

SECTION 3: WASTE AND SEWERAGE



November 2005

The worlds growing pollution problem

It is an unfortunate fact of modern life that the wealthier communities become the greater the volumes of waste they generate, and the more complex and potentially hazardous that waste becomes.

During the Rio Earth Summit held in 1992, the world's growing pollution problem was highlighted as one of the environmental issues of greatest concern to the global community.

The non-biodegradable waste that is generated in a household or tourism establishment can be categorized into glass, paper, metal, plastic or chemical products – all of which are polluting to produce and most of which create an enormous headache once they are no longer useful and must be thrown away.

Few options are available even in the best-case scenario. Some discarded goods can be reused or recycled, but most will need to be incinerated or banished to a dump.

The inadequate management of chemical waste and sewerage can be responsible for contaminating soil and

water sources and, ultimately, threatening human health.

Uncontained paper and plastic bags cause highly unsightly litter and carelessly discarded metal and glass are potentially harmful to humans and wild animals that may tread on or consume them.

Efforts at large scale recycling in Namibia are hampered by limited water supplies, and the fact that the nearest recycling plants for paper, glass, tins and plastics are a costly distance away in South Africa.

Despite this, opportunities for recycling have really improved in the last few years and it must be borne in mind that innovative and imaginative ways to re-use and recycle goods can result in impressive 50% or more reductions in the waste produced by a tourism establishment.

Tourism enterprises that operate within or near a large urban centre are lucky to be able to make use of good waste collection and disposal facilities.

However, those in isolated rural areas must make a concerted effort to ensure that their waste management practices cause minimal harm to the environment and human health.

Whether located within a town or not, tourism operations must develop a waste management policy that focuses on a reduction of the waste they create.

The world's waste problem is directly related to increasing human population and consumerism. Since current growth trends are likely to continue in the foreseeable future, our main challenge is to manage waste as best we can.

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GOAL :-

To reduce pollution by judicious purchasing, waste reuse and recycling. To ensure that wastewater and sewerage are disposed of in an environmentally safe manner.



Drawing up a waste management policy

Every tourism establishment should develop a written waste management policy that aims to reduce the amount of waste they generate and to limit their use of hazardous wastes to an absolute minimum.

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 insisting on certain practices.

The following points will help you to set goals for your policy:

- Conduct an assessment of the volume and type of waste your establishment generates in a normal week. This will give you an idea of how you can begin to reduce it;
- Have a purchasing policy that gives preference to organic, biodegradable items, containers that can be reused, and companies that offer any type of re-cycling assistance. Whenever possible buy products which contain natural, non-toxic ingredients;
- Avoid the purchase of chemical washing powders, bleaches, detergents, toilet cleaners, washing up liquid, furniture polish and metal polish etc. that are polluting and toxic to human health – choose to buy only biodegradable brands or use a harmless alternative;
- Avoid hazardous packaging. Think carefully how the substances you purchase have been packaged. Cardboard boxes, paper and glass can be recycled, but aerosol cans, plastic containers (unless they can be re-



used elsewhere) and polystyrene are difficult to dispose of and hazardous to the environment;

- Buying in bulk can reduce packaging, but in some cases, suppliers still individually wrap items in smaller amounts. Ask them not to do so;
- Separate all biodegradable from non-biodegradable waste. If it is feasible, create a compost heap from the biodegradable substances (vegetable peelings, egg cartons, newspaper etc.). The compost generated can be used to maintain a small vegetable garden for your operation. Get tips for making compost from a nursery;
- Good quality left over food that has not reached its 'sell by' date can be donated to feeding schemes for orphanages, old age homes or disadvantaged communities. Poor quality left over food and kitchen waste can be used as livestock feed for your own or community-run chicken farms;
- Have separate drums for paper, cardboard, plastics, tins, cans and glass. Cleaning staff must be trained to separate the rubbish from the guest rooms into the relevant containers.



A poorly maintained waste dump is both an eye-sore and a health hazard. A genuine eco-lodge should be as proud of its waste site as it is of its reception desk! © N.Maritz

**Reduce, re-use
and recycle**

Drawing up a waste management policy cont....

- Find out where the nearest Collect-a-Can outlet and glass recycling collection points are located. Collect-a-Can pays a small amount of cash for returned cool drink and other cans. This money could be put towards a community or staff fund, which can act as an incentive for the collection of cans and other litter;
- Do not discard any plastics that can be reused. Keep informed regarding any recycling programmes that may benefit your drive to reduce the amount of waste you eventually banish to the dump;
- Be aware of hazardous wastes – aerosol cans, old car and other batteries, paint, thinners, furniture polish, bleaches etc. These should be separated from all other waste and taken to the nearest large centre that has a waste disposal unit that deals specifically with hazardous waste. Scrap metal dealers buy batteries for recycling.

Consider all options for in-house recycling. For example:

- re-use all paper that has only been printed on one side;
- re-use envelopes;
- re-use old linen as cleaning rags for windows or in the garage;
- old newspapers are great for cleaning windows;
- save printer cartridges for re-filling etc.;
- Any non-recyclable items can be of use to nearby community projects like kindergartens and primary schools – egg cartons, yoghurt cups, etc. are used for art classes and play material;
- Glass jars can be used for home-made preserves by someone while plastic bottles can be used to fill up

toilet cisterns.

In the construction section there are tips for painting and building maintenance materials that are less toxic.

There are also many opportunities to use waste for construction. The *Habitat Research and Development Centre* has plenty of examples, for instance, tetrapaks (the foil-lined milk and fruit-juice boxes) make excellent foil insulation for ceilings when opened up and fixed back to back so that there is foil on both outer sides).

Polystyrene also makes excellent roof and wall insulation, which would be ideal if you need to upgrade staff housing (as opposed to using polyurethane foam) that gives off hazardous gas when it burns.



Buckets under the kitchen sink allows you more options in deciding where the wastewater should go—relatively clean water can be used to water the garden. © N.Maritz



Do not discard old junk, like refrigerators and air conditioner units. These contain gasses that deplete the ozone layer. Take these items to a properly managed waste site.

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Temporary waste storage sites must be properly secured. The cage above is totally inadequate as it does not prevent windblown litter, nor does it keep out scavengers such as rodents, jackals or crows

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In areas inhabited by wildlife and people, the waste site must be game-proof fenced. The gate must be locked so that children do not enter the site. There are many examples of human scavenging at lodge rubbish dumps.

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BOX 1 Natural Alternatives to Chemical cleaners

(Source: Seymour, J. & Giradet, H. *Blueprint for a green Planet*. Dorling- Kindersley Ltd.)

PRODUCT	CHEMICAL CLEANER	NATURAL ALTERNATIVE
Toilet cleaner	Chemical toilet cleaners often contain sodium hypochlorite which is a highly caustic agent that pollutes water and destroys the bacterial balance in sewerage	A strong solution of vinegar can be used to remove lime scale without causing water pollution. Lemon juice and lots of elbow grease also does the trick – use a cut half-lemon to scour with.
Washing Powder	Synthetic detergents in washing powder pollute water. Many of their ingredients (e.g. perfumes) have no practical value.	For hand washing, soap and small amounts of bicarbonate of soda dissolved in hot water make an effective cleaner. For washing machines. Phosphate free powders will reduce water pollution.
Washing up Liquid	Many washing up liquids contain high concentrations of phosphates which are damaging to aquatic life	In soft water areas, hot water and natural soap will remove grease effectively. Bicarbonate of soda dissolved in boiling water works well on more ingrained dirt.
Furniture polish	Most synthetic furniture polishes are based on synthetic silicones and solvents.	Combine two parts olive or vegetable oil with one part lemon juice. Beer, sugar and beeswax is another alternative.
Metal polish	Metal cleaners often contain ammonia and petroleum distillates that are highly poisonous.	Aluminium foil in a salt solution will remove tarnish from silver. Lemon juice will clean brass and copper, and apple cider vinegar will clean chrome.
Water softener for washing machines		Use plain white vinegar, can be bought in most cash and carry's in 25litre cans (cheaper than standard proprietary softeners

Creating awareness and contributing to pollution abatement

It is important to ensure that all members of your staff are aware of your waste management policy and the procedures regarding waste disposal.

They should be kept informed about the consequences of pollution, the high costs to local authorities and the environment of solid waste disposal, any recycling opportunities available (for example, Collect-a-Can) and the importance of safe sewerage disposal.

Create a poster that can be used to explain issues to new staff members and regularly discuss the dangers of pollution at staff meetings.

Seek ways in which your establishment can help clean up litter that escapes into the rural and urban environments from nearby communities.

Support or organise clean-up campaigns; inform communities about any glass recycling initiatives in your area; encourage projects that help local people create utilitarian or decorative objects out of discarded plastic, wire and other waste materials.

Information regarding your waste management policy should be supplied to guests either on a notice in their room or within an information booklet they are presented with on arrival. Most importantly guest must be encouraged to :-

- Bring empty tin cans, plastic water bottles and any other waste they have generated, back from day trips, visits to parks or remote areas where no waste removal systems are in place;

- Use only biodegradable soaps, washing powders, shower gels etc. A conscientious establishment will investigate which biodegradable products are available on the market and ensure that guests are supplied with samples of these in their rooms. Many glycerine soaps are available on the market.



Some establishments truck their waste back to the nearest municipal dump—this can be planned to coincide with a supply trip. Be sure to secure the load so that litter does not blow off the truck during transportation © P.Tarr

Sewerage disposal

All establishments that operate outside a town, city or village, must acquire a **waste disposal permit**. This is obtained from The Ministry of Agriculture, Water and Forestry.

The sewerage disposal method and site must be selected with care. It should not be in view (or in smell range!) of the tourist or staff facilities. Sewerage requires treatment for health, aesthetic and environmental reasons – ultimately the prevention of ground water contamination.

Despite popular belief all *pond systems* (French drains/oxidation/evaporation/reed beds) demand regular maintenance in order to get the minimum quality of treated effluent. To ensure that there is no groundwater contamination, these must be properly lined with a geo textile or plastic liner – an extremely expensive option.

The following 4 methods of sewerage treatment can be considered by small lodges/campsites:

1. A septic tank draining into a French drain.

Choose your site carefully. A septic tank should not be placed anywhere near shrubs or trees as their roots might penetrate the brickwork, and ruin the system.

Make sure that any inspection manholes and the whole system is properly sealed against mosquitoes.

It is recommended that a two or three-chamber septic tank system, rather than a *one* chamber system, is used.

Most civil engineers in Namibia have standard specifications for these systems.

Ensure that the system is able to cope with high and low occupancy. The bacteria within the septic tank require a certain minimal flow to keep active.

A civil engineer will also help you size the drain for your requirements, neither too big, nor too small.

Harsh chemicals will kill the digesting bacteria that you need. Avoid using them. A regular dose

of EM (effective micro-organisms) will help keep the system alive.

Place a grate trap at the system entrance and have it cleaned regularly.

Have any run-off from the third tank tested to see if the water is suitable for irrigation of gardens /vegetable patches etc.

The Ministry of Agriculture, Water and Forestry have a laboratory service that will do tests for you.

Place signs next to all toilets in the guest areas pointing-out the risk of disposing of the wrong items in the toilet, e.g. disposable nappies, sanitary towels etc.



Wildlife drinking from raw sewerage overflow is unacceptable. Establishments must ensure that all sewerage is properly treated, and the overflow must be a carefully constructed seepage system © P.Tarr

Sewerage disposal cont.....

A French drain consists of an underground empty 'reservoir' filled with stone and wrapped in geo-textile ("biddim") into which the liquids can drain and from there into the surrounding soil.

The best French drains are reticulated with a perforated pipe laid in a feather pattern. Make sure that the area around the French drain is out of bounds to vehicles. Ensure that there are no nearby trees and shrubs that could block the French drain. Reeds, however, can be planted as they will assist in the filtration process.

2. Septic tanks draining into a reed bed system.

In many circumstances, it might be appropriate to channel the overflow from the septic tank, into a reed bed. Reed beds can be effective at filtering semi-treated "sewerage water" but to be fully effective they must be con-

structed with care.

The National Building Research Institute (now incorporated into South Africa's Council for Scientific and Industrial Research) can provide advice.

Place a grate trap at the entrance to the reed bed. This must be cleaned regularly.

3. A bio-digester with various effluent water disposal methods:

In this method, the waterborne effluent is directly piped to a domed septic tank that concentrates the methane gas at the top. This gas can then be piped off to gas stoves, lights, etc. Cow manure can be added to the tank.

A working example can be seen at the staff house at Neudamm

Agricultural College, between Windhoek and Hosea Kutako airport.

The advantage of this system is that the by-product of bio-gas can be used for cooking.

4. Dry toilets:

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.



The new visitor centre at Twyfelfontein is installed with dry toilets. Note the air escape vents. © N.Maritz

An example of rustic though attractive dry "field loo" at Twyfelfontein. This facility is a hit with foreign visitors © N.Maritz



This reed walled flush loo drains into a well concealed septic tank © P.Tarr

