water to flush: |__1__|__2__|__3__|__4__|

Other: _____

(1: tap attached to toilet) (2: tap on stand) (3: tap on block) (4: more than 1 block)

23) Whose job is it to clean the toilets:
|__1__|__2__|__3__|__4__|__5__|__6__|__7__|__8__|__9__|

Other: _____

(1: father) (2: mother) (3: boychild) (4: girlchild) (5: teenage son) (6: teenage daughter) (7: tenant) (8: someone paid) (9: combination)

24) Who usually fetches the water to flush: |__1__|__2__|__3__|__4__|__5__|__6__|__7__|

Other: _____

(1: father) (2: mother) (3: boychild) (4: girlchild) (5: teenage son) (6: teenage daughter) (7: tenant)

25) Some people use their bucket only to flush the toilet. Other people also use the bucket for things in the house. What do the people in your house use the bucket for:
|__1__|__2__|__3__|__4__|__5__|__6__|__7__|

Other: _____

(1: water for cooking) (2: water for washing or bathing) (3: water for washing clothes) (4: water for cleaning inside the house) (5: water for cleaning outside the house) (6: only to flush the toilet) (7: wont answer)

26) If you were to improve the toilet, would you prefer to a) have an electric light in the toilet, b) have a bigger toilet room, c) get rid of the smell, d) have a tap in the toilet room, e) have a toilet that flushes with running water: |__1__|__2__|__3__|__4__|__5__|

(1: a) (2: b) (3: c) (4: d) (5: e)

27) If you could choose, which of the following would you most prefer to do: a) improve the toilet and the toilet room, b) add another room to your house, c) general improvements to house: |__1__|__2__|__3__|

(1: a) (2: b) (3: c)

28) How much more would you be willing to pay to improve the toilets: (R25pm / R50pm / R75pm): |__1__|__2__|__3__|

(1: 25) (2: 50) (3: 75)

29) I would very much like to see the things that you usually use to clean the toilet. Would you please show me the things that you use: |__1__|__2__|__3__|__4__|__5__|

Other: _____

(1: water only) (2: water and scourer) (3: water, scourer, and cleaning product) (4: don't clean) (5: wont answer)

30) I would very much like to see the things that you use to help yourself with in the toilet. Would you please show me the things that you use: |__1__|__2__|__3__|__4__|__5__|

Other: _____

(1: toilet paper) (2: rag or cloth) (3: newspaper) (4: ash) (5: wont answer)

31) Income per month:|__1__|__2__|__3__|__4__|__5__|__6__|

(1: <500) (2: 500 - 999) (3: 1000-1499) (4: 1500-1999) (5: >2000) (wont answer)

Environmental Sanitation - Behavioural Survey
(household survey)

Field Worker: _____

Village: _____

Dates of Interviews:

Number of households surveyed .....

Does household have a Toilet? .....

May I see the toilet? .....

Are there **flies, mosquitos** or **biting insects** inside the toilet? .....

Is there a **cover** on the toilet seat? .....

Is there a **ventilation pipe with fly screen** attached to the toilet? .....

Is there a **roof** on the toilet? .....

Is there evidence that the toilet is being **used**? .....

Is the toilet area **clean**? .....

Is there evidence of **toilet paper** as an anal cleaning material? .....

Is there evidence that the toilets are used for something else besides defecation? .....

What cleaning materials are used to keep the toilet clean? .....

Environmental Sanitation - Behavioural Survey

Does the toilet **smell** bad? .....

Proximity of toilet to both house and water resources .....

Are there **faeces around** the toilet? .....