

# Bush Telegraph

Vol. 6 - No. 1

2007

## WATER IS LIFE!



We need water to wash, cook and clean our homes everyday!

We need to drink water to survive!



Water is where we live. It is our home.



We need water for our crops and livestock!

We need water for our factories to produce goods!



We are all dependent on water. A long time ago, humans only lived in places where we could easily get water. Today that has changed. With technology, we have increased our ability to access the water that exists. Unfortunately, we cannot increase the total amount of water available on Earth. We need to protect our water by saving it and keeping it clean for us and all other living things!

Celebrate water by saving it and keeping it clean!

The United Nations has declared

### WORLD WETLAND DAY

2 February

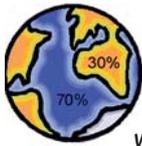
### WORLD WATER DAY

22 March



# THE WORLD'S WATER SUPPLY

## Namibia's small share



Seventy percent (70%) of the Earth's surface is covered in water. The other 30% is land.

Of all the water in the world, 97% is salty and only 3% is fresh! Although we can use salt water for transport, fishing and recreation, we must have fresh water to survive.

### GLOBAL WATER CYCLE

The water cycle keeps water moving and changing form all the time throughout the whole world.

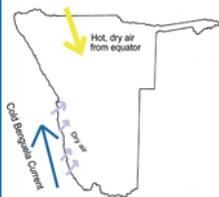
Draw a picture of the water cycle. Do not forget to include rainfall, evaporation, transpiration, condensation, recharge and runoff!



**DID YOU KNOW?** All over the world rainfall is not equal. The amount of rain a country will receive is based on many factors. Some of the factors are the shape of the land, wind, temperature, ocean currents and the position on Earth compared to the equator. If rain fell equally on all land on Earth, then we would all get about 660mm/year. What is the average rainfall in your area?

### NAMIBIA'S SMALL SHARE OF RAIN

Namibia is a dry country because it has low rainfall and a high evaporation rate. There are two main reasons for this: Namibia's distance from the equator and the cold Benguela Current.



If there is no moisture in the air, then no rain can form!

The Benguela Current comes from the south. It makes the Atlantic Ocean cold. Because the ocean water is cold, there is less evaporation. The ocean air, with little moisture, is blown inland.

At the equator, the sun is the strongest. There the air becomes very hot, rises and creates a space. Moist air fills this space and helps create rain. The hot air on top is then pushed by strong winds to the south. As this air travels, it becomes colder and drops. When this air gets closer to the Earth, it becomes hot again. In this low, hot air there is no space for moisture. This is the air over Namibia.

What happens to the rain that Namibia does receive?



## GROUNDWATER - Namibia's life line

About 50% of all fresh water used in Namibia is groundwater. All groundwater originally comes from rain. Unfortunately only 1% of Namibia's rain goes to recharging this limited resource. We must be careful not to overuse or pollute our groundwater as it is our main source of fresh water.

### WHAT IS GROUNDWATER?

It is water which is stored under the surface of the Earth. A large source of groundwater that can be abstracted (taken out) for use is called an aquifer. Here are three examples of aquifers: **ALLUVIAL AQUIFERS** are under dry riverbeds. The water moves between the sand.

**CONFINED AQUIFERS** are under the land. The water is trapped between two layers of rock or soil and rock.

**KARST AQUIFERS** are large underground caves. The water has dissolved the soft, limestone rock.

### HOW DO WE GET GROUNDWATER?

People first got groundwater by digging shallow wells with their hands. Today we have the technology to drill holes deep into the ground to reach underground water. These holes are called boreholes. They are usually very expensive to drill and often are unsuccessful.

If a borehole reaches water, the water then needs to be pumped out.



### HOW CAN WE PUMP GROUNDWATER OUT OF A BOREHOLE?

#### SOLAR ENERGY -

Solar panels are used to create electricity. An electrical water pump in the borehole pumps out the groundwater.



**WIND ENERGY -** A wind turbine is used to create electricity. An electrical water pump in the borehole pumps out the groundwater.

Alternatively, a windmill uses wind energy to turn a mechanical water pump in the borehole.



**FOSSIL FUELS -** A petrol or diesel generator can be used to create electricity for an electrical water pump. Petrol or diesel can also directly fuel a mechanical water pump.



The more water that is pumped out of the borehole, the more energy is used. If the pump uses fossil fuels, the impact on the environment increases. How?

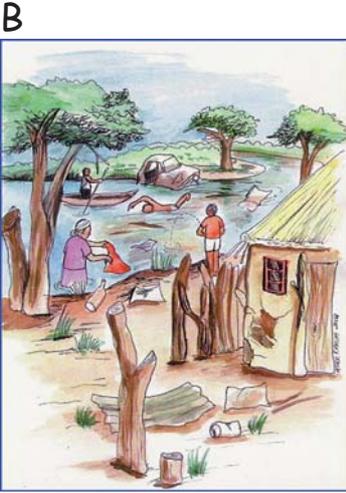
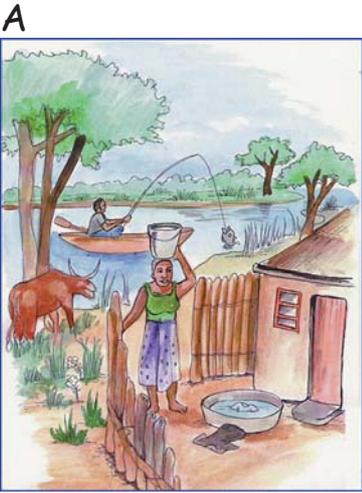
### HOW IS OUR GROUNDWATER THREATENED?

Groundwater is threatened by overuse and pollution. Although many aquifers can be recharged by rain, we have low rainfall. Fossil aquifers contain very old water that cannot be recharged. We must also be careful not to pollute our underground water with human and livestock faeces, poisons and pesticides, or other chemicals. Once groundwater is polluted it is almost impossible and very expensive to clean it again.

# SURFACE WATER: WATER IS HABITAT

Water is not just here for humans. Many animals and plants depend on water to drink and to live in. Wetlands are places with permanent or temporary surface water. For example, rivers, pans, dams, oshanas and lakes. Wetlands are found throughout Namibia and provide a habitat to many living things. Can you think of a wetland near your home?

Study the two pictures of the wetland habitats below. Can you see the difference between the two? In which one would you rather live? Make a list of all of the differences in the two wetland habitats. The first difference is given to you:



1. In picture B a man is urinating in the river.
2. ....
3. ....
4. ....
5. ....
6. ....

**WATER POLLUTION**  
 In picture B, we can see many examples of water pollution. Water pollution is an unnatural buildup of waste from human activities in water. For example, when poisons, pesticides, industrial chemicals and household cleaners are introduced into the water source. These pollutants can damage a wetland ecosystem or a groundwater aquifer. The water may become so dirty that the animal and plant life living there dies. Humans may become sick from drinking the polluted water.

**WETLANDS IN TROUBLE?**  
 Unfortunately pollution is not the only problem for the survival of our wetlands. Through our activities we are also causing the following problems:

- ☞ Overuse of wetland animals and plants (for example, fish and reeds)
- ☞ Overuse of water from wetland (for example, irrigation schemes)
- ☞ Invasion of wetlands by alien species (for example, *Prosopis* trees and *Kariba* weed)
- ☞ Development and change of natural flow of wetland (for example, through the many dams built on the Omaruru river)

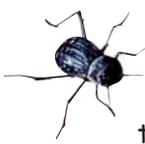
All of these problems cause a loss of wetlands and therefore:

**HABITAT LOSS**

## LEARNING FROM NATURE IN THE NAMIB

All animals and plants have different adaptations to survive in their environment. If a living thing is not adapted to its environment, it will die. For example, a waterbuck could not survive in the desert. Humans, unlike most other living things, are able to change their environment. However, we must also learn to adapt as the Earth's natural resources (water, oil, trees, etc.) are being used up and the human population is increasing.

The Namib Desert has little water. It receives some fog, dew and between 0-100 mm of rain per year. Animals and plants in the Namib have adapted to save the little water they have. Let us explore how we can learn from them!



The tok-tokkie beetle has lost the ability to fly. The wings of a tok tokkie beetle have become fused to its body. This has created a space (cavity). When the tok tokkie breathes out, the moisture in its breath condenses inside the wing cavity. When the tok tokkie breathes in again, it also breathes in this stored moisture.

Humans can use the same physical adaptation to save water. Swimming pools and dams that are open lose a lot of water to evaporation. By putting a cover on your pool or dam, the water that would evaporate during the day will now condense inside the cover and not be lost.



The Namaqua sandgrouse flies many kilometers; to find water. It will only drink in the early morning and just before sunset. It does this because it is the coolest time of day. The sun is the least powerful and the sandgrouse loses less water to evaporation.

Humans can use the same behavioural adaptation to save water. The best time of the day to water a garden is in the early morning or evening. Because the sun is the least powerful at this time, less water will be lost to evaporation.



The shovel-nosed lizard has the ability to store water. When there is rain, dew or fog, it will lick up the water and store some of it in a special bladder near its lower intestine. When there is no water available, it can then use its saved up water to stay alive!

Humans can also collect and store water from rain and fog. For example, a water tank can be connected to the rain gutter of a house. Water can also be collected from fog along the coast using shade cloth in a fog harvester.



All of these examples show us how we can easily save water by our behaviour or improving our infrastructure.

## WORKING WITH WATER



Are you thinking about what kind of job you would like to have when you are finished with school? There are many different jobs that work with water. Some are focused on researching water ecosystems, testing water quality, designing urban sewage systems or providing drinking water to rural communities. There are also water-related jobs in the field of education for example, as a lecturer in water biology or as an environmental educator. Read on to learn more about water-related jobs in Namibia.

**Where:** Ministry of Agriculture, Water and Forestry

**Job:** Geohydrologist

**Work:** A geohydrologist studies the movement, distribution and quality of water. For example, a geohydrologist may study and determine the location, quantity and quality of Namibia's groundwater to improve water supply and access. A hydrologist does similar work but with surface water.

**Education needed:** Bachelor of Science in Biology or Ecology with Honours in (Geo)Hydrology.



**Where:** Ministry of Environment and Tourism

**Job:** Wetland biologist

**Work:** A wetland biologist researches the interaction of all living things in a wetland ecosystem. For example, a wetland biologist may develop guidelines for protecting wetlands (Etosha Pan, Orange River Mouth, Sandwich Harbour and Walvis Bay wetlands).

**Education needed:** Bachelor of Science in Biology, Botany, Zoology or Ecology with Honours in Aquatic Ecology.



**Where:** Ministry of Agriculture, Water and Forestry

**Job:** Technician

**Work:** A technician may work with rural communities to set up water-point committees. These committees need to develop a sustainable water management plan for their community water supply.

**Education needed:** Diploma in Agriculture or related field.



**Where:** National Museum of Namibia

**Job:** Curator of aquatic animal life

**Work:** A curator is in charge of maintaining and developing a collection. For example, the curator may be responsible for a collection of all amphibians found in Namibia. This information is needed to determine and protect our bio-diversity. A curator also conducts educational activities with the public to raise awareness.

**Education needed:** Bachelor of Science in Biology, Botany, Zoology or Ecology with Honours in Aquatic Ecology.



**Get a water related job and take action for protecting our water resources!**

## PERSONALITIES IN CONSERVATION

**Name:** Shirley Bethune

**Organisation:** Freelance water biologist/aquatic ecologist and part-time lecturer

**Job Title:** water biologist/aquatic ecologist

**No of years on the job:** 25

**What are your main job responsibilities/tasks?**

Over the years I have had many different tasks to do with water biology. I have done different research projects on wetlands and their inhabitants for various government departments. As a lecturer I have taught about environmental impact assessments, wetland plants, ecology, trees and animal behaviour. Each year I try to help improve people's awareness about water in Namibia by working with Water Affairs and the Wetland Working Group to celebrate World Water Day and World Wetland Day. Since 1992 we have worked with others to write useful books about water and wetlands. You may have seen some of them in your school library.



**How did you become interested in water and wetland conservation?**

When I was 12 years old my parents took us to visit Dr Seely at Gobabeb and I knew that I wanted to become a biologist like her one day. I did two majors for my BSc degree, Botany and Zoology. I wanted to specialize as a biologist using both, so I chose water ecology, because it is about freshwater plants and animals as well as the chemistry and physics of our freshwaters. I knew I would work in Namibia where water is precious and that I would be able to work in interesting places.

**What do you think are the most important issues in water conservation?**

Both scarcity and pollution are very important in Namibia. Our rainfall is low, so we have less water than many other countries. Many of our plants and animals are well adapted to coping with little water and we too must adapt to make the best use of the little water that we have. We certainly cannot afford to pollute any of it. Polluted water cannot be used by anyone or anything.

**What is the biggest challenge in your work?**

Finding funding to do all the interesting water projects that need to be done. For example I want to prepare a teacher's resource package for school children about Namibian wetlands and I am trying very hard to find money to publish such a book.

**What is most rewarding about your work?**

Working with young people, passing on my love of nature to those who will care for our environment in the future.

**How can young Namibians get involved?**

Each year the Department of Water Affairs together with other "water" organizations organize an event (quiz, art, poetry, essay or poster contest) for schools to mark World Wetland Day and World Water Day. Find out what is organized and encourage your school to participate. Enter the Young Scientist competition and do your project on water or wetlands. You can also help by being careful not to waste water and not to pollute it.

**What is your message for Namibia's youth?**

Namibia is a beautiful but dry country, use the precious water that we have wisely and do not pollute it- plants and animals live there. Protect our wetlands!

## FOR THE BEGINNER READER: Water-related vocabulary

In this issue you have perhaps been introduced to many new vocabulary words. To help you understand them, read the definitions below:

- Accessible** - possible to reach
- Adaptation** - a change to fit into the environment to survive
- Condensation** - formation of water drops when moist air becomes colder
- Diverse** - of different kinds
- Dynamic** - relating to a force or power that causes movement or change
- Evaporation** - transformation of water from a liquid to a gaseous state
- Hydrology** - the study of the properties, distribution, and circulation of water on and below the earth's surface and in the atmosphere
- Limnology** - the study of bodies of freshwater
- Parastatal** - linked to the government
- Pollutants** - substances that make the air, water or soil dirty and/ or dangerous
- Sustainable** - something that can be kept going.
- Transpiration** - loss of water through the surface of a leaf into the air



### Word Search

Find all of the water-related vocabulary words in the word search below.

The words can go in these directions: ←→↑↓↖↗↘↙

U	F	J	H	I	X	D	P	U	L	L	S	Y	E	N
E	N	K	R	F	B	Y	X	A	H	U	P	G	V	O
O	T	Y	I	T	I	N	T	X	S	N	B	O	A	I
Y	C	O	G	C	K	A	W	T	Q	K	P	L	P	T
J	B	O	L	O	T	M	A	I	X	A	Q	O	O	A
T	R	A	N	S	P	I	R	A	T	I	O	N	R	T
A	I	P	A	D	N	C	X	N	E	E	X	M	A	P
M	P	R	H	A	E	Q	H	K	H	R	N	I	T	A
A	A	T	B	Q	O	N	K	L	Z	I	Q	L	I	D
P	E	L	E	L	B	I	S	S	E	C	C	A	O	A
X	E	P	O	L	L	U	T	A	N	T	S	T	N	G
Y	G	O	L	O	R	D	Y	H	T	B	L	V	D	D
D	I	V	E	R	S	E	C	M	T	I	C	K	I	E
F	Z	W	Y	U	R	X	V	L	Z	D	O	U	C	X
A	I	V	S	A	H	E	F	Y	J	T	I	N	L	W

## FOR THE ADVANCED READER: Is water a public good?

Water is a public good that belongs to all. It does not belong to one individual or company. The Government of Namibia, elected by the people, manages and supplies water for its citizens. A parastatal organisation, NamWater, has been given this task. We, the people, have the responsibility to help the government to take care of our water - to save it and keep it clean. So why must we pay for water if it belongs to all of us?

We do not actually pay for the water but rather for the 'delivery' of the water. (See pg 3 for ways to pump water) As extracting and delivering water via pipelines costs money, we the consumers must pay for this service. Today's cost of water however is very low to keep it accessible for all. Unfortunately this makes many people not realise the true value of water. As we know, without it we cannot survive. Check out the chart on the right to see what we are willing to pay for other liquids. Would you leave the tap running if milk were coming out?

AVERAGE COST OF EVERYDAY LIQUIDS PER LITRE	
LIQUID	COST/LITRE
Bottled water	N\$14/litre
Beer	N\$12/litre
Milk	N\$7/litre
Petrol	N\$7/litre
Tap water	N\$0,006/litre

### TEST YOUR MATHS SKILLS

Below is a list of some common daily activities for which we use tap water. First calculate how much you currently pay for the water. Then, calculate how much you would pay if it cost as much as beer. The first one has been done for you.

ACTIVITIES	AVERAGE WATER USE/DAY	COST @ N\$0.006/LITRE	COST @ N\$12/LITRE
Brushing teeth	0,5 litres	N\$0,003	N\$6.-
Showering	50 litres		
Washing dishes	30 litres		
Drinking	2 litres		
<b>TOTAL</b>	<b>82,5 litres</b>		

### THINK AHEAD

It is important for everyone to have equal access to clean drinking water. We must take the responsibility to use as little as possible and to keep our water sources clean. If we continue to disregard the true value of water, perhaps we will one day pay N\$12/litre. What do you think would be the impact on you, your family, community and country? What do you think the environment would be like?

## ACTIVITY PAGE

### PROJECT: MAKE YOUR OWN WETLAND

You can make your own wetland at home or school. For example, you can build a bird bath, waste water reed recycling system or a pond. This will help to provide a habitat for many different animals and plants. It will also be nice to look at and learn from. Make sure to not waste water in any of the project ideas!

#### DIRECTIONS: BUILDING A SMALL POND



1. Carefully select an appropriate site. Perhaps in some shade to reduce evaporation.
2. Decide on the size and shape of the pond. It will be easiest to build a circular or oval shaped pond.
3. Gather materials. Make sure the plastic lining is big enough for the size of your pond.
4. Dig out the pond. Make sure that one side of

#### MATERIALS:

Shovel  
Thick scissors or knife  
Thick plastic lining  
Sand  
Medium-sized stones  
Wetland plants

the pond has a gentle slope to allow small animals to climb out if they fall in by accident.

5. Make sure there are no sharp rocks in the hole. You can add some sand to protect the plastic lining.
6. Next, put in the thick plastic lining. Make sure it is smooth and that the plastic lining is hanging over the sides evenly.
7. Add some clay soil or sand to the inside of the pond. Slowly fill the pond with water.
8. Put sand and stones on the edges of your pond to hold down the lining. Make sure it looks nice and that the plastic lining is well covered.
9. Put in water plants. After about 2 months you can add fish.



#### MAINTAINING YOUR SMALL POND

It is important to have flowing water to create a healthy and dynamic wetland (i.e. no breeding of mosquitoes). This can be done by:

1. Having a small flow of water into the pond at all time via a hosepipe. The pond should then be built that there is a small overflow outlet on one side. To 'reuse' the overflow water have it flow towards a tree.
2. Manually creating a flow once a week. This needs to be done carefully to not disturb the plants and animals.
3. Having a small pump to circulate the water.



**YOUR NEW WETLAND HABITAT:** Soon you will not only have plants and fish, but also other animals such as birds, amphibians and diverse insects, such as dragonflies, living in your wetland. Well done!



## Chinga's & Nzovu's Corner



Dear friends,



Thank you for all the questions we have received. If you have any questions for Chinga and Nzovu, please write to:  
Chinga & Nzovu, NaDEET, P.O. Box 31017, Pioniers Park, Windhoek

Dear Chinga and Nzovu,  
How should one sustain a root eaten plant-such as onions and carrots? If you want to eat it, you have to uproot it.

Victoria in Ondangwa

Dear Victoria

There are many different kinds of vegetable plants that grow underground and need to be uprooted to be eaten. Carrots are grown from seeds. The seed germinates and forms a taproot. This taproot is the orange carrot that you can eat. Above the surface, the carrot plant has leaves which produce flowers and seeds. These seeds can then be replanted to grow new carrot plants.

Onions also grow from seeds but they form a bulb under the ground. Onions can therefore be re-grown from seeds-which may take two years to be produced or from 'bulblets'. Bulblets are small bulbs that grow from the large bulb underground.



Good luck gardening!  
Chinga and Nzovu

Dear Chinga and Nzovu,

I want to know more about HIV and AIDS. Why is it that when a family member is infected by HIV and AIDS, the whole family becomes affected? How do they actually get affected?

Hilma in Grootfontein

Dear Hilma

To answer your question, you must first understand what the two words mean.

**Infect-** to pass on a disease or virus

**Affect-** to have an impact on  
When a person is infected with HIV and AIDS, then he/ she actually has the virus or disease. All of the friends and family are affected by this in many different ways. For example, if your father becomes very weak and sick from HIV and AIDS then he will no longer be able to work and to give you the support that you need. How will that make you feel? Are you not influenced by it? How will your mother and siblings feel? Perhaps your father is a good community leader-how will the whole community suffer if your father can no longer be a leader? As HIV and AIDS has infected many people, all Namibians are affected by it. A lot of money is spent to help infected people and to raise awareness to prevent further infection. This money could otherwise be spent on other projects to improve the nation. Only if everyone helps to fight HIV and AIDS will Namibia be able to beat it.



Chinga and Nzovu

## UPDATES FROM LAST ISSUE

We apologise that there was no Bush Telegraph in 2006. Unfortunately we did not receive any funding. We hope to again have two to three issues in 2007.

### SUSTAINABLE SCHOOL CONTEST

We received a total of three entries. The winning school is:

**Olukolo JSS outside of Ondangwa**

Some of the sustainable activities this school is doing are tree planting, a nursery, small dam for irrigation and fish and a vegetable garden.

Food is cooked in a solar stove for needier children at school.

**CONGRATULATIONS & Keep up the good work!**

### WILD FRUIT CONTEST WINNER

We only received a total of two entries. The winner is:

**Johannes Shalonda**

from Nehale SSS in the Oshana Region.

His Wild Food Chart was about the Makalani Palm.

Thank you to the  and the  for sponsoring this issue!

The Bush Telegraph is a mini-magazine for Namibian youth. It aims to increase knowledge of and improve attitudes towards our environment through reading.

Written by: Viktoria Keding ~ Edited by: Danica Shaw, Shirley Bethune and Carole Roberts  
 Photos & drawings courtesy of N. Odendaal, P. Cunningham, A & V.Keding and A Karita (from Teacher's Resources on the Okavango River Basin-Bethune & van Wyk)

Please send all subscriptions to:  
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 yes,  please send me ..... additional copies.