

824 BW94

# **A TEACHERS' GUIDE**

**TO**

# **W**ORK WITH WATER

**PUBLISHED BY THE GOVERNMENT OF BOTSWANA  
MINISTRY OF EDUCATION  
GUIDANCE & COUNSELLING DIVISION  
GABORONE, 1994**

824 - BW94 - 12577  
-2

# FOREWORD

**The Teachers' Guide to Work with Water** provides information and ideas for teachers and contains examples of different activities which students can undertake which have been designed to stimulate their interest in the water sector and its opportunities. It also contains a number of activities which focus on gender issues. The water sector is only one of many sectors of the Botswana economy where women are under-represented, especially in technical positions. It is hoped that, through participation in these activities and the discussion which they might generate, more young women might be encouraged to consider taking up careers in the water sector.

Many of the activities suggested require students to conduct their own research. Some of them require that students leave their classrooms - perhaps to interview someone working in the water sector, to examine a nearby river or borehole, or to visit a water treatment plant, for example. The **Teachers' Guide** does not provide 'ready-made' answers to the questions which

students may ask. Instead, it encourages active learning, through participation and investigation.

It is expected that teachers will adapt the various activities and exercises provided to suit their own needs and the interests of their students.

The material for the **Teachers' Guide** originated from a number of workshops. Two workshops were held for teachers, in January and April 1994. The teachers visited water sector organisations, put together ideas, and undertook various activities with their students which provided the basis for the activities provided in the **Teachers' Guide**. A third workshop was held in May 1994 at which members of a smaller project group developed the material. The material was then compiled and edited. Project management was provided by SIPU International and the project was funded jointly by the Botswana Government and the Swedish International Development Authority (SIDA).

## Acknowledgements

Members of the Project Group for the **Teachers' Guide** were:

*K. Jayaraman (DLGSM)*

*Sian Griffiths (TS)*

*Motshwari Mabote (MOE)*

*Elisabeth Busang (MOE)*

*Miriam Proctor (MOE)*

*Mogakolodi Aabobe (MOE)*

*Bandie Ramothibe (MOE)*

*Per Jarby & Pauline Makepe (PESC)*

*Bengt Carlsson, Ellen Drake & Jeanette Moskovits (SIPU)*

*Elsie Alexander (local consultant).*

The Project Group is indebted to *Dr. P.T.M. Marope* (University of Botswana) for assistance with regard to gender issues.

The material was compiled and edited by *Sian Griffiths*. Final layout and coordination of production was provided by *Annabel Dunn*, Mahana Productions.

# CONTENTS

## **Chapter One**

*Talking About Gender Issues* Page 4

## **Chapter Two**

*Collecting Career Information* Page 16

## **Chapter Three**

*Careers in the Water Sector* Page 19

## **Chapter Four**

*Further Activities* Page 29

## **Chapter Five**

*Useful Addresses* Page 32

12577 (2nd copy)  
824 BW 94

## What is Gender?

It is important to make a distinction between **gender** and **sex**.

**Sex** identifies the *biological* difference between women and men. It is something that can not be changed. **Gender** identifies the *social* or *cultural* relationships between women and men. It, therefore, refers not to women or men but to the relationship between them, and how that relationship is socially determined or perceived. Thus gender is a dynamic concept, it changes as a result of modernisation, education, and higher levels of economic development. Since gender is socially determined, it is acquired and can be changed.

The nature of the relationships between women and men can be discussed on three levels; the domestic, the educational and the macro-economic.

Gender differences and attitudes begin in the home. It is the family which assigns to the child his or her first roles and responsibilities. At home, the child learns what is considered to be appropriate for girls and boys. Traditionally in Botswana, the girls were responsible for cooking, fetching water, washing clothes and harvesting, while the boys fed and herded cattle, ploughed the fields and supervised work. This traditional structure has begun to change due to the fact that women have started to work outside the home and also because an increasing number of households are headed by single women today.

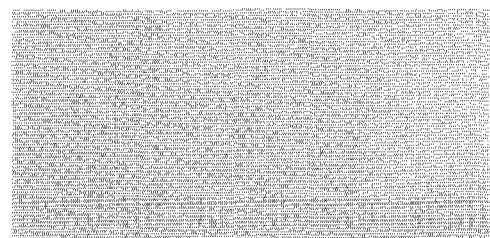
School is another social institution that plays a major role in shaping and changing gender attitudes. Teachers have a strong influence in terms of how the students act and in determining the roles which students play in the classroom. Research has shown that teachers give more encouragement to boys in science subjects. Text books in these subjects have usually been written by men, the content is often defined by men and is intended for male students. Science text

books tend to contain more illustrations of men than women. Perhaps it is due to these factors that more boys perform well in science subjects than girls and that more boys choose science or mathematics-based careers.

Traditionally, women did not participate in the economic life of the country. Today, however, it is recognised that development is more efficient through women's economic contribution. At this level, gender refers to the structural relationship of inequality between women and men as it is manifested in the different sectors of the economy, such as in education and employment. Inequalities are reinforced by traditional stereotyped attitudes, expected roles of women and men in society, discriminatory legislation and development policies. A prominent example is the gender imbalance between women and men in scientific and technical fields or sectors, such as the water sector. Botswana needs both women and men in these fields.

This first section of the **Teachers' Guide** focuses on gender issues. It contains a number of activities for students which are designed to make them more aware of gender issues. At the same time, both students and teachers can examine their own attitudes towards gender issues.

It is important to remember that as a teacher you influence and can change the attitudes held by your students and their parents. You can play an important role in influencing girls to study science and mathematics in order that they may consider taking up careers in scientific or technical fields.



# Making a Survey of Your Students' Attitudes



## Questionnaires

As a teacher, particularly if you are a guidance teacher, it is important to know your students well. One of the ways in which you can obtain useful information about your students, their attitudes and their aspirations, is by asking them to complete questionnaires. Similar questionnaires can be used to find out more about your students' parents or about your own colleagues - those who have some kind of influence over your students.

To make the best of the book **Work with Water**, it could be helpful to ask your students some questions about their attitudes toward certain school subjects, towards certain careers or types of work, toward gender issues, and so on. By asking questions about your students' backgrounds

and home environments, you might get some clues as to what or who are influencing them or shaping their attitudes.

**Aim:** To examine: students attitudes regarding girls or boys doing science, maths or technical subjects at school as well as choosing scientific or technical careers.

**Objectives:** To examine:

- a) how being a boy/girl affects a student's choice of school subjects;
- b) how being a boy/girl affects a student's choice of career;
- c) to what extent the attitudes of teachers or parents influence students' choices.

## Sample Questionnaires

The sample questionnaires provided, one for boys and one for girls, are examples that may help you when preparing your own. It is suggested that you adapt the questions to suit your own needs. Do not include more questions than necessary. Be clear about what you want to find out.

### Avoid overloaded questionnaire items.

Example of a questionnaire item which is overloaded:

*Do you think that your performance in science and mathematics is affected by the fact that you are a boy/girl?*

A better questionnaire item would be:

*For each of the following statements tick the one which best indicates your response:*

	Strongly agree	Agree	Disagree	Strongly disagree
<i>Boys have more problems in studying mathematics.</i>				
<i>Science and technical subjects are mainly for boys.</i>				
<i>My performance in mathematics is affected by the fact that I am a boy.</i>				

## Interviews

You could follow up the questionnaire exercise by interviewing a handful of students to get a clearer picture of their attitudes and the factors which have influenced them in forming their opinions.

## Group Discussions

Group discussions may also provide an opportunity for students to exchange ideas. Listening to fellow students can be a very important learning exercise for students; some may even find themselves questioning their own attitudes after considering those of their fellow students.



## Questionnaire: Boys

All information disclosed in this questionnaire will be treated as confidential and will only be used for the purposes of the survey. Names will not be used.

### 1. Personal information:

- a. Form: \_\_\_\_\_ b. Age: \_\_\_\_\_  
c. Sex: BOY d. Home Village/Town: \_\_\_\_\_  
e. When you are at home, with whom do you stay? \_\_\_\_\_  
f. What does the person you stay with do? \_\_\_\_\_

### 2. Family Details:

Give details of your parents' education by ticking in the correct box:

Education	Mother	Father
No formal education		
Up to Standard 7		
Up to JC		
Up to Cambridge		
Universtity Education		
Other (specify)		

### 3. Home Environment

- a. At home I do the following chores:  
(tick in the most appropriate box for each chore)

Chore	Never	Sometimes	Very Often
cook food			
wash clothes			
make fire			
clean the house			
look after the children			
look after the livestock			
fetch water			
fetch wood			
work in the garden			
mend clothes			
wash dishes			
wash the car			

b. At home my **sister/s** do the following chores:  
 (tick the most appropriate box for each chore)



Chore	Never	Sometimes	Very Often
cook food			
wash clothes			
make fire			
clean the house			
look after the children			
look after the livestock			
fetch water			
fetch wood			
work in the garden			
mend clothes			
wash dishes			
wash the car			

c. Have your parents ever given you advice about which subjects to choose at school?

Yes  No

d. Have your parents ever given you advice about which career to follow?

Yes  No

e. What do your parents want you to be when you finish school? \_\_\_\_\_

\_\_\_\_\_

f. Who, apart from your parents, do you discuss careers with? \_\_\_\_\_

\_\_\_\_\_



4. **Subject Choice**

a. Why did you choose the subject combination which you are now studying?

---

---

---

b. Do you think that being a boy influenced your choice of subjects?

Yes

No

Why?

---

---

c. Which are your favourite subjects at school?

1. \_\_\_\_\_ 2. \_\_\_\_\_ 3. \_\_\_\_\_

d. Why do you like these subjects?

---

---

---

e. For each of the following statements tick the one which best indicates your response:

	good	average	poor
My performance in mathematics is			
My performance in science is			

f. for each of the following statements tick the one which best indicates your response:

	strongly agree	agree	disagree	strongly disagree
Boys have more problems in studying mathematics				
Science and technical subjects are mainly for boys				
My performance in mathematics is affected by the fact that I am a boy				



5. **Career Choice**



a. What do you want to be when you finish school?

\_\_\_\_\_

b. Explain why you have chosen that career: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

c. Which subjects do you need to study at Cambridge level in order for you to be able to follow that career?

\_\_\_\_\_

d. Where would you be able to receive training for the career you have chosen?

\_\_\_\_\_

\_\_\_\_\_

e. Where would you prefer to work? (Choose from the options given below):

i) Urban area

Rural area

ii) Indoors

Outdoors

iii) In an office

Practical work

f. Do you think that there are certain jobs which are better suited for men and others which are better suited for women?

Yes

No

If you answered yes, give three examples of jobs which you think can be better done by men and three which you think can be better done by women.

i) Three jobs for which men are better suited:

1. \_\_\_\_\_

2. \_\_\_\_\_

3. \_\_\_\_\_

ii) Three jobs for which women are better suited:

1. \_\_\_\_\_

2. \_\_\_\_\_

3. \_\_\_\_\_



## Questionnaire: Girls

All information disclosed in this questionnaire will be treated as confidential and will only be used for the purposes of the survey. Names will not be used.

### 1. Personal information:

- a. Form: \_\_\_\_\_ b. Age: \_\_\_\_\_  
 c. Sex: GIRL \_\_\_\_\_ d. Home Village/Town: \_\_\_\_\_  
 e. When you are at home, with whom do you stay? \_\_\_\_\_  
 f. What does the person you stay with do? \_\_\_\_\_

### 2. Family Details:

Give details of your parents' education by ticking in the correct box:

Education	Mother	Father
No formal education		
Up to Standard 7		
Up to JC		
Up to Cambridge		
Universtity Education		
Other (specify)		

### 3. Home Environment

- a. At home I do the following chores:  
 (tick in the most appropriate box for each chore)

Chore	Never	Sometimes	Very Often
cook food			
wash clothes			
make fire			
clean the house			
look after the children			
look after the livestock			
fetch water			
fetch wood			
work in the garden			
mend clothes			
wash dishes			
wash the car			

b. At home my **brother/s** do the following chores:  
(tick the most appropriate box for each chore)



Chore	Never	Sometimes	Very Often
cook food			
wash clothes			
make fire			
clean the house			
look after the children			
look after the livestock			
fetch water			
fetch wood			
work in the garden			
mend clothes			
wash dishes			
wash the car			

c. Have your parents ever given you advice about which subjects to choose at school?

Yes

No

d. Have your parents ever given you advice about which career to follow?

Yes

No

e. What do your parents want you to be when you finish school? \_\_\_\_\_

\_\_\_\_\_

f. Who, apart from your parents, do you discuss careers with? \_\_\_\_\_

\_\_\_\_\_



4. **Subject Choice**

a. Why did you choose the subject combination which you are now studying?

---

---

---

b. Do you think that being a girl influenced your choice of subjects?

Yes

No

Why?

---

---

c. Which are your favourite subjects at school?

1. \_\_\_\_\_ 2. \_\_\_\_\_ 3. \_\_\_\_\_

d. Why do you like these subjects?

---

---

---

e. For each of the following statements tick the one which best indicates your response:

	<b>good</b>	<b>average</b>	<b>poor</b>
My performance in mathematics is			
My performance in science is			

f. for each of the following statements tick the one which best indicates your response:

	<b>strongly agree</b>	<b>agree</b>	<b>disagree</b>	<b>strongly disagree</b>
Girls have more problems in studying mathematics				
Science and technical subjects are mainly for girls				
My performance in mathematics is affected by the fact that I am a girl				



5. **Career Choice**

a. What do you want to be when you finish school?

\_\_\_\_\_

b. Explain why you have chosen that career: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

c. Which subjects do you need to study at Cambridge level in order for you to be able to follow that career?

\_\_\_\_\_

d. Where would you be able to receive training for the career you have chosen?

\_\_\_\_\_

\_\_\_\_\_

e. Where would you prefer to work? (Choose from the options given below):

i) Urban area

Rural area

ii) Indoors

Outdoors

iii) In an office

Practical work

f. Do you think that there are certain jobs which are better suited for men and others which are better suited for women?

Yes

No

If you answered yes, give three examples of jobs which you think can be better done by men and three which you think can be better done by women.

i) Three jobs for which men are better suited:

1. \_\_\_\_\_

2. \_\_\_\_\_

3. \_\_\_\_\_

ii) Three jobs for which women are better suited:

1. \_\_\_\_\_

2. \_\_\_\_\_

3. \_\_\_\_\_



## Worksheet

### How Many Women?

On page 23 of **Work With Water** you will find information on how many women are employed in four different water sector organisations.

Here is a table presenting the same information. However, this table has two additional columns which you are to fill in yourselves. You are expected to calculate the total number of first women and then men working in each of the organisations, followed by the grand total of employees (men plus women) within each organisation.

No. of employees (April 1994)	Water Utilities Corporation		Department of Water Affairs		Department of Geological Surveys		Local Authorities		Total		Grand Total
	Women	Men	Women	Men	Women	Men	Women	Men	Women	Men	
General Administration	98	266	147	39	1	1	18	32			
Workers	1	237	3	1960	2	26	198	1330			
Artisans	-	65	1	83	2	8	4	57			
Technicians	18	53	2	90	-	5	2	55			
Professionals	8	27	5	40	1	15	-	8			
<b>Total</b>											
<b>Grand Total</b>											

Once you have completed the table, answer the following questions using the figures given in the table.

- What percentage of employees in the water sector work for
  - WUC?
  - DWA?
  - DGS?
  - Local Authorities?
- Make a pie chart of your findings in answer to question 1.
- What is the ratio of women to men in the water sector?
- What percentage of the employees are women in
  - WUC?
  - DWA?
  - DGS?
  - Local Authorities?
  - The whole sector?
- How many women in the water sector are technicians?
  - How many more women need to be employed as technicians in order that 50% of the technicians are women?
  - How many more women need to be employed as technicians in order that 20% of the technicians are women?
- Why do you think so few women are working in the water sector or technical careers generally?

## Social Roles and Careers: Activities



Below are listed a number of different activities which students can carry out which will help them to examine the social roles which men and women perform - the expectations which society places on men and women to behave in certain ways in certain situations, and in particular with regard to careers.

1. Interview a man or woman who does not follow traditional male/female lines of household duties. Try to discover why the individual has developed his/her own way of attending to household responsibilities, rather than following traditional divisions of tasks and how he/she feels about the role he/she plays.
2. Survey your classmates in terms of the subjects girls have chosen to study versus those that boys have chosen. Make a chart similar to the one shown below. Add any other subjects that are done by your classmates. Compare the number of boys and girls taking each subject.



Subject	Girls	Boys
Home Economics		
Design and Technology		
Physics		
Chemistry		
Biology		

*Discuss the results of the survey with your classmates.*

3. Have you ever noticed a teacher responding differently to girls or boys in class? If you have, give examples of how the teacher responded differently to the boy/s or girl/s. Discuss how this might influence boys' or girls' behaviour and performance in school.

4. In the table below, list three occupations which you might be interested in doing. What abilities and interests are required for these occupations?

List of Occupations	Required Abilities and Interests
a.	
b.	
c.	

- a.
- b.
- c.

Do you think that men have abilities which women do not or that women have abilities which men do not? Do you think that any of the abilities which you have listed in your table are more commonly found amongst men or more commonly found amongst women?

5. Make a list of occupations related to the water sector. State whether mostly men or women, or both, are employed in those occupations. Discuss why some of the occupations are considered more appropriate for men and why some are considered more appropriate for women. What do you think?
6. Interview a woman or a man who is in an occupation that is not considered traditionally female or male. Discuss with the person how he/she feels about being in an occupation that is dominated by the opposite sex. Why did this person choose this occupation, despite the fact that it was not traditionally occupied by people of his/her sex. Find out if the person ever feels discriminated against at his/her workplace on the basis of sex.

After interviewing this person, consider whether your own ideas or feelings about the occupation which that person holds have changed or not. If your views have changed, how have they changed?

## How to Organise Student Research Activities

### What is Research?

When we carry out research, we are carrying out **an investigation** - either because we want to discover something new or to establish new facts, or because we have some information on a given subject and are looking for more information relating to the same subject.

**Work with Water** does not provide all the information about the water sector or careers which involve working with water. Students should be encouraged to research or to find out more information about the water sector organisations, training institutions or particular careers which interest them most.

### How to Conduct or Organise Research

#### Where and How can students get hold of information?

- From libraries: by reading relevant books, magazines, newspaper articles or advertisements, prospectuses for training institutions, and other relevant career guidance materials that are available.
- By visiting organisations or institutions. (See section of the **Teachers' Guide** on how to organise a study visit.)
- By writing to relevant organisations to request information. Students may write to a training institution to request a prospectus or for details of a particular course. They may write to a water sector organisation or employer to request information about that organisation and the employment opportunities there. Even Annual Reports of large organisations such as Water Utilities Corporation contain a lot of useful and interesting information.
- Students may collect information by conducting interviews (of teachers, water sector employers or employees, relevant people in training institutions etc.). If students are unable to visit the relevant

organisations in order to conduct interviews, it may be possible for them to post interview questions or written questionnaires to the people whom they want to interview. (See section of the **Teachers' Guide** on how to prepare questionnaires.)

### How can Students Write Up or Present the Findings of their Research?

#### How to prepare a written report after completing a research project:

1. **Subject or Topic:** First they should provide the research project with a title.  
*Example: How is Water Supplied to Our School and Who are The People Involved in the Process of Supplying the Water?*
2. **Statement of Purpose:** There should then be an introductory sentence or paragraph stating the purpose or reason for conducting the research project.  
*Example: The research project was carried out in order to find out how water is supplied to our school and which water sector personnel are involved in the different stages of the process of supplying the water.*
3. **Methodology:** Students should then explain the methodology used, in other words, how the information was obtained.  
*Example: a) The Council Water and Waste Water Department was visited and the Senior Water Engineer and other staff members were interviewed. b) The local Water Supply Operator was interviewed.*
4. **Findings of the Research:** All the information gathered during the research project which is considered relevant to the topic should be given here.



5. **Conclusion:** Here, students may provide some kind of conclusion or make observations regarding their findings.
6. **References:** Students should provide a list of books or other written materials which they referred to during the course of the research project.

### Alternative ways to present the findings of the research project:

1. Students may make oral presentations of their findings to their classmates.
2. Students may make posters which present the findings of their research in an attractive and accessible way.
3. Students may present their findings in the form of role plays.



## SPEEDCOP

Choosing a career is one of the most important decisions of a young person's life. It is also one of the most difficult.

The Guidance and Counselling programme offered in our secondary schools is designed to assist students to cope with and understand their own personal development, the society and environment in which they find themselves, and to plan for and make realistic decisions relating to their own futures.

The career guidance component of the programme seeks to provide students with up-to-date information about the world of work, and about particular careers.

The acronym SPEEDCOP refers to a number of different factors which a student should look at when considering a particular career and trying to match it to his or her own interests and abilities: **s**urroundings, **p**rospects, **e**ntry level, **e**ffects, **d**escription, **c**onditions, **o**rganisation and **p**eople.

### Activity using SPEEDCOP

Choose one of the careers offered in the water sector and, using SPEEDCOP as a guide, try to find out more information about that career:

- **SURROUNDINGS** ..... the environment in which you would work if employed in that career.
- **PROSPECTS** ..... what the career would lead to.
- **ENTRY & TRAINING** ..... the basic requirements for entry to the career and training offered.
- **EFFECTS** ..... how the career would affect your personal life.
- **DESCRIPTION OF THE WORK** ..... the different duties or tasks to be performed.
- **CONDITIONS** ..... the conditions and rewards offered eg. hours, pay, benefits, leave entitlement etc.
- **ORGANISATION** ..... the type of organisation in which you would work eg. school, hospital, factory, mine etc.
- **PEOPLE** ..... the people with whom you would work eg. children, elderly people, sick people etc.





## How to get Workplace Experience

One of the important stages which students must pass through before they can make wise or appropriate career choices or decisions is career exploration. There are a number of ways in which students can get real workplace experience which can provide opportunity for career exploration.

### 1. Tirelo Setshaba

Tirelo Setshaba provides many form-five school-leavers with their first experience of the world of work. Participants spend twelve months attached to user departments or organisations. In most instances, they are provided with some form of initial training and then work under the supervision of a qualified person. The Department of Tirelo Setshaba does try to place participants in departments or organisations which are in line with their expressed career interests, although this is not always possible.

Students are asked to put their career interests on the Tirelo Setshaba application forms. When they have been admitted and placed in a certain district, they can discuss

their career interests with the Tirelo Setshaba officers there, who will try to assign them accordingly.

Participants who are interested in water sector careers may be placed with District Council Water and Waste Water Departments, the Department of Water Affairs, Public Health Departments, NGOs or other related organisations. They can discuss their particular career interests with their supervisors or the Personnel Officers in the departments or organisations to which they have been assigned. Those people may be able to give them relevant work assignments.

### 2. Attachments, Job Shadowing, Vacation Jobs etc

It may be possible for some students, either whilst they are still at Secondary School or at a tertiary institution, to spend a short period of time within an organisation or company observing activities that are being undertaken there.

They may be attached to one or several employees or may 'shadow' someone (ie. follow someone closely as he or she is working) and, in this way, can be exposed to the day-to-day realities of the work situation.

In most cases, students are not paid for this type of learning activity but will be rewarded by way of experience acquired.

Students at some tertiary institutions (eg. the Polytechnic or VTCs) undertake industrial attachments as part of their training. Some students at this level also choose to find vacation employment to gain additional work experience. Students undergoing industrial attachments or engaged in this type of temporary employment are usually paid.

# CAREERS IN THE WATER SECTOR



## Career Opportunities at Different Levels

Below is a list of water sector careers. The list shows the different careers which are available at different levels: **professional** careers are those which require degree-level training, **technician-level** careers require diploma-level training, and **artisan or craft-level** careers are those which can be entered after completing certificate-level training or apprenticeships.

### Professional-level Personnel

1. Water & Waste Water Engineer
2. Environmental Engineer/Pollution Engineer/Sanitation or Sewage Engineer
3. Biologist/Bacteriologist
4. Chemist
5. Chemical Engineer
6. Geologist
7. Hydrogeologist
8. Hydrologist
9. Hydro-Chemist
10. Geophysicist
11. Telemetry Engineer
12. Sanitation Officer

#### Related Careers/Professions:

1. Mechanical Engineer
2. Electrical Engineer
3. Computer Scientist/Analyst
4. Public Health Officer/Sanitation Inspector
5. Cartographer
6. Surveyor

#### Non-Technical Professionals

##### Working in the Water Sector:

1. General Administrative and Personnel Management Staff
2. Accountants
3. Lawyers

### Technician-level Personnel

1. Water & Waste Water Engineering Technician
2. Water Laboratory Technician
3. Rig Technician
4. Environmental Health Technician
5. Telemetry/Instrumentation Technician
6. Driller

#### Related Careers at Technician-Level:

1. Technicians in Civil, Mechanical & Electrical Engineering
2. Quality Control Technician

### Artisan/Craft-level Personnel

1. Borehole Mechanic
2. Pipe Fitter
3. Heavy Plant Mechanic
4. Water Supply Operator
5. Driller
6. Plumber

#### Related Artisan-Level Careers:

1. Builder/Bricklayer
2. Welder/Fabricator
3. Draughtsperson
4. Machine Fitter

## Activities

The list of water sector careers provides a useful reference for both teachers and students. However, it is also suggested that teachers create activities or exercises for students using the list as a starting point. An example of the type of activity which can be created using the list is given on the following page.



## Student Activity

Choose five careers from the list and prepare a table similar to the one given below. Complete your table after having found out the necessary information about each of the careers you have chosen.

Career	Main Tasks Performed	Where Training Offered	Additional Information
Water & Waste Water Engineer			
Chemical Engineer			
Environmental Health Technician			
Borehole Mechanic			



## Main Steps in Providing Water and Waste Water Services

### Water Services

1. Water Source Development:
2. Raw Water Quality Assessment:
3. Intake Structures/Boreholes:
4. Pumping Facilities:
5. Water Treatment Plants:
6. Water Quality Monitoring:
7. Water Distribution:

### Personnel Involved

Hydrogeologists, Geologists, Water Engineers, Surveyors, Water Engineering Technicians, Drillers, Water Diviners

Chemists, Pollution & Water Engineers, Biologists, Water Engineering Technicians

Water Engineers, Civil Engineers, Borehole Mechanics

Electrical & Mechanical Engineers & Technicians, Water Supply Operators

Water Engineers, Civil Engineers, Plant Superintendents, Water Engineering Technicians, Biologists, Chemists, Environmental Chemists, Telemetry Technicians, Pipe Fitters, Plumbers, Water Supply Operators

Environmental Chemists, Water Engineering Technicians, Laboratory Assistants

Water Engineers, Civil Engineers, Water Engineering Technicians, Pipefitters, Water Supply Operators, Telemetry Technicians, Plumbers

## Water Services

1. Waste Water Collection:
2. Waste Water Treatment Plant:
3. Effluent/Treated Waste Water:
4. Waste Water Disposal:

## Personnel Involved

Water Engineers, Environmental Engineers, Civil Engineers, Surveyors, Hydrologists, Water Engineering Technicians, Pipefitters, Plumbers, Electrical & Mechanical Engineers, Water Supply Operators, Sewer Maintenance Personnel

Water Engineers, Environmental Engineers, Chemists, Water Engineering Technicians, Plant Superintendents, Plant Operators, Biologists, Pipefitters, Plumbers

Environmental Engineers, Chemists, Biologists, Water Engineering Technicians

Waste Water and Sewage Engineers, Chemists, Biologists, Water Engineering Technicians, Agricultural Engineers?



## Solid Waste Management

1. Storage of Solid Waste
2. Analysis of Solid Waste
3. Collection & Transportation
4. Solid Waste Disposal

## Personnel Involved

Environmental Engineers, Civil Engineers, Engineering Technicians

Environmental Chemists, Engineering Technicians

Environmental Engineers, Engineering Technicians, Transportation Engineers, Refuse Collection Staff, Automechanics, Mechanical Engineering Technicians

Environmental Engineers, Geologists, Hydrogeologists, Engineering Technicians, Heavy Duty Vehicle Operators, Automechanics, Site Superintendents

## 13.10 Visits by Water Sector Resource Persons

Teachers may invite resource persons from the water sector to come and talk to students on their own areas of specialisation or more generally on opportunities within the sector. Some suggestions are given below.

1. Invite a Waste Water Engineer/ Environmental Engineer to give a talk on:
  - water pollution control.
  - waste water treatment.
  - technology, pollution and health.
  - protection of water sources.
  - re-use of waste water.
  - manpower needs in waste water management.

2. Invite an Environmental Engineer/ Sanitary Engineer/Sanitation Officer to give a talk on:

- solid wastes: the need for proper disposal.
- solid wastes collection and disposal in the area of your school.
- landfills and compost plants for solid wastes management.
- manpower needs in solid wastes management.



# How to Prepare, Organise and Follow Up a Study Visit

## Before the Actual Visit

- Obtain permission from the school authorities to arrange and conduct the visit.
- Send a letter to the organisation/institution at least one month before the date on which you would like to visit. Give a number of possible dates.
- Follow up with a phone call. Establish contact with one or more contact persons. Find out how many students the organisation/institution can allow to visit.
- Collect background material about the organisation/institution to be visited. Open a file where you keep all material in connection with the visit.
- Brief students.
- Ask Students to prepare questions or questionnaires.
- Invite someone from the institution/organisation to come and give a career presentation before the visit. If possible, try to find a woman in order to give girls a role model.
- Since the visit will be exposing students to both processes and careers, it could be helpful to establish contact between career guidance teachers and science teachers. Maybe science teachers could help to prepare students for the visit eg. by conducting activities in their lessons which relate to the organisation to be visited.
- Arrange transport for the visit.

## The Visit

- Teachers should take cameras, video cameras or tape recorders. Students should take note-pads and questionnaires.
- Take packed food if necessary.

## After the Visit

- Ask students to write reports or give oral presentations. Present and discuss the best reports.
- Write about the school visit in the school magazine.
- Show video or photographs taken.
- Ask students to make posters.
- Discuss gender issues.
- Write a letter of thanks to the organisation/institution and include a good report.

## Some Places to Visit

- Training Institutions
- Water Utilities, Water Affairs, Council Water Departments
- Village Water Supply
- Waste Water Treatment Plant and/or Sewage Ponds
- Landfill Sites and/or Dump Sites
- Private Companies dealing with drilling or groundwater exploration, or construction companies building water supply or waste water systems.

# Worksheet



## The Water Pump

Below you will see a diagram of a Rotary Mono Pump, which is the most commonly used pump in village water supply systems in Botswana.

Your assignment is to visit your local Department of Water Affairs Depot or Council Water and Waste Water Department and find out as much as you can about this pump and how it works.

After your visit you should be able to answer the questions below and provide labels for the different parts of the pump shown on the diagram.

### Questions

1. How is the Rotary Mono Pump powered?  
(by batteries, electricity, diesel engine?)

\_\_\_\_\_

2. This pump has three main parts. What are these three parts?

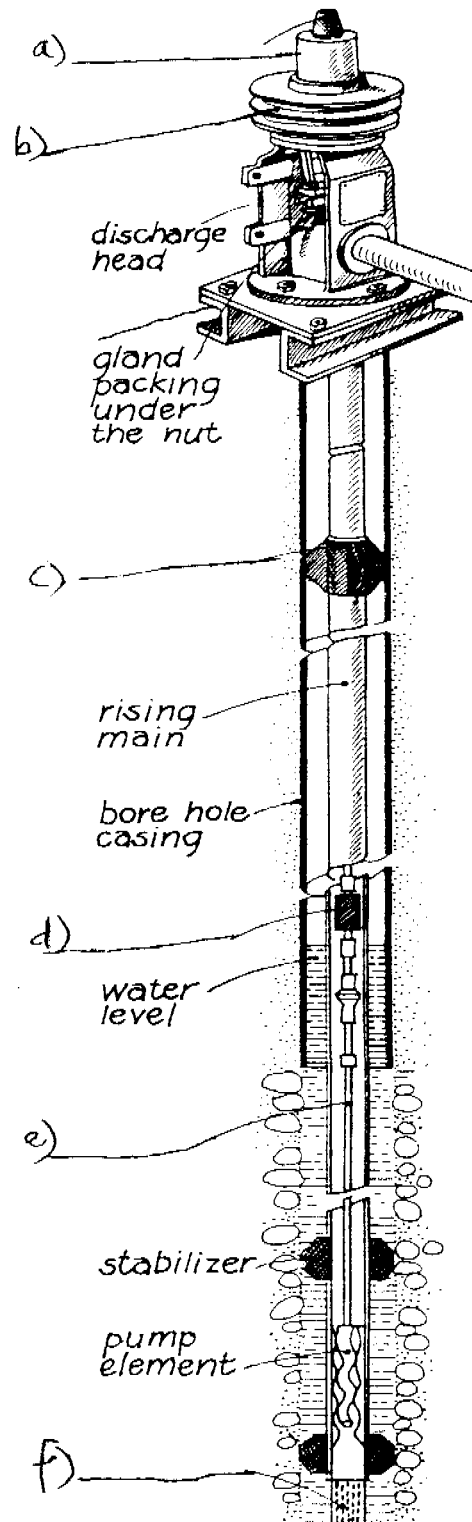
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

3. Label the different parts of the pump shown on the diagram. Try to find out the function of each of these parts.

- a. \_\_\_\_\_  
b. \_\_\_\_\_  
c. \_\_\_\_\_  
d. \_\_\_\_\_  
e. \_\_\_\_\_  
f. \_\_\_\_\_

4. Give the job titles of those responsible for operating and maintaining a water pump for a village water supply facility.

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_





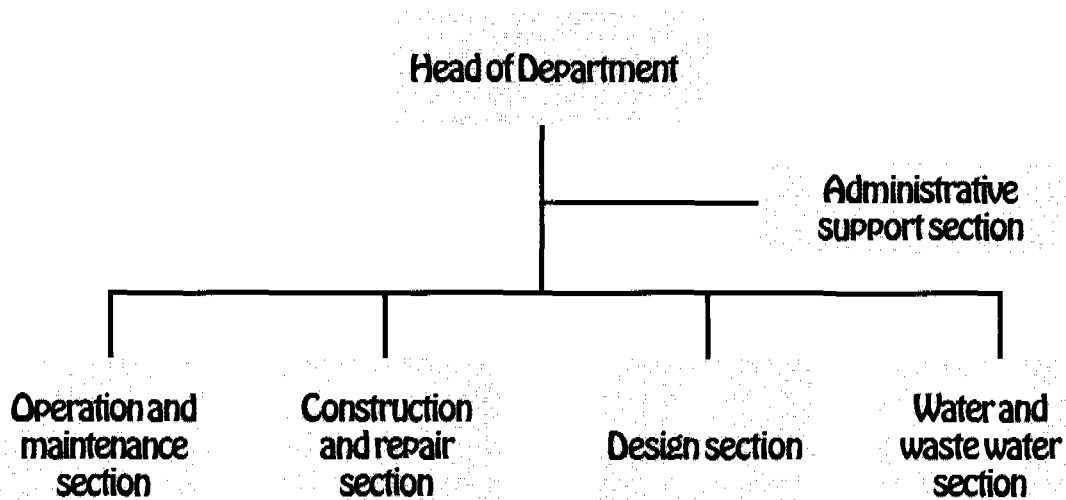
## How Jobs are Organised

### Organisational Chart

There are various ways to show how a company or department or any other organisation operates. The most common one is to draw an organisational chart or origram. The chart outlines how sections or units are related to each other, it shows who is in

command and the line of communication within the organisation. A full chart would show each post of the establishment and its place in the organisation. An overview chart would show the different sections of the organisation.

Here is an overview chart of a District Council Water & Waste Water Department:



### Schemes of Service

Each organisation has its own way of organising the various jobs and careers. In government organisations this is described in the schemes of service. The schemes of service will give information on:

- the main duties at each level of the organisation;
- what qualifications are needed to enter a certain career and what it takes to move from one level to another;
- the salary system that is used. For each post the basic pay is according to a certain scale and grade.

Each department has its own scheme of service, but there are great similarities.

Once a person has been employed in a certain organisation, he or she can be promoted and move upwards in a career. Promotion, however, never takes place

automatically. It is normally based on the following:

- a person must have performed well in his or her present job, and must be recommended by the supervising officer and head of department;
- there must be a vacant post on the higher level;
- the person must have the formal qualifications and specific experience, including number of years in service on a certain level. That is why most schemes of service are often linked to certain training paths.





Below is an example of a scheme of service. The facts are taken from the scheme of service for the Department of Water Affairs. The scheme of service distinguishes between artisan, technician and professional levels.

#### ■ Artisan Level

The posts to be found on this level are:  
Technical Assistant

- Senior Technical Assistant Grade II
- Senior Technical Assistant Grade I
- Principal Technical Assistant
- Chief Technical Assistant.

The basic minimum requirement for entry to the lowest level, Technical Assistant, is a Trade Test B Certificate and five years experience within the trade. A National Craft Certificate is needed to become a Senior Technical Assistant Grade I. A person must work as Senior Technical Assistant grade I for at least 3 years before he or she can be considered for a promotion to Principal Technical Assistant.

#### ■ Technician Level

The posts to be found on this level are:

- Technical Officer
- Senior Technical Officer
- Principal Technical Officer
- Chief Technical Officer
- Superintendent

The basic minimum requirement for entry to this level is an Ordinary Technician Diploma, like the Water Engineering Technicians Diploma presented in **Work With Water**.

A person must work as Technical Officer for at least three years with satisfactory service to be promoted to Senior Technical Officer. However, a person with a Higher National Diploma in, for example, Water & Environmental Engineering (see **Work With Water**, page 39) can be considered for direct entry to this level.

#### ■ Professional Group II Level

The posts to be found within Department of Water Affairs in this cadre are limited to the chemistry profession. The posts are:

- Assistant Chemist
- Chemist II
- Chemist I
- Senior Chemist
- Principal Chemist II
- Principal Chemist I

An Assistant Chemist must have a Bachelor's degree in chemistry.

#### ■ Professional Group I Level

There are four different professions belonging to this group:

- Hydrogeologist,
- Water Engineer,
- Electro-mechanical Engineer,
- Hydrologist.

These professions have in principle the same titles.

The posts to be found in the water engineering profession are:

- Assistant Water Engineer
- Water Engineer II
- Water Engineer I
- Senior Water Engineer
- Principal Water Engineer II
- Principal Water Engineer I
- Chief Water Engineer

The basic minimum requirement for entry to the Assistant Water Engineer level is a Bachelor's degree in a relevant profession or field. To become a Water Engineer I you need to have a post graduate diploma or a master's degree.



## ■ Job Description

For each type of post listed in the schemes of service, there must be a specified job description. The schemes of service would only indicate the scope of work.

As an example, this is what the schemes of service for Department of Water Affairs says about the Technical Officer's (TO) scope of work:

*A TO is a qualified technician able to accept full responsibility for the completion of a technical task in his/her area of expertise usually with only occasional advice and assistance from a more senior and experienced officer. The TO is able to supervise and direct the work of technical assistants and industrial class employees to ensure expeditious and efficient completion of the task and the setting as well as achievement of high standards of workmanship. More specifically an officer in this grade will carry out the following duties:*

- *The TO undertakes all tasks connected with construction works for water supplies including surveying, design and site supervision of construction, repair and maintenance of pipelines, storage reservoirs, pumping stations and renewable energy plants.*
- *The TO carries out field surveys, sets out work, collects and collates data for the detailed design of water supply and related projects, produces profiles and working drawings for the construction of such projects, keeps records and trains junior officers on the job.*

The actual job description for a specific post would then add details and specifications of the overview given in the schemes of service. When a person is employed he or she should be given a copy of the job description for the particular post. The supervisor should also explain thoroughly what the description entails and what is requested of the employee.

### **Exercise:**

**When students are doing research, one of the tasks could be to find out whether the persons they interview have copies of their job descriptions. The students could ask for copies of job descriptions and bring them back to school for further analysis.**

## Other Activities and Topics for Discussion



### Water

#### If you have a river near your school:

1. Go to the river or a reservoir and collect a sample of water in a bottle.
2. Go to where waste water is entering the river. Observe the condition of the river water - colour, smell, deposits, presence of fish, bubbles, spread of wastes etc.
3. Find out whether any one uses the downstream water for drinking/ bathing/ washing clothes etc.
4. Note how the water quality changes as you walk downstream.
5. Observe the quality of water in the river after a heavy rain. Is there any change? What is the difference?

#### At a Borehole:

1. Visit a nearby borehole. Observe a sample of water from the borehole.
2. Note the nearby surroundings. Are any of the following nearby: pit latrine, refuse heap, cattle manure, stagnant water pool? If any of these are near to the borehole, do you think that they could pollute the water underground.

### Water Conservation

- Water is a scarce resource, especially in Botswana, a country which experiences unreliable rainfall and periodical drought. Look at the diagram on page 29 of **Work with Water**. Note how much water was used in 1990 and compare it with the amount that will be used in the year 2020.
- Read the section 'Protect the Environment' on pages 32-33 of **Work with Water**. The population of Botswana is growing rapidly. How will this affect the water supply?
- What do you understand by the term 'water conservation'?
- Visit a house in a town or city and examine how water is used and how it is wasted. Try to think of different ways in which water could be conserved in that house.
- Examine the ways in which water is used in your school and possible wastage of water. Suggest how water could be conserved in your school?

- Visit the Water Utilities Corporation and find out how much water is wasted in the water distribution system and why. Ask the engineer to explain the water conservation measures adopted by WUC.
- Use a bath-tub and measure the quantity of water you used. On another occasion, use a shower and again measure the quantity of water used. On which occasion did you use most water?
- Measure the quantity of water dripping from a leaking/not properly closed tap during a given period of time. Calculate how much water is wasted from the tap in one day.
- Visit a standpipe with a broken/leaking tap and think of ways to improve the situation.
- Find out how much water is used when flushing a toilet just once. Can you think of any way in which the quantity of water used could be reduced?
- Visit Gaborone Dam. Can you think of any ways in which the amount of water lost from the dam through evaporation could be reduced?
- Can you think of any measures which could encourage more people to conserve water used in their homes (eg. if additional charges were imposed on those who used very large quantities of water)?

### Recycling

Make a *Water Uses Chain*. Students can do this individually or in teams.

- a) Choose from one of the following categories:
  1. water used in a persons home
  2. water used at our school
  3. water used in a given organisation such as a clinic, or restaurant, or hotel etc.
  4. water used in our community
  5. water used in Botswana
- b) List all the ways in which water is used in the category that you have chosen (eg. at home: drinking, cooking, washing dishes, washing clothes etc.).



- c) Can the water used for any of those purposes be re-used? List the number of ways in which water used in the category you have chosen could be re-used. Link together as many of the uses as possible to make a chain.  
eg. dish-washing water can be used for watering plants - this chain has two links.

dish-washing → watering plants

eg. dish-washing water can be used for watering plants and then reused again as run-off to a compost pit - this chain has three links.

dish-washing → watering plants  
→ run-off to a compost pit

The idea is to make the chain with the most links.

- d) What do you think happens to the water at the end of your chain? Does it sink into the ground? Is that likely to cause any problems?

## Waste Water

### Disposal of Waste Water:

1. Visit a petrol station/garage/car repair shop. Ask or observe where waste water is discharged (ie. where it is thrown or where it flows to). Could it lead to groundwater pollution?
2. Visit a nearby farm/park/garden. Ask what chemicals are applied to the plants there (pesticides, fertilizers etc.). Do you think that these chemicals could contaminate groundwater?
3. Visit an industry such as a brewery, abattoir or tannery. Find out what happens to waste water at that industry.
4. Pay a visit to a city council or district council and talk to the engineer in charge of sewage. Find out what legislation or regulations exist which control the discharge of waste water into sewers or rivers.
5. Find out why protection of groundwater against pollution is more important than protection of surface water in Botswana.

## Solid Waste Management

### Storage and Collection of Waste:

1. Select a few houses and measure the quantity of solid waste produced.
2. Sort through the solid waste and find out how much of it is paper, plastic, metal, wood, waste food matter etc.
3. Examine the condition of the refuse bins at those houses. Look for the following: food waste sticking to the inside of the bins, flies around the bins, holes or corrosion of the bins, do the bins have lids that fit properly? etc.
4. Request the driver of a refuse-collection vehicle to show you how the compaction device works.
5. Check how much refuse one refuse-collection vehicle can carry.
6. Note how much time it takes to collect refuse from a given number of houses eg. ten.
7. Visit a supermarket or hotel or factory and see how the waste is stored.

### Disposal of Waste:

1. Visit a disposal site, observe how the waste is laid, spread, compacted and covered.
2. Find out how a dead animal, such as a dog, is disposed of.
3. Find out what is done to properly dispose of a) a can of pesticides b) waste oil c) toxic industrial waste.
4. Which components of waste materials can be reused?
5. So you observe any of the following at the refuse disposal site: flies, mosquitos, rats, smoke, wind-blown papers or plastics, stagnant pools of water, people salvaging (ie people looking through the rubbish to see what they can use)?
6. Do you think that the refuse land-fill site can contribute to pollution of surface water or groundwater?
7. Find out how many vehicle-loads of refuse are deposited at the site daily. You could ask at the entrance.
8. Find out the names of the special types of machinery/vehicles which work at the site.
9. Find out what happens to the waste matter which remains covered at the site for a long time. Can it cause any problems at a later time?

# FURTHER ACTIVITIES

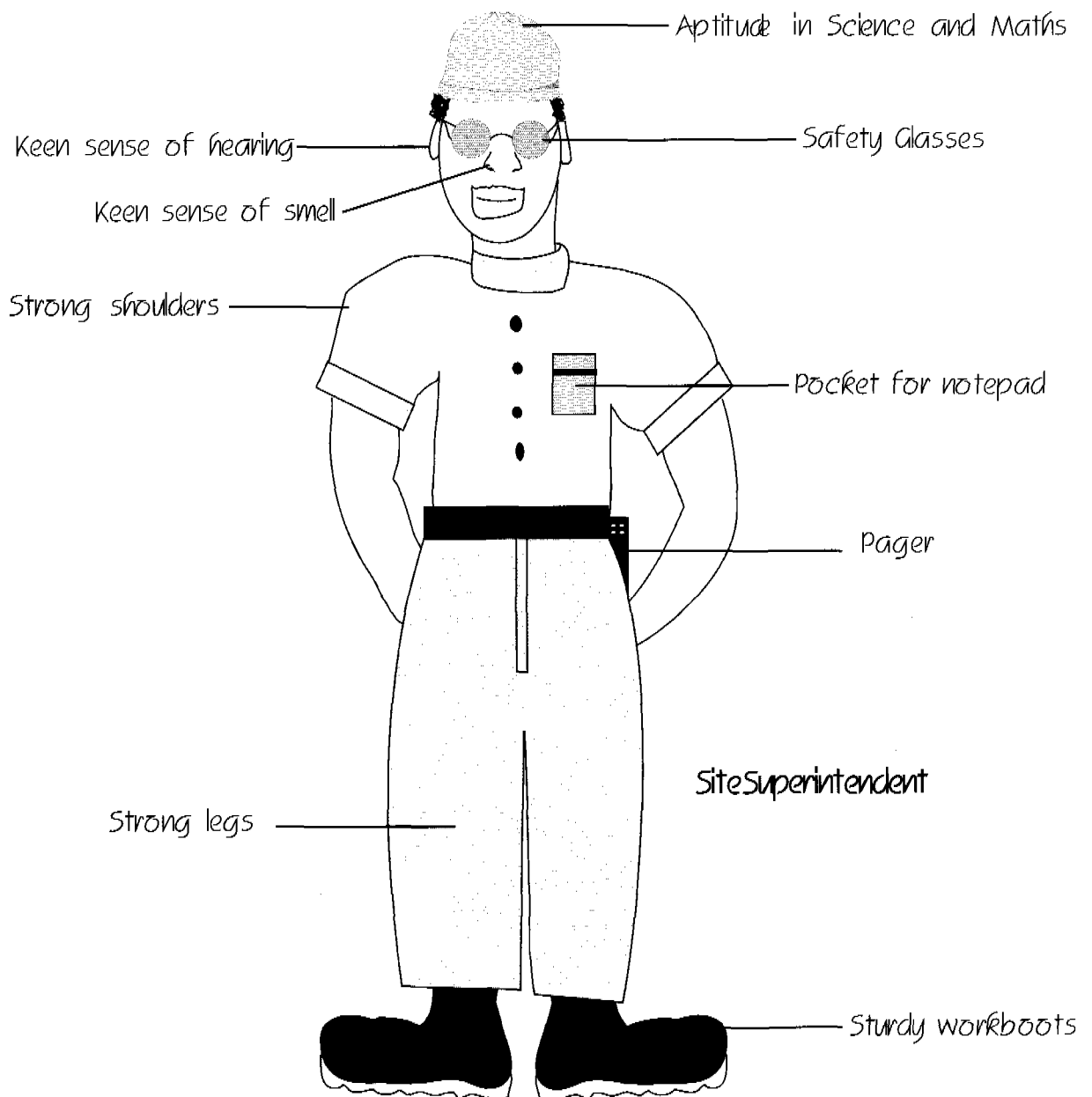


## Fun Activities

1. Select 10 words from the glossary at the end of **Work with Water**. Give the definitions of those words to the students and ask them to say which words are being defined. Give Students five minutes, then see how many correct answers they have.
2. Get students to make crosswords using some of the words given in the glossary. Students could also make crosswords using some of the abbreviations used in **Work with Water** such as WUC, DWA, WET and DLGSM.
3. Ask students to make their own glossaries of unfamiliar words. These may be words used in **Work with Water**, or may be words which students come across during their study visits or when conducting their own research.
4. Give students a long word or phrase which has something to do with water eg. water resources. Give them three minutes to make as many other words as possible out of the word/s you have given them. Points can be awarded as follows: two-letter words get two points, three-letter words get three points, and so on.
5. Ask students to write poems which convey the importance of water, or which contain messages about either environmental or gender issues.
6. Ask students to design a poster, draw cartoons, or devise car stickers which carry messages about the importance of water or of caring for the environment.
7. Get students to discuss what they consider to be waste. Get them to list the things which they call waste and give their reasons for calling those things waste. Get them to classify waste materials into the following categories: solid or liquid, organic or inorganic. Things like vegetable matter, bones and food waste are organic, while plastic and metal are inorganic. Organic waste decomposes easily, while inorganic waste does not.
8. Ask students to collect rubbish from the school grounds. Get them to group the different types of rubbish into the categories given above.

9. Ask students to produce maps of the school grounds showing places where littering occurs, if any. They should indicate on their maps the following:
- the different types of rubbish/solid waste found in different parts of the school eg. food waste in the vicinity of the kitchen or dining hall.
  - where additional rubbish bins should be placed in order to reduce the littering.
  - whether any of the rubbish/solid waste could be recycled.

10. Ask students to prepare identikit drawings similar to the one provided below. Each student should then decide who his or her identikit drawing represents eg. a water engineer, a pipe fitter, a water laboratory technician etc. The students should label different parts of the identikit to show the different qualities or attributes which are required for the career which their identikit person occupies. They should think of physical qualities such as physical strength, good eyesight, strong legs etc., academic qualities, and personal characteristics such as commitment, patience, a good sense of humour etc.



## Other Material to Use or Refer to



### Videos

1. *Science and Technology for the Future*, Guidance and Counselling Division, Ministry of Education, Botswana.
2. *Opportunities for Health Sciences*, Guidance and Counselling Division, Ministry of Education, Botswana.
3. *Role Models for Science-based Careers*, Guidance and Counselling Division, Ministry of Education, Botswana.

### Books

1. Borchard, David, et al., *Your Career Choices - Chance Changes*, (1980), Kendall/Hunt Publishing Company.
2. Linhard, Niels, et al., *Life Skills in the Classroom*, (1990), Maskew Miller Longman.
3. Linhard, Niels, *Guidance in the Classroom*, (1985), Maskew Miller Longman.
4. Page, Anne, *Your First Job*, (1984), Billing & Sons.

### Other Materials

1. *Botswana National Conservation Strategy*, Government Paper No. 1 of 1990
2. *Handbook for Village Water Supply Operators*, Unified Local Government Service, 1990.
3. *Girls-Boys: Roles and Careers*, booklet produced by the Gender and Education Committee, University of Botswana & Ministry of Education (undated).
4. *Girls and Women in Science: Science Technology Roadshow Report & Manual*, Commonwealth Secretariat Education Programme, Ministry of Education, 1991.
5. *Women and Men in Botswana: Facts and Figures*, booklet produced by Central Statistics Office and SIDA, 1991.
6. *Career Manual for Botswana Schools*, Guidance and Counselling Division, Ministry of Education, Botswana, 1993.
7. *A Handbook of Occupations for Junior Secondary Schools*, Guidance and Counselling Division, Ministry of Education, Botswana, 1993.



# USEFUL ADDRESSES

## Addresses

Here is a list of useful addresses and telephone numbers to organisations related to the water, waste water and waste management sector.

### Local Government

The coordinating personnel department for all district, town and city councils is Department of Local Government Service Management. The department has specialised divisions for recruitment and training of staff for the councils. The address is:

Establishment Secretary  
Department of Local Government Service Management  
Private Bag 0052  
Gaborone  
Tel. 354 100  
Fax. 304 613

Water & waste water services in the district councils are handled by the District Council Water & Waste Water Department. Waste water services in the town and city councils are handled by the sewerage section of the Engineering Department. Solid wastes services in all councils, both district and towns councils, are handled by the Public Health or the Environmental Health Departments.

All official letters to a council should be addressed to the chief executive of that council. The chief executive for a district council is the Council Secretary, for a town council it is the Town Clerk, and for a city council it is the City Clerk.

Please note that almost all district councils have sub-districts. Even in the sub-districts you will be able to find water & waste water units and public health units. The chief executive for a sub-district is the Assistant Council Secretary

Write on the envelope and the letter for the attention of the Head of Department you want to contact. Here is an example:

Council Secretary  
Attention: Head of Water & Waste Water Department  
North East District Council  
Private Bag 4  
Masunga

Here are the addresses and telephone numbers to all the councils.

Gaborone City Council  
Private Bag 0089  
Gaborone  
Tel. 353521, Fax. 300141

Francistown Town Council  
Private Bag 40  
Francistown  
Tel. 211050, Fax. 212 427

Jwaneng Town Council  
Private Bag 01  
Jwaneng  
Tel. 380 303, Fax. 381 395

Lobatse Town Council  
Private Bag 28  
Lobatse  
Tel. 330 392, Fax. 332 458

Selebi Phikwe Town Council  
Private Bag 01  
Selebi Phikwe  
Tel. 810 570, Fax 814 854

Sowa Township Authority  
Private Bag SOW1  
Sowa  
Tel. 613548, Fax 613425

Ghanzi District Council  
Private Bag 15  
Ghanzi  
Tel. 596 211, Fax 596 213

Charles Hill Sub District  
P.O. Box 47  
Charles Hill

Southern District Council  
Private Bag 2  
Kanye  
Tel. 340 217, fax. 340 103

Good Hope Sub District  
P.O. Box 6  
Good Hope  
Tel. 386 229



North East District Council  
Private Bag 4  
Masunga  
Tel 289 292, 289 263

North West District Council  
Private Bag 01  
Maun  
Tel. 660 241, Fax 660 029

Gumare Sub District  
P.O. Box 60  
Gumare

Chobe Sub District  
P.O. Box 20  
Kasane  
Tel. 650 381, Fax 650 368

Kgatleng District Council  
Private Bag 11  
Mochudi  
Tel. 377 411, Fax 377 216

Kweneng District Council  
Private Bag 5  
Molepolole  
Tel. 320 200, Fax. 320 209

Letlhakeng Sub District  
P.O. Box 86  
Letlhakeng  
Tel. 329 211

South East District Council  
Private Bag 2  
Ramotswa  
Tel. 390 251, Fax. 390 201

Central District Council  
Private Bag 01  
Serowe  
Tel. 430 411, fax. 431 360

Tutume Sub District  
P.O. Box 47  
Tutume  
Tel. 287 210

Bobirwa Sub District  
P.O. Box 334  
Bobonong  
Tel. 819 276

Mahalapye Sub District  
Private Bag 2  
Mahalapye  
Tel. 410 459

Serowe/Palapye Sub District  
Private Bag 20  
Serowe  
Tel. 421 100

Boteti Sub District  
Private Bag 5  
Lethlakane  
Tel. 278 219

Kgalagadi District Council  
Private Bag 5  
Tshabong  
Tel. 540 250

Hukuntsi Sub District  
P.O. Box 2  
Hukuntsi

### **Addresses to Water Utilities Corporation**

WUC Head Office  
Private Bag 00276  
Gaborone  
Tel. 352 521, Fax. 373 852

WUC  
P.O. Box 843  
Francistown  
Tel. 216 100, Fax. 213 326

WUC  
P.O. Box 626  
Jwaneng  
Tel. 380 397, Fax. 380 696

WUC  
P.O. Box 230  
Lobatse  
Tel. 330 494, Fax. 332 468

WUC  
P.O. Box 141  
Selebi Phikwe  
Tel. 810 270, Fax. 810 130

WUC  
P.O. Box 47  
Shashe  
Tel. 213 878

WUC  
Private Bag 55  
Sowa  
Tel. 613 295, Fax. 613 295

### **Addresses to Department of Water Affairs**



Director of  
Department of Water Affairs  
Attention Head of Training  
Section  
Private Bag 0029  
Gaborone  
Tel. 352 241, Fax. 374 372

DWA  
Private Bag F181  
Francistown  
Tel. 212 368, Fax 213 449

DWA  
P.O. Box 37  
Ghanzi  
Tel. 596 226

DWA  
P.O. Box 291  
Kanye  
Tel. 340 381

DWA  
P.O. Box 26  
Kasane  
Tel. 650 323

DWA  
P.O. Box 8  
Letlhakane  
Tel 278 267

DWA  
P.O. Box 42  
Lobatse  
Tel 330 204

DWA  
P.O. Box 30  
Mahalapye  
Tel. 410 251

DWA  
Private Bag 002  
Maun  
Tel. 660 452

DWA  
P.O. Box 486  
Mochudi  
Tel. 377 330



DWA  
P.O. Box 193  
Molepolole  
Tel. 320 263

DWA  
Private Bag 007  
Moshupa  
Tel. 349 228

DWA  
P.O. Box 21  
Palapye  
Tel. 420 286

DWA  
P.O. Box 89  
Ramotswa  
Tel. 390 225

DWA  
P.O. Box 203  
Serowe  
Tel. 430 441

DWA  
P.O. Box 132  
Thamaga  
Tel. 399 219

DWA  
P.O. Box 86  
Tonota  
Tel. 284 231

DWA  
P.O. Box 7  
Tshabong  
Tel. 540 216

### **Addresses to Other Departments and Organizations**

Department of Geological  
Surveys  
Private Bag 14  
Lobatse  
Tel. 330 327, Fax. 332 013

Environment Watch Botswana  
Somareleng Tikologo  
Private Bag Bo136  
Gaborone  
Tel 301 961

Kalahari Conservation  
Society  
P.O. Box 859  
Gaborone  
Tel. 314 259, 306 192

Tshomarelo Okavango  
Conservation Trust  
Private Bag 13  
Maun  
Tel. 660 852

Botswana Society  
P.O. Box 71  
Gaborone  
Tel 351 500

Botswana Technology Centre  
Private bag 0082  
Gaborone  
Tel. 314 161, Fax. 374 677

Rural Industries Innovation  
Centre  
Private Bag 11  
Kanye  
Tel. 340 392, Fax. 340 642

IUCN  
Private Bag 00300  
Gaborone  
Tel/Fax. 371 584

### **Addresses for Training Institutions**

Ministry of Education  
Department of Student  
Placement & Welfare  
(Old Bursaries Dpt.)  
Private Bag 005  
Gaborone  
Tel. 312 706, Fax. 312 891

University of Botswana  
Private Bag 0022  
Gaborone  
Tel. 251 151 Fax. 356 591

Botswana Polytechnic  
Private Bag 0061  
Gaborone  
Tel. 352 305 Fax. 352 309

Institute of Health Sciences  
P.O. Box 985  
Gaborone

Tel. 353 033 Fax. 300 935

Madirelo Training & Testing  
Centre  
P.O. Box 10087  
Gaborone  
Tel. 356 318

### **Vocational Training Centres**

Jwaneng VTC  
Private Bag 009  
Jwaneng  
Tel. 380 685 Fax. 380 890

Gaborone VTC  
Private Bag 00358  
Gaborone  
Tel/Fax 304 817

Auto Trades Training Centre  
Private Bag 00170  
Gaborone  
Tel. 353 961 Fax. 313 083

Palapye VTC  
Private Bag 0046  
Palapye  
Tel. 420 576 Fax. 420 960

Maun VTC  
Private Bag 0073  
Maun  
Tel/Fax. 660 518

Selebi-Phikwe VTC  
Private Bag 0062  
Selebi-Phikwe  
Tel/Fax. 810 045

### **Brigades**

Bobonong Brigade Centre  
P.O. Box 525  
Bobonong  
Tel. 819 237

Tshwaragano Brigadc Centre  
P.O. Box 181  
Gabane  
Tel. 347 058

Naledi Development Trust  
P.O. Box 1026  
Gaborone  
Tel/Fax. 308 860



Ghanzi Brigades  
Development Trust  
P.O. Box 387  
Ghanzi  
Tel. 596 211/247 Fax. 596  
166

Ngethu Brigades  
Development Trust  
P.O. Box 60  
Gomare

Gweta Brigades  
Development Trust  
P.O. Box 154  
Gweta  
Tel. 612 213/4  
Kang Brigades Development  
Trust  
P.O. Box 3  
Kang Tel. A2 RC 674

Kanye Brigades  
Development Trust  
P.O. Box 202  
Kanye  
Tel. 340 255 Fax. 340 534

Ramatea Vocational School  
P.O. Box 10357  
Mahikana, Kanye  
Tel/Fax 340 314

Chobe Brigades  
Development Trust  
P.O. Box 42  
Kasane  
Tel. 650 349 Fax. 650 211

Matsheng Brigades  
Development Trust  
P.O. Box 5  
Lehututu  
Radio Tel. 88

Boteti Brigade Centre  
P.O. Box 231  
Letlhakane  
Tel. 278 229 Fax. 278 235

Lobatse Brigade Centre  
P.O. Box 231  
Lobatse  
Tel/Fax. 330 484

Madiba Brigade Centre  
Private Bag 12  
Mahalapye  
Tel/Fax. 410 285

Mahalapye Development  
Trust  
P.O. Box 291  
Mahalapye  
Tel/Fax. 410 256

Marapong Development  
Trust  
Private Bag  
Marapong  
via Francistown  
Tel. 211200

Maun Brigades Development  
Trust  
P.O. Box 13  
Maun  
Tel. 660 282 Fax. 660 038

Kgatleng Development Trust  
P.O. Box 208  
Mochudi  
Tel. 377 356

Kweneng Rural  
Development Trust  
Private Bag 7  
Molopolole  
Tel. 320 385/386 Fax. 320  
385

Nkange Brigades  
Development Trust  
P.O. Box 137  
Nkange

Nswazwe Brigades  
Development Trust  
Private Bag Nswazwi  
via Francistown

Palapye Development Trust  
P.O. Box 113  
Palapye  
Tel 420 293 Fax. 420 366

Tswelopele Brigade Centre  
P.O. Box 99  
Ramotswa  
Tel. 390 226/233/301 Fax.  
390 226

Serowe Brigades  
Development Trust  
P.O. Box 121

Serowe  
Tel. 430 415/233/245 Fax.  
431 474

Okavango Brigades  
Development Trust  
P.O. Box 33  
Shakawe  
Radio Tel. 660 493

Shoshong Development  
Trust  
P.O. Box 228  
Shoshong  
Tel/Fax. 469 238

Kweneng Bophirima  
Development Association  
P.O. Box  
Takatokwane, Letlhakeng  
Radio Tel. 180

Tlokweneng Rural  
Development Centre  
P.O. Box 30148  
Tlokweneng  
Tel. 357 227 Fax. 284 224

Senyawe Brigades  
Development Trust  
Private Bag 004  
Tshesebe

Tutume McConnell  
Community Trust  
P.O. Box 132  
Tutume  
Tel/Fax. 287 223

Zwenshambe Brigade  
Centre  
Private Bag 10  
Masunga  
Tel. 289 230