

SECTION 2: WATER MANAGEMENT



November 2005

Namibia's water scarcity and pollution

Water is our most valuable natural resource. It sustains every plant and animal and without it, there would be no life on Earth. In addition to its life supporting properties, water is essential for cooking, maintaining personal hygiene, sanitation and almost all economic activities.

Namibia suffers from extreme fresh water scarcity. The only permanently flowing rivers lie near to, or form part of, the country's international boundaries.

Water in Namibia is scarce due to low and highly variable rainfall and extremely high rates of evaporation which ensure that, of the rain that falls over most of the country, no more than 2% is likely to end up as runoff

and less than 1% is available to recharge underground aquifers. Human demand for water in Namibia is expected to increase by at least 250% between 2005 and 2030.

Furthermore, as populations in the country continue to grow and become more industrialised, there will be the danger of greater volumes of polluting waste and more dangerous polluting substances accumulating in wetlands and other water sources.

Although the Tourism Industry is neither the highest consumer nor an excessive polluter of water, best practice demands that tourism establishments create awareness regarding water conservation.

They must limit their water consumption as much as possible, and abolish all activities that are potentially polluting to underground, wetland and other water sources.

Saving water also saves energy, as water needs to be pumped from place to place.

Evaporation rates in Namibia are so high that a 2,5 metre deep swimming pool in the south east would lose all of its water in a year because of evaporation

(Mendelsohn et.al. 2002)

Drawing up a water management policy

Every tourism establishment should develop a written **Water Management Policy** that will help them meet their targets for reduced water use and discourage water polluting activities.

Preferably all staff members should be involved in the formulation of this policy – this will help to ensure their co-operation and understanding of why you are promoting certain practices.

This policy should include:-

A Mission or Vision Statement.

For example: 'The Water Management Policy of Olumbingi Lodge

aims to abolish all water polluting activities and ensure efficient water use and to reduce per capita water consumption to 80 litres (or less) per day.

Goals and Strategies needed to help you achieve your Vision. For example:

Goal 1. *To abolish all water polluting activities, by: buying biodegradable detergents, toilet cleaners etc.*

Goal 2. *To reduce daily per capita water use (including staff) to 80 litres or less by: fitting low flow shower heads, replacing all old toilet cisterns with smaller ones; wa-*

tering gardens only in the evening; reducing the size of lawns etc.

A Recording and monitoring system

In order to help you to improve the water use efficiency in your establishment it is important to develop an accurate recording system that measures the water consumption in various parts of your lodge or hotel. It will be necessary to install a system of main and sub-meters to be able to keep accurate records.

This will help you to observe trends and alert you to potential problems. Start by keeping records of your existing use and monitor your progress as you introduce different savings measures. Put the latest information on the staff notice boards to encourage progress.

The goal:

To encourage more efficient use of water (no more than 80 litres per day per person) and to reduce all water polluting activities.

How to conserve water

General

Check for leaks by monitoring the main meter and then sub-meters over a period when there is no water-use (yes, it's difficult to find such a time, but in the early hours of the morning could be a good time!).

Staff water usage

Install water meters at each staff house. An acceptable water use rate per staff member could be calculated in conjunction with the workers committee.

This standard amount will be included as part of the basic remuneration package and any usage above that figure should be charged to the staff member at cost price.

To provide an incentive to use less water the following system can be adopted: If, for example, the set amount for usage is 2400 litres per person month, any usage *less* than that is repaid to the staff member at current supply cost, and any usage *above* that figure is paid by the staff member to the owner again at current supply cost.

This system is currently working well in certain lodges in the southern Namibia.

Toilets

Repair all leaks and cisterns that run. Train your staff to check regularly for leaks and to report them immediately.

When building a new establishment or expanding an old one, consider putting in dry- or self-composting toilets.

Examples of different systems can be viewed at the Habitat Research and Development Centre in Windhoek.

If possible, replace all old 20 litre cisterns with smaller preferably dual flush ones. Make sure that the design of the pot works with a smaller flushing system as this could be a problem.

Install double flush systems for toilets throughout and waterless urinals in public male toilets. The latter work effectively, but like toilets, need regular maintenance and cleaning.

Do not install new automatic flushing devices anywhere and, if possible, remove any that are already in place.

You can collect water from showers, basins and swimming pool backwash in holding tanks to flush toilets with. This is called a grey water sanitation system.

If it is not possible to replace old toilets immediately then the following will help to reduce water wastage from toilet cisterns:

- If toilets are fitted with copper arms on the ball valve, these can be bent downward to cut off the water flow at a lower level;
- If you have an automatic return float this can be removed so that releasing the flushing handle cuts off the flow of water (Have a sign explaining this to your guests);
- Place a rock, filled plastic water bottle or brick in the cistern to reduce the volume of water that is used for flushing;
- If you have double flush toilets

have a sign explaining to the guests how it functions, and why.

Showers

- Consider using only showers in your establishment.
- If possible, use low-flow shower heads. This is a viable option in town but may not be practical in rural establishments with low water pressure.
- You can insert an aerator between the arm and the shower rose ('Neo-Perl'), available from most hardware and plumbing stores across the country) that adds air to the water and reduces the flow.
- Measure the amount of water the showerhead uses when open full for ten minutes, and change to a different kind if it is too wasteful.
- Bucket showers work well and allow the guests to participate in water saving!



High paying tourists will accept a bucket shower if the reasons are properly explained © N.Maritz

How to conserve water cont....

Washing machines and dishwashers.

- Buy machines that use a minimal amount of water. American designed machines can use up to three times the water than those based on European standards;
- Top loaders use more water than front loaders;
- Only run these machines if they have a full load;
- Use the “eco-cycle” that many new machines are provided with. These save water and energy;
- Use a biodegradable washing powder and only use the minimum required, to reduce impact on water quality and thus make it easier to recycle;
- Plain white vinegar is biodegradable and can be used as a

softener.

Cleaning vehicles

- Never use a hose pipe to clean your vehicles. Staff must be shown how to clean vehicles using a bucket and cloths.

Swimming pools.

Pools are tremendous water wasters. The following are suggestions for reducing water wastage from pools:

- Your pool should be covered when not in use for extended periods. This reduces water losses from evaporation. Shade structures over pools can also help;
- Use eco friendly water treatment methods, such as a salt chlorinator;

- If possible use the backwash swimming pool water to irrigate your gardens. Alternatively, the backwash water can be pumped into a separate holding tank and use that to flush toilets in a grey water sanitation system, and
- If you have to build a pool – remember, the smaller the surface, the less loss from evaporation. A small deep plunge pool will be more economical than a long lap pool, and easier to shade, too.



Uncovered pool—evaporation is a major cause of water loss © P.Tarr



Vehicle washing by hose—using a bucket and cloth is less wasteful © P.Tarr



Strong detergents used in the kitchen pollute underground water—biodegradable alternatives are available © P.Tarr



Extensive lawns are unnecessary. They use vast amounts of water and require regular maintenance © P.Tarr



Watering lawns in the heat of the day is wasteful, as most of the water evaporates © P.Tarr



Leaking pipes often go undetected, even though this patch of green vegetation near the water tank is a clue to a leak © P.Tarr

How to conserve water cont....

Watering of gardens.

- Before establishing large lawns, read Section 5 on maintaining a *Sense of Place*;
- Reduce the size of your lawn or eliminate it completely. Instead, raked gravel, appropriate paving or drought-tolerant groundcovers may be water-saving and need less maintenance;
- Grass roots are very shallow. Therefore, lawns require frequent watering but for very short periods at a time. Any water that penetrates below the root level is wasted;
- Water lawns and gardens in the early evening or very early morning, to avoid losses due to evaporation;
- Use timed watering devices that can be easily switched off during a good rainy season;
- Do not plant indigenous succulent species (for example a kokerboom) near to a lawn – they will die if they get too much water;
- In some urban areas the municipality supplies semi purified water for irrigation of grounds. This may not be a cheap exercise as far as installation is concerned, but is environmentally sound and will pay off in the long run;
- When landscaping, remember that most indigenous trees, once well established, can find their own underground water and, therefore, will eventually require little or no irrigation. Their shade also helps to reduce evaporation from the rest of the garden;
- A good mulching system prevents evaporation from the soil and reduces the need for water;

Mulch is a soil 'blanket' made from leaf litter, grass cuttings or gravel. Ground cover plants can also be planted in the beds and around trees to reduce evaporation;

- Drip irrigation is an option which decreases the volume of water used and makes it more effective;
- When planting new trees and shrubs put a piece of plastic pipe about 70 cm long into the ground with a series of small holes drilled into it about 25cm from the end that goes into the ground. Until the tree or shrub has become established and finds its own moisture, water that is placed into this pipe, will go directly to the roots and there is zero evaporation.

Water features.

Water features sound nice and look nice (until the lime has packed up on all the surfaces), but they can lose a lot of water to evaporation. External water features are especially wasteful – consider replacing them with dry sculptures or arrangements. Reduce or eliminate indoor water features as well.

Recycling water.

A well planned water recycling system can channel large amounts of fairly clean or 'grey' water from showers, baths and the kitchen onto gardens or for flushing toilets.

Reed beds do not recycle water – they just help to clean it and, in the long term, are not always effective.

A biolytic filter, with effective micro-organisms, can clean smells and soapiness from grey water, but it works best when biodegradable soaps and detergents are used, even for cleaning bathrooms.



Pebbles are a good alternative to grass as a ground cover. They are easily obtainable, cheap and aesthetically pleasing.

© P. Tarr

Water is without doubt
Namibia's most precious
natural resource. The
tourism industry must be
innovative in its
management of water—
we must lead by example

How to conserve water cont....

Recycling cont...

Catering kitchens must always have fat-traps – whatever sanitation system you use. Fats and oils are highly polluting to water and if water is contaminated with these substances it is very difficult (sometimes impossible) to clean.

Partially recycled effluent from two or three chamber septic tanks can also be used for the irrigation of lawns and gardens. The outflow water must, however, be periodically tested to ensure that the water quality is acceptable (see Section 5 on sanitation).

To use water from the septic tank: Pump it using a submersible pump with a level switch from the 3rd chamber to trees via 30mm class 3 underground pipes and then into the 110mm diameter plastic pipe with holes in it next to the trees

The HRDC are busy with studies on re-using effluent water.

Rain water harvesting

This can assist in reducing your water usage if you are in an area that gets seasonal rainfall. However, the first rains' water from a thatch roof will have to be flushed or used for grey water, as it will be too dusty to purify.

Make sure that storage tanks are well covered against mosquitoes.

If you have trees in the vicinity, fit a leaf trap in the top of the tank.

Preventing water pollution

Be aware of the nature of all substances that go down the drains at your establishment. Insecticides, fats & oils, paint, thinners, harsh toilet cleaners, detergents and bleaches can all cause severe water pollution.

Whenever possible buy biodegradable soaps and detergents. See Section 3 on waste management for ideas to prevent water pollution.



One of the best ways of saving water and preventing pollution, is maintaining a natural garden. After all, tourists come to Africa to see indigenous nature, not alien plants!

© P. Tarr (above) and Wilderness Safaris (below)



How to establish an accurate water consumption recording system

Try to install water meters at critical points around your property, e.g.

- at the point where the main water line enters each guest accommodation block;
- at the start of each area of staff accommodation;
- at the kitchen and dining room; and
- In the garden area.

This will help you to establish which areas are using excessive water.

Record the readings from all meters at regular intervals, (at least

monthly).

Evaluate the readings. If readings are unusually high consider the possible reasons:-

- high guest occupancy;
- staff children home on holiday;
- very dry and hot period; etc.

When there are unexplained high readings it could mean that there are water leakages. If you suspect that you might have leaks, check the water meters between 0200 and 0400hrs when no taps should be running.

If you are using a borehole, regularly record the level of your water table. Be aware of any serious drops.

Regular water level inspection of the borehole can be done in the following way: Afix (with cable ties) an empty 30mm class 3 pipe next to your down pipe in the borehole, make provision for an easily accessible opening in the lid at the top (weld in a 30mm piece of pipe for strength). This works best with a light plumb level ("licht lot") which may be expensive .

If you cannot measure it, you cannot manage it

A simple, yet robust and reliable water metre is essential in order to determine water use. Readings must be regular and accurate. © P.Tarr



Tourists and staff must be equally water-wise. Unless people are informed and sensitized, they will probably not care about conserving water

© P.Tarr

Creating awareness regarding water conservation

All members of your staff should be made aware of your water management policy and kept informed about the consequences of water pollution and the high costs of water provision. The following are suggestions:

- Create a poster that can be used to explain your water conservation methods and regularly discuss these at staff meetings;
- Staff must be told to

report any suspected water pipe leakages (for example, unexplained water seepage or mud);

- Present water reports at staff meetings; and
- Staff must be shown how to use small amounts of water when cleaning.

It is equally important to remind guests not to waste water.

- Polite notices, in more than one language, should be put above basins and

outside showers;

- Remember – a picture is worth a thousand words, so try making them pictographs!
- Your guest information booklet should contain information on how scarce water is in Namibia and the importance of conserving it.