Chapter 8: Applied evaluative research

8.1 INTRODUCTION

"Evaluation is, much more than a mere analytical exercise, but part of a holistic approach to successful program implementation" (Sahn, Lockwood & Scrimshaw, 1988).

This chapter includes reflections on evaluation, with specific reference to application within the nutritional and sanitation context. 'Evaluation' as research activity is discussed in Chapter 2, in terms of various purposes (why it is done) and methodological approaches (how it is done). A literature study also shed light on the notion of the underlying theoretical constructs of 'evaluation' and 'evaluative research'. It became apparent that evaluation is also a research activity and that evaluation, as applied to interventions, clearly fits into this research framework. The literature study also notes the basic forms of evaluation, how evaluation differs from the activity called 'monitoring', and various evaluation models available that can channel evaluative studies. Throughout the reviewed literature, two distinct categories or types of evaluation were noticed. The first relates to the evaluation of process (also referred to as formative or implementation evaluation), the other to outcome (also called summative or impact evaluation). The literature study is incorporated into this chapter as theoretical background.

These reflections were used to set up an evaluation plan (indicated in Chapter 6 as part of the facilitation plan) and to apply the plan within the context of this particular study. The plan briefly positioned criteria, indicators and methods for both the process and the outcomes of the intervention. How the plan was executed is revealed in this chapter. The evaluation plan was implemented through actions of gathering and reviewing information and reflecting on the results. The chapter concludes with indications on how feedback on evaluation results was given to the community and reported to other researchers. The outline of the concept 'evaluation', as it was dealt with in this study, is represented in Figure 8.1.

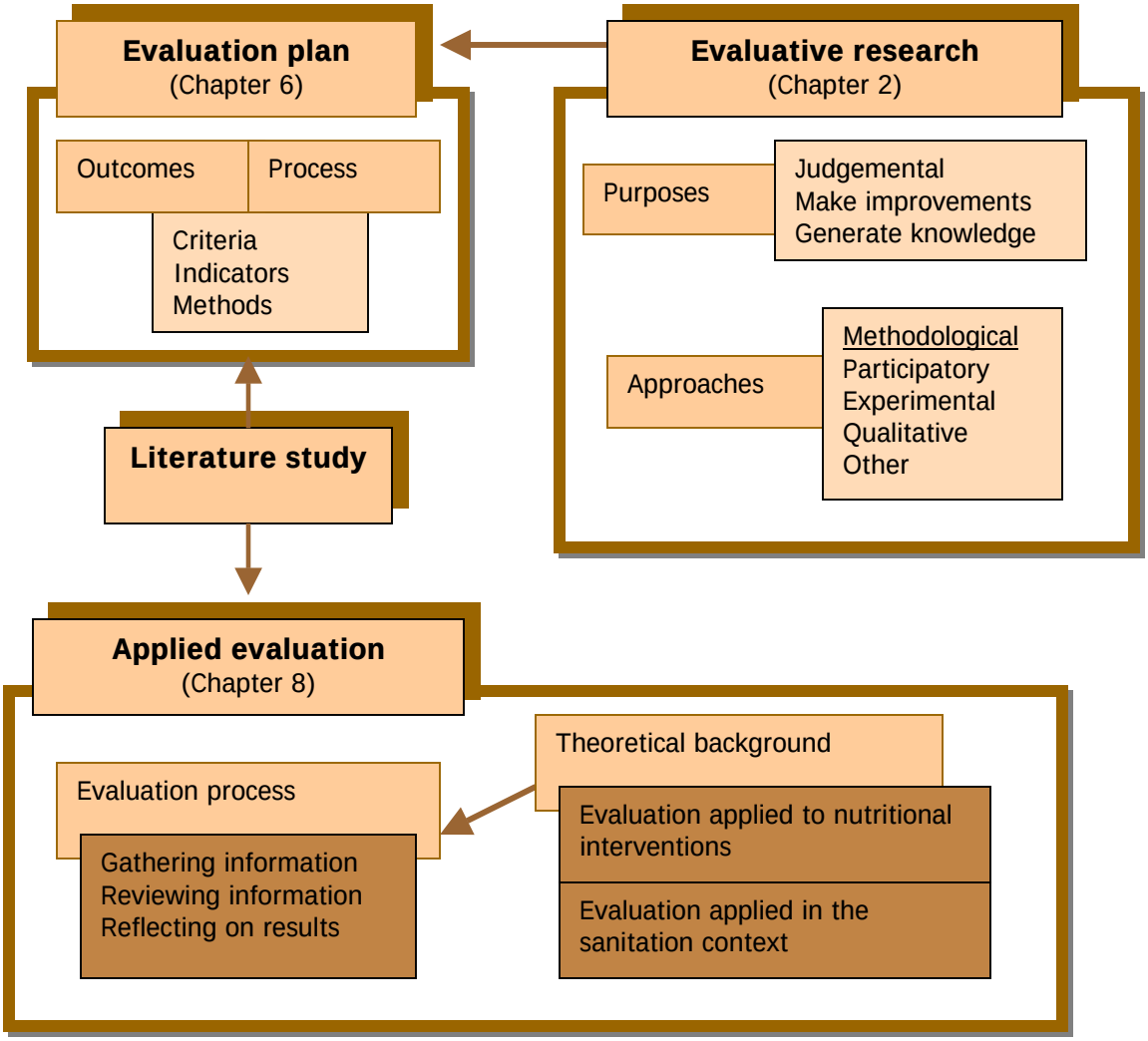

FIGURE 8.1: CONCEPTUAL FRAMEWORK FOR 'EVALUATION' AS DEALT WITH IN THIS STUDY

8.2 THEORETICAL BACKGROUND

The literature studied revealed that nutritional interventions in South Africa have been done ad hoc and its impact on health behaviour change has not been extensively evaluated. Nutrition surveys also suggest that nutrition education has not made much impact on achieving optimal nutritional status for South Africans. There is a definite need to know why certain interventions are successful and others not. Although interventions differ regarding target groups, goals and manner of implementation, the ultimate aim is usually to benefit the health of all. In that sense, it will not only be cost effective, but essential to know whether interventions are effective and why. Information regarding interventions should therefore be collected in a credible manner to tell if it is potentially

useful, accepted by the people involved and in the end made a significant impact on health behaviour and nutritional status.

8.2.1 The notion of evaluation

Evaluation is often mistaken for other related assessment tools such as monitoring or performance appraisal. The concept further conjures up images of judgment, faultfinding, threat, insecurity, punishment, interference and emotional trauma (Ewang, 1998:163). It appears not to be easy to provide a comprehensive definition of evaluation. The definitions offered by Cronbach (1963), Scriven (1967) and Glass (1969) stated that evaluation is the gathering of empirical evidence for decision-making and for the justification of the decision-making process. Stufflebeam (1971) said that it is the process of delineating, obtaining and providing useful information for judging decision alternatives (Murphy, 1989:454).

Smetherham (1981) described evaluation as *"the collection of useful information on the basis of which decisions can be made about feasibility, effectiveness and value of an organisation, institution, project or programme"* (Ewang, 1998:164). Ewang himself (1998:165) views evaluation as a periodic assessment of the relevance, performance, efficiency and impact of an intervention in the context of its stated objectives. If evaluation is seen as a research activity (as is the case in this study), then the description of Rossi *et al* (1999:4) is also worthy to be taken note of. They see 'programme evaluation' as *"the use of social research procedures to systematically investigate the effectiveness of social intervention programs that are adapted to their political and organizational environments and designed to inform social action in ways that improve social conditions"*.

From all the above-mentioned revelations, it is clear that 'evaluation' is a necessary component of the design and implementation of programmes. Evaluation is, however, much more than a mere analytical exercise, but part of a holistic approach to successful programme implementation. Evaluative research (as it is often called) is done to assign a probability statement of causality to the relationships of an intervention in a community context and the observed impacts, in order to determine the viability and replicability of a given programme design (United Nations Report edited by Sahn *et al*, 1988). Posavac and Carey (1997) wrote the following about programme evaluation: *"... the most basic form of program evaluation is an examination of the program itself – its activities, the population it serves, and how it functions. It includes an assessment of how*

much effort in the form of human and physical resources is invested in the program and whether the effort is expended as planned".

At this point it may also be necessary to distinguish between the concepts 'monitoring' and 'evaluation'. Monitoring has been defined as a continuous, routine checking of progress throughout the life of an intervention (Rietbergen-McCracken *et al*, 1998:119; Sen, 2001). Monitoring further appears to have three important functions, namely that it:

- Helps staff to make decisions aimed at improving the intervention
- Allows management to decide what impact the intervention is having on the intended beneficiaries
- Ensures accountability to all stakeholders (Ewang, 1998:164).

Two key areas are mentioned about which a monitoring system should give feedback on, namely performance and process. To monitor performance means to assess the use of resources and the production of outputs. Monitoring of process, on the other hand, assesses the efficiency and effectiveness of implementation (Ewang, 1998:164).

The specific differences between the two concepts 'monitoring and evaluation' are also indicated as follows:

- Monitoring is a general managerial function, where-as evaluation is rarely executed by the leaders
- Monitoring implies that performance is tracked on a regular basis with corrective action as a logistical consequence; evaluation is an occasional activity to reflect on performance in a diagnostic sense (Sen, 2001).

Evaluation is therefore dependent on an efficient monitoring system. It can only be facilitated if information is regularly collected, properly analysed and stored. Without proper feedback from the monitoring staff, no evaluation can be done correctly (Sen, 2001). The distinction between monitoring and evaluation is sometimes less evident, especially if evaluation is seen as a regular procedure undertaken throughout the life cycle of an intervention.

Two basic forms of evaluation can be distinguished, namely *summative* and *formative* evaluation. Summative evaluation refers to the examining of the outcomes of a programme and is also sometimes termed outcome or impact evaluation. Monitoring of procedures and activities to improve programme design and the delivery of services are called formative evaluation. This term is also used interchangeably with 'process evaluation', 'implementation evaluation', 'process

implementation' and 'programme monitoring' (Sahn *et al*, 1988). The task of summative evaluation is to estimate the difference between two conditions – one in which the intervention is present and one in which it is absent (Rossi *et al*, 1999:258). It also aims to answer questions of whether an intervention programme has been successful and effective or not, and whether the intended short- and long-term outcomes have materialised. A strategic issue is to isolate the effects of extraneous factors, so that observed differences can safely be attributed to the intervention. Control conditions therefore have to be established to isolate the effects of extraneous factors and that the observed differences safely be attributed to the intervention.

Formative (also called process or implementation) evaluation aims to answer questions of whether an intervention programme has been properly implemented, whether the target group has been adequately covered and whether the intervention was implemented as designed. Rossi *et al* (1999:231), indicate that formative evaluation generally involves one or more of three relatively distinct domains of programme performance, namely:

- Service utilisation (questions about coverage and bias)
- Organisational functions (organising efforts and using resources)
- Programme outcomes (indicators of programme results).

According to Patton (1997), formative evaluation should provide feedback on the original programme and improve programme implementation, while summative evaluation should determine if the desired outcomes are achieved and can be attributed to the revised programme.

8.2.2 Evaluation models

A model can be seen as an aid in the form of a framework, which presents the methodology to be followed during the development and implementation of a programme in a systematic way. Programme models, specifically, are called 'valuable focusing devices', which can especially systemise the process of programme evaluation (Ahmad, 1995:253). An evaluation model is thus a framework or plan that can be used to conduct an evaluation. An evaluation design is more specific than a model, which is used to organise the evaluation and to provide for planned, systematic data collection, analysis and reporting. A well-planned design helps to ensure that the conclusions drawn about the programme will be as accurate as possible. The design is developed during the early stages of programme planning and has programme goals and objectives as focus.

The literature revealed several widely-used 'evaluation models' applied to channel the evaluation of programmes. Lipsey and Pollard (1989:318-323) offers four theoretical forms that may be

applicable to programme evaluation, namely 'causal modelling', 'the basic two-step', 'stage-state models', and 'substantive models'. Another model worth mentioning is the 'Logic model' as indicated by McLaughlin & Jordan (1996:66). It has been described as *"a plausible and sensible model of how the programme will work under certain conditions to solve identified problems"*. It describes the logical linkages among programme resources, activities, outputs, and customer's reached and short, intermediate and long-term outcomes.

House (1980, in McKenzie & Smeltzer, 2001:234) present a well-constructed taxonomy of evaluation models that was consulted, which indicated the following types of models:

- Systems analysis
- Behavioural objectives
- Decision making
- Goal-free evaluation
- Art criticism
- Accreditation review
- Quasi-legal evaluation
- Case study.

Murphy (1989:460-462) briefly describes Stufflebeam's (1971) 'CIPP model', (referring to context-, input-, process-, and product- evaluation), the 'countenance model' from Stake (1967), and the 'illuminative model' developed by Parlett and Hamilton (1972). Within the field of nutrition, Ahmad (1995:253-258) describes the development of a model for a Nutrition Education and Training Program in Texas. Gillespie and Yarbrough (1984:169) propose a communication model to plan, implement and evaluate several short-term nutrition interventions.

Even more evaluation models do exist, but a discussion of each of these models is beyond the scope of this study. It is clearly indicated in the literature that no model is useful in all situations and that a single model need not be selected. No generic evaluative prescription or even guideline exists that can be directly applied to nutritional interventions. In this study, certain criteria derived from successful and effective interventions were considered and incorporated in the design and implementation of the evaluation plan. Criteria from both the fields of nutrition as well as hygiene and sanitation were included.

8.2.3 Evaluation criteria for nutritional interventions

The American Dietetic Association (ADA) stated certain key aspects for effectiveness in the case of nutrition education programmes. Firstly, programmes must focus on the gap between people's awareness of nutrition and their actual behaviour. Nutrition information must therefore delivered in such a form, that people can in fact use it to improve their current diets and nutritional practices. Secondly, programmes should be designed to go beyond the delivering of information, but should support individual behaviour change (Shafer, *et al*, 1996:1187). It is advisable to include these two key elements as part of a model when applied to evaluate nutrition education programmes and in this study – nutritional interventions. Other characteristics of successful nutritional interventions were reported as that it:

- consisted of interpersonal communication channels
- lasted more than three months
- contained specific and measurable behavioural changes that can be documented (Weimer, 1996:43).

Other features are that it included a limiting number of educational messages, reinforcing and personalising messages, providing hands-on activities, incentives, cues and access to health professionals and using appropriate theories of behaviour of change (Sahyoun, Pratt & Anderson, 2004:60).

A key problem in evaluating nutritional interventions is the specifying of outcomes. A renowned question is asked: 'can a discernible change in a person's knowledge about the relationship between diet and health result in that person making an appropriate change in behaviour'? Would relevant outcomes of an intervention be a change in a target group's knowledge, attitudes, behaviour or health status? An outcome such as improved health status cannot be measured until quite some time after the intervention is conducted. A more immediate outcome such as change in knowledge is likely to show only a small effect as a result of an intervention and it is more difficult to demonstrate a causal link with the intervention. However, if no effects are found for a distant outcome, it does not necessarily mean that that intervention was ineffective, but merely that a longer period of time or control for other factors was needed (Weimer, 1996:43).

Contento, Randell and Basch (2002:4-11) provided a summary of the kinds of evaluation measures used in 265 nutrition education intervention studies conducted between 1980 and 1999. The

review has shown that a wide variety of measures have been used to evaluate effectiveness. Judgements of effectiveness may depend on the appropriateness, validity and reliability of the measures to make the judgments. Measures need to be appropriate to the nature, duration and power of the intervention. The instruments need to be closely matched to the purpose and power of the intervention and to the literacy level of the participants. In interventions with groups in community settings, including low-literacy participants or with shorter interventions, greater attention need to be paid to respondent burden and shorter instruments may be required.

8.2.4 Evaluation criteria for hygiene and sanitation interventions

Evaluation of sanitation programmes usually focus on numerical targets such as the number of latrines installed. Findings of recent reported studies show that sanitation has to go beyond building latrines and implementation of infrastructure. Attention has therefore turned towards the use of behavioural change indicators (Rietbergen-McCracken *et al*, 1998:120). Intermediate goals also need to be evaluated, such as if the intervention had achieved sustainable results. Sustainability, though, requires both equitable and effective use of sanitation facilities to generate lasting benefits for the community involved. Nonetheless, it was once again indicated that evaluations should stop short of trying to assess long-term goals - like trying to prove ultimate health impacts (Rietbergen-McCracken *et al*, 1998:125). Health impact indicators are not easy to define or to measure, particularly in the short run. It may be more feasible to look at sanitation as a package of services and actions which, taken together, can influence the health of a person and the health status in a community (Samanta & Van Wijk, 1995).

An input and behaviour-orientated approach to defining the criteria is more practical, since better practices and conditions outline the pre-conditions of any later health impact. Input and behaviour further have the benefit of focusing attention on the processes and flexibility of implementation as well as the relevance of adjusting the planning to the needs and culture of the people (Samanta & Van Wijk, 1995). Almedon *et al* (1997) proposed hygiene evaluation studies to be a cycle within a larger project of planning, monitoring and measuring impact. They suggest repeating the hygiene evaluation cycle periodically, with the purpose of following-up or for further investigation of issues raised by the previous one or for monitoring or measuring impact. Evaluation is seen as a series of investigations and experiential learning cycles consisting of four processes, namely:

- problem identification
- gathering information systematically

- reviewing the information
- reflecting on the results.

Evaluation strategies applied within the participatory approach in sanitation programmes are:

- Review-workshops which bring participants together to discuss the performance of the intervention and to seek ways of improving it
- Field-based assessments which involve community members directly performing their own analyses of the intervention
- Self-evaluations whereby community members rate themselves and consider the impact of the intervention on their own lives (Rietbergen-McCracken *et al*, 1998:125; World Bank, 2002c).

Almedon *et al* (1997) also mention the following methods and tools:

- Health walks (systematic walkabout)
- Structured (spot check) observations
- Key informant interviewing
- History line
- Community mapping
- Seasonal calendar
- Gender roles/task analysis.

It may be possible to evaluate particular practices only by means of observation. An observer could observe people's activities without too much attention. Some hygiene practices and behaviours are harder to observe, for example adult defecation. In such cases, indicators of behaviour may be observed. Almedon *et al*, (1997) mention a number of indicators that are both effective in indicating the occurrence of a particular practice and relatively easy to assess. These include:

- cleanliness, safety and soundness of latrine structure
- location of latrine in relation to living quarters
- means of disposal of children's faeces
- turbidity and smell of water at the source and in the home
- presence of soap/hand washing facilities near latrines.

8.3 EVALUATION APPLIED TO THIS STUDY

The evaluative phase was administered as an empirical study, using mainly primary data with a hybrid mixture of numerical and textual data and a medium degree of control and structure, as proposed by Mouton (2001:160). Evaluation was done within the naturalistic paradigm for the purpose of generating knowledge and to make certain judgments. Participatory aspects, however, were also eminent in the sense that they brought together the principal players in the intervention - the research team and the participants themselves. It was also conducted in a collaborative manner, in which the participants were considered co-evaluators of the implementation process.

The **objectives** related to the identified, prioritised need were formulated as follows:

- Encouraging and motivating all adult female community members to participate in the intended intervention and to collaborate with the research team in order to adopt safer hygiene and sanitation practices after a 12 month intervention period
- Improving the hygiene and sanitation conditions within the community after a 12 month intervention period as measured according to set criteria and indicators
- Improving the hygiene and sanitation practices of at least 80% of the female adult group after a 12 month intervention period as measured according to set criteria and indicators.

Criteria, indicators and methods used for both process and outcome evaluation are summarised in Box 8.1

BOX 8.1: EVALUATION PLAN

Evaluation plan			
	Criteria	Indicators	Method
Process	Encouragement Motivation Participation Collaboration	% women participating and collaborating Willingness to participate Enthusiasm	Qualitative: ⇨ Group discussions ⇨ Observations ⇨ Field notes
Outcomes	Safer hygiene and sanitation practices Improved hygiene and sanitation conditions	% reduction in unhygienic practices % improvement in sanitary conditions	Quantitative: ⇨ Knowledge test ⇨ Behavioural scale ⇨ Scoring guideline Qualitative: ⇨ Key informant feedback ⇨ Observations

The *steps* taken in this study to attain the objectives and execute the evaluation plan are discussed next.

8.3.1 Data gathering

The quality of information collected is critical in the systematic assessment of hygiene practices (Almedon *et al*, 1997). Just asking questions about hygiene practices is not good enough; hygiene practices are private and morally loaded. Nobody likes to admit not washing his or her hands. Respondents often tell interviewers what they think they want to hear or what they think will bring the greatest benefit. Interviewing about hygiene is also of little use because of the sensitivity of the subject (UNICEF, 1999a:12). Qualitative techniques such as focus group discussions and participant observation do not expose the participants and they would therefore be more willing to participate. These techniques can also 'dig deeper' and produce more insight into various health problems.

Originally the thought was to recruit and train some members of the community and the owner of the farm to keep a track record of the intervention implemented on the farm. These records would have included notes on whether the intervention had been properly implemented, whether the target group had been adequately covered and whether the intervention was implemented as originally designed. Community members were illiterate, however, and the farm owner indicated that the farming activities would not allow time to be spent this way. The principle researcher therefore took up this task, assisted by the other team members.

Process evaluation was done using qualitative evaluation methods (Posavac & Carey, 1997:213). The participants of the intervention were studied in their natural setting with the focus on their own perspectives and views of the intervention. This approach is also called 'naturalistic' evaluation (Babbie & Mouton, 2001:356; Mouton, 2001:161; Posavac & Carey, 1997:224). Although the course of a naturalistic study cannot be predetermined, it neither eliminates the need for pre-fieldwork preparation, nor does it mean that the researcher can be haphazard by merely adjusting to events (Hammersley & Atkinson, 1996:24). Naturalistic, process evaluation in this study was conducted in a collaborative manner in which the participants were considered co-evaluators of the implementation process (Babbie & Mouton, 2001: 358-359). The methods employed for data collection were observations with field notes, group discussions and key informant feedback. Criteria included encouragement, motivation, participation and collaboration.

Outcome evaluation was done using quantitative and qualitative techniques. Quantitative techniques were a knowledge test, behavioural scale, a scoring guideline (see Chapter 6, Table 6.1) and an activity sheet on domestic hygiene (see also Chapter 7, Box 7.1). These techniques were also applied during the situation analysis (needs assessment) phase of the intervention. Data obtained qualitatively were used to augment the quantitative measurements obtained through observations with field notes, group discussions and key informant feedback. Criteria were safer hygiene and sanitation practices and improved hygiene and sanitation conditions, which included implementation of the seven summative core messages. The indicators that were used to describe successful implementation are revealed in Boxes 8.1 and 8.2. Outcome evaluation was done on a limited scale, because some of the outcomes would only become evident after a longer period of implementation. Such evidence would be, for instance, if improvement in hygiene and sanitation practices had a positive impact on the growth of young children. Such an effect, would however be very difficult to prove.

BOX 8.2: VARIOUS INDICATORS TO MEASURE THE IMPLEMENTATION OF THE SEVEN SUMMATIVE CORE MESSAGES (Almedon *et al,* 1997; Van Wijk & Murre, 1992:18)

Message	Indicator
Teach children to use toilets	Absence of children's faeces in and around the home Presence of potties or latrines for children
Use soap to wash hands	Presence of soap and washing facilities in the cooking area
Keep toilets clean	Appearance of toilets/latrines: Cleanliness, odour, seat cover, presence of material for anal cleaning Well-constructed floor and roof Door for privacy No soiling on walls and floors
Wash kitchen cloths everyday	Clean appearance and smell
After washing the kitchen cloths, hang them out in the sun to dry	Presence of cloths on washing line
Cover drinking water	Presence of a separate, covered container for drinking water Long-handled dipper No communal drinking cup No hands touching the water
Burn rubbish	Presence of burned rubbish, ashes (in drums or deep holes)

8.3.1.1 Observations with field notes

Mouton (2001:159) wrote, *"It is common in implementation evaluation studies to utilise all available modes of observation, both structured (questionnaires, tests, scales) and less structured (focus group interviews, individual interviews, participation observation), as well as analysing existing documentary sources (field records, participation records)".*

The first set of observations was done in an unstructured manner by noting down everything related to hygiene and sanitation that was observed. Observations were combined with a method called 'health walks' (Almedon *et al*, 1997) as well as household visits. Health walks are systemic walkabouts where the research team walk across the study site to foster spontaneous informal conversations and discussions on hygiene and sanitation-related topics. Because the field worker could speak the local language, she did health walks and informal visits on several occasions by herself. She asked to see the water sources, the places where rubbish is thrown, asking parents how they manage to keep their households and children clean, asking about sewage, latrines and stagnant water. She also observed aspects of the following practices - children's faecal disposure, hand-washing practices and how drinking water is kept. Directly after the observations were completed, we sat down and made notes. A negative aspect of this method was that we relied heavily on her memory of events and conditions. These notes also dealt with general impressions, translated comments from the community members and comments from the field worker herself. An extract of notes from such a health walk is shown in Box 8.3. These observations were later confirmed by my own set of observations.

The next set of observations (apart from the health walks) was more focused on the successful implementation of the advised messages. Observations were done as unobtrusive as possible. I kept extensive field notes to assess whether the hygiene practices and sanitation conditions in the community had improved. Field notes then included perceptions on programme outcomes (changes in people's knowledge and practices), aspects of personal, household and environmental conditions, including assessments of all the pit latrines. Field notes were handwritten, but an example was typed and is represented in Box 8.4.

The third set of observations dealt with whether the intervention had been properly implemented (process evaluation). Observations on the process included notes on the planning process, participant learning and programme structure (format, content, instructional method).

8.3.1.2 Group discussions

All the adult female community members were invited to participate in the group discussions. The aim of the discussions was to get as much participation from the community as possible. It was therefore essential for all the participants to also take part in the group discussions. The ideal number of participants is six to eight (Almedon *et al*, 1997) but participants were not turned away after they had arrived for the meeting. Twenty-two women were present and participated in the activities. A structured guide, based on certain pre-formulated evaluation questions, provided direction to the discussions (see Box 8.5). Discussions were recorded on tape, translated by the field worker and then transcribed by me the principle researcher. The outcome of the discussions was to reach consensus on the success and outcomes of the intervention.

8.3.1.3 Key informant feedback

Key informant interviewing is a standard anthropological method, which is widely used in health-related investigations (Almedon *et al,* 1997). The term key-informant may be used for anyone who can provide detailed information, on the basis of special expertise or knowledge of a particular issue. The community members unanimously elected a group leader during one of the group discussions and the research team considered this lady to be a key informant. She also assisted in the process of translating the assessed problems into felt needs (see Chapter 5).

During an interview session, feedback was asked from her, first in terms of the implementation of the core messages, which were transcribed (see Box 8.6). Feedback also included information on common problems experienced by the participants, identification of the most acceptable and difficult messages, ways the participants modified the recommendations and their motivations and constraints related to trying these new practices. The most common problem appears to be crowding. When more than five members are within a household, it is more difficult to keep the house clean. Not every household member is motivated to implement the recommended hygiene and sanitation practices at all times. Small children especially do not understand why their hands must be washed before eating and teenage children simply do not care. The most difficult practice (message) reported to implement was to clean the toilet and the easiest one was to wash hands with soap. Frequencies are presented in Table 8.1.

TABLE 8.1: REPORTED DIFFICULTY ON RECOMMENDED PRACTICES (n=16)

Most difficult practice	Frequency (%)	Easiest practice	Frequency (%)
Cleaning the toilet	44	Washing hands with soap	81
Hanging washed kitchen cloths in the sun	31	Covering drinking water	31
None of them	13	All the practices	13
Burning rubbish	6		
Washing the kitchen cloths with soap	6		

The key informant also indicated to us that the men in the community were interested in all our activities and wants to be included as well. If the men and husbands were involved, they would most probably would they have encouraged the women to improve their hygiene and sanitation practices. She said that within their culture (Southern Sotho) the women 'bow' to their husbands. Her recommendation put in her own words was: "*re tlamehile ho ruta banna le bona*" (we must teach the husbands as well).

8.3.1.4 Quantitative measurements

At the time the group discussions took place, another set of quantitative evaluations were also done. The same instruments were used that was also used during the needs assessment phase, namely a hygiene-and-sanitation (HAS) knowledge test, a HAS-behavioural scale and a HAS-scoring guideline, as well as an activity sheet to identify certain illustrated 'domestic hygiene mistakes' employed during the implementation phase. Results are indicated in Box 8.7.

Participants attained a slightly better score in the sanitation knowledge test (90%), compared to the previous average group score of 78% attained during the needs assessment phase. Results from the sanitation behavioural scale also improved (86% as compared to 77% previously). The statement that was marked incorrectly by most participants (91%) was that ash or ground could be used to clean hands and surfaces if soap is unavailable.

The scoring guideline (see also Table 5.1) was also used as an assessment form for the competition during the implementation phase. Average scores attained during each of the phases are indicated in Box 8.7. The differences between the scores attained in each phase were only statistically significant for the personal hygiene score (p=0.19). Individual items in which a

statistically significant difference was measured were: good body odour (p=0.08); frequency of bathing (once a week) (p=0.03); visible clean kitchen cloth (p=0.03); sun dried kitchen cloth (p=0.04); no visible cockroaches (p=0.009); spider webs in the pit latrines (p=0.01); bad smell in the latrines (p=0.003); covered seat on the toilet (p=0.01); clean swept yard (p=0.009); signs of rubbish removal (burnt/buried) (p=0.04).

Different findings were attained on the activity sheet, as compared to the outcomes of the previous test done during the implementation phase, three months prior to evaluation. These differences, however, were not statistically significant (p=0.1184). Differences on four single items were statistically significant however, namely 'the presence of a cat in the house' (p<0.001); 'person smoking while preparing food' (p<0.001); 'overloaded dustbin with flies' (p<0.001); 'drippings on the floor' (p=0.0172). Assessment of the activity sheets showed that 19 of the participants (95%) scored 50% and more in the activity sheet; 12 participants (60%) scored 80% and more; eight (40%) participants scored 100%. Scores obtained during the previous session (implementation phase) are presented in Table 8.1. The outcomes of the activity sheet were not discussed with the participants again and it is not clear why test scores were different (that certain mistakes were identified differently than the previous time). The only mistakes identified by all participants on both occasions were the presence of the cat in the kitchen and the overloaded dustbin with flies. The key informant's comment on this particular finding was that none of the community members own a cat and that everybody dislikes flies. She also reported that some participants had struggled with the interpretation of the picture. This picture should therefore be further adapted, refined and tested.

Results need to be faithful to the data and the final conclusion has to be endorsed by the data. With this statement in mind, reviewing (analysis) and reflecting (interpreting) of the data followed.

8.3.2 Reviewing (data analysis)

This step could have also been called 'evaluative data analysis'. The emphasis in this step was to make decisions on whether the objectives of the intervention had been met or not. In this step, the data was systematically organised (selected and condensed), displayed (see Boxes 8.3, 8.4, 8.6, 8.7) and then verified in order to draw conclusions (Babbie & Mouton, 2001:328; Coffey & Atkinson, 1996:6; Collins, 1999: 58; Miles & Huberman 2002:394; Wolcott, 1994:36). Data was organised according to a system derived from the data itself, which were the following categories:

- Young children using the open field to defecate, without adult supervision

- Hands not washed
- Filthy toilets
- Filthy kitchen cloths
- Uncovered drinking water
- No rubbish removal system.

Apart from the fact that data should be accurate and reliable, it also needed checking and crosschecking to establish trustworthiness. Criteria for trustworthiness of qualitative data are not a set of tests to be applied to the information after it has been collected, but built-in checks that are put in place before information gathering actually commence (Almedon *et al,* 1997; Babbie & Mouton, 2001:276; Smaling, 1992:316). All the aspects that were considered and executed in an attempt to enhance the quality of the data and the results obtained are presented in Chapter 3. Only relevant aspects are highlighted here.

The involved study leaders and members of the research team judgmentally verified the content of the data. The outcomes of group discussions and observations were used to enhance the construct validity as well as for triangulation purposes. The following procedures were followed to maximise credibility and trustworthiness:

- Prolonged engagement – data gathering was terminated only when 'saturation' seemed to have been reached
- Persistent observation and triangulation – different methods and techniques were pursued to evaluate the process and outcomes of the intervention
- Referential adequacy – all the completed tests, field notes, transcribed discussions and completed observation schedules were available as documents of the research process and outcomes
- Peer debriefing – perceptions, insights, analyses and interpretations were shared with an acculturated colleague
- Member checks – the data, results and interpretations were taken back to the participants of the study to check whether that was actually what they had said and meant.

Other measures used for triangulation in this study were 'peer reviews', referring to the checking with fellow researchers whether the collected data or the interpretation there-of did not contain any random errors.

8.3.3 Reflecting on results (interpretation)

Reflection involves looking back on what has been done, reviewing specific questions or problems that had emerged, to determine whether they have been addressed effectively. It also involved looking forward to how knowledge and skills acquired might be useful in future situations. As Mouton (2001:109) said: *"The ultimate aim of evaluation research should be to contribute to our understanding of why certain interventions work and others are less successful".*

Interpretation also meant determining what the results mean and how significant they were in the specific context. The reasons behind certain hygiene practices and to what extent they were influenced by socio-cultural factors was teased out. The following questions were answered when results were interpreted:

- what the results mean
- why the results turn out the way they did
- what the possible explanations are
- what needs further investigation.

Hygiene behaviour change can have significant effects on health by reducing a variety of conditions. These improvements in health can, in turn, lead to reduced morbidity and mortality and improved nutritional status (Billig *et al,* 1999:6). All efforts towards improving sanitation are worth undertaking, as they have community-level effects as well as individual ones. Long-term effects might be less disease; better health as measured by less diarrhoea, reductions in parasitic infections, increased child growth and lower morbidity and mortality. A healthier population is a more productive one and better sanitation can therefore improve income and the capacity to acquire food.

The interpretation of findings reflected the comments and suggestions made by members of the participants during the feedback sessions. This minimised the biases that can creep into the interpretation of results, making sure that they are not separated from the context in which the information was gathered (Almedon *et al*, 1997). To me the results meant that there was only a minor improvement in hygiene and sanitation practices and conditions. Although the participants were knowledgeable about hygiene and sanitation and had the intention to change behaviour, somehow, this did not happen to the extent that we were hoping for. According to Van Wijk and Murre (1995) the following four key factors strongly influence hygiene behaviour change, namely

facilitation, understanding, influence and autonomy. The results were discussed in terms of these four factors.

- Facilitation refers to making a good behaviour easier. The specific practices that we recommended were not difficult to implement in terms of means and effort. They did not have water directly available in their households, but they had a stable, reliable supply, which they need to collect daily. The distance they need to travel was only 200 metres, which were considered convenient (Billig *et al,* 1999: 9). The community were assisted in constructing two new facilities for households who did not have any and a special pit latrine were built only for the use by small children.
- Understanding refers to the participants' mode of thinking that change will improve their own and their family's health and quality of life. The participants did indicate understanding of the promoted messages and did perceive it to be desirable.
- Influence and support from others can also strongly effect sustained adoption of new practices. The participants did commit themselves as a group to the behaviour and to motivate one another in the implementation there-of. The husbands or partners of the participants should also have been actively involved in the intervention in order to provide further support and encouragement.
- Autonomy is the means and control to carry out the practices. The implementation of the new practices did not require new, specialised skills of expensive resources. They were free to use their own skills and resources. Additional means would only be time and energy to fetch more water or more regularly and to be disciplined in the act of practicing the behaviours.

To speculate thus on reasons why there was not a more significant improvement would centre on the support aspect. A strong support system, not only from spouses, but also from the local health authority, is a strong recommendation for future studies. The IRC (2003b) stated that it is universally accepted that people should have access to a basic domestic water supply, ranging from 25-50 litres per capita per day. The requirements for rural people can even be considered as much as 200 litres per capita per day if water for productive uses is included as well.

Sustainability can only be evaluated over a longer term. With a prolonged and gradual programme, it is possible to measurably reduce many risk behaviours and to sustain the improvements (Appleton & Van Wijk, 2003:30). The managers of the guesthouse on the farm were willing and able to assist in long-term monitoring and motivating of the recommended behaviours. Hygiene should definitely be included and addressed in the other planned interventions, for instance during

product development. All the participants were enthusiastically participating in the planned activities. Areas still in need of participation are monitoring and evaluation. Although the key informant assisted with these activities, the other community participants also have to become more familiar with these processes in order to assess their own improvement and progress in future times. Hygiene and sanitation however, is an educational task and can never be one-off. I can say with confidence that the participants were susceptible for assistance and advice. This particular intervention was also an enforcement of attempts by the previous owner of the farm. The participants offered many reasons for implementing the suggested hygiene practices. They do not like dirt or to have hands that smell bad. They also expressed a desire for comfort, beauty and social acceptability.

Certain practices were difficult to implement. In one household the grandmother reported the covering of drinking water to be very difficult, because there are too many children in the house using the drinking water facilities. They do not listen and do not practice what she tells them. Another lady said that to keep the toilets clean was difficult, again stating that there are too many children (eight) using the same toilet and they do not keep it clean. Three women locked the doors of their houses after cleaning it, in order to keep the children out, so that the houses can stay 'nice and clean' *("botle le ho hlweka").*

8.4 DISCUSSION

Analysis and interpretation ultimately lead to judging the findings as either positive or negative, or both and stating the reasons why. The findings may show what is good, bad, desirable, or undesirable in the way the intervention has promoted improved hygiene and sanitation practices, as well as in the way that the participants have responded to the intervention. The main questions that were answered were stated as the significance of the findings to the various stakeholders in this particular setting, to the intervention as such, to the participants and to other interested researchers.

The values of the study team were brought to bear on the findings. The first reflection was done in terms of the outcomes. The short-term outcomes set for the participants of this intervention were:

- Encouragement and motivation. The participants expressed feelings of being encouraged and motivated to implement the stated hygiene and sanitation practices and conditions. They also expressed personal benefits from being part of the study like cleanliness and well-being. During

the needs assessment phase eleven women participated compared to the 22 who showed interest during the implementation and evaluation phase.

- Received set of educational material regarding hygiene and sanitation. This material (in the form of posters) was promoted as reminders to continue with the implementation of the promoted practices and conditions. The messages on these posters were clear, and relevant to the community.
- Safer hygiene and sanitation practices. The participants expressed being capable to keep up the practices and conditions because it does not involve a large proportion of money, time and effort. Originally all the participants expressed the intentions to perform the desired behaviours but only 83% (n=18) managed to do so.
- Improved hygiene and sanitation conditions within the community. A marked improvement in environmental hygiene was observed (as shown by the results from the scoring guide, but not statistically verified). New latrines were also constructed – one for the use of small children and two for households that did not have any. Care should however be taken in using the word 'improved' (Samanta & Van Wijk, 1995). How and which particular improved practices and conditions are measured, must be defined locally. Participants themselves should make decisions on improvements. Researchers and change agents should only ensure that participants are informed and enabled to make wise decisions.

Intermediate outcomes were set as consumption of safe food, overall well-being, dignity and pleasantness. Longer-term outcomes were set as improved household food security, behavioural change, prevention of food contamination and infection, improved growth and physical development of vulnerable children, improved environmental health and productivity. For the research team, the outcomes were reliable research results, Masters' and PhD theses and publications. For the academic community and specifically the interested scholar and researcher, a generic model was the outcome, to use as guideline for the planning of similar interventions. General outcomes were collaboration among the various stakeholders and community ownership of the intervention.

8.5 CONCLUSION

The evaluative phase was administered as an empirical study, within the naturalistic paradigm for generating knowledge and to make certain judgments. A cyclical process was followed, consisting of the processes of data gathering, data revision (analysis) and data reflection (interpretation).

Qualitative data-gathering techniques were mainly used, which included observations with field notes, group discussions and key informant interviews. 'Applied' evaluative research was evident because we identified practical problems as research problems and emphasised the implications for practice rather than for theory.

Sanitation is generally defined as the access to adequate excreta disposal facilities that can effectively prevent human, animal and insect contact with excreta. Suitable facilities can include simple, but protected pit latrines. It also includes adequate access to safe drinking water that can be either in a dwelling or located within a convenient distance from the user's dwelling. Two hundred metres is regarded a convenient distance (Billig *et al,* 1999: 9). In terms of these set standards, this particular community's hygiene and sanitation status was judged as relatively good.

Whilst hygiene promotion plays a fundamental role in the prevention of infectious diseases, it also serves other needs. Among these is the desire to create order and beauty and to demonstrate respect for social morality (Appleton & Van Wijk, 2003:11, 16, 23). Those who seek to promote safe hygiene need to both understand the motivations underlying hygiene behaviour in general and need to be able to specify practices that may be putting health at risk (Curtis *et al*, 2000:22). Much has to be learned about the links between improved water supply and sanitation facilities and well-designed and implemented health/hygiene promotion and health. What is clear is that good hygiene practices are necessary for maintaining good health (Almedon *et al,* 1997).

Better facilities and hygiene messages rarely change people's hygiene behaviour by themselves (Van Wijk & Murre, 1992:11). People change their behaviour when they want and can do so for their own reasons. They also change when it is part of a communal decision process based on the educational stage of readiness. In this study, the members themselves decide that they will change and how they will promote and achieve the change. The research team did not direct the change, but helped them to choose the key changes and to organise the process of change.

Objectives were set for the participating adult female community members (described in Chapter 3 as the target group) to practice after the intervention had commenced. These practices were evaluated by the research team according to set criteria and indicators and by using methods such as observations with field notes, group discussions and key informant feedback. The objectives related to if the identified, prioritised need was met in the following way:

- The participants expressed that they had been encouraged and motivated to implement the stated hygiene and sanitation practices and conditions. They also expressed personal benefits such as cleanliness and well-being.
- Received set of educational material regarding hygiene and sanitation (in the form of posters) were promoted as reminders to continue with the implementation of the promoted practices and conditions. The messages on these posters were clear, simple and relevant to the particular community.
- The participants expressed being capable to keep up with the practices and conditions because they do not involve a large proportion of money, time and effort. All the participants expressed the intentions to perform the desired behaviours, but only 83% (n=18) managed to do so.
- An improvement in hygiene and sanitation conditions within the community was observed (as shown by the results from the scoring guide). New pit toilets were also constructed – one for the use of small children and two for households that did not previously had any.

BOX 8.3: AN EXTRACT OF NOTES FROM A HEALTH WALK (UNSTRUCTURED OBSERVATION)

Date: December 2004
The communal tap The research team walked past the communal tap 8:30 in the morning. Children were fetching water with plastic buckets. Some buckets did have lids. Some children carried these buckets on their heads back home, while others used wheelbarrows. Water was almost always spilled. The children stopped and played at several times. The tap was left running between the fillings of the buckets. Water was wasted. Several women were washing clothes over the three days of our visit. There were still signs of stagnant water.
Cleanliness of area The environment appears to be neater. No more papers, toys, wire, and old tyres were lying around. There were signs of a communal rubbish site and of recently burnt rubbish in congas. Several people were sweeping their front yards. Most chickens were kept at bay. Dogs were still very thin, but were chained for the duration of our visit. No human faeces could be seen within a radius of 5 metres from the houses or pit latrines.
Reasons for being clean Mothers were asked what they thought about hygiene and why hygiene is important to them. Here are some of the things they said: "I don't like my hands to be dirty; I don't like things to smell bad; It is very good to live in a clean house with a clean yard – everybody is more happier; If I go to town I dress up in nice clean clothes, but at home I am working all the time, so clean clothes are not necessary. Dirt comes from dust and animals and brings on illness".

BOX 8.4: TYPED EXAMPLE OF AN EVALUATIVE FIELD NOTE

Date: December 2003
Household 1: The single man who lives there is very clean. I regard his garden as one of the best in the community. He takes care of his chickens and has built them nests from grass.
Household 2: Urine could not be smelled anymore. The old lady also appeared cleaner than on the previous visit. The six children she takes care of look happy, content and cleaner. She did complain, however, about teaching all children to keep the drinking water clean and covered.
Household 3: We were not allowed to enter the house. Apparently the lady had a party the previous night and she was ashamed about the appearance of her house. This house does not have an attached toilet.
Household 4: The house appeared clean and neat. No flies could be observed. The chickens were kept at bay. Corn kernels were used as abrasives to clean pots and pans.
Household 5: No-one was present.
Household 6: The house, mother, grandmother and two children looked better in terms of cleanliness. A covered drinking bucket could be seen inside the house. The house is cleaner than the previously visited one.
Household 7: The mother and her daughter were very dirty. Their teeth looked awful. There were dried peaches and canned peaches on the shelves. After further questioning they told us they had done it themselves. Chickens run around loosely, with chicken dung all over the stoep.
Household 8: No-one was present.
Household 9: No-one was present.
Household 10: A flycatcher was in the house and in the pit toilet. The house was very clean and neat, so was the lady and the child she is taking care of. A spoon with an extended handle was used for scooping drinking water out of a container. The old lady staying next door (but as part of this household) was sweeping the yard.
Household 11: No-one was present.
Household 12: No-one was present.
Household 13: A remarkable improvement. The lady looked healthier, her clothes were clean, and her house was clean. She told the field worker how proud she is and wanted me to take photos. She showed us her clean kitchen cloth and water container.
Household 14: The house and the family members who live there appear to be clean (compared to the previous visit). Clean kitchen cloths were observed. The lady was willing to show us how she usually cleans her pit latrine. She showed us also the inside of her house, which was very neat and clean.
Household 15: Water is kept in a covered plastic bucket. It appeared clean. The lady was washing her clothes at the communal tap. There was not any soap present. She said that she usually boils the water in the winter.
Household 16: She won the price for the neatest person and household. Her house, yard and garden were still very clean. There were no signs of rubbish lying around. She also had a well-taken-care-of vegetable garden in her back yard.
Household 17: The owner has moved
Household 18: No-one was staying there

BOX 8.5: STRUCTURED GUIDE FOR EVALUATIVE GROUP DISCUSSIONS (n=22)

Date: 7 May 2004

1. We were visiting you for nearly 2 years now. We have learned a lot from you and we hoped that you have learned from us as well. What is it that you think you have learned from us?
2. What was good about our visits?
3. What did you not like about our visits. Why? Give examples.
4. Did you like all the people? Who did you not like? Why?
5. There was only a few things that we could do for you, like teaching you not to spread germs. Can you still remember what germs are? Did you find that specific information useful? Why is it important to be clean?
6. We know there are other things that you need such as water directly in your houses, a crèche, to learn to make clothes. We could not help you with those things. Do you understand and accept that?
7. People came to teach you about vegetable gardens. How did you feel about that? Have you learned new information? Could you managed your gardens? Sow the seeds? Did you harvest some vegetables yet? Which problems were there? Who is eating vegetables everyday? Are the children eating more vegetables?
8. We are also going to get two other students to teach you what to do with all the vegetables from your gardens. They will come later this year. Do you think it is necessary that they come? Do you want to learn more about cooking and preserving of vegetables?
9. Can you still remember that we sat there in the school and told you about vegetables and why it is important to eat them every day? Would you like another poster with information on that?

If we can look at the posters now, what don't you like about it? Why? What would you like differently? Do you understand the pictures? Will you be able to ask some of the children to read the written words (in English and Sotho)? Do you like your photos? Should we put them onto the other posters as well? What are you going to do with the posters?

Can we count how many of you have implemented the messages on the posters:

1. Teach children to use toilets (n=13)
2. Use soap to wash hands (n=16)
3. Keep toilets clean (n=13)
4. Wash kitchen cloths every day (n=14)
5. After washing kitchen cloths, hand them out in the sun to dry (n=5)
6. Cover drinking water (n=14)
7. Burn rubbish (n=11)

BOX 8.6: FEEDBACK FROM KEY INFORMANT (as transcribed and translated)

Message 1: Teach children to use toilets

My husband helped me to build a toilet for the young children. We showed the other people how to do it, but they do not have the material to construct one. The other children also make use of the toilet. The children like to go to their own toilet. They use toilet paper to clean themselves and scrap paper from schoolbooks if the toilet paper is finished. No one is supervising if they wash their hands after visiting the toilet. Washing facilities is only available in the houses. The mothers say that they do tell the children to wash their hands after defecating or urinating. The children know that they should not go to the veld to defecate, because if faeces are lying around, it can make them ill.

Message 2: Use soap to wash hands

I have seen that most women wash their hands with soap, especially before they prepare food. They did buy soap from my *spaza* shop. Only two women did not buy any soap. The one said that she did not have any money and the other one had opened her own shop recently.

Message 3: Keep toilets clean

It is not nice to clean the toilets, but the women know that it is important. They do not clean the toilets every day, but do so at least once a week. They usually remove the spider webs, take soapy water and wipe the seats and dump all the papers lying around into the toilet.

Message 4: Wash kitchen cloths every day

The women wash their kitchen cloths every day. They liked the new cloths they received as presents and they try to keep them clean. They usually wash the cloths with soap. They like to use clean cloths.

Message 5: After washing the kitchen cloths, hang them out in the sun to dry

They know that if cloths are hung out in the sun, that the sun will destroy most of the germs. They say that they do it every time the cloths are washed and I have seen them doing so on several occasions.

Message 6: Cover drinking water

We told the children that, when fetching water, that they must not mess with it. They should not play with the water in the bucket, because we have to drink it. They have to keep the lids of the buckets on all the way back to the house. I know that they often leave the buckets on the road, either to rest or to play.
I have seen some women washing the buckets outside and inside at the tap, before the buckets are filled. The filled water buckets are carried on their heads back to the houses. I do not know how often they wash the buckets though. I have a dipper that I use to scoop water for drinking. I would like to have a bucket with a tap on, so that I do not need to touch the water when pouring drinking water. People use the same dipper to pour drinking water, which is usually a cup. Sometimes they even drink directly from the dipper. They keep the buckets covered all the time.

Message 7: Burn rubbish

Nobody wants to take responsibility for one communal rubbish site. Male members from each household usually burn their own rubbish. It is easier to burn than to bury, because digging holes is hard work. We all have *congas* in which we can throw the rubbish. These we obtained from the previous farm owner. We all have matches to ignite the rubbish. Matches are very cheap. Rubbish does not take long to burn. The children usually want to see how the rubbish is burnt and they want to do it themselves as well.

General comments

The women like to be nice and clean *("botle le ho hlweka").* Some women are stubborn *("manganga")* and do not use soap to clean the dishes. If there are a lot of children *("bana ba bangata")* in a house, it is more difficult to keep it clean.

BOX 8.7: RESULTS FROM QUANTITATIVE MEASUREMENTS

Date: 14 August 2004

Knowledge test (n=22)
Participants attained a good sanitation knowledge score (mean=90%)

Behavioural scale (n=22)
Participants attained a good score (mean=86%) on the sanitation behavioural scale

Scoring guideline
Average scores from a maximum of 10 marks were as follows:

Category	Maximum score	Implementation phase (n=13)	Evaluation phase (n=20)
Personal hygiene score	10	4.18	6.40
Household hygiene score	10	4.09	5.92
Environmental hygiene score	10	2.45	5.08

Activity sheet on domestic hygiene
Reported frequencies of correctly identified 'mistakes' were as follows:

Item ('mistake')	Implementation phase n=12 (%)	Evaluation phase n=20 (%)
Presence of a cat in the kitchen	12 (100)	20 (100)
Person smoking while preparing food	12 (100)	17 (85)
Overloaded dustbin with flies	12 (100)	20 (100)
Open tin	11 (91.37)	17 (85)
Presence of a mouse in the kitchen	10 (83.33)	19 (95)
Raw chicken thawing on a cupboard	9 (75)	15 (75)
Food boiling over on the stove	9 (75)	14 (70)
Drippings on the floor	7 (58.33)	18 (80)
Mixing fish and raw vegetables	4 (33.33)	11 (55)
Dirty kitchen cloths and clothes	4 (33.33)	9 (45)
Number of participants who scored 50% and more	11 (91)	19 (95)
Number of participants who scored 80% and more	5 (42)	12 (60)
Number of participants who scored 100%	3 (25)	8 (40)