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# Pack 101, Item 11

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**Farmers improve yields with traditional soil-building practices that restore and fertilize damaged soils**

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### Notes to broadcaster

Burkina Faso is a country in the heart of West Africa. Desertification, or progressive drying of the land, has grown worse in the country over the last four decades because of drought. Water and wind erosion and the impact of human activities such as farming have significantly degraded soils. Scarce and irregular rainfall also makes farming difficult, and climate change further complicates farmers’ lives.

But farmers in the Central Plateau of Burkina Faso are having success tackling this situation with traditional techniques such as *zai*, demi-lunes and stone lines. Indeed, much land that was damaged is now suitable for farming and farmers are receiving better yields.

In this script, we meet with local farmers and an agricultural expert who share their experiences in restoring degraded land.

This script is based on real interviews.

You could air this script on your station, using actors to represent the characters. If so, make sure to inform your audience at the beginning of the program that the voices are those of actors, and not the people involved in the original interviews.

You could also use this script as inspiration to research and develop a radio program on ways to revive damaged soils and degraded lands in your own area.

If you choose to use this script as inspiration for creating your own program, you could talk to farmers and other experts, and ask the following questions:

* If there are damaged lands in your area, how were the lands and soils damaged?
* What solutions have farmers found for reviving these soils?
* What are the challenges or barriers to adopting these solutions? Have farmers found solutions to these challenges or barriers?

Apart from speaking directly to farmers and other key players in the local agriculture sector, you could use these questions as the basis for a phone-in or text-in program.

Estimated running time for this script is 15 minutes, including intro and outro.

Instrumental music

**HOST:** We are in Tanlili, a large village of 2,600 people in the rural district of Zitenga, northwest of Ouagadougou, the capital city of Burkina Faso. *Tanlili* means “hidden by mountains” in Mooré, a local language. The village is hilly and the soils are dark red and eroded. It is the dry season, and there are few plants apart from shea trees, which stretch as far as the eye can see.

But in this village, farmers have successfully restored the degraded lands with traditional techniques such as *zai*, demi-lunes and stone lines. Hamidou Ouédraogo is the chairman of the union of village associations. He explains.

**Hamidou Ouédraogo:** (GRIMLY) The railroad crosses our village. When the railroad was built, bulldozers dug up the earth and used the soil to make a bed for the railroad tracks.

As a result, our soils are highly degraded and there are holes everywhere and huge empty spaces, with a significant reduction in cropland.

We needed to feed our families, our children, our wives and our livestock. How could we do this when our lands were dry and the rains were diminishing – and we couldn’t even predict how long the rains would last? We had to find farming techniques to handle the situation. This is how we came to adopt *zai*, demi-lunes and stone lines. These methods have provided us with some good results, and we can now get the crop yields to support our families.

**HOST:** How *zai* was introduced to Tanlili is an interesting story. The chairman will tell us about it.

**Hamidou** **Ouédraogo:** We were looking for ways to improve the fertility of our soils when we heard about the *zai* method. This method is well-suited to degraded and dry soils and the results are promising.

Ousséni Zoromé lives in Ouahigouya, about 200 kilometres north of Ouagadougou. Some time ago, he returned to his village after some years in Côte d’Ivoire. He noticed that his family’s farmland had become dry, hard, and damaged. So he used *zai* on this land and he was successful. Indeed, he got good crops on land that seemed unsuitable for farming. He is the one who taught us *zai* techniques in 1989.

**HOST:** Dear listeners, I am convinced that you are eager to learn about *zai*, how it works, and what type of equipment it requires. Don’t worry! The explanation is coming next.

10 second musical bridge

**HOST:** *Zai* means “to get ready in advance” in the local language, Mooré. It is a traditional farming technique that helps restore and increase the value of damaged lands that are unsuitable for farming. To learn more, let’s listen to Omar Ouédraogo, an extension agent.

**Omar ouédraogo:** (SMILING AND WITH A CONFIDENT VOICE) Let me describe the *zai* technique. *Zai* holes are 20-30 centimetres in diameter and 15-20 centimetres deep. They are dug with a pickaxe. Farmers dig *zai* during the dry season, preferably two or three months before the rainy season, so that organic materials and sand are deposited by the wind in the zai hole.

Farmers arrange *zai* holes in staggered lines along the contour line of a hill. They leave 40 to 100 centimetres between each *zai* hole in a line, and 80 centimetres between lines. *Zai* holes slow down surface water runoff and help the soil hold the maximum amount of water.

Farmers fill each zai hole with two or three handfuls of manure once every two years. They plant seeds in the *zai* holes when the soil is well-soaked after the first rains. Seeds are sown inside, around the edges of the *zai* hole, but not in the middle of the *zai* hole. Farmers hoe inside the *zai* hole. The crop yield can reach 750 to 800 kilograms per hectare.

**HOST:** Z*ai* holes can allow farmers to help restore lands where the soil is so damaged that it has been abandoned. It can improve soil fertility and increase yields. Practicing *zai* has greatly benefited people in Tanlili. Here are some local farmers to tell you about it.

**Kalifa congo:** (ENTHUSIASTIC AND VERY DETERMINED) We do not regret choosing *zai*. This technique enables us to increase the value of our damaged lands and restore old, abandoned land for farming. The hoeing is easy because it is done within the *zai* holes. My yields have improved and my grain stores are always full. Crop shortages during the lean season between sowing and harvesting are just bad memories now. *Zai* makes life worth living again.

**Sibdou ouédraogo:** (IN A SHY BUT CONTROLLED VOICE) Before adopting *zai*, our husbands used to cultivate a large amount of land and get poor yields. Now, they use less land and get higher yields. Our millet and sorghum stalks are strong and the seed heads are big. *Zai* has enabled women to restore abandoned lands and use them for farming. The women grow various crops which provide for their needs, such as clothes, beauty items and books for children.

**Rihanata sinaré:**  (VERY CALM AND ASSURED) Thanks to *zai*, we now have land to grow groundnuts, Bambara groundnuts and other crops. Land disputes between husbands and wives are now over. Women do not need to rely so much on their husbands anymore. They can get along without their husbands for some needs.

**Souleymane CONGO:** Thanks to *zai*, young people have become partially independent in Tanlili. We can build sheet-roof houses, and we can buy mopeds and other things we like because there are enough supplies, and our parents can save money for family needs. Also, farmers don’t need to use the income from raising livestock to buy millet. Instead, families can use this money to buy themselves little treats.

**HOST:** How encouraging it is to hear all these stories! Don’t they show that hard work is the key to success?

Now let’s learn about demi-lunes, another technique which improves soil fertility.

Five seconds of music

**HOST:** Demi-lunes are half circle-shaped structures made with earth, which are built on degraded lands. Plants are grown inside the demi-lunes. They help restore damaged lands by reducing soil erosion from water that flows downhill. Demi-lunes capture runoff water and soil and help stabilize soils on steep slopes. All this helps the plants inside the demi-lune stay strong and yield well.

How do you build demi-lunes? Let’s hear from the extension agent again.

**omar ouédraogo:** Demi-lunes are built on plateaus and on sloping lands. Demi-lunes are half circles. You draw a circle with a diameter of from one to five metres, but use only one half of the circle. This is the demi-lune.

You dig out the soil from the demi-lune to a depth of 20 to 40 centimetres, and create a ridge or bund at the edge. Then you add some manure to fertilize the soil. Demi-lunes are dug across the slope in staggered rows. In other words, you build four demi-lunes in each corner of a square and a fifth in the middle of the square.

The earth bund downslope of each demi-lune must be tamped down. This helps the demi-lune better resist runoff. The earth bund downslope of the demi-lune should be 30 to 60 centimetres wide. You can reinforce the bunds by placing stones or perennial grass seedlings such as bluestem on with a line of stones or with perennial grass seedlings such as bluestem. This helps the earth bunds better resist water runoff. (*Editor’s note: The scientific name for bluestem is* Andropogon gayanus. *It is also known by the common names gama grass, onga and Rhodesian blue grass*).

**HOST:** Farmers don’t build demi-lunes randomly. They follow a definite pattern. Let’s listen again to the extension agent.

**OMAR OUÉDRAOGO:** Dear farmers, you need to arrange demi-lunes so that there is bare ground between them. The space between demi-lunes across the slope is between half a metre and one metre.

When a demi-lune is filled with runoff water, any excess water goes around the sides of the earth bund and is captured by the next demi-lune downslope. But the earth bund prevents the manure from being washed away by runoff water.

If you dig demi-lunes at the bottom of a slope, and they receive so much water that it destroys the structure, you should build a protection ditch 40 centimetres wide and 30 centimetres deep at the top of the slope above the lines of demi-lunes.

MUSICAL BRIDGE

**HOST:** Are there other details farmers should pay attention to when making a demi-lune? Here is the extension agent.

**OUMAR OUÉDRAOGO:** Farmers sow seeds in the middle of demi-lunes, and plants grow well because the demi-lunes capture both water and soil that flow downhill. The depth of a demi-lune is important. As I mentioned, they should be 20 to 40 centimetres deep. If demi-lunes are too deep, the water remains in the pit for a long time and the seeds are likely to drown.

**HOST:** Demi-lunes are very effective, but farmers in Tanlili do not like them because they require a lot of work. Listen to these farmers.

**Amado OUÉDRAOGO:** (IN A PERSUASIVE VOICE) Demi-lunes do have benefits, but building them takes a lot of effort. This is why farmers prefer *zai* over demi-lunes. Indeed, to build a demi-lune, you must engage many people. You need to dig one to five metre half-circles on very hard and damaged soil. And demi-lunes need a fairly large amount of manure. The work takes many hours and farmers cannot always afford the equipment needed.

**Assèta SAWADOGO:**  Women do not use demi-lunes because we don’t have either the strength or the money for it. We are not strong enough to dig demi-lunes, nor do we have carts to transport manure. So this technique is not available to us. But we have noticed that those who use it have good yields, especially when rainfall is not too sparse.

**HOST:** *Zai* and demi-lunes are more effective if they are protected by stone lines. There may be many stone lines in a field. How do they help? Here is the extension agent again.

**OMAR OUÉDRAOGO:** Farmers build stone lines across a slope to slow down water runoff. When you slow down water, you enable it to seep into the soil. You also capture the organic materials which are carried along with the runoff water, and these fertilize the soil. Stone lines improve crop yields.

**HOST:** How do you build stone lines? For example, what materials do you need?

**OMAR OUÉDRAOGO:** You need the following materials to build stone lines: a coil of rope, sticks, a water level, a triangle, a cart for moving stones, and, of course, stones.

First, you mark out contour lines across the slope of the hill, using a water level and a triangle. You insert a stick every three or four metres across the contour line to guide you in creating a furrow. Second, you create the furrow 10 to 20 centimetres deep and 15 to 20 centimetres wide along the contour line, where you will place the stones. The stones must be aligned so they act as a barrier to slow the water running downhill. The space between stone lines is 30 to 45 metres. In other words, you build a stone line every 30 to 45 metres down the slope of a hill.

**HOST:** Combining demi-lunes or *zai* with stone lines helps restore damaged land and improves yields. Let`s listen as some farmers tell us how stone lines have helped them.

**Naaba COMPAORÉ:** Stone lines reduce water erosion. Instead of eroding soil as it rushes downhill, water slows and seeps into the soil, enabling the soil to stay moist. Stone lines capture organic material which is carried downhill by water. This feeds the soil and helps plants grow well. I would say that stone lines enable a good distribution of runoff water in the fields.

**Amado ouédraogo:**  I will add that stone lines protect *zai* and demi-lunes. They prevent water from destroying demi-lunes and damaging the *zai* holes. They also allow *zai* holes and demi-lunes to be well-soaked and to remain moist for a long time. Plants can then withstand extended droughts.

**HOST:** The farmers seem to be happy with these techniques. But, despite the good yields that demi-lunes provide, small-scale farmers are not attracted by them. They require too much work.

As for women, *zai* has put an end to disputes they used to have with their husbands at home. According to Rihanata Sinaré, women now have enough land to grow groundnuts and ground peas.

Nevertheless, these techniques are effective only if there is enough rainfall. They do not work well in extreme droughts.

We will end the discussion here. I thank you for listening to us. After hearing the farmers’ satisfaction, we will end on this happy note. Goodbye and I will meet you on the next program.

## Acknowledgments

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**Information source:**

Interviews carried out on January 13, 2015 with:

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