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What you can do

- Do not discard waste (for example oil, paint and rubbish) into sewer or stormwater systems.
- If you observe unlawful discharge of any waste by industry, report it to your local authority or to the Department of Water Affairs and Forestry (see *Useful addresses*).
- Use rainwater for domestic and garden purposes by catching and storing run-off.
- Use water from your household activities (washing dishes or bathing) to water the garden.

Further reading

UN Water. Website www.unwater.org

A guide to water saving in South Africa. S. Camp. Umgeni Water: Pietermaritzburg.

Enviro Facts: *Wetlands, River Catchments, Estuaries, Pollution.*

Useful addresses

Department of Water Affairs and Forestry. Private Bag X313, Pretoria, 0001. Tel (012) 336 7500; Fax and e-mails refer to website; Website www.dwaf.gov.za

Share-Net: People, places and publications for environmental education. PO Box 394, Howick, 3290. Tel (033) 330 3931 ext 124/144. E-mail sharenet@wessa.co.za; Website www.wessa.org.za



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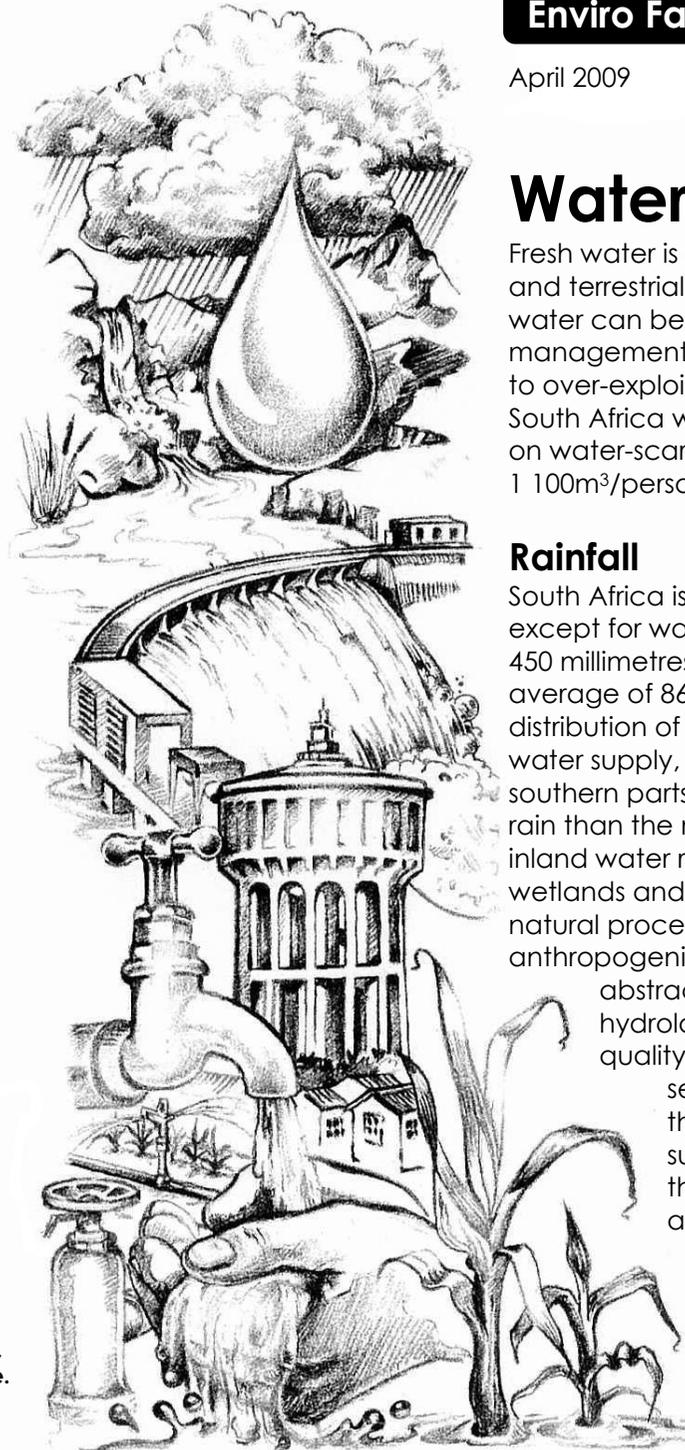
A full set of 60 Enviro Fact sheets is available from Share-Net.

Please write to: Share-Net, Enviro Facts Project,

PO Box 394, Howick, 3290. Tel (033) 330 3931 ext 124/144;

Fax (033) 330 4576; e-mail sharenet@wessa.co.za

In the quest for living and working more sustainably we have printed this enviro fact using non-toxic ink that is derived from soya, rather than petroleum. We use a wet ink process that requires no metallic toner or energy demanding heat, and solar energy, from current sunlight, rather than a fossil-fuel based, energy source. We hope you will enjoy reading this fact sheet and join us in seeking to live more sustainably.



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Water

Fresh water is essential for the daily lives of all aquatic and terrestrial organisms, including people. Although water can be a recyclable resource, it needs careful management and protection because of its vulnerability to over-exploitation and pollution. This is particularly so in South Africa where we are a water-stressed, bordering on water-scarce country, with water availability of only 1 100m³/person/annum.

Rainfall

South Africa is extraordinarily rich in natural resources - except for water. Our average rainfall is about 450 millimetres (mm) per year - this is half the world average of 860 mm per year. The geographical distribution of rainfall, and subsequent availability of water supply, is highly variable, with the eastern and southern parts of the country receiving significantly more rain than the northern and western parts. South Africa's inland water resources are the rivers, dams, lakes, wetlands and subsurface aquifers. These, together with natural processes (such as rainfall and evaporation) and anthropogenic (relating to people) influences (such as abstraction and discharges), form the hydrological (water) cycle that controls the quality and quantity of our inland waters and the services they provide. Within the cycle, there are complex interactions between surface and ground water and between the water and the sediments, stream banks, animals, plants and microbes in rivers, dams and wetlands. All these have to be taken into account in water management. The chemical characteristics of water depend on the source of water, the local geology, local ecology, and the impact of local human activity.

Water Management Areas. Our water resources are currently allocated to 19 Water Management Areas (WMAs) covering the country. The uneven distribution of water resources means that a significant amount of water transfer needs to take place between WMAs, both nationally and internationally. Substantial transfers take place from the Upper Orange to the Lower Orange, the Upper Vaal to the Middle Vaal, and from Lesotho into the Upper Vaal.

Rivers and Dams. Most of our water requirements are provided by surface water supplies (rivers and dams). Generally these surface water resources are highly developed over the country, with about 320 major dams having a total capacity of more than 32 400 million m³, which is some 66% of the total mean annual runoff of about 49 000 million m³/annum. This includes about 4 800 million m³/annum draining from Lesotho into South Africa and a further 500 million m³/annum draining from Swaziland to South Africa. A portion of this runoff (about 20%) needs to remain in rivers and estuaries to support the ecological components of the country.

Groundwater. Groundwater is used extensively, particularly in rural and arid areas where surface water is inadequate, as, for example in the greater Orange River catchment. This water source contributes significantly to base flow in the perennial rivers along the eastern escarpment and wetter north-eastern parts of the country. Generally, however, groundwater resources tend to be limited in South Africa.

Effects of human activities

Pressures by human activities on water resource quality include:

- **Industry and mining.** Mining can result in a change of pH (acidity of the water), increased salinity, increased metal content, and increased sediment load. Industrial contributions include poisonous and hazardous chemicals, nutrients, elevated salinity and increased sediments.

- **Increased urbanization and deteriorating standards in wastewater management.** Little or no treatment of wastewater takes place in some circumstances, such as at informal settlements. Where treatment is available, sewer reticulation can be inadequate or poorly maintained, resulting in uncontrolled releases such as leakage and overflow to the natural environment. The consequence is increased nutrient and organic load, plus microbial contamination. An urgent need exists for adequate and improved wastewater treatment, to minimize the negative impact, including the cost of damage to our critical inland water resources.

- **Agricultural drainage.** This includes irrigation return flows and seepage, which may contain salts that include nutrients (fertilizers),

other agro-chemicals (including herbicides and pesticides), and runoff or effluent from animal husbandry locations such as feedlots, dairies or chicken farms, which also contribute to contamination.

- **Waste disposal.** Industry, mining and urban development result in an increased production of waste, creating a need for additional and improved waste management facilities. Although techniques for containing waste are available, older waste repositories (industry and mining) and landfill sites release contaminated leachate into adjacent water sources.

- **Land use.** An increase in the laying of impervious surfaces (such as tarmac and concrete) diminishes rainwater recharge to groundwater. Lack of the dilution effect that would otherwise take place can lead to a rise in solute concentrations of the existing underlying aquifers. Overgrazing and clearance of natural vegetation increases the risk of erosion and the entry of sediment into surface waters.

- **Delays in classifying water resources.** Each water resource needs to be adequately classified from a quality perspective. Lack of reliable monitoring data, from which valid statistical results can be drawn, together with a lack of capacity, has delayed this process, creating problems with the issuing of water-use licenses, or the granting of licenses with inappropriate conditions.

Threats from Invasive Alien Plants. Invasive alien plants (IAPs) pose a direct threat not only to South Africa's biological diversity, but also to water security, the ecological functioning of natural systems and the productive use of land (see *Enviro Facts Biodiversity*). They intensify the impact of fires and floods and increase soil erosion (see *Enviro Facts Soil Erosion*). IAPs can divert enormous amounts of water from more productive uses and invasive aquatic plants affect agriculture, fisheries, recreation and water supply.

Did you know?

- *South Africa has a National Water Bill that attempts to ensure an equitable and sustainable water supply.*
- *According to the United Nations, every person needs 20-50 litres of safe freshwater a day to ensure their basic needs for drinking, cooking and cleaning. More than one in six people worldwide (894 million) do not have access to this amount of safe freshwater.*
- *Globally, diarrhoea is the main cause of illness and death. 88% of diarrhoeal deaths are due to a lack of access to sanitation facilities, inadequate availability of water for hygiene and unsafe drinking water.*