

A FARMERS' TRAINING MANUAL

Regenerative Kitchen Gardening

in Non-Irrigated Drylands



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Hillside Organic Garden

Regenerative Kitchen Gardening in Non-Irrigated Drylands

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Preface

Across Kenya's drylands, rain falls rarely and unpredictably, soils are often eroded and compacted, and many households struggle to put a varied, nutritious diet on the table. Yet the same land can become productive again. Small regenerative kitchen gardens, built to catch and hold every drop of rain, can feed a family, heal degraded soil and bring life back to bare ground.

This manual is a practical, step-by-step guide to establishing and managing regenerative kitchen gardens in drylands without irrigation. It is written for farmers, community groups, extension workers and trainers. It follows the seven steps of establishing a garden – from choosing the site to planting and managing it – and then covers seed saving, sharing knowledge, and preserving and adding value to the harvest.

How to use this manual

- **Follow the seven steps in order.** Chapters 2 to 6 follow the seven steps of establishing a regenerative kitchen garden.
- **Use the photographs and diagrams.** They come from real dryland gardens and can be shown to groups during field training.
- **Look for the boxes.** Shaded boxes highlight key tips and safety reminders.
- **Adapt to your site.** Every garden is different. Use the materials you have, observe what grows well and build on what works.
- **Check the glossary.** Technical terms are explained at the back of the manual.

Introduction to Regenerative Kitchen Gardens

Establishing small kitchen gardens is a great way to regenerate and rehabilitate dryland while meeting the nutritional needs of dryland communities.

Objectives of a Regenerative Kitchen Garden

- **Nutrition:** Kitchen gardens greatly improve household nutrition, especially for women and children, by providing a diversity of foods – vegetables, root crops, herbs, grains and fruits.
- **Control of surface run-off:** Kitchen garden methods reduce run-off and improve water percolation into the soil. The techniques catch run-off and put it to productive use around homes and settlements.
- **Healthy vegetation cover:** The kitchen garden method improves vegetation cover and creates diversity, syntropy and companionship among crops, producing a healthy plant community that covers the soil well. Soil cover protects the soil from the heat and scorching of the sun, keeps it moist for longer, and prevents demineralisation and the loss of volatile minerals.
- **Economic value:** The kitchen garden method improves the socio-economic status of women, especially in the drylands. With it, women can not only feed their families but also earn income by selling surplus harvests.

The Seven Steps of Establishing a Regenerative Kitchen Garden

Establishing a regenerative kitchen garden in drylands involves incorporating a rainwater harvesting system. The process has seven steps, each described in this manual:

- 1. Site selection** (Chapter 2)
- 2. Site assessment** – slope and surface water mapping (Chapter 2)
- 3. Enclosing and fencing** (Chapter 2)
- 4. Digging rainwater harvesting structures** (Chapter 3)
- 5. Soil amendment in the growing areas** (Chapter 4)
- 6. Planting** (Chapter 5)
- 7. Management of the garden** (Chapter 6)

CHAPTER TWO

Site Selection, Assessment and Enclosure

Site selection is the decision on where to locate the garden. It also involves understanding the type and level of degradation the site has experienced.

Factors to Consider When Selecting a Site

Accessibility

Kitchen gardens need a lot of management and maintenance, so they should be as close as possible to where people live – preferably within the home compound.

Size of land

A kitchen garden can range from a tiny space to as much as half an acre, depending on the land available and the farmer's capacity to manage it.

Type and level of degradation

The condition of the land must be understood to decide how to establish the garden. The most common form of degradation in drylands is erosion.

- **Eroded and compacted sites:** Most of the topsoil has been washed away by surface run-off (Figure 2.1). The compacted clay subsoil is exposed and fertility is low because of the lost topsoil. Little water percolates into the soil. The site may be rocky and full of pebbles from the exposed, partly weathered lower soil layers. The priorities here are to improve water percolation and to restore fertility with organic matter, which brings back microbial activity in the soil.
- **Eroded and gullied sites:** Gullies have formed because of intense surface run-off (Figure 2.2). Gullies are likely to form where the slope of the land changes direction in a convex shape.



Figure 2.1 Initial eroded and compacted condition of the regenerative kitchen garden in Chepareria Livestock Café, West Pokot County, Kenya. Photo | A. Mwangi



Figure 2.2 Initial condition of the Livestock Café site in Chepareria, West Pokot County, Kenya, eroded with gullies formed by surface run-off. Photo | A. Mwangi

Slope and Surface Water Mapping

Understanding the slope is important because it determines the direction and layout of the rainwater harvesting structures. The purpose of these structures is to **catch, spread and sink** rainwater. They must therefore intercept surface water, slow its flow and give it time to percolate into the soil.

Two lines guide this work:

- **Contour line:** a line across the slope joining points of the same height.
- **Key line:** the contour line where the direction and steepness of the slope begin to change. This is where a swale (a trench along the contour) is dug to slow the water and spread it out, instead of letting it flow straight downslope.

Chapter 3 explains how to find and mark contour lines using a simple A-frame.

Land Size and Enclosing the Garden

The size of a kitchen garden depends on the farmer's capacity to install and manage it. For most households, an area of **50 m × 50 m** may be adequate.

The garden should not be so large that the farmer cannot enclose it with a fence that keeps animals out.

The site should also be close to the farmer's house and animal enclosures (kraals). This:

- allows easy access to the garden;
- reduces the labour of moving manure and other materials to the garden;
and
- makes it easy to enter often to harvest and to manage the plants and soil.

Rainwater Harvesting Structures

This chapter describes the basic rainwater harvesting structures to build into kitchen gardens in drylands: contour trenches and berms, half-moons, circle gardens and zai pits. Each one catches run-off and turns it into a growing area.

Contour Lines: Trench and Berm

How to make and use an A-frame

To mark a contour line you need an A-frame (Figure 3.1).

1. Join two pieces of wood or strong sticks of equal length at the top, using nails or rope, to form an A shape.
2. Fix a shorter piece of wood across the two legs as a horizontal bar.
3. Make a plumb line by tying a stone or piece of metal to a string, and attach it to the top of the A.
4. **Calibrate** the A-frame on level ground (e.g. a house floor): let the plumb line hang and mark the point where it crosses the horizontal bar.
5. To use the A-frame, mark a starting point with a stick and place one leg of the A-frame on it. Move the second leg until the plumb line hangs exactly over the mark on the bar. That point is level with the first.

To mark a contour line, keep one leg on the last point found and swing the other leg until the plumb line again sits on the mark. Repeat across the whole area, placing a peg at every point. Joining the pegs gives the contour line.

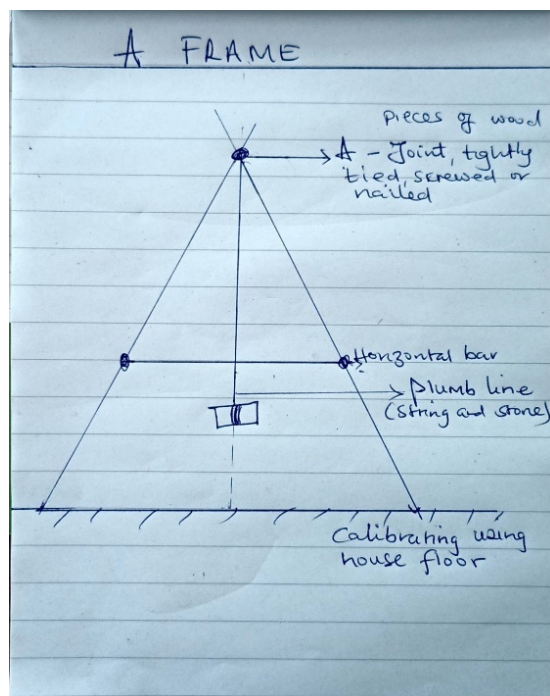


Figure 3.1 An A-frame for marking contour lines

How to make contour gardens: trench and berm

Once the contour line is marked, dig a trench along it. The trench should be **1 m wide** (about the width of a garden bed) and **half a metre deep** to allow for hugelkultur layering (see Chapter 4).

All the soil dug from the trench is used to make a **berm** (ridge) on the downhill side that forms a raised growing bed. The soil on the berm is amended with sand, ash and manure to improve fertility and reduce clay compaction over time. Both the sunken bed (trench) and the raised bed (berm) are then planted with a variety of vegetables and legumes (Figure 3.2).

- **Sunken bed (trench):** plant water-loving crops such as pumpkins, arrowroots, cocoyams and green vegetables.
- **Raised bed (berm):** plant drought-tolerant crops such as cowpeas, *Dolichos lablab*, cassava and sweet potatoes.



Figure 3.2 A contour trench and berm garden. Photo | A. Mwangi

Half-Moon Trenches and Berms

Half-moons are semicircular trenches and berms set out along the contour on moderate to steep slopes. They create micro-catchments that slow and spread water so it can percolate into the soil, and they are used to make sunken and raised gardens that make the best use of surface run-off.

How to make half-moon trenches and berms

1. Mark a point on a contour line.
2. From the point, mark out a semicircle with a **2 m radius** using a peg tied to a string (Figure 3.3).
3. Leave a space of **1 m** between one semicircle and the next, all along the contour.

4. Plan the layout so that water is distributed across the land without overflowing or breaking the berms. Stagger the half-moons in the next row downslope so they catch water passing between those above (Figure 3.4).

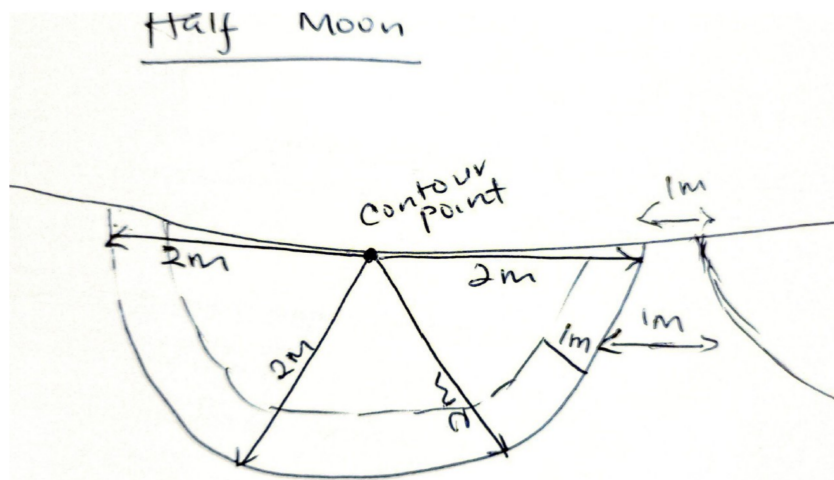


Figure 3.3 Half-moon structure and measurements

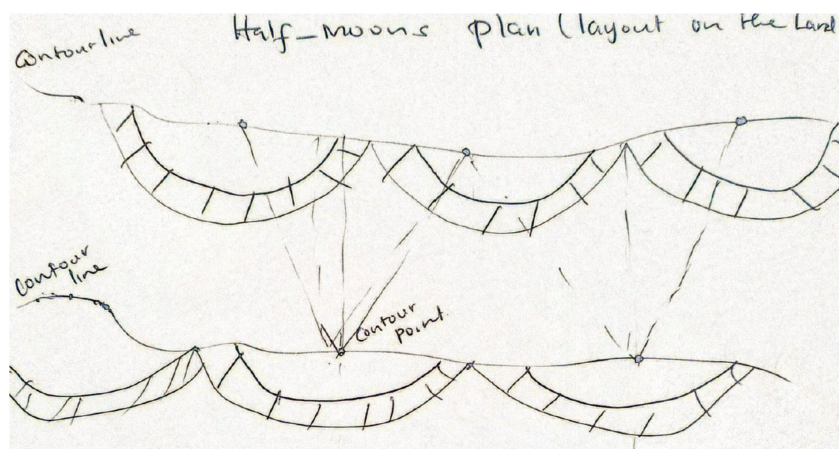


Figure 3.4 Half-moon distribution plan on the land



Figure 3.5 Half-moon gardens established in a dryland site. Photo | A. Mwangi

Circle Gardens

Circle gardens slow and sink water, especially where natural run-off waterways need to be intercepted on moderate slopes.

1. Dig a hole about **2 m in diameter** (larger if the area allows) and **1 m deep**, and direct water from the waterway into it.
2. Around the hole, make an overflow ring about **½ m wide and ½ m deep**.
3. Use the excavated soil to build a berm around the overflow ring. Amend the soil on the berm and turn it into a garden.
4. On the edge of the berm, dig **four planting holes** and plant bananas in them. The banana holes should be as deep as the centre hole if possible.
5. Plant the rest of the berm with sweet potatoes, cassava and herbs (Figure 3.5).

If the natural waterway carries a lot of water, make a wider circle. The hole intercepts and holds water that would otherwise run off. Fill and cover the hole with plenty of mulch so it holds water for longer; as the mulch decomposes it also releases nutrients for the bananas planted around it.

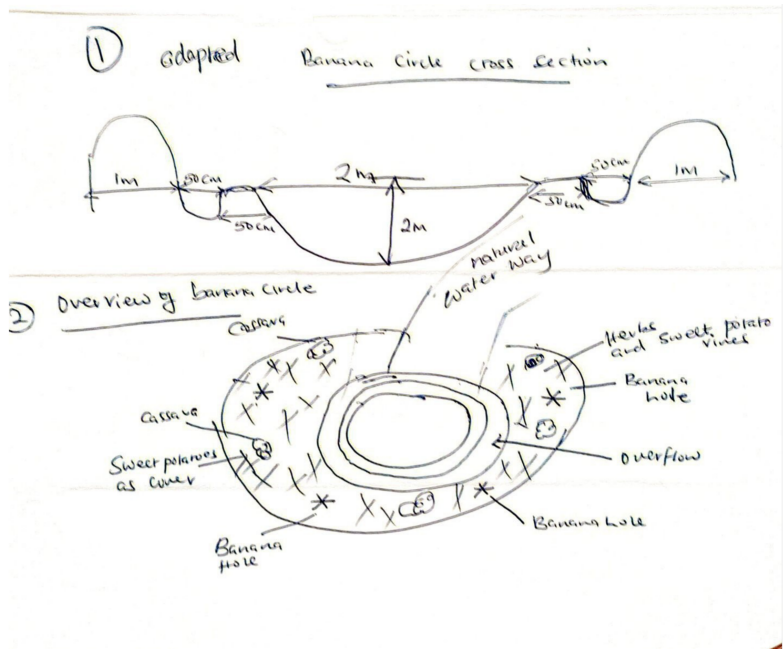


Figure 3.6 Banana circle garden: cross-section and overview



Figure 3.7 A circle garden intercepting run-off. Photo | A. Mwangi

Zai Pit Gardens

Zai pits are round or square planting basins dug to plant a tree, with or without vegetables. They are ideal for planting trees in the kitchen garden. Fruit trees improve the diversity of the garden, provide shade for vegetables and give the farmer fruit.

- A typical zai pit is **30 cm in diameter** and **20 cm or more deep**.
- Zai pits can be dug within a half-moon catchment. The number of pits depends on the size of the catchment; for a typical 2 m half-moon, one or two pits are enough.
- To help the pit hold water and supply fertility, layer it using the hugelkultur idea: a layer of sawdust, then a layer of green matter, then mixed soil (soil, composted manure, ash and sand).



Figure 3.8 *Planting in a zai pit. Photo | A. Mwangi*

Soil Amelioration and Hugelkultur

Degraded sites have very low biological fertility. Biological fertility depends on the presence of humus and microbial activity. To restore it, degraded soils need to be amended with manure, sawdust, wood chips and other organic materials.

Soil Amendments

Manure and compost

Manure (Figure 4.1) is a good source of nitrogen and other minerals. Because it decomposes quickly, it needs to be applied often as a top dressing. For longer-lasting biological activity and to encourage fungi, use manure together with woody materials, which decompose more slowly and improve the soil's water-holding capacity for longer.



Figure 4.1 *Manure ready for use as a soil amendment. Photo | A. Mwangi*

Woody material

Woody material can be used as sawdust, shavings or chips (Figure 4.2). The smaller the particles, the faster they decompose; the denser the particles, the longer they last. Wood chips are best, but sawdust and shavings can be used where chips are not available.



Figure 4.2 Sawdust and wood shavings for soil amendment. Photo | A. Mwangi

River sand

River sand is used to balance the proportions of soil particles. Check by feel whether clay dominates the soil. Most compacted soils are clay-dominated and may need river sand mixed in so that the soil is loose and well aerated for roots and lets water percolate. Depending on its mineral content, river sand can also add minerals to the soil.

Ash and charcoal dust

Ash and charcoal dust are excellent regulators of soil pH, and most degraded soils have a pH that has shifted from what is ideal. Ash and charcoal also add minerals. Apply them only in small quantities so as not to shift the pH too far.

Simple compaction test

Push a stick into the soil and note how far it goes before meeting resistance. The shorter the distance, the more compacted the soil – and the more it will benefit from sand and organic matter.

The Hugelkultur Method

Hugelkultur is an excellent way to build growing beds. Layers of organic matter are stacked, starting with dense woody material at the bottom and ending with light, easily decomposed material at the top, and then buried under a layer of mixed (ameliorated) soil.

Benefits of hugelkultur beds, especially in drylands

- Woody material decomposes slowly, feeding the bed over a long period.
- Carbon-rich and nitrogen-rich materials are combined and decompose in place.
- Mycorrhizal fungi are introduced, helping plant roots absorb soil nutrients.
- Aeration of the bed improves, encouraging better root development.
- Both water percolation and the water-holding capacity of the bed improve.

How to make a hugelkultur bed

An ideal hugelkultur bed is built in the five layers described below (Figure 4.3). Depending on the materials available, the method can be adapted, and it works for both raised and sunken beds.

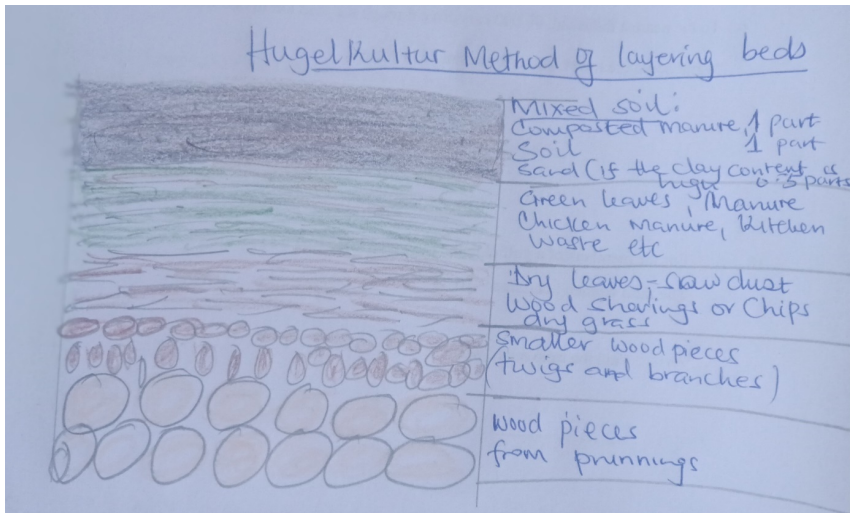


Figure 4.3 The hugelkultur method of layering beds

1. **Logs and heavy wood:** Start by laying logs from pruned trees, if available. Bury only **dry** wood so that the logs do not sprout into new plants. Logs make the bed last a long time because they take very long to decompose. If heavy wood is not available, skip this step.
2. **Smaller wood:** Over the logs, lay smaller pieces such as twigs and branches. These break down faster than logs, giving a second level of decomposition.
3. **Dry, loose material:** This layer (which becomes the first layer if no wood is available) is made of dry, loose material. Sawdust, wood shavings or chips are best, but straw, dry grass, dry leaves and other dry material can also be used. Make it thick, especially if there is no wood underneath. It acts as a water reservoir for roots because the materials soak up and hold water.
4. **Nitrogen-rich material:** Next add green leaves, manure (especially fresh manure) and kitchen waste. This layer releases nitrogen slowly to the plants over several seasons and kick-starts the decomposition of the carbon-rich layers below.
5. **Mixed soil:** The top layer is the growing layer, especially for shallow-rooted seasonal crops. It should be well formulated: biologically active, rich in minerals and loose enough for water to soak in. If the soil has too

much clay it will clog and little water will reach the layers below, so mix in sand. For microbial activity and fertility, mix in decomposed manure; to regulate pH and add minerals, add a little ash and biochar.

Mixed soil recipe

1 part soil + 1 part decomposed manure + ½ part sand

Sprinkle a little ash and biochar over the mix. Adjust the proportions to suit your soil and the materials available.

Planting and Plant Selection

The Planting Plan

The aim of planting in a regenerative kitchen garden is to build up as much organic matter in the soil as possible through dense and continuous plant cover. Consider the following factors when deciding what to plant.

1. Moisture levels

Rainwater harvesting structures such as half-moons create two moisture zones: the sunken part and the raised part. The sunken part holds the most water and loses less to evaporation than the berm.

- **Sunken part:** crops that need more moisture, such as green vegetables, pumpkins, cucumbers and melons, as early crops; and crops that do well with moderate moisture, such as maize, tomatoes and beans, as late crops.
- **Berm:** crops that need moderate to low moisture, such as *Dolichos*, pigeon peas, sunflower, cassava, sweet potatoes, green grams, cowpeas, millets and sorghums.

2. Diversity of crops

Weather in the drylands is erratic, especially with climate change. Planting a diversity of crops reduces the effect of unpredictable weather on production. Aim for a good mix of drought-tolerant crops, cover crops, perennials, annuals, legumes, grains, root crops, fruit crops, leafy crops, herbs and scented plants – all in one garden. To achieve this, practise companion planting, crop guilds and layered growing, and create a small agroecosystem in the garden.

3. Companion planting

Companion planting means growing crops that benefit one another. A classic example is the “three sisters”: maize, beans and pumpkins. Farmers can also explore local companions such as:

- bananas and cocoyams;
- carrots and beetroots;
- cabbages and onions;
- finger millet and pigeon peas; and
- cassava and beans.

4. Layer (strata) planting

Because plants grow to different heights and shapes, different crops and trees can be interplanted according to their need for sun or shade. Taller plants such as maize, sunflower, cassava and fruit trees can be spaced to support and shade vegetables such as kale, spinach, zucchini, pumpkins and tomatoes.

5. Pest management and attracting pollinators

- Interplant crops with plants that repel or trap insect pests.
- Plant flowering crops to attract bees and other pollinators. Good pollination raises the yield of fruiting crops such as pumpkins, melons, passion fruit and eggplants; poorly pollinated fruits fall off the plant.
- Plant sunflower among grains (maize, sorghum and millet). Birds prefer sunflower seed and leave the grain alone – this is called a **sacrificial crop**.

6. Succession planting

Plant so that early crops give way to late crops, making the best use of the season and of each crop's strengths. This increases the productivity of the garden.

Type	Characteristics	Examples
Early crops	Fast-maturing; need more moisture and cooler temperatures.	Amaranth, nightshade, kale, mustard greens, beans, beetroot
Late crops	Take longer to mature; need less soil moisture as they mature; tolerate strong sun and drier conditions.	Maize, sorghum, millet, cowpeas, cassava, sweet potatoes, sunflower, butter beans

Type	Characteristics	Examples
Perennials	Keep the garden producing after the main harvests and through dry periods.	Pigeon peas, cassava, <i>Dolichos</i>

7. Cultural, economic and social functions

The garden serves different needs, and these can guide planting. The farmer can choose main crops for income or as staple food. In many communities the staples are energy foods such as grains, cassava or sweet potatoes, which may be planted in larger quantities. Other crops then play supporting roles: diversifying the diet, and providing medicine, beauty, animal feed, building materials, and plants for ceremonies, rituals and other social and cultural uses.

8. Ecological functions

The garden also needs plants whose main value is ecological, even if they serve the farmer in other ways too:

- **Bioaccumulators:** plants with wide, deep roots that draw up nutrients and store them in their leaves – for example comfrey, nettles, clovers and buckwheat. Harvest them to make liquid fertilizer or cut them down as mulch. Take care, as some can spread aggressively.
- **Biomass crops:** plants grown to produce mulch, especially in less useful patches and along fences – for example bamboo, tobacco plants, bananas, grasses and castor plants.
- **Soil-building and conservation plants:** deep-rooted plants that hold the soil, especially on steep slopes and in gullies. They conserve soil where it is likely to be lost and, where it has already been lost, create conditions for soil to build up again – for example vetiver grass, aloe and agave.

Garden Management Practices

Mulching

Mulching is crucial in regenerative kitchen gardens, especially in drylands, because it keeps soil moist for longer. As mulch decomposes it releases nutrients that feed the plants, it boosts microbial activity and it can even protect crops from pests such as ants and termites.

For mulching, the denser the material the better. Suitable materials range from dense wood chips to hay and dry leaves.

Top Dressing

A regenerative kitchen garden depends on regular applications of composted manure during the growing season. Top-dress with compost **every 1–2 months** during the growing season. This keeps the garden supplied with humus and stimulates microbial activity.

Chop and Drop

Chop and drop means cutting down weeds and cover crops and leaving the cuttings on the ground as mulch. It works well in parts of the garden with weeds and cover plants that are not meant for harvest. The farmer can also cut vetiver or other grasses grown along the edges for soil conservation or mulch production. In this way weeds are controlled in a regenerative way and turned into mulch and useful humus.

Advantages	Disadvantages
Retains moisture Controls weeds and invasive plants Builds fertility and cycles nutrients Builds soil life – insects, worms and microbes	Can spread diseases or pests if infected material is dropped Hard to chop and drop among crops meant for harvest without losing some

Harvesting

In a regenerative kitchen garden, harvesting can continue throughout the seasons, depending on the planting plan (Chapter 5). The more varieties planted, the more varied the harvest. The farmer can use the harvests to learn which crops and varieties suit each season and which planting combinations work best.

As far as possible, harvest by **cutting** the plants and leaving the roots in the soil to rot and add to the soil's organic matter.

Seed Saving and Knowledge Sharing

One objective of a regenerative kitchen garden is to keep producing seeds and planting material. Seed saving is key to the local adaptation and improvement of the crops grown in the garden.

The Soil Seed Bank

The soil is the best place to store seed. Seeds in the soil are always in their natural conditions: they stay dry through the dry season and germinate as soon as soil moisture rises, taking advantage of the earliest rains. It is worthwhile leaving some crops – such as beans, tomatoes, amaranth and other greens, and maize – to drop their seed into the soil.

After the rains, the farmer may need to transplant seedlings from the soil seed bank to space them properly and keep to the planting plan, so that the garden stays diverse and each crop uses its best niche.

The soil seed bank alone is not enough, however. It favours the most aggressive self-seeders and crops that spread by several means, and a farmer who relies on it alone is likely to lose some crops to the most successful ones.

Seed Selection

The farmer can choose to save seed of the main crops needed in the garden. It is especially important to save seed of crops that produce few, large seeds.

Let seeds mature fully, then select viable ones. Avoid saving seed from hybrids or from plants that may have cross-pollinated. To prevent cross-pollination, set aside a part of the garden for seed production and grow unrelated crops next to each other there: plants of different families do not cross-pollinate. For example, small plots of tomatoes and maize can be grown side by side, but not

two varieties of maize, because they will exchange genetic material and the seed will be crossed – unless producing a cross is the aim.

When selecting seed, choose seeds that are:

- mature and viable;
- of good size, with the correct features;
- from healthy plants (not diseased or attacked by pests); and
- from vigorous, high-yielding plants.

Drying and Storage

Seeds must be dried thoroughly before storage. They can be left to dry on the plant during the dry season, but only if the plant does not scatter its seed (by wind, animals or pods and fruits splitting open). Otherwise, harvest the seed when mature but not yet dry, and dry it afterwards.

Traditionally, farmers dry seed by hanging it in shaded, airy places where it can dry slowly without rotting. Some communities dry seed in the kitchen roof, where soot from wood stoves helps preserve it. Ash has also long been used to protect seed from rotting and insect attack.

Seeds can be stored in different containers. Glass jars are ideal, but plastic containers can be reused too. What matters most is keeping moisture out: keep containers dry and tightly closed, and store them in a dry, cool room. Label each container clearly with the crop and the date.

Farmer Knowledge Generation and Sharing

Regenerative farming is about learning by doing. Farmers learn over time which plants grow where and how. They can use indicators such as yield, plant vigour, resilience and growing time to judge which plants do best in their environment.

Because the objective of a regenerative kitchen garden is to improve the soil through organic matter and microbial activity, farmers should favour plants that give good ground cover and biomass, tolerate low moisture, yield well and grow well with companions.

Regenerative kitchen gardeners and their partners can meet regularly to exchange experiences, share seeds and planting material, and work out together how to overcome challenges.

Preservation and Value Addition

Because non-irrigated kitchen gardens are seasonal, farmers need to preserve part of the harvest to cover very dry seasons and droughts when harvests are low. At times the family may also have more of one crop than it needs. In both cases it makes good sense to use an appropriate preservation method.

Drying

Drying is the most common and widely applicable method. It suits leafy vegetables, starchy root crops, pulses and grains.

- **Leafy vegetables:** blanch them in hot water for about five minutes, cool them in cold water, drain, then sun-dry them on black sheeting. A simple, low-cost solar dryer can also be used.
- **Roots and vegetables:** chop them into small pieces so they dry faster and more evenly.
- **Grains and roots:** can be ground into flour before or after drying.

Fermentation

Fermentation suits fruits and vegetables. Chopped vegetables are fermented in salt or sugar water in closed containers fitted with a vent to release the gas produced by the microbes. Fermentation is complete when the fizzing stops and no more gas is released. The vegetables can then be stored, either dried or in the fermentation liquid.

Fermentation can also add value to fruits by turning them into new products such as wine and vinegar.

Canning

Canning requires some investment in equipment and containers. Rural farmers can raise the capital by coming together as a group or cooperative to bulk, process and sell preserved produce. Canning is suited to perishable fruits and vegetables such as tomatoes, carrots, cucumbers, pumpkins and butternuts.

Equipment needed

- Water-bath canner or pressure canner
- Cooking pots
- Canning jars or tins
- Strainers
- Choppers
- Canning lids and sealers

Method

1. Chop or dice the vegetables and cook them until soft.
2. Increase the acidity of vegetables that are not acidic enough by adding food-grade vinegar, lemon juice or citric acid.
3. Strain the cooked vegetables through a wide-holed sieve, then fill the canning jars using a funnel.
4. Place the jars or tins in the canner and heat them – in boiling water or under pressure – for **15 minutes or more**, following a tested recipe for that food. In a water-bath canner, the jars must be fully covered with water.

Food safety when canning

Low-acid vegetables such as carrots, pumpkins and butternuts can carry the bacteria that cause botulism, a serious and sometimes fatal food poisoning. Water-bath canning is safe only for acidic foods such as fruits, pickles and tomatoes with added acid. Low-acid vegetables must be processed in a **pressure canner**, or pickled first to make them acidic. Always follow tested recipes and processing times, and throw away any can or jar that is bulging, leaking, or smells or looks wrong.

Glossary

Key terms used in this manual.

A-frame – A simple A-shaped wooden tool with a plumb line, used to find and mark contour lines.

Berm – A raised ridge of soil, usually built on the downhill side of a trench, used as a raised growing bed.

Bioaccumulator – A plant with deep, wide roots that draws up nutrients and stores them in its leaves.

Biochar – A stable, porous form of charcoal added to soil to hold water and nutrients.

Biomass crop – A plant grown mainly to produce material for mulch.

Blanching – Dipping vegetables briefly in hot water, then cooling them, before drying or storing.

Chop and drop – Cutting weeds, cover crops or grasses and leaving them on the soil as mulch.

Companion planting – Growing crops together that benefit one another.

Contour line – A line across a slope joining points at the same height.

Cross-pollination – The transfer of pollen between different plants or varieties, which can mix their traits in the seed.

Half-moon – A semicircular trench and berm on the contour that catches run-off for planting.

Hugelkultur – A way of building beds from layers of wood and organic matter covered with soil.

Humus – Dark, stable organic matter in the soil formed from decomposed plant and animal material.

Key line – The contour line where the direction and steepness of a slope begin to change.

Micro-catchment – A small structure that collects run-off from the surrounding area for plants.

Mycorrhizal fungi – Fungi that partner with plant roots and help them absorb water and nutrients.

Percolation – The movement of water down into the soil.

Pressure canner – A sealed pot that heats jars above boiling point; needed for safely canning low-acid foods.

Sacrificial crop – A crop grown to draw pests or birds away from the main crop.

Soil seed bank – Seeds left in the soil that germinate naturally when the rains come.

Succession planting – Planting so that early crops are followed by late crops through the season.

Swale – A trench dug along the contour to catch and hold run-off.

Syntropy – Plants growing together in ways that build up, rather than use up, the system's resources.

Water-bath canner – A large pot in which sealed jars are boiled; safe only for acidic foods.

Zai pit – A small planting basin that collects water and organic matter around a plant.

About the Author

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Alice Mwangi is an agroecology and regenerative agriculture consultant and the founder of Hillside Organic Garden. She holds a Master of Science in Human Ecology from the Vrije Universiteit Brussel (VUB), Belgium, and a Bachelor of Science in Range Management from the University of Nairobi (UoN), Kenya.

This manual shares practical methods for turning degraded dryland into productive, rain-fed kitchen gardens – from harvesting rainwater and rebuilding soil to planting, seed saving and preserving the harvest.

Also by Alice Mwangi

Mwangi, A. (2026). *Regenerative Agriculture Farmers' Training Manual*. Hillside Organic Garden, Kabete, Kenya. ISBN 978-9914-29-410-1.

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Regenerative Kitchen Gardening

in Non-Irrigated Drylands



ABOUT THE AUTHOR

Alice Mwangi

Alice Mwangi is a health and fitness enthusiast whose interest in permaculture and agroecology grew alongside her academic training as a Human Ecologist (VUB, 2006). Her passion for healthy organic food for all took her beyond buying organic produce from the shop to growing it herself – and to inspiring many households to use whatever space they have to produce organic, ecologically grown food for themselves.

Alice continually learns, researches and develops growing methods that achieve high productivity without chemical fertilizers or pesticides, and she teaches and trains people in these methods across Kenya, especially in urban and dryland settings. Hillside Organic Garden has grown into a demonstration site for the many growing techniques she has been working on.

This is her passion and purpose: to see as many families as possible gain affordable access to safe, nutritious food, while upholding the ecological integrity of our environment.

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