



7



Improving Tree Cover

47 • The Importance of Plant Cover

This chapter considers some of the ways in which the protection and cultivation of trees and plants can be used to improve local environmental conditions.

Why protect natural areas?

There are many reasons why we should protect the nature around us. One reason is that we don't have the right to destroy nature just because we have the power to do so. We humans are just one of the 10-15 million different species on Earth, and other organisms have the same right to exist as we do.

Why should we care if some or all these other species disappear forever?

One very obvious reason is that we humans need nature - in fact, we totally depend on



it. There are numerous historical examples of past civilizations that disappeared because they did not manage their natural resources well, such as The Mayans, the people of Easter Island, or the Viking settlers on Greenland.

The plants and trees are the basis for nearly all other forms of life, and it is therefore essential to preserve a healthy and diverse vegetation.

The greater the number of species living on earth, the more stable the global environment is. This means that natural systems are better able to survive the global environmental changes that occur regularly. And we need these natural systems in order to purify the earth's water and air. As natural environments are degraded, the water purification cycle is destroyed and topsoil that has been built up over centuries is eroded and washed out to sea. Climate change makes the maintenance and restoration of a healthy environment even more urgent.

People also benefit directly from the existence of many species. Many of the profits gained from tourism are

intimately linked to nature and wildlife. Over one half of the prescription drugs from the USA have their origin in plant life yet only a fraction of existing plants have been researched for their medicinal properties. So there are many reasons to preserve the nature around us. Below are some examples.

Gwembe District, Zambia - How the degradation of nature results in difficulties for cultivators.

The Munyumbwe area of the Gwembe District was flooded for several weeks in 2003 due to heavy rains. Cars and trucks could not cross the river for two weeks. Such rains come about every ten years. But this year the problem was much worse because of the reduction of vegetation on the hillsides. People are now clearing new fields and cutting down for use as charcoal and firewood. When there are fewer trees, more water flows off the hills instead of entering the soil. Much of the fertile soil is carried with this rainwater and ends up in the river beds. Because the riverbeds are filled with the eroded material, there is less space for the water and the low-lying areas are easily flooded. This is precisely what happened in 2003. Not only were the crops destroyed by the water, but the floods also deposited a large layer of sand on the fields. The farmers thus have lost their fertile soil and have infertile sand instead.

We do not have statistics from the area but some people told us that the problem has become worse over the years. This is a good example of why it is important to protect the environment.

Bana River System in Rajasthan, India, experienced the same problem many years ago. However people started planting trees and creating systems to stop the water from running off. Twenty years later the water is running again in the streams and the valleys have become green again. It is possible to restore degraded natural areas and re-establish the balances, which are so important for all life.



Deforested river bank-the result was loss of agricultural area due to erosion



48 • Nature Preservation

How to protect natural areas

The first step is to decide which area should be protected. The areas along the streams and rivers where water collects are critical. This is where much of the rainwater gets a chance to sink into the soil and becomes groundwater, which later supplies water to the streams throughout the dry season.

You must also decide what it means to protect the area. This will depend on the local conditions, and various degrees of protection can be agreed upon. If there is a lack of firewood in the area, one model might be to create a smaller area which is completely protected and a larger one outside of this where it is permitted to collect dead or fallen branches, and so on.

In other areas there are trees which grow many shoots from the roots - especially after fires. In such areas it can be beneficial to harvest the smaller shoots for firewood and let only one (the largest) develop into a tree. This applies to mopane trees and many of the trees in miombo and acacia forests. Similar decisions must be made regarding the grazing habits of goats and cattle, which will depend on the availability of food in the area. If possible, the best thing to do is to decide that there is to be no grazing allowed in the protected area. If this is not possible, then it may be possible to have a systematic type of grazing in the area. This means that animals can only graze when they are with someone who will make sure they graze in one area at a time. The animals can only return to the area when new grass has grown in.

Much tree destruction is due to frequent fires. New small trees burn before they

grow large enough to survive the fires. It is therefore very important to prevent the protected area from burning. This can be done by creating a fire belt (an area with little vegetation) around the protected area.

Early in the dry season when fires can still be controlled easily, a ring is burned around the area. It is best to carry out such controlled burning early in the morning or

late in the afternoon. The vegetation in the firebreak can also be kept low by allowing animals to graze there.

Other critical areas are wetlands or lakes. Normally it will not be possible to protect a whole lake since people need it for water supply or fishing. But it can be very beneficial to protect a part of the lake. People will find that if a part is protected, they will benefit as bigger fish are caught outside this area. Similarly, there are fields around many wetlands and lakes and along rivers. Communities will gain in the long term by restoring a zone of natural vegetation to border the water or wetland. This will avoid a loss of wetlands due to a lack of groundwater and reduce erosion along rivers.

Such discussions must take place at village meetings where all community members can contribute their views, and the community must be mobilized to select one or more areas to protect.

Restoring degraded vegetation

The first step is to find out which area is most important to restore. This will in many cases be the areas around the riv-



Destructive fires often spread when fields are prepared by burning



ers, streams and lakes. In some places it is enough to protect the area against fire and grazing. The vegetation will grow back on its own because of seeds in the soil or new shoots coming from existing roots. In other places you will need to actively replant some of the trees which have been cut. Take this chance to learn about these trees by talking to the experienced elders in the area. They can tell you which trees used to be there and where to find them today.

tem. Dig carefully around these seedlings and make sure that you dig much of the soil up as well. In this way it is often possible to move the seedlings to a new place. If all the soil falls from the roots they will often die. The best time to find these seedlings is halfway into the rainy season, and this will also be the best time to move them. You should plant the seedlings in the same kind of area as you found them.

If you can't find any seedlings of the tree you want, then maybe you can find the seeds and grow your own seedlings. The seeds must be collected during the dry season when they are ripe. This is when the fruit opens so that the seeds can fall out, or when birds and other animals are eating the fruit. It is usually best to let the seeds dry and then let them soak in warm water overnight. The next day you can plant them in small containers such as small plastic bags or plastic bottles cut in half. It is best if you can mix some old manure or compost in the soil some time before planting the seeds.

Often the areas close to flowing water are sloping, which means they are more prone to erosion. This is why it is so important to maintain a good cover of vegetation. When a large part of the plant cover has been damaged, it is necessary to stop the rain-water from running down the hills, because it removes nutrients and fertile topsoil. This can be done mechanically by making terraces with stones, soil and branches. It can also be made by planting grasses like the vetiver grass along the contour lines of the slope (lines at the same level). This will stop much of the water and cause it to sink into the soil.

You should choose a wet area where it is easy to establish a vetiver nursery. Here the grasses will multiply and produce new shoots for you to plant where it is necessary to stop soil erosion. (See section 23 for more information about vetiver.)

YOU ARE NOW ENTERING A PROTECTED AREA. PLEASE FOLLOW THESE RULES:

**MILAWO YA BUSENA
BUKWABILINDWE**

- 1. Kanyina kuumpa sokwe.**
No burning of grass.
- 2. Kuyina kumvwima banyama, bayuni a kulida nzuki.**
No hunting of bees, birds and animals.
- 3. Kunyina kusya miyanda a kukwama makwa kuzyisamu.**
No cutting of roots for medicine.
- 4. Kunyina kugonka loozi**
No cutting of fibres.
- 5. Kunyina kugonka masamu**
No cutting of trees.

Sign with rules in a protected area of Zambia

When you have agreed which trees should be planted, you must look for seedlings of this kind of tree. Seedlings are the very young plants which are growing from the seeds and do not yet have a large root sys-



Some areas may be so destroyed that they need more help to be restored. This will be the case if the fertile topsoil has been washed totally away by the rain. Then you must start a nursery of plants that can help restore nutrients in the soil. These include the legume plants - plants which all have fruits that look like beans (pods). The pigeon pea is one of these plants. It can grow in poor soil and dry conditions. You can plant these in the degraded area and plant vetiver grass to control the erosion. After a few years, the soil will have improved and other trees will start to establish themselves in the area. You can also plant native trees which you know can grow under difficult conditions. You can help them get going by making a large planting hole - 50x50x50cm - and filling it up with compost and old manure.

All villages should select an area to preserve or to restore. This is necessary to maintain and restore a healthy water cycle - for our benefit and for the benefit of all other living things.

Restoring vegetation

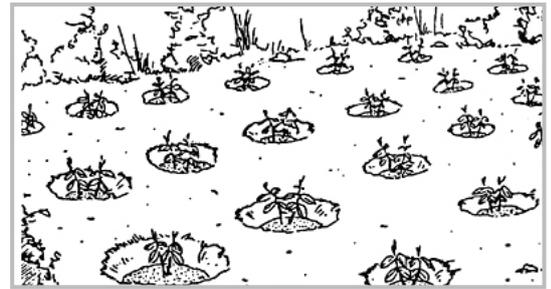
- Make holes in the ground and fill them up with soil and compost.
- Find seedlings of the trees during the rainy season.
- Transplant the seedlings and make sure you get plenty of soil along with the roots.
- Find seeds and grow your own seedlings.
- Plant them in the holes and cover the roots, but make sure you leave the surface lower than the ground level so that water is absorbed.

Collecting water

You can make small semi-circular ridges of soil to collect rain water on the side pointing downhill of the planted trees. This can be used even on gently sloping areas. More water will penetrate the soil and the trees will grow better.

This system works best if the area is not too steep. The ridge systems must be at least two metres apart from

each other and the basin in which the trees are planted must be lower than the ground level in order to hold water. You can get even better results by planting vetiver grass on top of the ridges. This will save you maintenance work.



Trees planted in holes to collect water



Semi-circular ridges of soil help to collect water in the holes where trees are planted