



Module 1: Forest Garden Design



Goal

Farmers will begin the Forest Garden project by creating a Forest Garden design for his or her family's field that meets the core Forest Garden design principles. Farmers will use their designs as a draft blueprint when developing their Forest Gardens, updating them as needed over the course of the project.

Learning Objectives

1. Learn the structure and layout of Forest Gardens, primary components and layers, and uses of different trees.
2. Learn to draw a map of a field to scale.
3. Learn Forest Garden design principles: security, erosion-control, soil quality enrichment, pest control, climate smart agriculture, family needs, women and youth, market-oriented.

Venue and Timing

This workshop should be held about five months before the rainy season. It should be held at the lead farmer's field. The facilitator will use a neighboring field for the top view mapping demonstration.

Relevant Technical Manual Chapters

Before this training event, the facilitator should read, review, and thoroughly understand the following chapters in the Technical Manual:

- Chapter 1: Introduction to the Forest Garden
- Chapter 2: The Forest Garden Approach

Preparation

- To ensure the training goes smoothly in the allotted time, meet with the lead farmer where the training site is located and ask him/her to show you where they would like to have a Forest Garden. Then briefly explain the session and the lead farmer's role. Let them know that the farmers mapping the farm will give them suggestions of how to better their Forest Garden site and that they should be ready with responses as to

what they think would work or not work. The farmer should be willing to speak for around 5 minutes.

- Make sure that the farmer either has enough room inside their home to conduct the session or has plenty of shade outside for all workshop participants. Look for surfaces the participants can use for the mapping exercise.
- Invite lead farmer's family to the workshop and explain the importance of their participation in the workshop.
- Identify one of the Lead Farmer's neighbors who will let the group map their field during Activity 1.
- Collect or identify 4 or 5 flat clean surfaces (sheet of wood, tables, wall) to use for drawing designs.
- Create the "Growing Potential" table on a piece of flipchart paper (for example see Activity 2).

Supplies

- Roll of flipchart paper and tape
- 5 Clipboards
- Pencils, one for each farmer
- 20 sheets of A4 (printer size) paper
- Markers of various colors
- Copies of Handout: How to map your Forest Garden, one for each farmer

Total Time

Approximately 4-5 hours

Handouts in Farmer Workbook

- How to map your Forest Garden

Module 1: Forest Garden Design

Summary of Activities

Opener: Forest Garden Recall and discussion (1.5 hours)

- Review Forest Garden concept and phases of establishment
- Review the Trees for the Future program expectations
- Recap dream field activity

Activity 1: Top View Mapping demonstration (45 mins)

- Draw the border of the land on the paper
- Draw the physical features
- Draw what is outside the field

Activity 2: Small group mapping (1 hour)

- Form groups
- Measure the border
- Draw the field
- Present maps

Activity 3: Forest garden design (2 hours)

- Discuss the land
- Discuss the family's needs
- Design a Forest Garden
- Present Forest Garden designs
- Family selects the best design

Take Home Activity 4: Design your own Forest Garden (15 mins)

- Follow-up

Opener: Forest Garden Recall

Description

The facilitator reviews the Forest Garden concept, then recaps the visioning exercise done during the mobilization meeting. It will get farmers to open their minds and think about the future – about what they want from their land and how trees can contribute.

Instructions for Farmers

1. Review Forest Garden concept and phases of establishment

There are many types of crops in a Forest Garden: fruit trees, timber trees, vegetables, field crops, and more all planted together in one area. Many of the plants grown will have multiple uses. There are many benefits, including providing nutritious food throughout the year by better using space and increasing biodiversity.

- Why are Forest Gardens important?
- What makes a Forest Garden different from what you have now?
- Do Forest Gardens use more or less water, nutrients and sunlight?
- Do Forest Gardens use more or less inputs such as chemical fertilizers, fuel-powered machinery or pesticides?
- What are the different layers of a Forest Garden, and a few examples of each?
 - Tall plants
 - Medium height plants
 - Shrubs
 - Ground covers
 - Roots/tubers, Vines/climbers, vegetables/crops...
- What are the three phases of the Forest Garden Approach? What is the focus of the first phase?

2. Review the Trees for the Future program expectations

During this four-year training program you will learn how to grow your own Forest Garden. For each year you participate in the project, TREES will supply you with the materials you need to meet the goals of the trainings given. Some important program highlights are:

- We do provide highly marketable vegetables seeds
- We do provide seeds for useful and marketable woody shrubs and trees
- We do provide some of the necessary tools and materials needed to establish and manage your Forest Garden
- We do not provide Eucalyptus or invasive plants
- We do not provide current staple field crop seeds or seeds of vegetables you already grow
- We expect you to invest your own time, tools, water, and materials as well to demonstrate your commitment.

3. Recap dream field activity

Recall the dream activity you completed during our last meeting. You dreamed of planting all types of trees and food crops in your new Forest Garden. Close your eyes and picture your dream field again.

- What kinds of trees did you plant in your dream Forest Garden?
- What foods are you growing?
- What other products are you harvesting?

Today's workshop will help you turn your dream into a reality. We will design Forest Gardens in two steps. The first step is to map the field on paper and show everything that is in the field now. Then, based on what we see in the field and what we hear from the field's owners, we will use the same map to plan what to plant in the new Forest Garden.

Activity 1: Top View Mapping Demonstration

Description

The facilitator demonstrates how to draw a top view map of a farm, including the perimeter and physical features. Map a different field than the one to be mapped by the farmers in Activity 2, ideally one that is near the lead farmer's field so that farmers can compare what they see to the map.

Instructions for Farmers

1. Draw the border of the land on the paper

Today I will draw a map that will represent a bird's-eye (aerial) view of the Forest Garden land and the land immediately surrounding it. I will start by drawing a nearby field.

- Before I draw I should walk the border and either use a measuring tape or count the number of steps (one step equals one meter) to estimate the lengths of the sides of the field.
- After I draw the border on our paper, I mark North with an arrow.

2. Draw the physical features

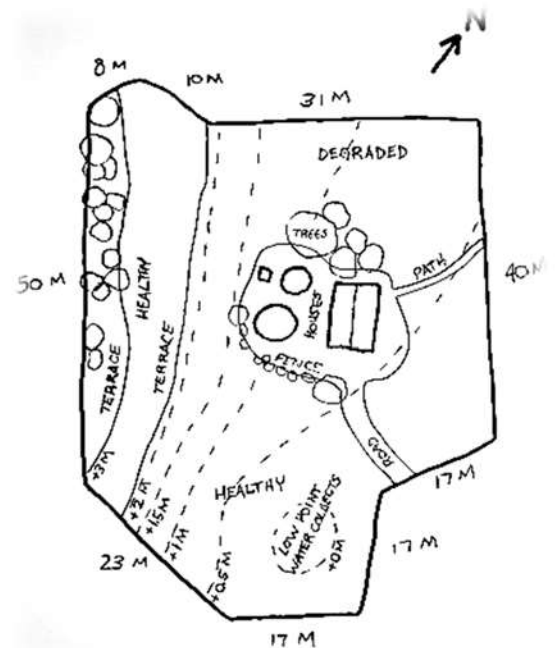
Now I draw the physical features of the field as accurately as possible with regard to location and size. We want to include:

- Structures: houses, storage rooms, latrines, water taps, etc.
- Roads, driveways, walkways, etc.
- Things we can't move like terraces, bunds, termite mounds, other immovable manmade or natural structures.
- Trees and year-round plants, using a circle to represent the crown of the plant and its approximate size.
- Major variations in slope, identifying high points and low points.
- Rivers, streams, ponds, springs, swamps, seasonally flooded areas, gullies, and severely eroded or degraded areas.
- Soil type and quality (e.g. very healthy, healthy, degraded, highly degraded).

3. Draw what is outside the field

Finally, I draw the things that we see immediately outside of the field that may affect the future Forest Garden. These may be good or bad things. Examples include:

- Neighbors who are rearing bees
- Dead trees or piles of brush next to the field that may attract pests
- Other fields where pesticides are sprayed



Activity 2: Small Group Mapping

Description

Farmers practice mapping in small groups using the lead farmer's field. During the debrief, small groups share their observations and farmers will begin to be more receptive toward things they may not have observed and included in their maps.

Instructions for Farmers

1. Form groups

Split into small groups of 4 or 5 people and come and collect paper and markers. Choose a mapper, someone who understands the concept well, and a reporter.

2. Measure the border

Now we will all go to the field and the lead farmer will show you the boundaries of his/her field. Walk around the perimeter of the field with your group and measure the border by counting your steps as I showed you. While doing this, observe the trees, plants, objects, resources, and topography of the field as it is now. As you walk around the field, draw the perimeter onto the paper, scaling the shape, directions, and lengths as closely as possible.

- Start at one corner of the land and walk (taking steps of approximately one meter) in a straight line along the border of the land until it turns in another direction, counting the number of steps you take.
- When you arrive at the end of a line along the border, draw a line that corresponds to the number of steps you took, and write the number next to the line.
- From the end of that line, continue walking along the border until it turns again, counting the number of steps.
- Draw another line from the end of the first that corresponds to the number of steps you took as well as the direction you travelled. Write the number of steps next to that line.
- Continue following steps 3 & 4 until you have drawn a series of connecting lines with corresponding lengths and directions around the entire perimeter of the land. The end of the last line should connect with the beginning of the first line, where you began.

3. Draw the field

Work with your group members to draw a map of the field on the paper provided, like I did for the demonstration. Make sure to include:

- Border: be sure to write the number of steps/meters on each side as you walk and draw it.
- Physical features: buildings, paths, termite mounds, trees, hills, water, soil quality.
- Important things next to the field

4. Present maps

When everyone is finished drawing their map, each group will stand up and explain their map. We will all vote to select the map that looks most like the field. As you show your maps, I will make a list of crops that are growing on the farm now on flipchart paper.

Activity 3: Forest Garden Design

Description

The facilitator interviews the lead farmer's family to help them envision their future Forest Garden and develop a design. Farmers form the same small groups as Activity 2, and each group uses the same map. This activity can be done using markers of a different color than the previous activity, or on a separate piece of paper. Refer to the best map selected at the end of Activity 2 during the discussion.

Instructions for Farmers

1. Discuss the land

To make the best Forest Garden, you need to consider everything you observed in the field. You also need to think about what the family needs from the land. With that information you can start to determine how planting trees can meet those needs and improve the field.

Let's look at the map we voted on and discuss the challenges we see on the farm and how planting trees and garden design can address those challenges and meet the family's needs.

Questions about the farm:

- Is the field **secure** from animals and pests? How can you secure it? Does it need a **green wall**?
- Are there **erosion** problems on the field? How can you reduce erosion? Do you need to plant a **contour barrier**?
- Is the **wind** a major problem? What direction does the wind generally come from? How can you protect the field from wind? Do you need to plant a **windbreak**?
- Is the **soil quality** good? Does the soil quality vary across the field? Are there parts of the farm with degraded soil? How can you improve the soil? Do you need **compost**? Do you need to plant **fertilizer trees**?
- Are **pests** (animals, insects, diseases) a problem on the field? What do farmers do to **control pests**? Are there plants that repel pests? What are some alternatives to the use of expensive chemical pesticides?
- Are **rainfall patterns** changing? How can you keep more **water** in the soil? What can you plant that will tolerate unpredictable rainfall?
- What **weather** extremes should the field be prepared to endure? Are there frequent floods or droughts? How have weather patterns changed over the last few years? Which species might be the quickest to rebound from extreme weather?
- Is fire a problem in this area? What is a good way to protect the field from fire? Should you make a **fire break**? Where? How?
- Should the Forest Garden be divided into halves or sections for **rotating crops** or segmenting production? Should you plant lines of vegetation to **divide the sections**?

2. Discuss the family's needs

The lead farmer's family should move to the front of the group so they can answer questions about their household needs. As they talk, I will make a list of items that the family wants to grow in the future.

I will ask some questions that will give us information about the family's current situation and their interests. You all may help with some of the answers. Take notes on the responses, as you will use this information for the next activity.

Questions about the family:

- What trees would provide more **food** for the family?
- When is the **lean season(s)**?
- Which foods and other tree products can be **harvested in the lean season**?
- Does the family need **wood for cooking**? Where do they get it? What would make it easier? Which trees give fuelwood? Where could they be grown?
- Does the family need to **feed animals**? Where do they get the fodder? What are the challenges/issues with this (e.g. cost, land degradation, time, etc.)? Which trees are good for animal forage? Where could they be grown?
- What products will be the easiest for the family to **sell**?
- Which set of products is the **farmer group** dedicated to growing and selling?
- How can trees diversify the **timing** of when the family generates income?
- What products will make the most money in the **short term**?
- What will make the most money in the **long term**?
- How can the Forest Garden minimize the **burden of women** in the family?
How can the Forest Garden **increase income** specifically for women in the family?
- How can the Forest Garden provide young men or women in the family (youth) with **learning or business opportunities**?

3. Design a Forest Garden

Your challenge is to work with your small group to create a top view map that to show the design a Forest Garden to help the family get what they need from their field and improve the health of the land. Work in the same groups and use the same map from the previous activity. You will use **a different color marker** to draw your Forest Garden design. After you finish working in your small groups to make your Forest Garden design, your small group will stand up and explain your Forest Garden to everyone.

When designing the Forest Garden, think about:

- **Spacing:** Spacing trees so that each tree has enough room for its roots and canopy as it grows
- **Sun and shade:** The types of plants that need more sunlight and the types of plants that like shade
- **Orientation:** The shade of a tree will move straight from west to east so other trees, shrubs or plants which requires sunlight all day should not be established in that route.

4. Present Forest Garden designs

Each group will select someone to report out (7-10 minutes each). Describe the mapping process of the existing plot and any questions, concerns. Describe your map of recommended Forest Garden plants, the location of those plants, and the benefits you believe those plants will give the farmer and their family.

- Is the number of trees appropriate for the space? Are there too many trees? Not enough trees?
- Is the spacing correct for the type of tree? Are they too close? Too far apart?
- Are the trees placed correctly based on the movement of the sun?
- What crops or products will you plant around the trees when they are still small?
- As the trees grow and shade out the crops, what products (shrubs, ground covers, roots, vines, etc) will you grow underneath your trees?

5. Family selects the best design

Now that we have heard from all the groups, we want to hear from the lead farmer and his/her family about which Forest Garden design they like for their field and why.

Take Home Activity 4: Design your own Forest Garden

Description

This is the most important activity in Module 1. Farmers take what they learned from the workshop and create a design for their family's Forest Garden. The farmers will refer to and improve on this design throughout the four-year Trees for the Future training program.

Instructions for Farmers

1. Assess family needs

What does your family need from the land? Food, fuel, fodder for your animals? How will the design for your farm be the same or different from what you created today?

2. Design Forest Gardens

Over the next few days, map your farm and create your ideal Forest Garden design for your farm like we did today for the lead farmer.

3. Lead farmer follow-up visit

Within the next month, the lead farmer will come to visit your farm and can help you to design your Forest Garden, like you helped him today. I will also come to see your farm and review your Forest Garden design. You will keep your Forest Garden design and we will use it again for future workshops and site visits.

Follow-up

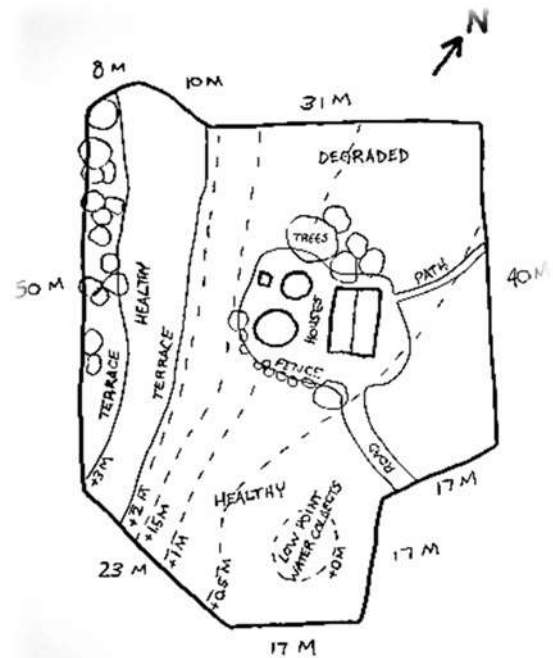
The facilitator follows up with each farmer about their Forest Garden design, photographing the map. Leave flip-chart paper and markers with the lead farmer for use by the farmers for the assignment.

Farmer Resource: How to Map your Forest Garden



Draw what your field looks like today

1. Walk your field to **measure the border** and then **draw the border** on your map. Draw an arrow outside the border to show North.
2. Draw the **physical features** as best you can in the correct location and size. Be sure to include:
 - Physical structures (houses, storage rooms, latrines, water taps, etc.)
 - Roads, driveways, walkways, etc.
 - Terraces, bunds, termite mounds, immovable structures, man-made or natural.
 - Trees and perennial plants, using a circle to represent the crown of the plant and its approximate size.
 - Major variations in slope, identifying high points and low points.
 - Rivers, streams, ponds, springs, swamps, seasonally flooded areas, gullies, and severely eroded or degraded areas.
 - Soil type and quality (e.g. very healthy, healthy, degraded, very degraded).
3. Draw the **outside of the field**, things next to the field that may affect the future Forest Garden like: neighbors who are rearing bees, dead trees or piles of brush next to the field that may attract pests, other fields where pesticides are sprayed.



Draw what your field will look like in the future

4. Talk to your family about what you will need from your Forest Garden.

Questions about the farm

- Is the field secure from animals and pests? How can you secure it? Does it need a green wall?
- Are there erosion problems on the field? How can you reduce erosion? Do you need to plant a contour barrier?
- Is the wind a major problem? What direction does the wind generally come from? How can you protect the field from wind? Do you need to plant a windbreak?
- Is the soil quality good? Does the soil quality vary across the field? Are there parts of the farm with degraded soil? How can you improve the soil? Do you need compost? Do you need to plant fertilizer trees?
- Are pests (animals, insects, diseases) a problem on the field? What do farmers do to control pests? Are there plants that repel pests? What are some alternatives to the use of expensive chemical pesticides?
- Are rainfall patterns changing? How can you keep more water in the soil? What can you plant that can tolerate unpredictable rainfall?
- What weather extremes should the field be prepared to endure? Are there frequent floods or droughts? How have weather patterns changed over the last few years? Which species might be the quickest to rebound from extreme weather?
- Is fire a problem in this area? What is a good way to protect the field from fire? Should you make a fire break? Where? How?
- Should the Forest Garden be divided into halves or sections for rotating crops or segmenting production? Should you plant lines of vegetation to divide the sections?

Questions for the family

- What trees would provide more **food** for the family?
- Which foods and other tree products can be **harvested in the lean season**?
- Does the family need **wood for cooking**? Where do they get it? What would make it easier? Which trees give fuelwood? Where could they be grown?
- Does the family need to **feed animals**? Where do they get the fodder? What are the challenges/issues with this (e.g. cost, land degradation, time, etc.)? Which trees are good for animal forage? Where could they be grown?
- What products will be the easiest for the family to **sell**?
- Which set of products is the **farmer group** dedicated to growing and selling?
- How can trees diversify the **timing** of when the family generates income?
- What products will make the most money in the **short term**?
- What will make the most money in the **long term**?
- How can the Forest Garden minimize the **burden of women** in the family? How can the Forest Garden **increase income** specifically for women in the family?
- How can the Forest Garden provide young men or women in the family (youth) with **learning or business opportunities**?

Reviewing the Forest Garden Design

- Is the number of the trees appropriate for the space? Are there too many trees? Not enough trees?
- Is the spacing correct for the type of tree? Are they too close? Too far apart?
- Are the trees placed correctly based on the movement of the sun?

Evaluation Checklist for Skills Learned in Year One



At the end of the year you will be evaluated on the following practices that you learned and discussed during training events. After demonstrating that you have completed the year one evaluation criteria, you will be invited to continue in the second year of the project.

Year 1 Evaluation Criteria

- Green Wall
 - At least one row planted, surrounding the entire site
 - At least part of the second row is planted
 - Proper spacing between rows
 - Proper spacing across lines
 - Terminal buds pruned
 - Brush and weeds cleared
 - Dead fence surrounding green wall (for all projects where this is determined to be a requirement)
- Alley Cropping and/or Contour Planting
 - Minimum of 1 row planted across cropping area
 - Agroforestry trees interspersed throughout site
 - Proper spacing between rows
 - Proper spacing between trees within rows
 - Contour lines followed (on sloped sites)
- Compost
 - Appropriate placement
 - At least two active piles
 - Good mix of materials (N, C, water, air)
 - Passes stick test when the pile's stick is pulled out; if the stick is warm it passes the test)
 - Demonstrated product and application
- Permagarden
 - Double-dug beds
 - Raised or sunken beds
 - Amended soils
 - Mulching
 - Triangular spacing
 - Adequate spacing between plants
 - At least four species/plant types
 - At least two species/types that were not planted previously by the family
 - Companion planting

Module 1: Facilitator's Notes



The facilitator should use the following pages to note down any questions or findings from the group that should be kept for or addressed at a later time. Depending on the module this may include species selection by group, crops identified in seasonal calendars, or anything else that should be noted.