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sharing knowledge, improving rural livelihoods

## **Rural Radio Resource Pack**

**No 04/3**

**AGROFORESTRY**



CTA is funded by the  
European Union

The Technical Centre for Agricultural and Rural Cooperation (CTA) was established in 1983 under the Lomé Convention between the ACP (African, Caribbean and Pacific) Group of States and the European Union Member States. Since 2000, it has operated within the framework of the ACP-EC Cotonou Agreement.

CTA's tasks are to develop and provide services that improve access to information for agricultural and rural development, and to strengthen the capacity of ACP countries to produce, acquire, exchange and utilise information in this area.

#### *Rural radio*

Radio remains, despite all the interest in the new ICTs, one of the most important communication tools in ACP rural communities. CTA began supporting rural radio back in 1991. Every year since then we've produced a set of Rural Radio Resource Packs (RRRPs).

Each pack is on a specific topic – anything from crop storage and cassava to small ruminants and soil fertility. The choice of topics depends on what ACP partners suggest. The number of topics covered has now reached 51. Inside each pack are materials for a radio programme on that topic – interviews on cassette or CD, a transcription and a suggested introduction for each interview, technical information on the topic, advice for how the pack can be used and a questionnaire for users to provide feedback to CTA.

You can find most of the RRRP material on CTA's Rural Radio website  
<http://ruralradio.cta.int/>.

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# **AGROFORESTRY**

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CTA

*Rural Radio Resource Pack*

2004/3

*Agroforestry*

**TECHNICAL INFORMATION**

(and suggestions for using RRRPs in the studio)

**Introduction**

Agroforestry is the deliberate cultivating of trees and shrubs on farmland. The trees and shrubs can have a wide range of functions. They may provide fuelwood for the household, building materials such as poles (another source of income), fodder for livestock, other 'non timber products' such as nuts, resins, fruit. They may also improve the productivity and sustainability of the farm, in particular its crop production. For example, trees and shrubs planted along contours in sloping land can help to reduce water runoff and soil erosion. The foliage of some trees and shrubs can be used as green manure, mulch or compost, improving the fertility and water retention of the soil. Some shrubs can be used to shorten fallow periods between crops. These are just a few examples, but there are many ways that trees planted on farms can support farming livelihoods.

**Why do we need agroforestry?**

Agroforestry systems help farming families to increase the productivity of their farms, and diversify their sources of livelihood. Poor families may not be able to afford inorganic fertilizer, but can improve their crop production by using leaves as compost/mulch, or by planting certain shrubs as fallow crops. Deep rooted trees can access nutrients deep underground unavailable to crops. If leaves from the trees are incorporated into the soil, crops can get the benefit of these nutrients. Fodder shrubs can improve milk production in dairy cattle or goats. Other products from trees can be sold - e.g. poles for building, or firewood.

Growing population has led to crop farming expanding onto land that previously may have only been used as pasture for livestock. This 'marginal' land is very vulnerable to erosion and quickly becomes degraded and useless for agriculture, unless farmers can boost the nutrients and organic matter in the soil. Planting the right trees and shrubs can help to protect the soil from erosion and add nutrients, and prevent desertification.

Forest resources are in many areas under pressure - the need for firewood and building materials has depleted them, and the need for more farmland has also led to forest clearing. But preserving forests is obviously important, not least because of their ecological functions - e.g. capturing rainfall, protecting land from erosion, and as habitat for plants and animals. Planting trees on farms is a way of reducing the pressure on the forests.

## Agroforestry techniques discussed in this pack

**Soil fertility improvement:** The leaves and foliage of many tree and shrub species can be added to the soil, either directly, or as part of compost, to improve soil fertility. In the interview *Gliricidia sepium* for field and garden a farmer describes the benefits of using *Gliricidia sepium* leaves as a fertilizer for his main field and for his vegetable garden. African winterthorn, *Faidherbia albida* (also called *Acacia albida*) and *Tephrosia vogelii* are other good species for soil fertility, and feature in *Green fertilizer at planting time* and *A wide range of benefits*.

**Improved fallows:** species such as *Sesbania sesban* and *Tephrosia vogelii* can be grown as fallow crops. These can be grown for short periods (6 months to 1 year), or for two or more years, and when incorporated into the soil greatly increase yields in the subsequent crop. The use of improved fallows is discussed in *Agroforestry for food security*.

**Live fencing and boundary trees:** using tree and shrub species as a living fence can save considerable money compared with building walls, or using barbed wire fencing. Species have to be carefully chosen; the branches need to develop low down on the stem of the plant to prevent livestock breaking through the bottom of the fence. If the plant is thorny that also makes the fence more effective. *Protecting crops and feeding livestock* includes the use of *Acacia laeta* in The Gambia as a live fence species. Trees and shrubs can also be planted on field boundaries to minimise conflicts over field use between neighbours.

**Livestock feed:** *Leucaena leucocephala* and *Gliricidia sepium* are popular fodder species for livestock; they may be available during the dry season and a much cheaper option during this period than other feeds such as groundnut hay. Both plants are being recommended to crop/livestock farmers in The Gambia - see *Protecting crops and feeding livestock*. In Malawi *leucaena* was initially popular with livestock farmers, but has since suffered from pest attack. Pest resistant varieties of *leucaena* are now being trialled - see *A wide range of benefits*. The mixed crop/livestock farmer featured in *Adding trees to a mixed farm* uses *Grevillea robusta* as a source of cattle feed and soil fertility.

**Food and cash crops:** fruit species, whether indigenous or exotic, are a valuable source of either food or income for farming families. Some indigenous species of tree, although at times undervalued by farmers, can have advantages over exotics e.g. needing less water, having resistance to termites, frost, poor soils or drought. *Domesticating wild fruit trees* and *Promoting fruit tree cultivation* both discuss the planting of fruit tree species close to the home, and *Adding trees to a mixed farm* features a farmer doing just that. Other species such as Gum Arabic produce gums and resins which can be sold as a cash crop - see *Restoring lost land in Cameroon*.

**Fuelwood and building materials:** Eucalyptus is a popular, fast growing tree (see *Adding trees to a mixed farm*) which produces excellent poles for building, is a source of fuel, and also protects soils from erosion. Many agroforestry species can be used to supply limited quantities of fuelwood, even if this is not their primary function.

**Environmental protection:** One of the great advantages of agroforestry techniques is that they can achieve both poverty alleviation and environmental protection at the same time. Planting trees on farms, to supply fuel and building materials helps to reduce the pressure on natural forests and reverses deforestation. Trees increase infiltration of water, and protect soils from the damaging effects of sun, rain and wind, thereby reducing soil erosion. They also provide shade for both humans and livestock.

### **Why do agroforestry projects not always succeed?**

Many attempts to introduce agroforestry have not been taken up by farmers. There are, no doubt, many reasons for this:

Farmers may not be consulted about the problems they are facing, and therefore do not adopt the agroforestry practice because it does not meet their needs.

The method requires labour for planting and tending/pruning trees. This labour may not be available at the time when it is needed - or if the benefits of the trees are not recognised, the work won't be done.

The method may have long term benefits but not yield any benefits immediately. This can discourage poor families who are struggling just to survive - they may not have the time, energy or money to invest in long term projects.

Sometimes the agroforestry technique suggested simply does not achieve what it is meant to. For example, farmers may use leaves to fertilize their fields, but crop yields may not improve.

There may be social or legal obstacles; land ownership is a crucial factor for agroforestry. If people do not have secure access and rights to the land they are farming, they may be reluctant to invest in long term soil fertility improvement, since the land may be taken away from them. They may also not be allowed to plant trees on the land, under the rules of tenancy.

### **How can agroforestry techniques be successfully introduced to rural communities?**

Many of the interviews in this pack describe how an organisation has attempted to introduce agroforestry techniques to farming communities. Successful introduction has typically depended on some or all of the following factors:

- Identify the needs of the farmers: as indicated in *Protecting crops and feeding livestock*, agroforestry techniques must address the problems facing farmers if they are to be adopted.
- Don't ignore other needs of community: if communities have other priorities, such as need for a clinic or road, agroforestry projects should consider bringing in other organisations to address these needs as well. See *Agroforestry for food security*.
- Work through local authorities: land use may often be controlled by chiefs or other local authorities. Planting trees usually requires the permission of the land owner, so projects must try to get the support of these people. See *Promoting fruit tree cultivation*.
- Work through schools: if children are taught the benefits of planting trees on farms while in school, there is a good chance they will adopt the technologies later in life. See *Promoting fruit tree cultivation*.
- What support do farmers need to establish the technologies? While many agroforestry techniques are relatively cheap for farmers to adopt, some will need investment - e.g. to set up a tree seedling nursery. They may also need training, e.g. in propagation, planting and tree tending techniques. See *Domesticating wild fruit trees* and *Adding trees to a mixed farm*.
- Consider the options for commercialisation: if farmers are to sell products from their agroforestry species, they will need access to markets. Is the road infrastructure good enough, or will government need to be involved to improve it? See *Domesticating wild fruit trees*.

### **More information:**

The ICRAF website - <http://www.worldagroforestrycentre.org> - provides background information on what agroforestry is, frequently asked questions, successful examples etc.

### **Using this RRRP in the studio**

In general, the interviews contained in this pack describe the many benefits that well-chosen trees and shrubs offer to farm productivity and to the environment. They can be used to raise awareness about the advantages of agroforestry, but you may wish to advise your listeners of where they can get further information. You could also invite a guest speaker into the studio to comment further on technologies that may be particularly appropriate for your listeners. Here are some issues and questions you may want to address when tackling agroforestry.

**How can trees improve crop yields?** The use of tree and shrub leaves as a green manure, often rich in nitrogen, can be an excellent substitute for chemical fertilizers, which may be either too expensive or unavailable to smallholder farmers. Such tree species can play an important role in food security, or can boost yields to the point where farmers can sell excess produce. Improved fallows can have similar rewards. *Agroforestry for food security*, *Green fertilizer at planting time* and *Gliricidia sepium for field and garden* provide good coverage of this.

**Which trees have the widest range of benefits?** Many species of tree used in agroforestry have more than one use. *Gliricidia robusta* and *Grevillea robusta* can both be used as a source of soil fertility, livestock feed, wood for building or burning. *Faidherbia albida* and *Tephrosia vogelii* similarly have many different uses. The interviews *Green fertilizer at planting time*, *A wide range of benefits* and *Adding trees to a mixed farm* emphasise the value of these multipurpose trees.

**Can poverty alleviation and environmental protection be combined?** Many agroforestry techniques manage to combine these two, sometimes conflicting goals. E.g. domestication of wild fruit trees and planting of species for fuel and timber reduces pressure on forests, while also contributing to family income. *Domesticating wild fruit trees* and *Agroforestry for food security* emphasise the environmental benefits of agroforestry.

**Growing fruit for improved diet and income** Planting fruit trees close to the homestead provides valuable vitamins to farming families, and surplus can be sold. *Domesticating wild fruit trees* and *Promoting fruit tree cultivation* emphasise the value of indigenous trees, while *Adding trees to a mixed farm* features a farmer growing exotics.

**How can trees and shrubs support livestock keeping?** Livestock farmers can benefit from agroforestry species, many of which can provide fodder, including during the dry months. Well chosen species can also be used as livestock-proof fencing eg. for vegetable gardens - see *Protecting crops and feeding livestock* for both issues, and *Adding trees to a mixed farm* for other ways that trees can be integrated into a mixed farm.

**How do land tenure rules affect agroforestry adoption?** The interview *Restoring lost land in Cameroon* could be used to raise this subject, but you would need to supplement this with either another interview or comment by invited guest to explore the issue in the context of your own country.

**What factors encourage adoption of agroforestry techniques by farmers?** Many attempts to introduce agroforestry techniques have failed. You could discuss why this is the case, and better ways of introducing them. The interviews *Agroforestry for food security*, *Promoting fruit tree cultivation* and *Domesticating wild fruit trees* contain several suggestions for good practice in introducing new methods.



## CTA

### *Rural Radio Resource Pack*

2004/3

#### *Agroforestry*

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<i><b>Protecting crops and feeding livestock</b></i> Ansumana Jarjue, Principal Research Officer for agroforestry at NARI in The Gambia explains how agroforestry trees can help livestock farmers.	6'07"
<i><b>Domesticating wild fruit trees</b></i> Ann Degrande of ICRAF in Cameroon tells Martha Chindong how families can benefit from cultivating wild fruit tree species near their homes.	5'36"
<i><b>Promoting fruit tree cultivation</b></i> Lesoga Motoma, Executive Director of the Forestry Association of Botswana explains how her organisation is promoting fruit tree cultivation.	5'45"
<i><b>Gliricidia sepium for field and garden</b></i> Chris Kakunta visits Harrison Chongwe, an innovative farmer who is using <i>Gliricidia sepium</i> instead of chemical fertilizer, with excellent results.	3'57"
<i><b>Adding trees to a mixed farm</b></i> Virginia Wangui Njunge, a mixed crop/livestock farmer shows Eric Kadenge how she is growing fruit and other beneficial trees on her farm near Nairobi.	6'34"
<i><b>A wide range of benefits</b></i> Henry Phombeya of Malawi's Land Resource Centre outlines the benefits of various popular agroforestry species, including those offering soil fertility improvement.	5'29"
<i><b>Restoring lost land in Cameroon</b></i> Researcher Oscar Eyog Matig explains how intercropping of trees and cereal crops, combined with water harvesting, has restored degraded land in north Cameroon.	6'57"
<i><b>Green fertilizer at planting time</b></i> Robin Mlolo, a farmer from Malawi's lakeshore area, describes the many benefits to be gained from <i>Faidherbia albida</i> , the African winterthorn.	5'10"



# Agroforestry

## *Agroforestry for food security*

### **Cue:**

In Zambia's Central Province, slash and burn, or shifting cultivation, known locally as *chitemene*, is the traditional system for food production. For some years, government subsidisation of chemical fertilizers encouraged farmers to abandon the practice, but withdrawal of subsidies in the 1990s saw slash and burn farming regain popularity. This has led to severe land degradation in the province, and hunger is the result.

The Green Living Movement is an environmental organisation that has been working closely with three remote villages in the province, located in Serenje district. After doing an appraisal of community needs in the year 2000, the movement began introducing agroforestry as a way of improving food security and supplying firewood and livestock feed. Emmanuel Mutamba, one of the project workers, spoke to Daniel Sikazwe about the role of agroforestry in supporting sustainable food production in the area.

**IN:** "Agroforestry apparently is a new technique....  
**OUT:** .... so co-operative to the project."  
**DUR'N** 5'38"

### **BACK ANNOUNCEMENT:**

Emmanuel Mutamba of the Green Living Movement, which is introducing agroforestry techniques to Zambia's Central Province.

### **Transcript**

#### **Mutamba**

Agroforestry apparently is a new technique although we could say an old technique but with a new name - perhaps that's the best way. Because it entails managing land in a way that it produces for the present generation and for the generations to come. So in the past there were times when people would grow one crop and let the land fallow for some years so that it recovers. And then they would come and plough on the same land. The slash and burn system was that they would cut down the trees this year and then after they have harvested the crop the following year then they would leave the land fallow so that there is some regeneration. And then they would go back after ten years. Now the problem is that over the past few years the populations have increased so the fallow periods have reduced.

#### **Sikazwe**

*So then how does the new system differ from the old practice?*

#### **Mutamba**

The new system differs in the sense that the species of trees that we are using help the land to recover its fertility in a shorter period. So the fallow period has been shortened. People would be planting the agroforestry trees that would be in the field for maybe two to three years and then they would be able to grow crops again as opposed to times when the fallow period was longer. That's one benefit. The other one is that in agroforestry you are talking about integrated agriculture where people would get benefits from the crops and benefits from the trees. You are talking about growing multi-purpose trees. For example, you can grow trees that will provide people with timber. You can grow trees that will provide people with fruits. And you can grow trees that actually will provide fodder for the

livestock. So you are talking of really a holistic kind of approach to managing the land and the forests.

**Sikazwe** *I've seen a few commercial farmers embarking upon agroforestry but I'm not sure what the situation is like with the rural poor themselves. How are they organised as a community? Are you dealing with them as individuals?*

**Mutamba** No we are not dealing with them as individuals we have organised them into groups. They call them clubs. Some clubs we found them already in existence. The women's clubs for instance, we found them already organised and some clubs we had to help them organise themselves. Because it becomes easier for them to learn together as a group. And for us as partners it becomes easier to source for external support or to conduct training when they are working as a group. So basically that is what we have done. In each village we have five or more clubs in which people are organised.

**Sikazwe** *Let me take you back to the issue of women. I'm sure that when trees are cut it's the women who suffer the most. What is the response to agroforestry in Serenje?*

**Mutamba** I must say that we actually had the best response to this intervention from the women. As you have put it rightly women suffer the most when it comes to problems related to land degradation. When there is no water in the village it is the women who have to walk long distances to fetch water. Firewood, when there are no trees around the village then women have to walk long distances to go and fetch firewood. But our interest has been not necessarily to promote women's clubs *per se*. We have been promoting what we call community development clubs. Because we would like women and men to work together and share their experiences because each one of them has something to bring in.

**Sikazwe** *You have briefly touched on the issue of benefits but I think we need to elaborate a bit more. What are some of the visible benefits in the community with regard to the practice of agroforestry?*

**Mutamba** Well our primary benefit that we are looking at, is to help people improve their household and food security basically because people will be able to practise these sustainable systems. And the other good thing about agroforestry is that it is cheap. There isn't so much that is expensive in the practice. So people have enough food, they have multi-purpose trees from which they can harvest a number of wood products. And also in the long term they will be conserving the environment and they are also improving their quality of life by preserving the environment.

**Sikazwe** *Anything very important that I have not asked about with regard to this project, its management and probably the future and practices?*

**Mutamba** I must say we have been very lucky in this project because the first thing we did was to ensure we took on board the traditional leadership. The chiefs in the area we are working have been very very co-operative. I also must mention that at the beginning when we did an assessment you realise that agroforestry did not rank very highly on the priorities of the people. So people had problems like health problems, they needed a clinic for instance. They also needed a good road to their

villages. They also needed schools, they needed a bridge. So you find that agroforestry I think it ranked further down on the ladder. So what we did was, we didn't want to ignore the other interests or the other issues people wanted to deal with. So we did what we call referral services, where we referred some of these concerns to other organisations. So you see that you don't ignore the other social interests for the people if you want projects like agroforestry to succeed. So we brought in all these other players so that we could solve other social problems. And by so doing people have been so interested and so co-operative to the project. *End of track.*



## Agroforestry

### *Protecting crops and feeding livestock*

**Cue:**

Many agroforestry tree species are known as multipurpose trees, because they can have many different, useful functions in a farm. For example, the same species of tree might provide both food for animals, firewood, and green fertilizer for crop production. In The Gambia the National Agricultural Research Institute (NARI) has been investigating how such trees can be used to answer a range of challenges faced by farmers in the country. Such challenges include the need to protect crops and gardens from roaming livestock, the difficulty of feeding livestock during the long dry season, and severe soil degradation, particularly in the upland areas.

To find out how agroforestry might help farmers to overcome these challenges, staff from NARI made a visit to neighbouring Senegal, a country that already has considerable agroforestry experience. Having learned about a range of technologies, NARI has since developed a package of recommendations for farmers, involving a number of very successful agroforestry tree species. Ansumana Jarjue the Principal Research Officer responsible for agroforestry at NARI explained to Ismaila Senghore how this package, combining different tree species, has been developed.

**IN:** "Prior to going to Senegal we had to consult....

**OUT:** .... As far as farming is concerned it is top on the agenda."

**DUR'N** 6'07"

**BACK ANNOUNCEMENT:**

Ansumana Jarjue, Principal Research Officer for agroforestry at the National Agricultural Research Institute in The Gambia.

**Transcript**

**Jarjue**

Prior to going to Senegal we had to consult, make countrywide consultations of farmers' need for agroforestry in this country. The most important areas of farmers concern in these surveys was need for live fencing. Farmers crying that they have a serious problem with fencing, particularly fencing vegetable gardens, protecting them against roaming animals. The alternative is to create live hedges, that is called live fencing. The other one is because of the low fertility of our natural resource base, soil fertility is a major problem in the upland cropping systems in The Gambia in general. So soil fertility is a major concern. We said there is a possibility of exploring the potential of agroforestry in this area and this is doing very very well in Senegal. And the third one is the feed supplementation of our livestock, small ruminants. The dry season is longer than the wet season in this country. It is too long a dry season that the carrying capacity is no longer there. The grasses get dry and there is no more vegetation cover. So animals suffer, some end up having serious mortality because of the problems around lack of feed. So there are potential multipurpose tree species that can supplement the livestock feed in this country. So these are the three primary areas of our concern that are demand driven. Demand driven, by that I mean farmers are crying for these areas of intervention and, God so good, we are able to meet these technology challenges to be able to implement what we call tree species evaluation. Multipurpose tree species evaluation in three main locations across the country, established in 1998.

- Senghore** *Now what would you say are the most workable combinations, talking about species of trees?*
- Jarjue** To begin with live fencing we have what we call *Acacia laeta*. This is very very very important, it's one of the best live fence materials in the sub-region. Because any good live fencing must have these characteristics of the protection at the base. It has that branching pattern from the soil surface about 5 centimetres up to 10 centimetres, not more than that. So you can see that lower branching is its major characteristic that makes it a very good live fencing, and it is very thorny. And the next benefit of that species is that it is edible to livestock and branches can be used as fuel wood to some extent when you are pruning or weaving. Livestock fodder you talk about *Gliricidia* and *Leucaena*. These are very very good livestock fodder species. *Leucaena* is meant for cattle and so on. And then *Gliricidia* is well managed under very good conditions, shade conditions, shade drying and processing to meet the requirement of the small ruminants. You can imagine how beneficial this is in substitute to groundnut hay that's almost costing the same price as groundnut pods, which is very scarce in the market now because it is very expensive. Now the soil fertility species, we talk about *Acacia albida*. In the dry season it accumulates a lot of green biomass. But in the rainy season it sheds all the leaves and these leaves are very nitrogen fixing. This litter fall is able to make up the soil fertility that has been depleted by crop residue removal. So we use combination of these species to make a production system function. For example you have your fodder bank in the farm and then you have the same field perimeter enclosed by a live hedge of thorny materials. That is called live fencing. Then within the same field you have soil fertility improvement species like *Acacia albida*.
- Senghore** *What would you think would be the scenario in terms of economic benefit for the country and for the farmers?*
- Jarjue** Apparently Mr Senghore, there is a lot of savings in substitution from cement wall construction, barbed wire construction to protect your garden, to protect your farm produce, to replace that with live fencing. An economic analysis has been conducted after we did our species evaluation trial. It was just too great, over 200% economic gain. You can imagine! Apparently when you talk about fertiliser, chemical fertiliser, you know well about it, nobody should mention it. It's very very expensive, there is no subsidy on it presently in this country. We said how can we maintain the carrying capacity of our soil? It's mainly to plough back our natural resources into the soil through manipulation of these shrubs and trees species pruning. There is a problem in the landscape, in the farmland, particularly in the upland cropping systems. You can hardly see four big trees in one hectare because of what? It's been deforested. Mainly because of mechanisation. Agroforestry now is calling back these trees into the land to be able to have a compromise between mechanisation and trees presence in the fields by what you call parklands, planted by human beings. We will plant them in a geometry that is favourable to mechanisation. Trees have run away from the crop land because of the deforestation, now we want to bring them back.
- Senghore** *Now what would be the limitations of agroforestry in the country?*



- Jarjue** The fact that we have resource constraint in terms of mobility. Really that's the worst bit. So all we have to do mostly is to be able to have an outreach programme. To meet our clients here, to meet the farmers, the target beneficiaries. We have given them the planting materials through the NGO's, through individuals who are able to put up these technologies. We want to see what is happening at the field level, it's just too much an area.
- Senghore** *So you mean the farmers are willing to take on the technology and they are motivated enough?*
- Jarjue** In fact they have already adopted the technologies particularly live fencing and this livestock fodder and feed, as well as soil fertility interventions. So what we want to do is to scale up and widespread adoption of the technology is what we are advocating for. And this requires high level mobilisation. So that's why we are closely linking with NGO's who have the resources to be able to mobilise their staff to be able to follow up what we have implemented with them through partnership at the field level. People really need to come into agroforestry, that is the word. We really see the benefit of agroforestry. It is world-wide recognised and our farmers are really putting it high on their agenda in terms of development. As far as farming is concerned it is top on the agenda. *End of track.*



# Agroforestry

## *Domesticating wild fruit trees*

### **Cue:**

In Cameroon, as in other parts of Africa, people derive many benefits from wild, or indigenous, tree species. They are an important source of food and medicines for farming families, and can also be a source of income. However many forest fruit trees are being lost through deforestation and farmers are having to walk farther and farther from their homes to harvest them. One solution to this problem is for farmers to plant wild fruit species near their homes, a process called domestication.

Ann Degrande, who works for ICRAF, the World Agroforestry Centre, in Cameroon, has been part of a programme to support fruit tree domestication. She spoke to Martha Chindong about the benefits indigenous fruit trees can offer, both to farmers and to the environment, and about the challenges facing farmers who want to earn income from their fruit. Martha began by asking whether the programme itself was supplying farmers with tree seedlings to plant.

**IN:** "The technology we are developing now is tree domestication....  
**OUT:** .... will get him a more diverse package of income."  
**DUR'N** 5'36"

### **BACK ANNOUNCEMENT:**

Ann Degrande of the World Agroforestry Centre on how planting indigenous fruit trees benefits both farmers and the environment.

### **Transcript**

**Degrande** The technology we are developing now is tree domestication and we want people to select their own trees. So the best trees they can find in their environment. We teach them how to multiply, how to propagate those best trees that they can find in their environment. However, sometimes farmers in a particular village are asking for new species, for new trees that they can't find in their environment. And then we try to link them up with other communities, with other farmers in other areas that have those trees on their farms. And we try to develop a kind of exchange of seeds or vegetative material.

**Chindong** *What are the environmental aspects of it, are they really achieving anything?*

**Degrande** That is a very interesting question, and the great advantage of agroforestry is that it can combine poverty alleviation and environmental protection. Because we are talking here of planting more trees to help farmers to get more income but by planting those trees we are also protecting the environment.

**Chindong** *You talked of fruit trees or domestication. I wanted to find out whether these trees they plant only help for environmental protection or they have other benefits from the trees?*

**Degrande** Trees usually have a lot of benefits. Trees can give fruits that can be sold on the market that can give income. The same fruits can also be eaten, consumed by the household and that has advantages for everybody in the household to have a

more balanced diet, to have more vitamins, to have more minerals in their diet. The other benefit that trees have is that they can provide firewood, they can give shade, they can also protect against wind. Trees have many benefits and that's the good thing about trees.

**Chindong** *Ann, if I can get you well, it means that as of now you don't have any problem with farmers accepting the new techniques of agroforestry, your problem is only to extend the technique?*

**Degrade** No, that would be too much said. There are always problems when you introduce a new technology. First of all there is the problem of sensitising people. People need to be sensitised and informed about the new technique and the benefits of trees and the benefits of tree domestication. That is the first thing. The second thing is adopting new techniques and especially vegetative propagation needs some initial investment. You need for instance to set up a nursery, that requires some financial means, that sometimes individual farmers cannot have. Sometimes farmers group themselves and try to generate the necessary means to set up a nursery. But sometimes they need some help, they need financial support, maybe in the form of credit from NGO's or the government. And then another thing is about the marketing, the commercialisation of the tree products. In Cameroon a lot of tree products are consumed widely, they are in the markets. But there are a lot of problems for farmers to get to those markets. There is for instance bad infrastructure, the roads are not good and that means that a lot of this fruit especially the perishable fruit remain in the village and cannot generate income for farmers although they are demanded in the market. So there is a whole issue of infrastructure and even support to farmer groups to commercialise their tree products. And that needs some attention I think from support organisations and even from government.

**Chindong** *Considering the villages that you work with can you picture your farmers with hectares of agroforestry gardens?*

**Degrade** I think it's a progressive thing. What we first try to promote is that at least every farmer has some fruit trees or some beneficial trees on his farm or her farm. So we don't exclude that some of the more enterprising farmers, they can go for hectares and hectares of fruit trees. There will be some farmers who will do that but the majority of farmers they will integrate trees in their cocoa farms, they will plant more trees on the boundaries of their farm, they will plant better trees in their home garden and that's how they will get more out of these trees. Another thing is that we are also developing approaches to help to assist farmer groups to market their products as a group so that they get more bargaining power. So those are the kind of things we are looking at and we want to make small changes but that will mean something to the farmer that will get him a more diverse package of income. *End of track*

# Agroforestry

## *Promoting fruit tree cultivation*

### **Cue:**

While the planting of trees in homesteads and crop land is a traditional practice in many areas, in other places it is a more recent innovation. And even though the benefits of trees on farms are now widely recognised, organisations that aim to spread agroforestry techniques still have to plan their approach carefully. In Botswana, for example, an NGO called the Forestry Association has, since 1983, been working to reverse the destruction of natural woodland. One recent project has been the promotion of fruit trees on homesteads. But getting a 'new' technology like this widely accepted has required the organisation to work through local chiefs and through schools, as well as offering incentives to the farmers themselves. Lesoga Motoma, Executive Director of the Association spoke to Busani Bafana about the work.

**IN:** "Farmers like to develop....

**OUT:** .... acquired from primary level and secondary level."

**DUR'N** 5'45"

### **BACK ANNOUNCEMENT:**

Lesoga Motoma, Executive Director of the Forestry Association of Botswana, was talking to Busani Bafana.

### **Transcript**

#### **Motoma**

Farmers like to develop but then the question sometimes is the practicability of those methods whether they can afford to do that. Taking into consideration that the land which they have been given are just small plots, but they would need a larger chunk in its entirety. Unless they come together as communities in woodland management projects - be it agroforestry or anything - but when they come together then they can be able to get larger chunks of land to manage sustainably.

#### **Busani**

*You have talked about the challenge that has faced your Association, in effect promoting a fully fledged agroforestry. But you have recorded some successes in planting indigenous trees even for orchards. Tell us briefly about that.*

#### **Motoma**

I wouldn't say for orchards, that is a big thing. But the other thing that we have done which is still in the line of agroforestry is the homestead one, where people planted trees in their own homesteads. They would plant three indigenous species, one of which would be a fruit tree and they would plant two exotic species, one of which would be a fruit tree. And in that way, that was the agroforestry of the home, which would also provide shade, it would provide some form of firewood, it would also provide some form of soil fertility. We are encouraging Batswana people to plant the indigenous species so that they can maximise the benefits from them. The benefits mainly being that they don't have to water them as much, they are frost resistant when they are in their right environment. They can withstand the termites, the poor nutrition of the soil also is OK for them because they sink their roots quite deep. They can also stand the drought because they tap water from quite deep. So that's basically what we are encouraging the farmers, even at their homes, to do. We are not only limiting

ourselves to big farmers; even the upcoming ones in schools we are also targeting and we are encouraging all the facets of agroforestry in the schools, and also targeting the teachers to teach agroforestry as they teach their agriculture curricula.

**Busani** *I notice in the summary of the Association's performance you indicate that to date we have planted indigenous trees in the 64 villages in approximately 7,250 households through the Home Tree Planting Programme. How easy has this been to get the involvement of the communities?*

**Motoma** I would say we were successful because we approached it the traditional way. We went through the chiefs and we used the Kotla system. The Kotla system is where the local gathering area that is called by the chief. So that is how we would come in. And people would embrace this around the home tree planting, and then that's when we would discuss on how best to do it. And that is how we have been successful. Although since people didn't quite believe so much in indigenous tree planting, at the beginning when they started they would take care more of the exotic species than the indigenous. But because we also had incentives for those who had 100% or 80% survival some would just go along so that they get those incentives, which were two grafted citrus fruits. And because they wanted that they would take care of the indigenous species as well. And in that way since the indigenous species would only need that one year to be taken care of, then they would get established and thereafter need not much attention. And that's how we have managed to succeed. But we lost out on those who were sceptical at the beginning or the laggards who would come after everybody else had gone because by the time they came we had already passed to another village. We wouldn't go back to the same village the same time. This is one thing that we have learnt that in future we will have to stay in one area for more than a year.

**Busani** *And what does the future hold? What do you hope to do in the future as far as expanding your programmes?*

**Motoma** We still have a lot to do. We need to go back to communities and get them together because that's the way to go now. And on agroforestry encourage the inter-cropping of horticulture, trees, both exotic and indigenous because we can't cast out the exotic trees, there are those ones which are good. We would also like to move aggressively into soil conservation and addressing the energy issue of using fuel wood because now people are cutting live trees for fuel wood and that is very bad for a fragile environment like Botswana. We also would like to continue with the schools - to target primary schools, to target secondary schools so that they grow up with the knowledge of planting trees, of agroforestry and all the interventions of woodland management or environmental management. So that even when they grow up wherever they go to work, whatever career they choose, they would have that basic knowledge in them, having been acquired from primary level and secondary level. *End of track.*

## Agroforestry

### *Gliricidia sepium* for field and garden

**Cue:**

*Gliricidia sepium* is a tree with many uses. Originating in the lowlands of Central America, the tree is now planted widely across the tropics, and is commonly used as a living fence species. Its nitrogen-rich leaves can be used as a mulch or green manure; adding the leaves to the soil improves crop production by boosting soil nutrients, controlling weeds, conserving moisture and reducing soil temperatures. Its leaves can also be used as fodder, especially for ruminants, and its branches make good firewood and building materials.

In eastern Zambia, the World Agroforestry Centre has been working closely with farmers to develop better ways of using this versatile tree. Chris Kakunta spoke to one of these farmers, Harrison Chongwe from Chipata North, about how cultivating *Gliricidia sepium*, and using the leaves as a green manure, has affected his productivity, both in his maize fields and in his vegetable garden.

**IN:** "This tree is a tree that will continue....  
**OUT:** .... have palatable vegetables on their plate."  
**DUR'N** 3'57"

**BACK ANNOUNCEMENT:**

Chris Kakunta was talking to Harrison Chongwe, known as the Professor because of his agroforestry innovations.

**Transcript**

**Chongwe** This tree is a tree that will continue to supply fertility into your garden because once you plant it, you plant it at least for a long time. You can cut the stump, it will re-shoot, regenerating each time supplying leaves every season.

**Kakunta** *We are right up in your garden. Could you just show me some of the vegetables that you have grown and perhaps also show me exactly what type of leaves you have put in the soil. Let's go and show me.*

**Chongwe** Yes sure.

**Kakunta** *I can see that you have some onion here and some cabbages. What did you do to these crops, they look so beautiful?*

**Chongwe** Oh yes, in this area here, this is the red creola onion and I've applied *Gliricidia sepium* leaves, we call it biomass technology. We have got a first bed of onions, a second bed of sugarloaf cabbage, in fact six of them I have been applying, have incorporated them with *Gliricidia sepium*.

**Kakunta** *With the leaves?*

**Chongwe** With the leaves.

**Kakunta** *So the leaves are actually helping you fertilise your crop in the main field as well as in the garden?*

- Chongwe** Yes it does. So researchers have come up to say a farmer could be helped for two seasons possibly. During the rainy season we can apply biomass in the main field, but off-season it could be useful in somewhere. So they have come up with a good answer to say, can't we try it on a dimba, in the garden?
- Kakunta** *And it's working also well?*
- Chongwe** And it is working so well.
- Kakunta** *So are you benefiting from this technology Mr Chongwe?*
- Chongwe** Yes very much so because it has saved me with the fertiliser headache.
- Kakunta** *So in terms of the yield, how different is this yield compared to when you were applying fertilisers?*
- Chongwe** Previously if fertiliser could come in good time it could put up a good yield. But of late, during the past ten years there has been an erratic supply of fertilisers. So you cannot say I had a good harvest time previously but this time my harvest is steadily increasing.
- Kakunta** *Obviously one would say why did it take so long for you to actually embark on this project? You didn't know about it?*
- Chongwe** No, the thing is when you are given trials by the researchers each project has got its own advantages or disadvantages. But in this one here the only disadvantage is the labour that is involved, there is intensive labour. It takes time to learn, that is what I can say. But now this technology is settling with me, I can do anything, I've got my own innovations as you can see.
- Kakunta** *In fact I'm told they call you Professor in this area? Why do they call you Professor?*
- Chongwe** That name came as a professor because the retired general at the head office paid me a visit. And seeing my work that we have done as partners, researchers and the farmers, they were impressed.
- Kakunta** *Wonderful. Now as we come to the end of the interview Mr Chongwe, what would you like to tell your fellow farmers who are yet to practise this concept?*
- Chongwe** My word is to encourage them to participate in this technology. This technology is very much free. Anybody can take it. If they have got a dimba they should also try it on the dimba and they will have palatable vegetables on their plate. *End of track.*



## Agroforestry

### *Adding trees to a mixed farm*

**Cue:**

The benefits of mixed crop and livestock farming are well known. Livestock produce manure which can boost soil fertility and crop production. Those crops produce by-products, such as maize stover, which can be used to feed the livestock. Planting trees on a mixed farm can increase whole farm productivity even further, particularly if farmers are careful in their choice of species. Eric Kadenge recently visited a farmer in Kikuyu division, not far from Nairobi, who has introduced a wide variety of tree species to her farm. Having discussed her use of agroforestry, Eric also spoke to the extension officer responsible for Kikuyu division, and sent us this report.

**IN:** "I am standing on a two acre....

**OUT:** .... even the watering and caring for them ."

**DUR'N** 6'34"

**BACK ANNOUNCEMENT:**

John Kibuika ending that report from Kikuyu division near Nairobi in Kenya. The farmer Eric spoke to was Virginia Wangui Njunge.

**Transcript**

***Kadenge***

*I am standing on a two acre farm in a place known as Muguga that is about 20km west of Nairobi. And right now from where I am standing, there are some nice and healthy-looking cattle on my left, there is also some cabbages, some sugar cane, some arrow roots and a number of fruit trees and many other trees on this farm. And today I will be talking to a lady who practises mixed farming, and she will be telling us more about her farming and the trees especially and of what benefit they are to her.*

***Wangui***

My names are Virginia Wangui Njunge. I am a retired teacher, I do farming - mixed farming - I keep cattle, I also grow fruits like avocado, guavas, I also grow apples on my two-acre land. I also grow beans, tomatoes cabbages and sukuma wiki.[Kale]

***Kadenge***

*Well that sounds like quite a large variety of crops. Now next to us is a tree that has got some bright and broad looking leaves. Let's start with this one. What tree is this?*

***Wangui***

This one is an avocado tree. I have two trees and they give me fruit, which I sell and get some money.

***Kadenge***

*Okay let's move on now to these other smaller looking trees. What trees are these?*

***Wangui***

This one is the apple tree. It has been grafted and it gives me fruit as you can see them and I sell them. Now they have been flowering. You can see some have got fruits also they have got flowers. You can see that there are no weeds. So I always pull the weeds so that they can do the flowering nearly all the year round.

***Kadenge***

*And what fruit is this that we have here right now? Could you just pluck one?*

**Wangui** Guavas. They are fruits, I also sell some and children use the others.

**Kadenge** *Okay. And this certainly looks like a mango tree is it?*

**Wangui** Yes it is a mango tree. It has now taken two years, but it has not started giving fruit because it was not grafted this one. It failed the first time but I am planning to do it again. If I graft it, it will give me fruits soon.

**Kadenge** *Now are all your fruit trees grafted or some of them are not?*

**Wangui** No they are all grafted - all of them.

**Kadenge** *And what was the reason for grafting them?*

**Wangui** To make them start flowering soon instead of taking long time so they flower quickly when they are grafted than when they are not grafted.

**Kadenge** *Now earlier on we saw some cows just as I was entering your farm and you have talked about manure. Do you get your manure from the cows?*

**Wangui** Yes. I get a lot of manure from those cows because I have zero grazing so I get a lot of manure from there.

**Kadenge** *And do you mix the manure from with cow with any other manure - maybe from the vegetation on the farm?*

**Wangui** Yes I do because I have got a compost pit so I get the manure from there. Afterwards I put some weeds and all the leaves, the dry leaves, and so I mix them and then spread them on my farm.

**Kadenge** *Okay let's walk over to the other side of the farm. Now we are walking down to an area where there are eucalyptus trees being grown, but just before we get there, we have some grass here. What grass is this?*

**Wangui** This is Napier grass which I use to feed my cows.

**Kadenge** *I notice that in between the Napier grass there are some small seedlings. What trees are these?*

**Wangui** Grevillea.

**Kadenge** *And what is the benefit - why are you planting this tree on your farm?*

**Wangui** They give food to the cows and also it helps my farm - I have planted it where it is not very fertile.

**Kadenge** *So it also is able to enrich the soil fertility?*

**Wangui** Yes it is.

- Kadenge** *Okay let's move nearer to the eucalyptus trees.*
- Wangui** *Yes these are the ones which I have planted on half an acre.*
- Kadenge** *And the benefits of the eucalyptus to you?*
- Wangui** *They grow very fast and also they will give timber and also firewood and that is why I have planted them.*
- Kibuika** *My names are John Kibuika. I am an extension officer in Kikuyu division. So my work is to co-ordinate extension activities in the division whereby there are livestock, there are crops, that are grown and all rely on extension. Of course when I mean crop/livestock farming it also encompasses agroforestry.*
- Kadenge** *Yes, in fact I was going to mention right now I can see something that looks like a seed bed. Could you just explain to us what little trees I am seeing here are and some of their benefits?*
- Kibuika** *We have a number of different type of trees. Like we have the *Grevillea robusta*. They are fast growing, they are also very good for wood. They also provide the foliage part of it. The leafy part of it are fed to the animals during the dry period whereby we have nothing to give to our animals. They are also very good in soil fertility because of their leaves fall quite frequently and they decompose very fast. So they also improve soil fertility. We also have another tree called the neem tree, which are good for medicinal value. They prevent and also heal malaria and other diseases. We have the Eucalyptus, the blue gums, which are very fast growing especially this variety from South Africa which grow within five years, they mature within five years. And we get poles from them, also they are very good for charcoal and they are also very important in preventing soil erosion.*
- Kadenge** *And so are you involved in making sure that such nursery beds are taken well care of and made in the right way?*
- Kibuika** *That is actually our work. We had a demonstration sometime back whereby we showed them the way to go about making a nursery just from the beginning. The way to lay a nursery bed, filling the poly tubes and of course even transferring the small seedlings to the poly tubes and of course even the watering and caring for them. *End of track.**



# Agroforestry

## *A wide range of benefits*

### **Cue:**

While agroforestry, as a science, is quite new, in fact farmers have been enjoying the benefits of having trees on their farms for generations. Some trees, for example, produce nutrient-rich leaves which, when they fall on the soil, act as a natural fertilizer. In the lakeshore areas of Malawi, *Faidherbia albida* trees, known locally as msangu, are often left by farmers, who recognise the fertility benefit they give. But agroforestry is about more than just increasing soil fertility. Carefully chosen trees and shrubs, if planted on farms, can provide a huge range of benefits, from building materials to insecticides. Excelllo Zidana recently spoke to Dr Henry Phombeya, Project Co-ordinator for Malawi's Land Resource Centre, about the many advantages of having trees on farms.

**IN:** "There are several and normally I like dividing them....

**OUT:** .... agroforestry really can help to boost crop yields."

**DUR'N** 5'29"

### **BACK ANNOUNCEMENT:**

Dr Henry Phombeya of Malawi's Land Resource Centre, talking to Excelllo Zidana.

### **Transcript**

**Phombeya** There are several and normally I like dividing them in two categories. We've got some technologies that are dealing with soil fertility improvement and for these we use shrubs like *Tephrosia vogelii*, *Sesbania sesban*, and trees like *Faidherbia albida* locally known as *msangu* or *mtete*. And then there are some technologies that are to do more with afforestation. And here we have trees like the Sennas, *Senna spectabilis*, *Senna siamea*.

**Zidana** *What are the other forms of agroforestry that you have been using or that you know?*

**Phombeya** There are other forms yes of agroforestry technologies. For example we can talk of biomass transfer. These are instances where you've got trees that are planted say as boundaries around your farm. You can at times prune the branches, take the biomass that you realise from there and apply it to your field. That has proved to be a very important technology and crops have improved under such systems. And then when you get the leaves like that you have the branches and of course the tree you can use for fuel wood. So you have got two benefits here. Not even two, three. You are improving soil fertility, you have the trees that are demarcating your boundaries to avoid conflict with your neighbours and then you've got the fuel wood which is a very important factor now that there is rampant deforestation.

**Zidana** *When we look around in the villages in Malawi we have discovered that a number of farmers have taken up the technology of using *Tephrosia vogelii*. What are the specific advantages regarding this shrub?*

**Phombeya** *Tephrosia* it's a very important shrub in that first and foremost it has got a very good biomass that when we incorporate in the soil it helps to build up organic

matter. And at the same time it's a legume, it fixes nitrogen. That's contributing to soil fertility. But up and above that *Tephrosia vogelii* has got some insecticidal properties. If you crush the leaves of *Tephrosia vogelii* and you've got maize stalk borer, you put it in the maize funnel the maize stalk borer goes away. So it has got that insecticidal property that is a very important component.

**Zidana** *You also talked about the tree which is locally known as msangu in Malawi.*

**Phombeya** *Faidherbia albida*, that is the scientific name.

**Zidana** *Faidherbia albida. Now if we talk about the lake shore areas, these trees are numerous, they are all over. Do the farmers realise the importance of retaining or keeping these trees?*

**Phombeya** Yes I did research on *Faidherbia albida* specifically. And in the survey that we conducted it showed that people value these trees and they deliberately leave them on their farms. And asking them about why they leave them there their answers were, if you plant maize underneath a *Faidherbia albida* tree it does very well and you've got a variety of crops that can be grown underneath it. So in a way they know it's an important tree.

**Zidana** *So they are convinced that if you are using these trees definitely the fertility of the soil may be improved in one way or the other?*

**Phombeya** Yes, they are aware of that, only that they don't know exactly what happens for that fertility to come about and that's the work of the scientist.

**Zidana** *You have been talking about the trees like Leucaena but now we haven't seen you doing much on the Leucaena. Is there any problem?*

**Phombeya** Yes *Leucaena leucocephala* was a very important tree in those old days when agroforestry just came into the picture. But as we were working with it a terrible pest attacked it. That pest is called psyllid; it's a pest that attacks the leaves, the tender leaves of *Leucaena* and it devastates the whole tree. A very dangerous pest.

**Zidana** *But the animals enjoyed consuming or eating the leaves from the Leucaena tree?*

**Phombeya** It was a very good fodder, highly nutritive. But all is not lost because breeders are looking at other species of *Leucaena*, like *Leucaena pallida*, *Leucaena esculenta*. They are looking at *Leucaena* that have resistance to psyllid attack.

**Zidana** *How do you look at farming if many people adopted this concept?*

**Phombeya** If people adopted agroforestry, like others have already done, productivity of their farms will be very high. We compared fields where we had just maize growing on its own and a plot where we had maize and then the agroforestry species and a bit of chemical fertiliser. The differences in yields were just too high, over 200%. So agroforestry really can help to boost crop yields. *End of track.*

# Agroforestry

## *Restoring lost land in Cameroon*

### **Cue:**

In much of north Cameroon the clay soils are very sensitive to erosion. With the pressure of increased population, fallow periods have shortened and land degradation has become severe. An estimated 30% of land in the area is degraded, and nearly 20% has been abandoned. So, in a joint venture, soil scientists and foresters have for some years been working with farmers to try to find ways of regenerating the lost land. And by combining tree and crop species, and using existing water harvesting methods, they appear to have developed a sustainable system that can restore productivity to these abandoned fields. Tunde Fatunde recently spoke to one of the researchers, Oscar Eyog Matig, to find out how a simple intercropping of crops and trees could bring lost land back into production. But Oscar began by explaining that their initial efforts had not been successful.

**IN:** "The first step was that scientists tried to use very heavy machinery...."

**OUT:** .... Are needed? Yes."

**DUR'N** 6'57"

### **BACK ANNOUNCEMENT:**

Oscar Eyog Matig on a research project that has been helping farmers to restore degraded farmland in north Cameroon.

### **Transcript**

**Matig** The first step was that scientists tried to use very heavy machines to plough the land, to allow the land to increase its water holding capacity. And after two years we discovered that the soil will come back at the initial level of degradation.

***Fatunde*** *So two years of wasted effort?*

**Matig** Because you have a very good yield of cotton or rice the first year but later on, two or three years after the yield becomes as it was at the beginning.

***Fatunde*** *Then what was the next solution to that?*

**Matig** The next solution was how to sustain this. To sustain it we need to continue to harvest water and secondly to provide people and the land with crops which will continue to provide products to the farmers.

***Fatunde*** *Yes and what are these?*

**Matig** And the practice that we used was farmer practice. The way they are harvesting water in that type of land and they are digging small dams, with all of those practices which can harvest the maximum of the rainfall. The species that we planted was tree species that have available water all the time and because of a lack of amount of water we decided also to make inter-cropping.

***Fatunde*** *Inter-cropping between what kind of trees and what kind of crops?*

- Matig** As the water was in a very huge quantity we decided to use rice.
- Fatunde** *Rice.*
- Matig** And for the trees, we used two types of trees. The first one is what we call *Acacia senegal*, which is producing Gum Arabic.
- Fatunde** *So Acacia senegal means Gum Arabic trees?*
- Matig** Yes and the second was a fruit tree, local fruit trees which is called a marula but the scientific name is *Sclerocarya birrea*
- Fatunde** *Two trees?*
- Matig** Two trees.
- Fatunde** *Now how did you marriage, through inter-cropping, these two trees and rice?*
- Matig** You have the rice in the middle because the trees are planted 4 metres by 4 metres and in between you have the rice.
- Fatunde** *What purpose do the trees serve?*
- Matig** With this system we have three advantages. The first is that we have almost lost 20% of the farmland in the region which we have now recovered. The second benefit is that we have planted a crop. Even if you are planting it only the two first years they can use it as additional, add value. Now for the third benefit, is the trees. You have Gum Arabic which is well known in the world, used to produce this chewing gum, used to produce coca cola. And you have also *Sclerocarya birrea* which is a fruit, a local fruit tree. Those ones will continue providing a product for the farmers.
- Fatunde** *While at the same time rice production is going on seasonally?*
- Matig** Yes.
- Fatunde** *After two years or three years of this experimentation what was the reaction of the farmers who were working on a pilot project?*
- Matig** The farmers were very surprised because for them this land was lost completely and they have noticed that we have regenerated the land. So for them it's a very... even if it was the only success of the project it was enough.
- Fatunde** *But that was not the only success of the project?*
- Matig** But it was not the only success, they were producing crop as inter-cropping and it was another success for them because they were involved, it was they who were planting those crops and harvesting it.
- Fatunde** *Did they also go ahead to multiply, reproduce this experiment on their own farms?*



- Matig** Yes. Let me tell you one thing which is a major concern for the farmer to implement the same system by his own. There is a problem of land tenure. Whenever you have to plant a tree you should be the owner of the land. It is only those who are owners and mainly the chief who are able to implement the same system.
- Fatunde** *Were they also able to have enough money to also build wells and so on?*
- Matig** Yes because as I told you the system we use was learned from the farmers. Even the well or the small dams they are doing it themselves for other purpose. They are doing it for what we call a very specific variety of sorghum, we call muskwari. We are doing it already.
- Fatunde** *Oh, they were doing it. What you people did was to do inter-cropping now?*
- Matig** Now it's only awareness, to tell them that what you are doing with the sorghum you can sustain it by putting very very important species and permanent species which can provide them incomes. When an *Acacia senegal* is well managed you have the Gum Arabic forever.
- Fatunde** *I see. Now going back to the farmers, since you've visited some of them, how did you evaluate the progress you saw from what they learnt from your pilot project?*
- Matig** The progress in the farmer when you have a new technology is very slow because the farmer was very happy to implement it as soon as possible. As I have told you they have the land constraints but this can be solved because it's a problem of meeting local authorities and also it's at policy level. So this can be solved. Technically what we found was that few farmers have started planting their own trees within the farmland. So when they started planting trees within the sorghum land it was an improvement. What we noticed was a very big demand of tree seedlings by farmers.
- Fatunde** *So how do you see the future of this inter-cropping system you have introduced among the farmers in northern Cameroon? What is your own evaluation based on what you saw in the ground?*
- Matig** What I saw on the ground is that this technology can quickly take off but they need some assistance, a policy support by the government and technical support by the scientists in the region.
- Fatunde** *Are needed?*
- Matig** Yes. *End of track.*



## Agroforestry

### *Green fertilizer at planting time*

#### **Cue:**

Normally, when the rains end and the dry months begin, we expect trees to drop their leaves and for the landscape to become increasingly brown. But in the lakeshore areas of Malawi, one species of tree is breaking the rules. The African winterthorn is very unusual; it is covered with green leaves throughout the dry season, but sheds them at planting time, when the rains arrive. This characteristic makes it a very useful species for farmers, and as a result, this African tree has now been successfully introduced in Asia and South America. Grown together with cereal crops such as sorghum, millet and maize- and even in flooded rice fields - the tree is able to improve soil fertility and provide much needed shade for people and livestock during the hot months.

To find out more about this unusual tree, Patrick Mphaka visited Salima district, an area where for generations farmers have been leaving these trees to grow in their fields. He sent us this report.

**IN:** “It is not the most beautiful....

**OUT:** .... fast growing tree here in Salima, than to other places.”

**DUR’N** 5’10”

#### **BACK ANNOUNCEMENT:**

Robin Mlolo ending that report from Salima district in Malawi. The African winterthorn, *Faidherbia albida* is in fact able to grow well in many different environments, from low lying areas to high savannahs and woodlands.

#### **Transcript**

##### ***Mphaka***

*It is not the most beautiful of trees when you look at it. It has thorns. It sheds its leaves with the rains and is green during the dry season. When fully grown, it is a large deciduous tree to 30 metres high, crown wide and rounded. The list of its uses is endless. Welcome to the African winterthorn, also known as Acacia albida, or Faidherbia albida. Here, it is locally known as Msangu.*

*Now that agroforestry, and Faidherbia albida in particular, is being promoted country-wide by the Ministry of Agriculture, this district has become a demonstration district. I came over to see what I never saw of the tree, and know what I never knew. I chatted with Mr. Robin Mlolo, a local farmer in Traditional Authority Maganga in the district. I found him working in his field.*

##### **Mlolo**

These trees are most useful here. We use them as soil fertility trees. And in most times in our gardens, we don’t apply fertilizer. These trees act as fertilizer in our fields.

##### ***Mphaka***

*For other trees, we avoid the cover which the leaves of trees do give to the crops because sunlight does not reach the crops. What happens with these big trees, do you tolerate them to hinder sunlight from reaching the crops? What happens?*

- Mlolo** In other trees, there is a shading effect to our crops. But to this tree, which is *Msangu*, it is a special tree. This is how God has created it. In the beginning of the rains, is the time when it is shedding its leaves.
- Mphaka** *So it sheds the leaves, it doesn't have the leaves?*
- Mlolo** Yes, during the cropping period, it doesn't have leaves.
- Mphaka** *But the leaves are there when people have harvested?*
- Mlolo** Yes after harvesting, that is when it starts producing the leaves.
- Mphaka** *And you use the leaves as fertilizers?*
- Mlolo** As fertilizers.
- Mphaka** *These are very big trees and they are very old indeed. Is there anything which the people here are doing to make sure that these trees do not finish as we know that most people use the trees for firewood as well as for making charcoal?*
- Mlolo** Yes, there are many projects which are going on here in Salima, mainly in replanting this tree to other fields or other gardens. These projects are helping us also to maintain these species in our gardens. We know the usefulness of these trees, mainly the leaves. It's hard for a farmer like me to cut down this big tree, *Msangu*. If I want, I can just cut the branches and leave the whole tree.
- Mphaka** *You do that because you know the usefulness of the trees?*
- Mlolo** Yes, the usefulness of the tree.
- Mphaka** *What are other uses which these trees are used for?*
- Mlolo** These trees are mainly useful to us, we can use it as a medicinal tree. And also we can use it as a shade to people like us, and our animals mainly during the hot season, it's when it gives the leaves while other trees are shedding off the leaves. We can also use this tree for poles, building our houses, whatsoever. Firewood, and also the pods of this tree, if they fall down, it can be as feed to our livestock.
- Mphaka** *Oh I see. Like when I was coming over here, I saw that one of the big trees there has got a hole, and I found that there were some bees.*
- Mlolo** Okay, okay, I forgot. We can also harvest honey in our trees. That is my honey. We can also put some beehives on these trees. You can see one over there. But do not go near, because bees sting.
- Mphaka** *You use *Msangu* as we have seen, do you apply any amount of fertilizer in these fields?*
- Mlolo** No, no, no. We don't apply any fertilizers. The funny thing is that when we are using these *Msangu* trees, we can raise our crop production from 50%-250%, which is similar to fertilizer application.

- Mphaka** *And maybe we can say higher because for the fertilizer, you have to buy and you use some money there?*
- Mlolo** Yes, yes, yes.
- Mphaka** *Whereas this one is almost free?*
- Mlolo** It's almost free, yes. We do not use fertilizer here.
- Mphaka** *How easy or difficult is it to propagate or to plant Faidherbia albida in other areas other than this lakeshore area?*
- Mlolo** Here in our area, it's a hot area. These trees favour hot areas. And you can see the soils are almost sandy. So it is a fast growing tree here in Salima, than to other places. *End of track*