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## **School Sanitation and Hygiene Education Symposium** **The Way Forward : Construction is not Enough!**

June 8 – 10 June 2004, Delft, The Netherlands

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### **SANITATION, HEALTH AND HYGIENE EDUCATION TO ENHANCE THE QUALITY OF LIFE – THE OZWATHINI CASE**

(Unedited version, May 2004)

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#### **Abstract**

Poets and painters have often been inspired by water's life giving properties. Water seems to have a new, fresh, almost magical quality that makes it powerful symbol of life. But, to secure our future and that of the next generation, we must use our water wisely. No single measure can do more to reduce poverty, reduce disease and save lives than providing safe water along with adequate sanitation and hygiene awareness/education to all our people. Umgeni Water is not just a supplier of water, but we can also boast one of Africa's most innovative water education programmes.

The programme, which is designed to encourage learners to be both motivated and think more critically about water related issues has been the work of dedicated water educationalists who run the organisation's highly successful External Education Services (EES) Section. The services long-term challenge is to help people become water literate and to educate the public about the problems and complexities resulting from contamination of water through poor practices. The demand for EES water education programmes continues to increase. The programmes are aimed at raising public awareness about environmental issues, to minimise pollution in a catchment and to help schools and communities to be more water wise by better management of this scarce natural resource

Our vision is that through the water education initiatives of the External Education Services Section, we will build bridges of knowledge and understanding between students and communities to ensure safer water for all in the future. Our locally designed education resources enable students and communities to analyse the quality of their water, thus reinforcing concepts learned in the classroom, assisting in acquiring new skills and forging new links between the diverse communities found in Southern Africa. External Education Services is our solution to promote a spirit of water awareness and conservation for a brighter future

This paper gives an overview of the sanitation, health and hygiene education programmes and materials/resources that are designed, developed and implemented. The successful impact of the education programmes is demonstrated by using the work that was done in Ozwathini (a rural area in the province of Kwa Zulu Natal, South Africa) as a case study.

## Overview of the external education services unit

### History/Background

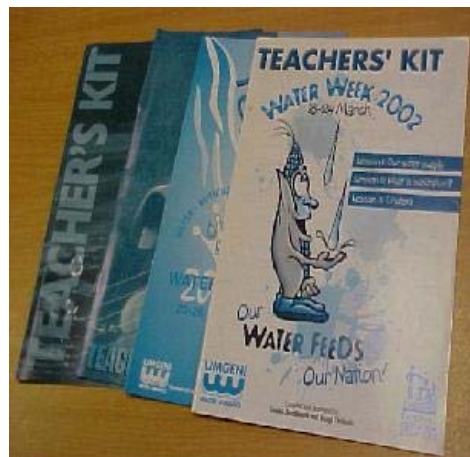
Umgeni Water pioneered water education in South Africa. This led to an enormous demand for our water education materials nation wide. The section started in 1990 as Project W.A.T.E.R (Water Education through Educational Response.) and changed to External Education Services in 1993. We are currently looking at a name change again to Environmental Education Services as this has more appropriateness to the sort of services that we offer. The programme is primarily demand driven, but we also work proactively, liaising with schools and other organizations to inform them of our services to form partnerships with them as well as other organizations. Materials are also sometimes developed with project partners.

### Achievements

- 1992 Finalist in the Green Trust Award (Corporate Category)
- 1993 Finalist in the International Water Supply Congress held in Budapest (Water Educating the Young Category)
- 1995 Winner at the 20<sup>th</sup> International Water Supply Congress held in Durban (Most Effective Water Education Poster)
- 1995 “In Search of the Mayfly Nymph” won the international award for the best Environmental Education video
- 1995 IWSA Public Relations Award in “The essential service – Keeping the customer informed”.
- 1996 Winner of the Green Trust Award (Water Conservation Category)
- 1997 IWSA Award in “The essential service – Audio-visual”.
- 2001 Finalist of the Green Trust Award in the Water Awareness Category.

### Services Offered

- ◆ Water education outreach programmes. Water Educationalists visit schools, industries and communities to run water workshops based on water related issues like sanitation, health and hygiene, pollution, conservation, water supply and water treatment.
- ◆ Water education materials ranging from videos, teacher guides, posters, manuals, etc. Some of which have won international awards.
- ◆ Mail Order Catalogue. This mail order service has the most comprehensive collection of water education materials in South Africa. Materials are charged at cost.



- ◆ There are three water classrooms situated on site at the Durban Heights Waterworks, Midmar Waterworks and Darvil Wastewater works that are fully equipped with audio visual facilities and seating for a maximum of 45 learners.
- ◆ Assistance is given to schools and factories to conduct water audits

### **Schools and Community Benefits**

- ◆ Cross-curricular resource materials
- ◆ Skilled and experienced staff to run Workshops, presentations and train trainers.
- ◆ Hands on experience on solving water-related problems.
- ◆ Educational tours to Waterworks and Wastewater works.
- ◆ Assistance in conducting river clean-ups.
- ◆ Assistance with water related projects

### **The water education classroom**

#### **Background**

The Water Education Classroom at the Durban Heights Waterworks was the first of its kind to open its doors in Southern Africa. It allows a completely flexible approach to learning about the local environment. Since its inception in May 1996 to date the classroom has had close to 35 000 visitors. Due to the success of the classroom at the Durban Heights waterworks, two other classrooms have since opened their doors. These are at the Midmar Waterworks and the Darvil Wastewater works

#### **Aim**

To create learning opportunities for children to investigate the water treatment process at Durban Heights Waterworks.

#### **Objectives**

To develop a day's activities based on the school curriculum and integrating with the pupil's school project work to:

- ◆ Extend the children's knowledge and understanding of the environment.
- ◆ Introduce the children to new skills and develop their existing skills.
- ◆ Promote positive attitudes to environmental issues.
- ◆ Promote an understanding of the water treatment process.
- ◆ Encourage a cross-curriculum approach to water education.



## Facilities

The Classrooms are fully equipped with audio-visual facilities and has seating for a maximum of 45 people. Activities are organised and supervised by a resident teacher and the visit is without charge to the school.

## Programmes

The programmes are designed to suit the age group (senior primary, high school, tertiary groups and other special interest groups as well as to stimulate pupils to investigate:

- ◆ Our Water Supply
- ◆ Water Treatment
- ◆ Water Conservation
- ◆ Water Pollution
- ◆ Water borne diseases
- ◆ The Water Cycle
- ◆ Water and the community
- ◆ Habitats

## Methodology used at the classroom

Learners are involved in group discussions that focus on various water issues like water supply and treatment, pollution, sanitation, health and hygiene, water borne diseases and conservation. There is recognition of their prior knowledge. This is achieved by using guided questioning to find out what the learners already know, to stimulate discussion as well as to find solutions to problems. These discussions are supplemented by the water education videos. Due to time constraints, copies of worksheets and other activities are sent back to school with the educators. Educators use the visit to the classroom either as preamble to their lessons on water or to conclude/round up the theme. Since the water classroom is based on a Water works, the highlight of the visit is the tour around the waterworks. This offers a very practical, hands-on approach to the purification process and the learners have a better understanding of the purification process, as well as why it is important for us to pay our water bills.



*Picture: learners on tour of waterworks*

## The Ozwathini Case

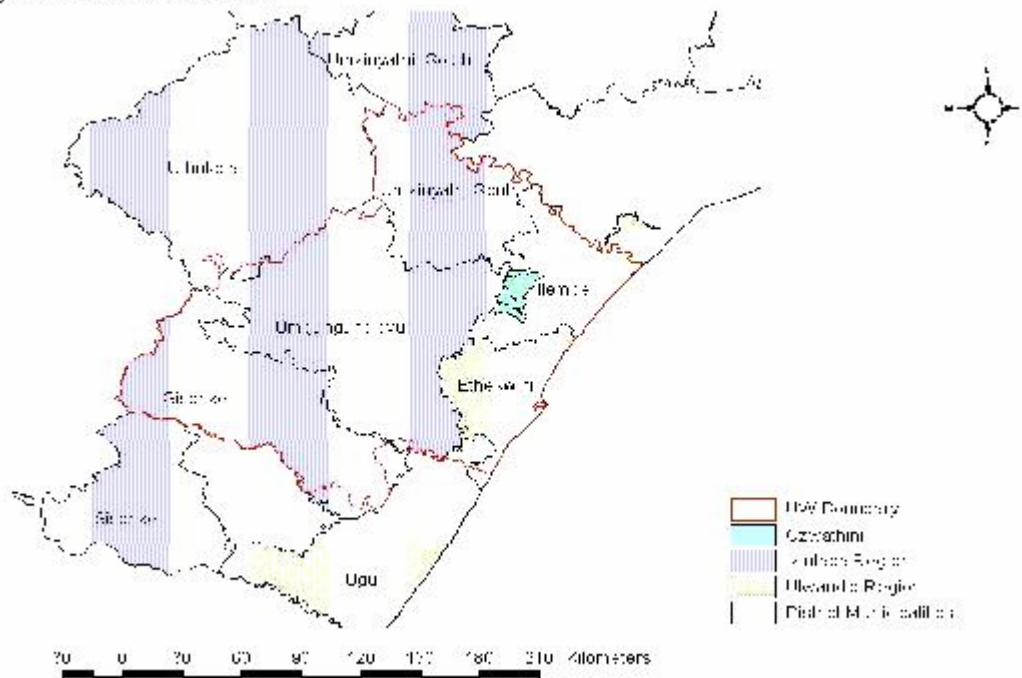
As already mentioned, one of the services that is offered is Water education outreach programmes. Water Educationalists visit schools, industries and communities to run water workshops based on water related issues like sanitation, health and hygiene, pollution, conservation, water supply and water treatment.

To demonstrate the effectiveness of this programme, reference will be made to the project that was run in the Ozwathini Area.

## Location

The Ozwathini area within the District Municipalities of Ilembe and Umgungundlovu in the province of KwaZulu Natal in South Africa. This area is to be provided with potable water as an RDP scheme in the near future. The scheme is still in the planning stage and will eventually supply a population of approximately 58 000 people with borehole water as the source. Stewart Scott is the consultant and Umgeni Water is acting as Implementing Agent. The location of Ozwathini may be seen in Figure 1, which shows the Umgeni Water operational area divided between the Izintaba and Ulwandle Umgeni Water Regions.

Figure 1: Location of Ozwathini



## Pre-Scheme Water Quality Survey

The results showed significant bacteriological contamination in both the source waters and in the containers being used by the community, Consumption of water contaminated to this extent is a serious health risk and could lead to severe gastro-intestinal infections.

In summary, 38% of the water sources were classified as being unsuitable for consumption without treatment, while 50% were of marginal quality. Only 12.5% of the sources were satisfactory for consumption without treatment. A surprising result was that 63% of the community water storage containers surveyed were classified as being unsuitable for consumption, which effectively meant that poor storage of the water by the community was resulting in further bacteriological contamination and increasing the health risk. A summary of these results is given in Table 1.

	<b>Raw water sources</b>	<b>Community containers</b>
Ideal water quality – suitable for consumption	12.5%	0%
Good water quality – suitable for use, rare instances of negative effects	0%	0%
Marginal water quality – conditionally acceptable. Negative effects may occur in some sensitive groups.	50%	37.5%
Poor water quality – unsuitable for use without treatment. Chronic effects may occur.	25%	25%
Dangerous water quality – totally unsuitable for use. Acute effects may occur.	12.5%	37.5%

*Table 1: Percentage of Ozwathini raw water sources and community containers in each water quality category*

### **School Education Campaign**

In the light of these deeply disturbing results, it was decided that a community health and hygiene educational programme, focussing on water care, should be carried out with schools to be targeted as being the most cost effective campaign for mass education. The assistance of Illembe District Municipality was kindly given in order to map out and list the schools, which may be seen in Figure 2 at the end of this paper.

### **Methodology**

The approach to providing water care education at the 46 schools identified in the Ozwathini area was to initially target the junior schools as the senior ones were preparing for examinations late in 2002. The Department of Health at Ndwedwe was approached for assistance in contacting the schools and accompanying and assisting Umgeni Water staff with the presentations. Two teams were formed to simultaneously provide the education programmes at the primary and high schools.

Ozwathini is divided up into four Tribal Wards, namely Mathulini, Mlamula, Nodwengu and Kwagcwensa. Each team had to cover two Wards and Team A had Nodwengu and Kwagcwensa, while Team B covered Mlamula and Mathulini. The approach used was to arrange appointments by personal visits to the schools. It was necessary to drive to the schools since those in the rural areas had problems with the postal addresses, and many did not have telephones. The list of schools visited may be seen in Table 2 (see at the end of this paper)

The focus of the presentations was on issues such as the importance of water, pollution, causes and ways to prevent pollution, purification of water and how to save water. The Health Officers spoke on water related diseases, sanitation and hygiene. The talks were followed by the showing of a video on Health and Hygiene and finally an open floor discussion for questions was held. Students were asked questions to find out the effectiveness of the presentations. Three different types of Posters were left at each classroom, namely concerning Sanitation, Bilharzia and Cholera.

Pre- and post-education questionnaires were prepared for the learners to fill in, in order to assess the effectiveness of the campaign. The questionnaires are shown in the Appendix. Pre-assessment questionnaires were given to the principal of the schools while arranging appointments. The principal and teachers were to select learners randomly from the different grades to answer the questionnaires, while the post-assessment questionnaires were to be left at the schools after the presentations for later collection.

## Results

The results of the pre- and post-questionnaires for the primary and high schools are given in Tables 3 and 4. (see at the end of this paper)

The pre-education questionnaire was divided into five sections, namely:

1. General water health knowledge
2. Looking after toilets
3. Handling of water
4. Handling of food
5. Waste management

Similarly, the post-education questionnaire was comprised of four sections, namely:

1. Handling of water
2. Looking after a toilet
3. Handling of food
4. What has been learnt

Each section of the questionnaires was scored and then overall percentages calculated. From assessment of the pre-education questionnaire, it is evident that the level of the respondent's knowledge was quite high. It was subsequently learnt that the Environmental Health Officers had been conducting workshops in the area as there had been outbreaks of cholera. This meant that the respondents had the necessary information, but were not putting it into practice. A problematic area was the handling or looking after toilets that was lacking and more focus was spent on this issue. One of the schools had had a bilharzia episode and thus the campaign was fortuitous as it explained to them the reason for having this disease and the importance for treating it.

The results of the post-education questionnaires showed that there was an increase in knowledge of the areas covered. There was a keen interest in having more talks of the same nature for the whole community as well as covering particular aspects of health such as HIV/AIDS. The impression gained was that the learners would welcome follow-up campaigns. There was now a link established between behaviour at home and at school, which had been an area of concern, as the pupils had believed that what they did at school should be different from what they did at home. In other words, practice good habits at school but not at home.

In summary, 28 primary and combined schools comprising 14 000 learners and 18 high schools comprising 8 900 learners were visited and educated. The education was well received and the aim of the campaign was achieved.

### **Discussion of problems encountered**

A number of problems were encountered in this education drive, which are listed below to be taken into account with future campaigns:

- ◆ Appointments made at schools, but on arrival there were no contact teachers or principals available. This resulted in delays.
- ◆ Lack of commitment from the teachers. When arriving at school students are not ready, they will start cleaning and setting up the venue/hall. This delays the programme.
- ◆ Time given by the principal to spend with students is not enough, in such a way that it is difficult to engage students in activities like PHAST tools.
- ◆ At some schools, the hall was not big enough to accommodate all the pupils, which resulted in the pupils being divided up into groups, resulting in further delays due to multiple presentations.
- ◆ At other schools, the pupils would be forced into a hall too small, resulting in overcrowding. The outcome was that some pupils could not see the video adequately.
- ◆ There was a big problem in getting the pre- and post-questionnaires filled in. At some schools there were logistical problems when the pre-questionnaires were not filled in before the presentations commenced. Collection of the post-questionnaires was also problematic with forms being lost, or the contact teachers or principals being absent at collection time.

As a result, of the 46 schools visited, there were just 30 returns of pre-questionnaires and 20 returns of post-questionnaires.

### **Recommendations**

- ◆ It is recommended that a re-survey of water quality in the community homes and storage containers be carried out six months after the introduction of the water supply scheme.
- ◆ At the same time, health records from the local clinics for the pre- and post-scheme introduction periods could be compared to assess health and education benefits.
- ◆ Workshop with teachers, principals, and environmental educators is needed to discuss problems encountered and how these problems will be tackled for future progress.
- ◆ Environmental educators need to look at the effectiveness of the approach they are using (“talk and chalk”, outcomes based approach, active learning, constructivism).
- ◆ Educators need to come up with activities that will get the learners actively involved.

### **Approach used with community awareness programmes**

- ◆ PHAST (Participatory Hygiene and Sanitation Transformation) tools are used to help encourage the community to participate through out the workshop and discuss their sanitation problems, health & hygiene practices as a group. This results in sharing of information and the community identifying and recognising and solving their own problems.
- ◆ Research statistics shows that students learn easily if learning is fun and interactive. Educators can design competitions, role-plays, drama, experiments etc. The learners and

communities learn easily if they discover/identify problems/situations themselves rather than being told.



*Photo: members of the community using the PHAST tools*

- ◆ Environmental educators need to do away with the old approach where the educators will come up with what they think the problem is or the needs of the community. People need to identify problems themselves and relate it to their local environment. The same approach may be used with students.

APPENDIX: Figures and tables

Figure 2: Location of schools

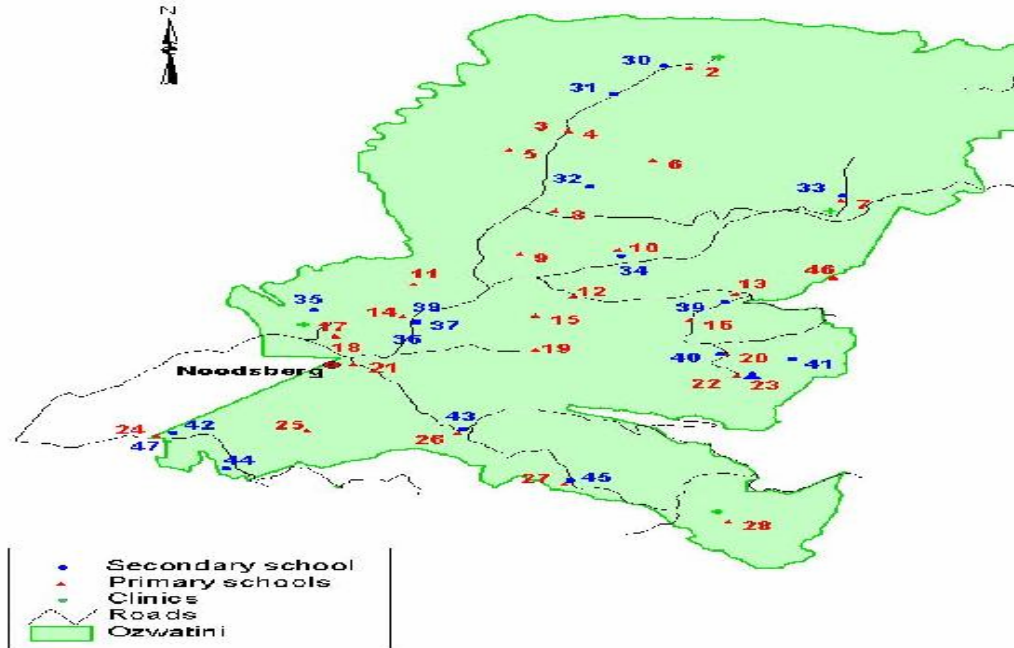


Table related to fig.2.

Legend	School Name	Legend	School Name
1	Phambela	25	Nhlangakazi
2	Chibini	26	Ozwathini
3	Deda	27	Maqokomela
4	Mlamulankunzi	28	Dikwayo
5	Sogidi	29	Chief Ngonyama
6	Ngayiphi	30	Qalakahle
7	Sion	31	Siyaphumula
8	Noodsberg	32	Ngcongcongca
9	Qhubakahle	33	Simunye
10	Emkhambeni	34	Mjele
11	Kwelifuphi	35	Nondenisa
12	Dalibo	36	Sikhulile
13	Ndabenhle	37	Mthuli
14	Amathuli	38	Lukhasa
15	Sibongile	39	Manaba
16	Insuze-Gwen	40	Mahlube
17	Appelsbosch	41	Our Lady of the Rosary
18	Inqolayolwazi	42	Sotobe
19	Bulawayo	43	Khanyisa
20	Manzamhlope	44	Dumane S. Comm.
21	Nondabula	45	Amabutho
22	Emsengeni	46	Montobello
23	Wewe		
24	Montobello		

Table 1: Percentage of Ozwathini raw water sources and community containers in each water quality category

	Raw water sources	Community containers
Ideal water quality – suitable for consumption	12.5%	0%
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Poor water quality – unsuitable for use without treatment. Chronic effects may occur.	25%	25%
Dangerous water quality – totally unsuitable for use. Acute effects may occur.	12.5%	37.5%

Table 2: List of schools visited

Primary and Combined Schools	High Schools
Nodwengu Tribal Authority	Nodwengu Tribal Authority
Montobello C.P School (Our Lady of the Rosary)	Montobello High School
Nhlangakazi C.P School	Khanyisa Secondary School
Nondabula C.P School	Sotobe Secondary School
Ozwathini C.P School	Dumane Commercial School
Maqokomela C.P School	
Dikwayo C.P School	
Kwa-gcwensa Tribal Authority	Kwa-gcwensa Tribal Authority
Ndabenhle Primary School	Simunye Secondary School
Emkhambeni Primary School	Ndukwenhle Secondary School
Dalibo Primary School	Lukhasi Secondary School
Amabutho Primary School	Amahlubi Secondary School
Nsuze Gcwensa Primary School	Manaba Secondary School
Wewe Primary School	
Manzanhlophe Primary School	
Mathulini Tribal Authority	Mathulini Tribal Authority
Inqolayolwazi Primary School	Mjele High School
Appelsbosch Primary School	Mthuli High School
Amathuli Primary School	Sikhulile High School
Bulawayo Primary School	Nondemse High School
Sibongile Primary School	
Kwelifuphi Primary School	

Mlamula Tribal Authority	Mlamula Tribal Authority
Ngayiphi Primary School	Siyaphumula Secondary School
Sogidi Primary School	Chief Ngonyama Secondary School
Mlamulankunzi Primary School	Ngcongcongca Secondary School
Deda Primary School	Qalakahle Secondary School
Qhubakahle Primary School	Ntuli Secondary School
Noodsberg Primary School	
Sion Primary School	
Phambela Primary School	
Chibini Primary School	

Table 3: Pre and post-questionnaire results for primary schools

Pre-questionnaire for Primary schools					
Name of School	General Water Health Knowledge	Looking after Toilets	Handling of water	Handling of food	Waste Management
Mlamulankunzi	80%	75%	80%	80%	70%
Amathuli	70%	80%	60%	65%	60%
Dalibo	80%	60%	70%	80%	70%
Amabutho	80%	60%	80%	80%	80%
Nsuze-Gcwensa	80%	60%	80%	80%	80%
Manzanhlophe	90%	50%	80%	80%	80%
Mantobelo	90%	80%	90%	90%	90%
Nhlangakazi	70%	60%	70%	70%	60%
Nondabulo	90%	60%	80%	80%	90%
Ozwathini	90%	60%	80%	80%	80%
Maqokomelo	80%	60%	60%	80%	70%
Dikwayo	70%	80%	80%	80%	80%
Sogidi	70%	60%	70%	80%	70%
Ndabeni	80%	75%	80%	90%	80%
Noodsberg	80%	75%	80%	90%	80%
Qhubakahle	60%	60%	90%	90%	100%
<b>Average</b>	<b>79%</b>	<b>66%</b>	<b>77%</b>	<b>81%</b>	<b>78%</b>
<b>Overall</b>	<b>76%</b>				

Post-questionnaire for Primary schools					
Name of school	Handling of water	Looking after a toilet	Handling of food	What has been learnt	
Nondabula	100%	95%	100%	100%	
Qhubakahle	100%	100%	95%	100%	
Ozwothini	100%	95%	100%	100%	
Maqokomela	100%	100%	95%	100%	
Kwelifuphi	100%	100%	100%	100%	
Inqolayolwazi	100%	95%	100%	100%	
Manzanhlophe	100%	100%	95%	95%	
Insuze-Gcwensa	100%	100%	100%	100%	
Ngayiphi	100%	95%	100%	100%	
Wewe	100%	90%	95%	100%	
<b>Average</b>	<b>100%</b>	<b>97%</b>	<b>98%</b>	<b>100%</b>	
<b>Overall</b>	<b>99%</b>				

Table 4: Pre and post-questionnaire results for high schools

#### Pre-questionnaire for high schools

Name of School	General Water Health Knowledge	Looking after Toilets	Handling of water	Handling of food	Waste Management
Dumane	90%	70%	70%	100%	85%
Lady of the Rosary(Mantobelo)	80%	65%	70%	100%	80%
Sotobe	75%	65%	70%	80%	90%
Qalakahle	90%	70%	75%	100%	85%
Ngcongcongong	95%	70%	75%	100%	80%
Khanyisa	90%	70%	80%	100%	95%
Indukwentsha	90%	60%	65%	80%	85%
Mahlubi	90%	75%	95%	100%	95%
Mjele	85%	70%	95%	100%	90%
Simunye	85%	85%	90%	100%	90%
Manaba	85%	65%	90%	100%	90%
Nondenisa	85%	80%	65%	100%	95%
Sikhulile	60%	75%	70%	90%	80%
Siyaphumula	85%	65%	70%	90%	80%
<b>Average</b>	<b>85%</b>	<b>70%</b>	<b>77%</b>	<b>96%</b>	<b>87%</b>
<b>Overall</b>	<b>83%</b>				

**Post-questionnaire for high schools**

<b>Name of school</b>	<b>Handling of water</b>	<b>Looking after a toilet</b>	<b>Handling of food</b>	<b>What has been learnt</b>	
Mahlubi	100%	65%	100%	95%	
Indukwentsha	100%	60%	100%	100%	
Mjele	100%	70%	100%	100%	
Siyaphumula	95%	75%	100%	95%	
Sikhulile	95%	65%	90%	100%	
Qalakahle	100%	70%	100%	100%	
Mthuli	85%	60%	90%	100%	
Simunye	100%	70%	95%	100%	
Ngcongcongga	100%	60%	75%	100%	
Lukhasi	100%	75%	100%	100%	
<b>Average</b>	<b>98%</b>	<b>67%</b>	<b>95%</b>	<b>99%</b>	
<b>Overall</b>	<b>90%</b>				

## APPENDIX 1: PRE-QUESTIONNAIRE

### General

1. Where do you relieve yourselves?
  - Toilet
  - Bush
  - Other
2. If the toilet is not there, do you see any need for it? No/Yes. Give a brief explanation.
3. How does it help to have a toilet?
4. Do you wash your hands after being in the toilet?
5. What do you use to wash your hands?
6. What diseases are caused by improper sanitation?
7. Why are flies dangerous?
8. How do you avoid flies?
9. Where can toddlers relieve themselves?
10. What causes obstructions in a toilet? Name the obstructions.

### Cleaning of the toilet

1. Do you clean the toilet?
2. How do you clean the toilet?
3. Do you throw the remains from cleaning the toilet into the pit?

### Safe water

1. Where do you fetch water?
2. What do you do to the water before drinking it?
3. How do you keep the water clean?
4. What do you use to clean water?
5. In what condition should water containers be kept?
6. How is unclean water dangerous?
  - From where it is fetched?
  - At home?
  - In the veld?
7. How is water disinfected?
8. What amount of disinfectant is necessary for the water?

### Food handling

1. What do we have to do before handling food?
2. How do we keep food free from germs?
3. What do we do with the dishes after finishing the food?

### Waste disposal

1. Where do we dispose of waste?
2. What do we do with the pit when it is full?
3. Why is it important to burn waste?
4. What are other uses of waste?
5. Do you have gardens?

## **APPENDIX 2: POST-QUESTIONNAIRE**

### **General**

1. How do we avoid water-borne diseases?
2. In order to prevent contracting water-borne diseases, what do you and your family have to do to the water fetched from the river?
3. How is it important to drink clean water? Explain briefly.
4. Why do we have to cover drinking water containers?

### **Cleaning of the toilet**

1. Is it necessary to clean the toilet?
2. How do we get rid of toilet odours?
3. Why is it important not to throw the remains from cleaning the toilet into the pit?

### **Food handling**

1. What do we have to do after being in the toilet?
2. What kind of water should be used in preparing food?
3. Why is it important to cover food?
4. What is the important thing to do after changing a baby's nappy?

### **What you have learnt**

1. What have you learnt from this educational programme?
2. Have you informed your family about what you have learnt?
3. Do you apply your acquired knowledge at home?
4. Would you like to attend another educational programme?
5. What would you like the programme to deal with?