The term land degradation describes a process. When something is degraded, its character is changed for the worse – damage is done. This sounds serious, and it is – never more than when it refers to the earth.

Much land is covered with a thin crust of soil (or earth) that has taken many thousands of years to form. A great deal of life on the planet – including human life – depends on it. But it is very vulnerable, and once lost or damaged, it is extremely difficult, sometimes impossible, to put back. The most extreme evidence of land degradation is desert.

The process of loss is often called soil erosion. When this happens, the structure of the soil and also sometimes the underlying shape or structure of the land is damaged (for example, through mining or quarrying). The plants and animals that live on the land are also harmed, or even wiped out.

Land degradation can happen on a local scale, or over vast areas. Deserts are currently spreading at an alarming rate in dry areas around the world. Land degradation has been happening for millions of years – some major deserts existed before human activities made any impact – but the accelerated soil erosion taking place today is always as a result of human activities.

Soil and land degradation are caused by:

• Deforestation: The removal of trees and other vegetation (for firewood, commercial logging or to clear land for farming and settlements).
• Overgrazing: Allowing farm animals to eat all the covering vegetation until the soil is exposed and the plants cannot regenerate themselves.
• Poor land management: This can be inappropriate farming methods for the type of land/soil; farming that is too intensive (forcing the land to produce food crops year after year without letting it ‘rest’ to build up the nutrients again; using chemical or no fertilizers rather than natural fertilizers such as animal dung or organic matter).

Other causes of land degradation include:

• Fires: This includes bush and veld fires, caused by people, which strip the soil of the plant material that prevents soil erosion.
• Pollution: This is caused by dumping scrap metal, plastics and packaging and building rubble.
• Mining: This damages the soil and the underlying structure of the land. Chemicals used or mined themselves pollute soil and water courses.
• Neglect: Failing to look after local plants, trees and biodiversity. Neglect means that the soil will not be naturally fertilized and protected, so it cannot in turn nurture other life.

When land is degraded, wildlife, plans and people suffer. It can worsen the effects of poverty and bring about hunger. Degradation of land has serious consequences for food security. Many small scale farmers in areas of degraded land can only watch in dismay as their soil grows less each year to feed their families. This situation is made worse by droughts and unpredictable weather patterns caused by climate change.

Birdlife South Africa

The fact sheet on this page is reproduced here by kind courtesy of BirdLife South Africa (BLSA). BLSA strives to conserve birds and their habitats, working with people to ensure the sustainable use of natural resources. BLSA is a registered non-profit, public benefit environmental organization. Visit them at www.birdlife.org.za.
LEARNING ABOUT BIODIVERSITY

Biodiversity benefits people

Why should we conserve biodiversity? Most of humanity’s basic requirements for food and clothing are now met through agriculture. Although a relatively few species of plants and animals currently provide a high proportion of these needs, diversity at all levels is still fundamental to agricultural systems.

Centuries of selective breeding have produced tens of thousands of varieties of crop plants adapted to local conditions. These forms, which are being lost at an unprecedented rate, play a hugely important role in ensuring food security for many of the world’s rural poor. They, along with the wild relatives of domesticated crops, are an invaluable source of material for plant breeders, who are ever in search of new ways to increase productivity.

Many wild species play a largely unappreciated role in agriculture. Soil organisms help to maintain fertility, while wild pollinators – flies, beetles, bees, birds and even rodents and bats – are responsible for ensuring successful cropping of many of our food plants.


CURRICULUM-BASED ACTIVITIES

What can you do?
Collect the series of articles ‘Gardening with indigenous traditionally useful plants’ by Phakamani Xaba on page 186 and in previous issues of Veld & Flora and encourage your school and family to grow some of the important plants featured.

Make a poster
Find out what food and medicinal plants are locally indigenous to your area and make a poster about them. Send in your poster and we will feature the best ones in Veld & Flora. If your poster is chosen your school will receive a free subscription to the Botanical Society of South Africa (BotSoc) which includes four issues of Veld & Flora each year. For more information on how to submit your poster, see contacts on page 154.

TOP: Doreen Karungi monitoring biodiversity in a grassland near Mariepskop.
Photo: Cathy Dzerfes.
BELOW: Spring flowers in the biodiverse Haenertsburg grassland. Photo: Cathy Dzerfes.
ABOVE RIGHT: Wild pollinators like this Donkey Daisy Copper play a vital role in ecosystems.

Alien plants and...

Information and activities for teachers and learners

Lets get some meanings sorted out

An indigenous plant or animal occurs naturally in the place in which it is currently found, and has not been assisted in its travels by people. Being indigenous does not mean that a species has always occurred where it is now found – some species shift their distribution quite quickly, for example, when blown by strong winds or naturally transported by ocean currents.

The indigenous concept also applies to habitat, and does not refer just to a geographical area. For example, the birds indigenous to dry thornveld are very different from the birds indigenous to mistbelt forest, even though they may be only 10 km apart.

An endemic species is not only indigenous, but is restricted to a particular area. The blue crane, for example, is indigenous to southern Africa, and is found nowhere else. This makes it endemic. The wattled crane is also indigenous, but it is not endemic to southern Africa as it is also found further north in Africa.

An alien species does not occur naturally in an area (i.e. it is not indigenous) but has been introduced there by humans. Sometimes people use the word ‘exotic’ instead of alien.

A few alien species spread (or ‘escape’), unassisted by humans, into areas where they do not naturally occur. These invasive aliens pose a serious threat to nature conservation. Expensive and drastic measures are required to control invaders.

Some indigenous species also invade new areas but these invasions are brought about by changes in the area invaded, for example Acacia karroo rapidly takes over overgrazed grassland. Control of such invasions involves correcting the management of the area, in addition to control of the invading species itself.

WHY DO SOME ALIENS BECOME INVADERS?

Alien species find themselves in an environment different from the one in which they evolved. Usually such a drastic change in environment is fatal. Occasionally however, conditions prove favourable, usually because the normal diseases, parasites and predators, which kept the species in check in its natural environment, are absent. Under these conditions populations can explode with the invaders overwhelming the indigenous fauna and flora. Plant invaders are plentiful, especially in the south-western Cape, KwaZulu-Natal, and Mpumalanga. None of these plants cause problems in their native lands. Their invasive qualities were unsuspected, which goes to show that no alien plant or animal should ever be released into the veld without screening for its invasive potential. Almost any alien could become an invader.

To find out more about invasive plant species go to http://www.botany.uwc.ac.za/envfacts/facts/aliens.htm.
Schools can participate in alien plant removal as part of the national curriculum. Learners from Mitchell House School and Forest Hill Primary School show how it’s done.

Sowing seeds of knowledge
Driving through Pinetown and being greeted by the majestic pine plantations in the early morning reminds me of happy carefree days driving to Durban as children. Ignorance was bliss. As an adult the reality of plantation trees that ‘escape’ into indigenous areas, that alter the water catchment potential, degrade the soil and change the fire regime dampen my enthusiasm and raise the challenge of reaching an economic and ecological balance.

In 1993 as a young researcher I was invited to a rural school in Bushbuckridge to celebrate Arbor day. To my horror the trees to be planted were invasive ones. Out of politeness I said nothing about planting those trees but so began the quest to raise awareness about alien invasive plants to communities and later on through the WESSA/WWF Eco-Schools programme with funding from the De Beers fund.

Aliens are not useful plants
People often do not want to participate in alien plant removal because they think that garden favourites such as roses, azaleas or food plants like mealies or peaches are targeted. This is incorrect. Although these plants do come from other countries they do not spread and hence do not compete with indigenous plants or spread into the river systems. Some favourites like the Jacaranda tree, Guava and Prickly Pears are invasive and care should be taken that they are confined to where they are planted. If this is not possible then it is more responsible to remove them.

How can your school fight aliens?
Schools can participate in alien plant removal as part of the National Curriculum. In the learning area of Natural Sciences, Senior Phase, human activities, such as the introduction of alien species, habitat destruction, population growth, pollution and overconsumption make up part of the core knowledge that should be developed in learners. Hands on learning opportunities where learners participate in removing alien invasive plants are encouraged as part of the Eco-Schools programme. Pulling, cutting and where possible poisoning these plants is far more effective in teaching plant identification than learning from books.

The school was invited by Magoebaskloof Adventures to clear invasive lantana, wattle and gum that were encroaching the riverbanks. Magoebaskloof Adventures has created an abseiling canopy tour through three waterfalls by means of 11 cable slides, a swing bridge and 13 platforms bolted into the gorge’s rock face and between the indigenous trees. Previously, access to the river and waterfalls would have entailed a scramble down the steep sides of the gorge, dislodging soil and using the natural vegetation as a foothold. Use of the canopy tour through the seasons has built an appreciation of the natural flora that occurs in the gorge and hence the necessity of removing the alien vegetation.

Alien plant removal can also involve younger children as was demonstrated by Forest Hill School in Haenertsburg and is more educational than litter pick-ups. On a Saturday morning parents and children removed wattle, bugweed and lantana from the Critically Endangered Woodbush Granite grassland in Haenertsburg. In this case the parents did most of the hacking but the children helped by pulling the branches to collecting points and finding the aliens in the thick grass. It is important that children see that adults are not only money driven but are prepared to get involved in a good cause. To avoid apathy or a doom and gloom mentality towards the environment, children need to know that constructive action is possible. The Eco-Schools programme provides many such opportunities.