



# Environmental Degradation

## Seen Environmental Learning Information Sheet no 5

### What is environmental degradation?

This is a term used to describe a situation in which a part of the natural environment is damaged. It can be used to refer to damage to the land, to water or the air. Environmental degradation can also mean a loss of biodiversity and a loss of natural resources in an area.

Environmental degradation is not a new thing, it has been happening all over the world for centuries. The problem is that it is now occurring at a much faster rate, therefore not leaving enough time for the environment to recover and regenerate. The greater demands placed on the environment by an ever increasing human population is putting a great strain and drain on the earth's limited natural resources.

Environmental degradation is a serious threat to the lives of people, animals and plants, making it imperative that we stop further degradation from occurring.

### Types of environmental degradation

There are many different types of environmental degradation. Some of the main types in Namibia are **soil erosion, deforestation, bush encroachment, desertification and salinisation**.

#### Soil erosion

Soil erosion is the gradual wearing away of soil by either physical breakdown or chemical solution which is then transported away by means of water, wind or ice to another location. Soil erosion is the leading cause of damage to our soils, leaving them barren and ultimately less productive. It can take centuries to create just a few centimetres of soil and only a few moments to destroy the same few centimetres. Today the rate of erosion has been speeded up by human activities. Consequently making soil erosion an

ever-increasing problem. Soil erosion results from the ways that people use the land. Practices such as tree felling cause deforestation, and can lead to soil erosion. The removed trees would usually guard the soil from rain and wind as their roots hold the soil in place. Additionally many land owners cut down trees to create space in which to plant crops and raise animals which eventually can lead to soil erosion.

#### Soil salinisation

This is a type of environmental degradation that is particularly common in naturally dry areas that undergo irrigation and do not allow for any fallow periods for the land to recover. Irrigation schemes are set up to provide a constant flow of water to drylands so that crops can be grown. However when irrigation systems are badly designed the results can be disastrous. The irrigation causes the water-table level to rise bringing natural salts to the surface. The salts cause problems as they restrict the root activity of the plant and therefore slow down its growth. In areas with high rates of evaporation the salts become even more concentrated.

The final result is that the soils are too salty for plants to be able to grow in them and the degraded land has to be abandoned. Soils which have been affected by salinisation are very difficult and expensive to rehabilitate and often remain unused and abandoned.

#### Desertification

Desertification occurs when productive lands are turned into non-productive desert as a result of poor land-management. This generally occurs in semi-arid areas such as Namibia. (See the Information Sheet on Desertification)

#### Deforestation

This is the permanent destruction of indigenous forests and woodlands which results in a loss of natural resources as well as a protective barrier

for topsoil. (See the Information Sheet on Deforestation)

### **Bush Encroachment**

Bush encroachment happens where woody vegetation gets so thick that it threatens farming lands. Bush encroachment happens because woody vegetation and grasses have different growth rates leading the woody vegetation to take over and dominate a piece of land. Before the introduction of domestic livestock, the balance between grasses and woody vegetation would have been kept in check by fires and game. This would have resulted in an African savannah dominated by grass with only a few scattered trees.

With the introduction of livestock the balance was upset. Most of the game was eliminated and selective grazers were brought in. Fire outbreaks have also been eliminated as far as possible due to human intervention. This means that grasses are heavily eaten but the trees which are usually controlled by fires, continue to grow. The result is a shift in the balance in favour of trees and woody vegetation.

Since the growth of grass is limited the soil is largely left bare making it especially susceptible to soil erosion by wind and water. The deposits of nutrients are therefore increasingly found only under trees and bushes, making it difficult for grasses to grow. Eventually the grasses cease to compete for water and die out.

Most of Namibia's best farming lands are bush-encroached. As a consequence the land supports less and less livestock per hectare as the woody vegetation increases. It becomes more difficult for the cattle to move in or amongst the bushes in search for pastures. The majority of valuable nutrients and water in the soil are then taken up by the encroaching bush and the grasses cannot access them.

The national beef industry loses about 34 000 000 tonnes of beef each year because of bush encroachment. This converts to be a N\$100 000 000 loss in beef production. More than 14 363 000 hectares of agricultural land has already been lost to bush encroachment. The landscape loses

its appeal to tourists as it loses its biodiversity and beauty.

### **Loss of biodiversity**

Loss of biodiversity is a reduction in the variety of plant and animal species.

In areas where environmental degradation has occurred there is often a loss of biodiversity as a result of the disruption to the ecosystem. However the loss of biodiversity itself can be considered a form of environmental degradation. The range of genetic make-up (plant and animal varieties) in a particular area can be considered to be a natural resource and is important in maintaining a healthy environment.

The biodiversity of an area can decrease as a result of **pollution, poaching, expanding agriculture and urbanisation**. Sometimes there is a direct reduction in the number of a particular species which itself is being threatened, but more often it is as a result of a disruption in the ecosystem and food chain, which causes a domino effect, effecting a greater number of organisms. (See Biodiversity topic sheet)

### **Causes of environmental degradation**

**Inappropriate land use** can lead to soil degradation. Bad farming techniques are often responsible for land degradation. Leaving fields bare, or ploughing them up and down the sides of a hill can cause severe soil erosion when it rains heavily as the soil has nothing keeping it in place. When the left over parts of crops and animal manure are ploughed back into the soil they serve to replenish and fertilise it. However, if the crops are cut to be fed to animals and the manure is burnt as a fuel, the soil will have no way of replenishing itself, and decreases in fertility.

Sometimes landowners make changes in the way they use the land in an attempt to make the land more productive, but often these changes damage the land and actually make it less productive.

**Overcultivation** happens when a farmer does not allow a piece of land to recover in between plantings, exhausting the soil. Left unchecked this can eventually lead to land degradation as the land is being used in a way which is unsustainable.

**Overgrazing** is when more animals than a piece of land can support are allowed to graze in that area. This can cause serious damage to the land. When too many animals are allowed to graze on a piece of land they eat the plants that hold the soil in place. Too many animals may mean that the grass is eaten down to the roots faster than it can grow back. This in turn leads to overgrazing.

Overgrazing can cause and accelerate soil erosion and with it a loss of soil fertility. When large herds are concentrated around one particular area the animals compact the soil by trampling on it resulting in the soil being unable to retain as much moisture as it needs. Once the animals have overgrazed an area it is often left barren with no protection, and the wind blows away the topsoil.

**Pollution** is also an important factor in causing environmental degradation. Soil can be damaged as a result of waste products and pollutants being deposited and left in it. When rubbish from factories, mines and households are dumped in the natural environment it pollutes the land and leaves its toxins within the soil. The soil is therefore unfit to support any plant growth or animal life. The increase in the global population has caused an massive increase in levels of waste and pollution, adding to increasing environmental degradation.

**It is often the people living in degraded environments are responsible for the damage that as occurred, but this is often as a result of underlying social and economic problems.**

**Poverty** is a major contributing factor to land degradation as it forces millions of people to destroy the resources that are around them in order just to survive. Poor people often do not have access to the best land, leaving them to depend on the most fragile areas and resources.

Their situation may mean that they have no other choice other than to use what resources are available to them, even if these result in the degradation of the land.

**Foreign debt** often forces Governments in poor countries may to pursue policies and practices which are harmful to the environment in order to keep up with their debt payments, such as intensive farming for export. These are important for the national economies of these countries but may take the place of traditional land uses which may have been more ecologically friendly and provide food for people to eat. As well as population growth, natural disasters such as floods and droughts and national emergencies such as war and political tensions can also add to the pressures which are placed on the land.

**Unfair land allocation** in Namibia is often the root of land degradation and is closely linked to poverty. This is because poor people often have little choice over how to use their land. In conditions of poverty people do not have access or money to purchase the most appropriate or effective resources for farming. During the colonial period people were often forced to live in designated areas, this resulted in overcrowding and subsequently overuse of the land.

## Some Solutions to Environmental Degradation

### Bio-physical:

Planting trees over degraded land or **afforestation** can help to protect the soil from strong wind and from being washed away by soil erosion. If trees are planted in rows along the edges of field they can be very effective in sheltering both crops and soil which does not have crops in it.

Soil salinisation and waterlogging can both be avoided by using **drip irrigation** which delivers only as much water as is needed to a specific area as opposed to high-pressure sprinklers which cause the soil to be permanently covered with water.

There are certain traditional farming methods which are better for the land and are more sustainable than some of the methods used by commercial farmers. Rather than monoculture (a practice which involves only the growing of one just crop type) which removes all of the goodness from the soil and leaves crops very susceptible to disease, **mixed crops or crop rotation** can be a good way to replenishing valuable nutrients in the soil along with maintaining a high level of biodiversity in the area.

Effects of overgrazing can be minimized by **carefully stocking your land** so as to ensure that it is not being grazed by more animals than it can support. It is therefore more likely to stay healthy and to be able to sustain cattle for a longer time.

Bush encroachment can be hindered through many processes:

- Bulldozing is one possible way of stopping bush encroachment, but it is very expensive and labour intensive. It is also not always as effective as the manual felling of bushes since the trees soon re-grow.
- Using fires is another method, but this too is also time consuming and labour intensive and not always effective at killing the trees.
- Using chemicals is a very risky method of de-bushing as it is non-selective and kills lots of vegetation that helps to support the ecosystem. It is also very costly and is likely to have long-term ecological implications.
- One group in Namibia, the Cheetah Conservation Fund, has developed a method of compressing the wood from the encroaching bush into bricks that burn much longer and with more heat than normal wood. Therefore by using the bricks you are helping stop encroachment, and gaining a useful source of energy!

### **Social and Economic:**

The mass effects of poverty can only be eliminated through the agreement and implementation of the World's leading politicians. Without their commitment to end debt, make trade rules fairer, and give more aid to those countries in need poverty will not be eliminated. Politicians also need to sincerely address the pressing environmental problems that face our societies today, and again commit to policies that enforce the sustainable use of our planet. (see information sheet on Poverty & Inequality).

### **Important Ideas to Stress in your Teaching and Learning**

- Environmental degradation is damage caused to the air, land or sea
- Environmental degradation is now happening at a much faster rate than ever before.
- Types of environmental degradation include soil erosion, soil salinisation desertification, deforestation, bush encroachment, biodiversity loss, and pollution
- Causes of environmental degradation include inappropriate land use, overcultivation, over grazing and pollution. Root causes include poor government policies, foreign debt and unfair land tenure.
- Solutions to land degradation require changes in policies, the elimination of poverty and technical solutions

### **Sources/ Further Reading**

Wikipedia Encyclopedia

Earth Health check for a planet, The Guardian August 2002