Practical guide to creating an agroecological farm

PDL's approach to "Model Farming"

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1 Introduction and context

Agroecology can be defined as...

"The application of ecological concepts and principles to the design and management of sustainable agroecosystems" (Altieri, 1995). At its core, it is people and farmers' organizations innovating, building upon, and combining local knowledge with added information, and emphasizing farms' biological processes, as opposed to external and chemical inputs. (Brescia, Fertile Ground, 2017).

Groundswell International and PDL emphasize farmer-centered processes of agroecological innovation and farmer-to-farmer extension to spread learning and effective practices. It is a practical, learning by doing approach through which farmers continuously improve their farming systems with each agricultural season.

In many localities and communities in the Global South and around the world, there is a growing body of practice and evidence demonstrating the effectiveness of agroecological farming and sustainable local food systems to improve food production and incomes, reduce poverty and malnutrition, regenerate land and biodiversity, and build resilience to climate change. Agroecology is defined and understood in many ways. As the field of agroecology grows, important work has been done to harmonize key principles and elements.

In 2019, 197 countries endorsed the 10 elements of agroecology, developed by the UN Food and Agricultural Organization (FAO) through a multi-stakeholder process. That same year, the UN's High-Level Panel of Experts on Food Security and Nutrition (HLPE) introduced 13 principles of agroecology to guide policy discussions and provide independent, evidence-based analysis.

This synthesis of 13 principles, grounded in levels of food system transition (Gliessman 2007) and key elements, provides important shared frameworks for program development, learning, and assessment. (see graphic on page 8).

5 Levels of Food Transition

(Gliesmann 2007)

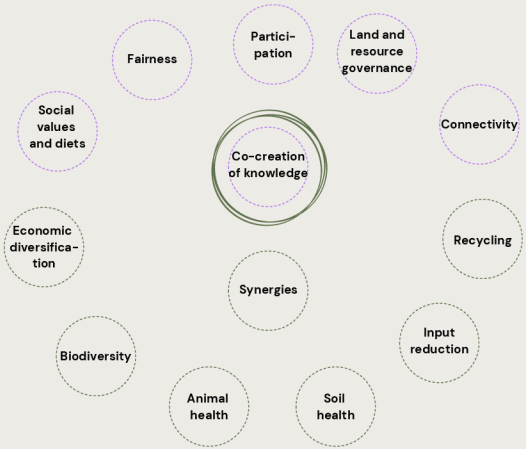
Transformational
Level 5: Rebuild the global food system so that it is sustainable and equitable for all.
Level 4: Re-establish connections between growers and eaters; develop alternative food networks.

Agroecosystem Levels
Level 3: Redesign the whole agroecosystem based on ecological processes.
Level 2: Substitute alternative practices and inputs.
Level 1: Increase efficiency of industrial inputs.

Incremental
Level 0: No agroecological integration.

13 Principles

(HLPE)



10+ Elements

(FAO)

The 13 principles and the 10+ elements of agroecology arranged according to the five level of food transition adapted from Gliesmann (2007). According to Gliesmann's 5 levels, a system is in line with basic agroecological principles if Level 3 has been reached. Level 4 and 5 are going beyond production and focus on socio-economic aspects such as re-establishing connections between growers and eaters and responsible governance.

Yet how do we apply the principles at community levels in different contexts to drive change? What strategies and social processes work? Without this practical work, these principles risk remaining abstractions on paper.

Based on the experience of PDL in Haiti and Groundswell International, an essential starting point is ensuring that smallholder farmers have a central role in experimenting with, developing, and spreading agroecological alternatives, from farms to landscapes to policies. This is the foundational principle of "Co-creation of Knowledge." There is no agroecology without strengthening the agency of farmers

Key agroecological practices promoted by PDL

- Controlling soil erosion through soil and water conservation structures
- Increasing soil organic matter and fertility: don't burn crop residue, but instead integrate into the soil. Add compost.
- Improving seed quality and access
- Promoting crop diversity (intercropping, crop rotation, integrate trees)
- Improving plot maintenance
- Natural pest management
- Integration of cover crops

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Goals of this guide

This comprehensive methodological guide serves as an essential resource for transforming traditional agricultural practices into sustainable, agroecological farming systems. Its primary purpose is to equip organizations and agricultural professionals with proven methodologies for helping farmers develop resilient, productive farmlands that can withstand climate change impacts while increasing production and net-incomes and ensuring year-round food security for farming families.

The guide presents field-tested approaches, and a "basket of practices" validated through PDL's extensive implementation experience, demonstrating measurable outcomes across three critical dimensions: food production efficiency, economic viability, and environmental sustainability.

Who is this guide for?

- **Agricultural support organizations:** This guide is primarily intended for organizations dedicated to agricultural development in Haiti and elsewhere in the world, including members of the Haiti Food Systems Alliance (HFSA) and Groundswell International networks, as well as other institutions working with farmers in tropical and subtropical regions.

- **Agricultural professionals:** Agronomists, agricultural technicians, and farmer-educators will find this guide valuable for designing and implementing training programs. The content provides a framework for systematic farmer support while allowing for contextual adaptations based on local conditions and needs.

- **Farmers and farmers organizations:** While primarily designed for organizational use, this guide can also be served as a comprehensive resource for farmers and their organizations in Haiti and globally who seek to enhance their agricultural practices. They can learn and implement the practices presented in this guide independently or in consultation with agricultural technicians or more experienced peer farmers.

3 Methodological approach

PDL's program approach draws inspiration from several established schools of thought and practices including...

PDL's peasant group (gwoupman) formation methodology is inspired by MPP's transformative approach, which centers on a series of 10 training days covering essential themes. This process helps community members develop critical awareness of their living conditions, recognize and analyze social challenges, and strengthen their collective capacity to work together to address these issues. During these training sessions, facilitators employ various engaging tools including posters, Haitian songs, and proverbs to convey messages in an inclusive and welcoming atmosphere. These gwoupman serve as the foundation for building community structures and peasant organizations across multiple communities in each communal section. They also function as the basic organizational structure for implementing programs to improve the lives of involved farmers and communities, savings, and credit, including agricultural improvement, income generation, and community health and hygiene programs.

MPP'S APPROACH TO PEASANT GROUP FORMATION

PDL program's approach also draws from Groundswell International's and network NGO members approaches to rural development, which emphasizes bottom-up development. This approach focuses on strengthening local/peasant organizations' capacities to play an active role in their community's development. In each program area, PDL enhances leadership capabilities, planning, and management capacities of community organizations, recognizing their crucial role in community mobilization and program co-management.

GROUNDSWELL INTERNATIONAL ORGANIZATIONAL CAPACITY BUILDING APPROACH

PARTICIPATORY TECHNOLOGY DEVELOPMENT - FARMER EXPERIMENTATION AND FARMER-TO-FARMER EXTENSION

PDL's agricultural program implementation process primarily focuses on first organizing peasant gwoupman and peasant associations that link multiple gwoupman within and across villages, and then facilitating agroecological training and learning, through these community-based organizations, of many farmers at once. PDL staff provide exposure and training on "baskets" of agroecological techniques that have proved effective in relation to the main challenges that farmers confront in their local contexts. Farmers then have a choice. They decide to test and adapt those techniques they find meet their most immediate needs and are most suitable on their own farms. PDL continues to provide ongoing accompaniment and support to farmers testing these practices, who continue to innovate with each agricultural season and transition their farms towards more robust agroecological systems. Through participatory dialogue with these farmers, PDL and the most successful farmers have developed the concept of "model farmers." *(Appendix A).*

There are several methodologies that have been developed around the world to systematically support this kind of farmer-centered, participatory technology development. These include the Farmer Field School approach, and the Comités de Investigación Agrícola Local (in Spanish), or CIAL's.

The Farmer Field School (FFS) represents a participatory and experiential learning methodology that enables farmers to acquire new techniques through hands-on fieldwork and peer-to-peer knowledge exchange. This approach emphasizes local experimentation, encouraging farmers to test various methods in their fields, observe outcomes, and make informed decisions based on what proves most effective for their specific conditions.

The guide presents a flexible implementation framework founded on these fundamental principles:

Journey-based approach

This guide represents a journey of agricultural transformation rather than a prescriptive recipe. Like any journey, it involves progressive learning, adaptation, and growth. Each farmer and organization will chart their unique path while following the core agroecological principles, understanding that regenerative agriculture is an evolving process rather than a fixed destination.

Participatory learning and co-creation of knowledge

The methodology emphasizes the vital importance of blending traditional farming wisdom with scientific understanding. Through participatory learning and knowledge exchange, farmers become active creators of agricultural knowledge rather than passive recipients. This approach recognizes that meaningful agricultural innovation emerges from the dynamic interaction between farmers' experiential knowledge and technical expertise.

Collective action and farmer to farmer knowledge sharing

Farmer groups and organizations play a crucial role in this transformation process. These collectives serve as platforms for: farmer-to-farmer learning and knowledge sharing; collective problem-solving and innovation; resource mobilization, solidarity and social support; community-level resilience building; sustainable practice adoption at scale. Cross-visits are organized between farmers from diverse groups or areas to allow farmers to visit each other’s plots to share knowledge and experiences.

Adaptive application

Rather than presenting rigid prescriptions, the guide offers evidence-based principles that can be adapted to diverse agricultural contexts. Users should view it as a strategic framework that accommodates local innovation and adaptation.

Evidence-based practices

The methodologies presented are grounded in successful implementations across PDL's network in Haiti, providing proven strategies for agroecological transformation while remaining open to local adaptation and improvement. Effective strategies are also learned from other organizations in Haiti and other countries.

Adaptation to context

Implementation should carefully consider local environmental conditions, available resources, and specific farm characteristics. Users are encouraged to modify approaches based on their unique circumstances while maintaining core regenerative farming principles. Implementing organizations should build the capacities of farmers to reflect and adapt practices to their context and specific needs.

Practical and experiential learning

The guide emphasizes hands-on learning and practical application, enabling farmers to progressively transform their agricultural practices through direct experience, observation, and collective experimentation.

Technical facilitation and support:

At the heart of this transformation process lies the essential role of trained agricultural professionals. Agronomists and agricultural technicians serve as skilled facilitators who guide and nurture the learning journey. Their role encompasses several critical dimensions:

1. First, they act as knowledge bridge-builders, moderating mass training sessions where they can create an environment conducive to learning and exchange. Through their expertise, they help translate complex agricultural concepts into practical, actionable knowledge that farmers can apply in their fields.
2. Second, these professionals facilitate group learning, steering discussions toward productive outcomes while ensuring every voice is heard. They help farming communities reach consensus on key actions and next steps, balancing different perspectives and needs within the group.
3. Third, they train successful farmers as farmer-to-farmer agricultural promoters (usually volunteers) who contribute to establish a multiplier effect. These community-based educators represent a sustainable knowledge transfer system to effectively support other farmers in their learning and implementation journey. This cascading approach ensures the widespread adoption of sustainable practices while building upon and strengthening the capacity of local people and organizations.

This comprehensive framework recognizes that successful agricultural transformation requires the careful orchestration of multiple elements: skilled facilitation, farmer empowerment, collective action, and adaptive learning. Its effectiveness stems from recognizing both the individual farmer's journey and the power of collective action through farmer organizations. Success depends on fostering meaningful participation, encouraging knowledge co-creation, and building strong farmer networks while maintaining fidelity to core agroecological principles. The role of technical facilitators proves especially crucial in weaving these elements together, ensuring that theoretical knowledge translates into practical success in the field.

4 Initial Preparation and Farmer Organization

The success of PDL's agroecological program lies in its thoughtful approach to community engagement and relationship building at the initial phase of the process.

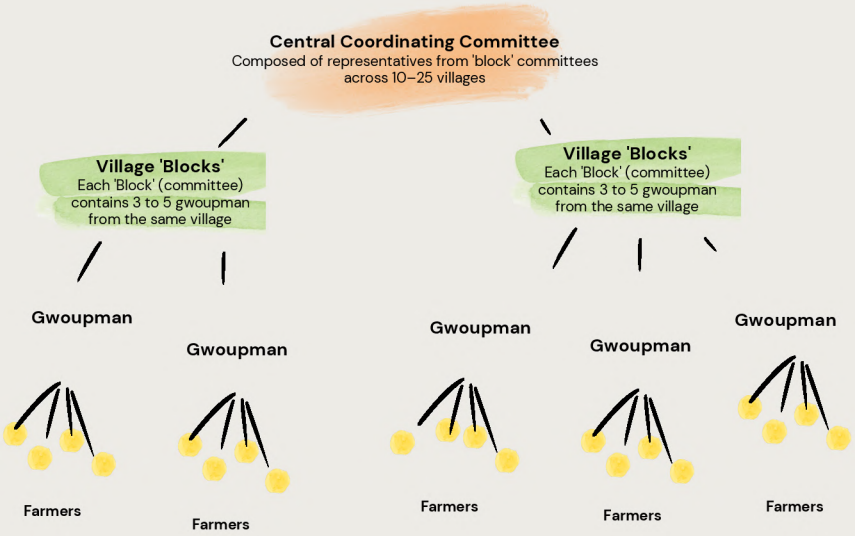
This approach recognizes that meaningful agricultural transformation begins not with technical solutions, but with strengthening deep community trust and collective solidarity. The first phase of PDL's program in a community begins with a comprehensive participatory dialogue process. PDL facilitators engage in detailed conversations with local leaders, community members, and small-scale farmers to develop a nuanced understanding of local realities and major challenges from the farmers' point of view. These discussions go beyond simple problem identification, they create spaces where farmers can articulate their challenges, share their aspirations, and reflect on their community's potential for change.

The insights gathered from these preliminary community conversations, are then utilized to facilitate a consciousness-raising process that transforms individual concerns into opportunities for collective action. Rather than imposing external solutions, PDL helps farmers identify existing resources and capabilities within their own communities. This process illuminates pathways for change that farmers might not have previously considered, demonstrating how solidarity and collective action can multiply the impact of local resources and knowledge. Farmers begin to see themselves not as isolated individuals facing insurmountable challenges, but as members of a powerful collective capable of driving meaningful change in their communities.

Formation of Small Solidarity Groups (Gwoupman) and Peasant Organizations

The formation of Gwoupman (basic groups) is the cornerstone of PDL's approach to community development. A Gwoupman consists of 15 to 20 farmers from the same community, brought together based on their geographic proximity and shared interests. These groups form the basic building blocks for larger community-based peasant organizations with which PDL works to implement its programs.
Gwoupman members are trained through a comprehensive educational process called Study Circle adapted from the Mouvman Peyizan Papaye (MPP). Through a series of ten days of reflection and training, this program aims to raise awareness and inspire farmers to take charge of their destiny while catalyzing positive change in their communities. Key themes covered during the training process include friendship & love; division & reconciliation; many members, one body; exploitation; patience & perseverance; human values; and living in community.

Once three to five gwoupman within the same village or neighborhood are formed, an intermediate structure called "Block" (community-level coordination committee) is formed, with representatives elected from each gwoupman. Once at least five communities have been organized at the "block" level within a communal section, those "blocks" elect leaders to create the General Assembly of a peasant organization. This representative organizational structure and hierarchy ensures efficient coordination, representation, planning, and action at various community levels. The entire process fosters a broad and evolving set of opportunities for effective and responsive leadership to expand and grow, in contrast to a history of centralized and exploitative leadership that has often been fostered by authoritarian regimes. This emerging culture is referred to as "Collective Leadership." (cf.: chart below).



Gwoupman
8–15 people living in proximity to each other. Many are model farmers.

Why is it important to organize farmers?

While the method or approach may vary, and we recognize that other organizations may not fully adopt this organizational process, organizing farmers into small groups prior to engaging them in agroecological learning processes (or joint action for improved health, income, or other needs) presents several advantages:

Breakdown into manageable units	Organizing farmers into small groups (10 to 25 members) allows an organization or facilitator to have more manageable groups to work with. Working with smaller groups of farmers facilitates the training and learning process. It is easier to coordinate and train smaller groups than an entire community to ensure active participation and better knowledge transfer. In addition, working with individual farmers in a one-on-one manner is an ineffective, costly, and slow way to spread improved farmer and community development.
Foster solidarity and collective problem solving	In a context where labor force is getting increasingly rare and costly in Haiti, when working together, farmers can mutually support each other through konbit1 to collectively address and overcome these challenges. As the motto says: Unity makes strength.
Participatory learning process:	The transition to more regenerative farming practices is a learning journey where participating farmers are actively engaged in the process. When they are organized, farmers have more opportunities to make their voices heard by sharing their knowledge and experiences.
Farmer-to-farmer transfer of knowledge	Working with organized groups facilitates farmer-to-farmer sharing of knowledge through regular meetings and field visits. It also enables intergenerational sharing of knowledge where elders can share their experiences with younger farmers.
Capacity building and decentralization of power	Farmer organizations create healthy spaces and opportunities for broad leadership development.

Farmers' Perspectives

Importance of a basic group according to gwoupman members:

In a workshop moderated by PDL in 2022 with gwoupman representatives from different partner organizations, they provided the following answers among others when asked about the role or importance of a gwoupman in a community:

- "A development model for the community"
- "A family in the community"
- "An example of collaboration, gesture of solidarity"
- "Helping others, help the community grow"
- "It is the support for the community, reflect on community issues to find solutions"
- "It is a salt to give it a good taste the community"
- "It is a support and light for everyone in the community"
- "Lightens any burden (no load is too heavy)"
- "Gwoupman members are always ready to help others"
- "Konbit for development"
- "Solidarity and mutual support"
- "Work together to achieve our goals"
- "A motor of development"
- "Put what we have together to support each other"
- "Solidarity with those in need"
- "A tool for social and economic development"
- "Allows members to reflect on all community issues"
- "Provide good examples to others through model farms"

5 Different Steps and Practices to Set-Up an Agroecological Farm

1. Soil Preparation

Key practices:

- Fencing (where possible to prevent free-grazing animals) *
- Zero Burning
- Soil and water conservation structures (erosion control)
- Stone contour barriers
- Straw contour barriers
- Live contour barriers
- Terracing
- Contour trenches (water diversion ditches)
- Building soil health through incorporation of organic matter

**** Note: Farmers do not always have resources for fencing their plots. Live fencing can be developed over time. In areas where a critical mass of farmers is beginning to practice agroecology, a cultural shift can be fostered at community levels away from free grazing of animals, and towards farmer penning or tying their animals. This can also facilitate management of manure for soil fertility.***

Understanding Your Land

Before implementing any practices, farmers must develop a deep understanding of their land's characteristics and available resources. This knowledge forms the foundation for all future decisions and helps farmers make informed decisions about where to implement different practices.

Key elements farmers should observe on their parcels include:

- Soil type, color, and depth
- Understand soil texture through simple hand tests
- Identify natural and traditional indicators of soil fertility
- Slope steepness, direction and length
- Analyze how water flows during rainfall
- Notice signs where erosion already exists
- Existing vegetation including trees, shrubs, and grasses
- Understand sunlight patterns throughout the day noting sunny and shady areas and wind patterns that could affect crops
- Special attention should be paid to locally available materials that can be used for soil conservation: stones and rocks that could build barriers, crop residues from previous harvests, bamboo or vetiver grass for living barriers
- Identify existing biodiversity including naturally occurring vegetation
- Availability of organic matter from tree leaves and animal manure,
- Any existing traditional soil conservation structures from previous generations.

Soil and Water Conservation

In Haiti's mountainous landscapes, soil and water conservation structures are essential tools for sustainable agriculture, **protecting precious topsoil from erosion, allowing soil fertility to be improved over time, while maximizing the use of limited rainfall.** These structures work together to **slow water movement, increase water infiltration, and create favorable conditions for crop growth.** When intelligently designed and maintained, conservation structures can **transform steep, degraded hillsides into productive farmland** while building long-term resilience against climate extremes.

While many of these techniques have roots in traditional Haitian farming practices, their systematic implementation is labor-intensive and requires good planning, community cooperation, appropriate technology, and an understanding of how different structures complement each other across the landscape. Through kombit farmer groups can join forces to effectively tackle these challenges. Kombit embodies Haiti's spirit of mutual aid and collective action. It contributes to strengthening community bonds, maintaining cultural elements and allows all members of the group to benefit from shared labor by rotating work between members' plots. This section explores some of the most common soil and water conservation structures suitable for small-scale farmers using locally available materials and can be implemented with manual labor and basic tools.

Considerations for Implementation

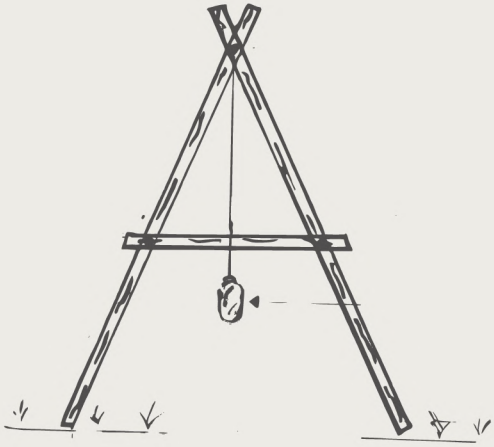
Defining contour lines:

Before any soil and water conservation structures can be established, farmers must define contour lines on their land. This can be done using a cheap and easy to build “A-frame level”.

Steps to construct the A-frame level

Materials needed:

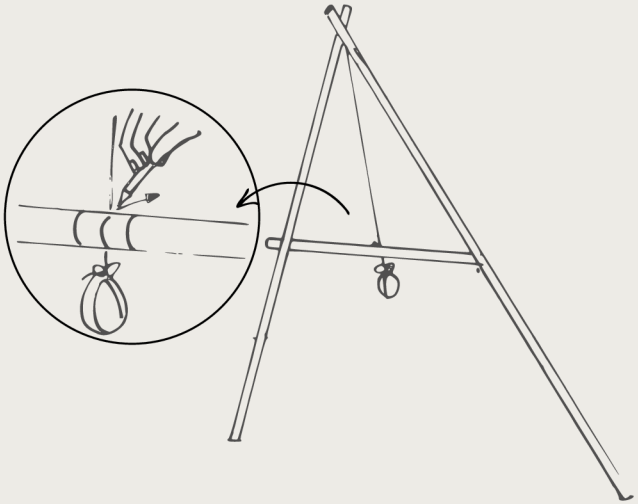
1. Two straight wooden poles (2 meters long)
2. One shorter wooden pole (approximately 1 meter long)
3. A sturdy string or rope
4. A weight (e.g., a stone or small bottle filled with sand) to act as a plumb line
5. Nails or screws to assemble the frame

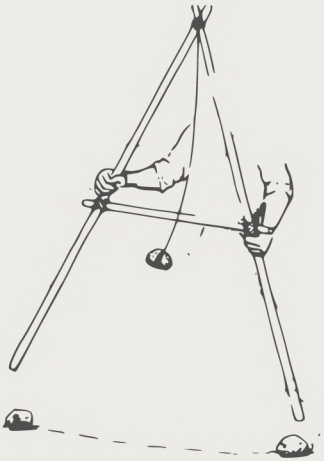


1. Tie, nail, or screw the two long poles to form an "A" shape, with their tops joined and their bases spread wide (1.5 to 2 meters wide).
2. Attach the shorter pole horizontally about halfway to stabilize the frame and connect the legs of the "A." The crossbar must be placed at equal distances on both poles to ensure it's horizontal.
3. Tie the string to the top of the "A" frame, allowing it to hang freely.
4. Attach the weight to the bottom of the string below the cross bar to create a plumb line.

To calibrate the A-level:

1. Place the A-level on a flat, horizontal surface.
2. Mark where the plumb line crosses the horizontal pole; this is the "level" mark.
3. Reverse the legs to confirm accuracy.



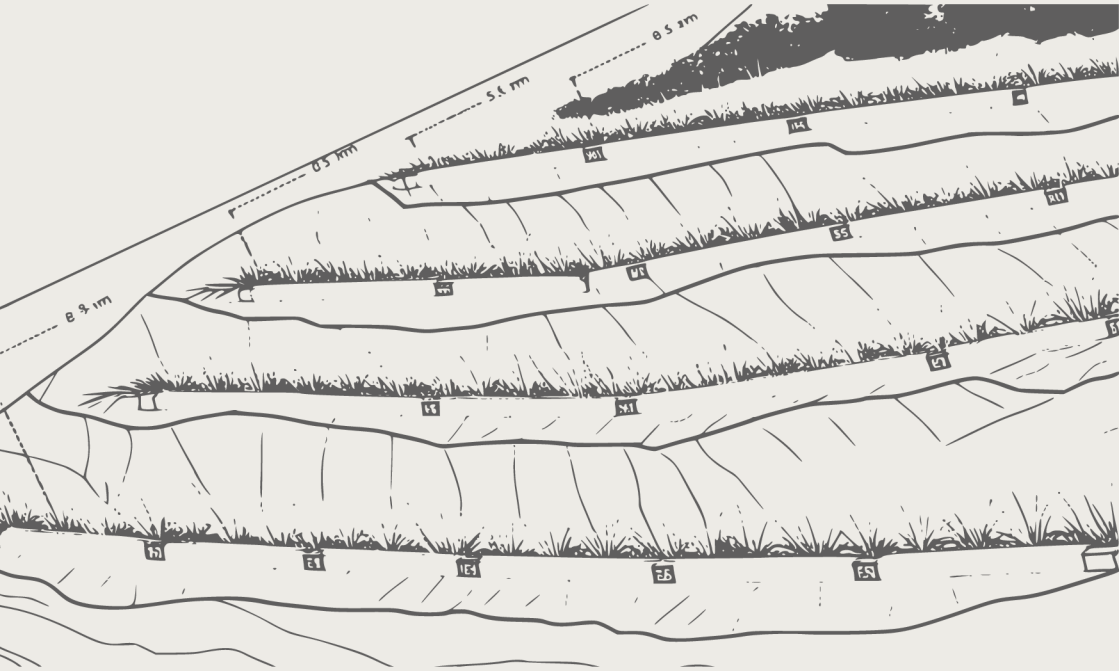


Using the A-frame level:

To mark contour lines:

1. Place the A-frame on the slope with one leg uphill and the other downhill.
2. Adjust the frame until the plumb line aligns with the center mark on the crossbar, indicating that both legs are at the same elevation.
3. Mark these points with stakes.
4. Rotate the A-level, placing one leg where the second leg was previously marked. Adjust again until the plumb line aligns with the center mark, then place another stake.
5. Repeat this "leapfrog" process across the slope to mark points of equal elevation.
6. For accuracy, ensure the A-frame is stable on firm ground, and periodically verify level marks by reversing the frame's position. These stakes will serve as a guide for installing soil and water conservation structures.

Strategic placement of soil and water erosion control structures



For effective erosion control, soil and water conservation structures must be placed strategically in the field.

Start at the Top: Erosion begins at the top of sloping terrain. It is recommended to establish the first structure at the highest point in the field.

Distance between structure:

The distance between consecutive barriers depends on the steepness of the slope.

- For **gentle slopes:** A spacing of 10-12 paces (approx. 8-10 meters) is recommended however,
- For **steep slopes**, the structures must be closer to one another with around 5-7 paces (approx. 4-6 meters).

Ravine correction:
Contrarily to slopes, when addressing ravines, interventions need to start from the bottom because this is where water flow is typically most concentrated, and erosion is most severe. Stabilizing the lower part of the ravine first helps to reduce the speed and volume of water running downstream, preventing further degradation of the base. This creates a solid foundation for upstream interventions.

In large fields, farmers must:

- Identify and prioritize the most fragile areas with visible erosion risks or poor soil structure to protect first.
- Install multiple structures: avoid building a single barrier across the entire field. Instead, install multiple, strategically positioned barriers in vulnerable sections. The space between barriers enhances soil retention and protection, ensuring that benefits extend throughout the field.

Common soil and conservation structures:

Fencing represents a fundamental investment for small-scale farmers, serving multiple essential functions in agricultural management and land protection. While fencing itself does not conserve soil and water, it supports the practices that do, protecting efforts aimed at improving soil conservation, fertility and regeneration. In Haiti's context, where free-grazing animals are common and land boundaries can be subject to dispute, proper fencing is crucial for protecting crops and establishing clear property limits. Living fences, created with species like Spondias purpurea (siwèl), Burseara simaruba (gonmye), Gliricidia, Sisal and Moringa offer a sustainable and cost-effective alternative to expensive wire fencing while providing additional benefits such as fodder for livestock, green manure for soil improvement, and even food for household consumption. “Dead” fences made from local materials like bamboo or thorny branches can serve as temporary solutions while living fences establish themselves.

Beyond protecting crops from animal damage, well-maintained fences help:

- Define farm boundaries.
- Reduce conflicts with neighbors.
- Create microclimates that protect crops from intense winds.
- Serve as physical markers for soil conservation structures. helping to maintain their integrity over time.

When combined with other soil conservation practices, fencing becomes the first line of defense in a comprehensive land management strategy, allowing farmers to invest with confidence in long-term soil improvement and perennial cropping systems.

Straw ramps/mulching_

Using crop residues, straw ramps or mulching are one of the simplest yet most effective soil conservation structures farmers can implement. These barriers are created by laying organic materials like crop residues (like corn stalks, bean vines, or banana leaves) in strips along the contour lines of the slope.

This technique serves multiple purposes including:

- Reducing raindrop impact on the soil.
- Serve as speed bumps that slow down rainwater as it flows downhill.
- Increase water infiltration.
- Suppress weed growth.
- Trap soil particles but also gradually decompose, enriching the soil with organic matter.
- Mulching helps protect the soil surface and retain valuable moisture during dry periods.

This method is particularly valuable in Haiti because it makes use of materials that farmers already have on hand.

Rock or stone walls

Known locally as "mi-sèk" in Haitian Creole, stone bands and rock walls are especially crucial for steep hillsides. These structures are built by carefully stacking locally available rocks along the contour lines, creating a strong physical barrier (wall) against soil erosion. The walls need to have a solid foundation dug into the ground, with larger rocks at the base and smaller ones on top. Over time, soil builds up behind these walls, creating natural terraces that make farming easier and more productive. This technique has been used successfully in Haiti's mountainous regions for generations.

Water retention ditches

Also called infiltration pits, are particularly important in areas where water conservation is crucial. These ditches are dug along the contour lines and can be enhanced by planting along their edges. They capture runoff water, allowing it to slowly seep into the soil rather than rushing down the slope. In Haiti's variable climate, these structures help store water during heavy rains for use during drier periods.

Productive living barriers

Productive living barriers combine the erosion control benefits of dense vegetation with productive elements that support farm livelihoods. These structures consist of strategically planted rows of mixed vegetation along contour lines, typically combining deep-rooted perennial grasses like vetiver or lemongrass with productive species such as pigeon pea, Gliricidia or leucaena. Other species to consider include sugarcane, pineapple, moringa and Napier grass. The dense root systems and above-ground growth create effective barriers against soil erosion while the carefully selected plant species provide multiple benefits for the farming system (e.g., nitrogen fixing, leaf litter and organic matter, biodiversity for soil fertility, fodder, food, fuelwood, etc.). In the Haitian context, where land is limited and farmers need to maximize returns from every parcel, these multi-functional barriers transform necessary conservation structures into productive assets that contribute to both environmental sustainability and household needs.

Building Soil Health (Flat Land)

Once erosion control is established on flat land or gently sloping land where erosion may not be an immediate concern, farmers can focus on enhancing their soil's health and fertility through natural methods and targeted conservation practices. While these plots may not require intensive structural measures like barriers or terraces, they still benefit from careful soil and water management.

Key practices begin with mulching techniques using locally available materials such as crop residues, dead leaves, or grass clippings to protect the soil surface, retain moisture, and gradually build organic matter content. Farmers should systematically integrate organic matter through methods like composting, manure application, and green manure crops and cover crops to improve soil structure, fertility, and biological activity.

CONTOUR TRENCH

In areas prone to seasonal flooding or heavy rains, proper drainage becomes crucial. Implementing shallow contour trenches or drainage channels will help prevent waterlogging that can damage crops and degrade soil structure. Additionally, farmers can establish raised planting beds where appropriate or slightly elevated growing zones to ensure proper root development during wet periods.

Role of a Facilitator

A facilitator can play a crucial role in empowering farmers to adopt sustainable soil conservation practices. The facilitator can lead the discovery process through participatory activities that value farmers' traditional knowledge while introducing new techniques. Using simple language, participatory and hands-on methods, the facilitator can help farmers to understand, implement, and adapt these techniques using locally available materials. The emphasis should be on fostering collaborative learning and building on the farmers' existing knowledge and resources.

Key activities may include

- Facilitating group observations.
- Digging soil profiles in different locations to compare soil color, depth and presence of microorganisms.
- Creating rough sketch maps of their parcels marking problem areas and resources.

Guiding slope measurement with the A-frame level:

- Demonstrate how to build a simple A-frame level using materials like wooden sticks, a plumb line, and a small weight.
- Guide farmers in using the A-frame to measure slopes accurately, ensuring proper alignment of contour barriers.

Constructing contour barriers:

- Showcase practical methods for creating contour barriers using rocks, crop residues, or vegetation.
- Emphasize correct spacing based on the gradient of the slope, illustrating how this reduces erosion and improves water retention.

Identifying soil-holding plants:

- Provide guidance on selecting plants such as vetiver grass, leucaena, moringa, and pineapple that stabilize soil.
- Facilitate planting demonstrations to ensure proper placement along barriers for maximum effectiveness.

Composting techniques:

- Lead hands-on workshops to demonstrate composting using crop residues, animal manure, and other organic materials readily available to farmers.
- Explain how to utilize compost and the benefits of compost for enriching soil health and improving crop yields.

Building capacity through community involvement:

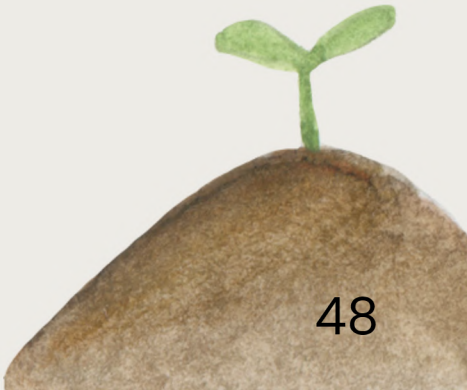
- Encourage farmers to share their knowledge and experiences within the community, fostering a culture of learning and innovation.
- Organize group discussions and field visits to farmers plots to highlight successful implementations and inspire others to adopt similar methods.

2. Local Seeds Selection

Key practices:

- Local seeds selection
- Mass seeds selection
- Germination test
- Farmer-managed seed systems

Seeds are the foundation of any farming system, and using high-quality, locally adapted seeds is critical for resilient and productive agriculture. Haitian small-scale farmers often rely on traditional seeds saved from previous harvests. This chapter provides guidance on local seed selection, ensuring good germination, improving seed quality through field practices, and fostering collective approaches like community seed systems.



Local Seed Selection

- Identify seeds from locally grown crops that have proven productive and resistant to pests and diseases in the area.
- Select seeds from plants that demonstrate desirable traits, such as high yield, sturdy growth, and tolerance to local conditions (e.g., drought or heavy rain).

Using grain purchased from local markets

Farmers sometimes use grain purchased from local markets as seed due to limited access to certified seeds. While this can be a viable option, it requires careful steps to ensure the grain will germinate and produce healthy crops:

- Inspect the grain: Select grains that are uniform in size, clean, and free from visible signs of damage, mold, or pests.
- Conduct a germination test: Before planting, test a sample of the grain to check its germination rate.
- Assess adaptability: Ensure the grain is from a crop that thrives in local soil and climate conditions. Grains from distant regions or imports may not perform well in the local environment.
- Pre-treatment for pests and diseases: Treat the grains with natural methods, such as soaking them in neem leaf extract or ash water, to reduce the risk of pest and disease transmission.

Mass Seed Selection on Farms

- During the growing season, identify the healthiest plants that show good vigor, pest resistance, and high yields.
- Mark these plants and collect seeds from them at the end of the season.
- Avoid taking seeds from plants that show signs of disease or weak growth.

Germination Tests

- Test the viability of seeds before planting to ensure high germination rates.
- How to test: Soak seeds overnight, then place them on a damp cloth. Keep the cloth moist and observe how many seeds sprout within 5–7 days.
- Use only seeds with high germination rates to maximize productivity.

Farmer-Managed Seed Systems

Preserving and improving local seed varieties ensures food sovereignty and maintains biodiversity. PDL's approach focuses on creating decentralized community seed banks with revolving seed credits to facilitate farmers' access to quality seeds.

- Seed banks allow farmers to store, exchange, and access high-quality seeds during planting seasons.
- When farmers are organized, community groups collaborate to establish local seed banks at household level using the house of a leader or group member with appropriate space.
- Ensure proper storage conditions (cool, dry, and dark) and locally available equipment (metallic siloes, plastic barrels, calabash, etc.) to maintain seed viability.

Facilitator Tips and Guide

Facilitators play a crucial role in guiding farmers through these practices, fostering knowledge sharing, and strengthening community collaboration. This guide provides some practical steps to help farmers build resilient and sustainable seed systems through local seed selection, testing, and community collaboration.

Initial assessment activities

- Bring seeds to meetings: Ask farmers to bring local seeds to share and discuss.
- Create a variety inventory: Work with farmers to list all local crop varieties, note rare or disappearing types, and identify who maintains traditional seeds.
- Map seed sources: Identify local sources of seeds, including markets, farmers, and seed-saving practices.

Hands-on training on basic seed selection and testing

- Conduct field walks to identify plants suitable for seed collection.
- Teach farmers to mark mother plants based on selection criteria, including plant vigor, disease resistance, production quality, local preferences.
- Demonstrate how to inspect grain and conduct germination tests.

Setting up seed banks

- Facilitate group discussions to establish rules for a community seed bank.
- Train farmers on: Storage methods (cool, dry, and dark conditions); Record keeping (inventory, source); quality control and maintenance.

3. Planting and Crop Diversification

Key practices:

- Planting techniques
- Intercropping and mixed intercropping
- Tree integration and management

Crop diversification involves cultivating a variety of crops and integrating different plant species within a single agricultural system to enhance productivity and sustainability. After securing the necessary seeds, preparing the soil, and implementing erosion control measures, the farmer's next step is to determine the most effective planting methods and crop arrangements. In Haiti, where smallholder farmers often face challenges such as soil degradation, erratic rainfall, and limited market access, crop diversification offers a resilient solution. By adopting this approach, farmers can improve soil fertility, increase yields, ensure a steady supply of nutritious food, and contribute to ecological restoration, all while optimizing land use.

Planting Techniques

Proper seed placement ensures good germination and healthy plants.

Planting seeds in holes

- Dig holes of appropriate depth based on the seed type, ensuring proper germination and growth.
- Incorporate organic compost or manure into the holes to boost soil nutrients.
- Use appropriate number of seeds per hole. For example, for small seeds like beans: 2-3 seeds maximum; for medium size seeds like corn: 2 seeds per hole; for large seeds: 1 seed per hole.
- Remove weaker seedlings after germination.

Respect planting distance and crop density

- Follow recommended spacing guidelines to avoid overcrowding, which can lead to competition for resources and increased pest risks.
- Maintain appropriate density to optimize sunlight exposure and airflow.
- Find the balance between too close and too far. Too close spacing wastes seeds and creates weak plants whereas wide spacing wastes land and allows weeds.

Intercropping and Mixed Intercropping

Intercropping refers to the practice of cultivating multiple crop species on the same plot of land within a given year. This strategy aims to enhance soil fertility by combining complementary crops, such as legumes, cereals, root and tuber crops, and trees, while also boosting food and biomass production. Intercropping extends the harvest period by incorporating crops with varying growth rates, improving food access and security throughout the year. This land-use diversification integrates three key approaches:

- **Mixed intercropping:** where different crops are grown together in the same without a specific planting pattern. This technique maximizes land use and takes advantage of crop interactions, such as shade or pest deterrence.
- **Temporal intercropping**: faster-growing crops are sown alongside slower-growing ones, allowing staggered harvesting. For example, seasonal crops like okra can be planted with longer-maturing crops like cassava or plantain.
- **Agroforestry:** trees are integrated into the farming system to provide shade, improve soil structure, reduce erosion, and add long-term economic value through timber, fruits, or nuts.

Crop Integration

Integrating a diverse range of plant species into farming systems (10-20 species) maximizes land productivity, enhances soil biology, improves soil health, and ensures year-round harvests. This approach involves planting species with varying resource needs, growth cycles, and harvest times, creating a resilient and sustainable system. Farmers can include:

- **Root crops:** Sweet potatoes, cassava, and yam provide reliable, nutrient-rich staples and help reduce soil erosion.
- **Legumes:** Beans and peas fix nitrogen in the soil, improving fertility while providing protein-rich food.
- **Cereals:** Crops like corn and sorghum offer energy-rich staples and support other crops through complementary planting.
- **Fruit trees**: Papaya, banana, citrus, and mango add long-term value, diversify yields, and contribute to agroforestry.
- **Nitrogen-fixing trees:** Moringa and leucaena enhance soil fertility and provide additional products like fodder and food.
- **Medicinal plants:** Integrating common medicinal herbs in strategic locations can enhance plot diversity and meet household health needs.
- **Cover crops:** They protect soil, suppress weeds, and improve organic matter content between planting seasons.

Additionally, seasonal timing is crucial when adding new plants to existing plots. For example, legumes can be introduced after harvesting cereals to replenish soil nutrients, while fruit and nitrogen-fixing trees can be planted during the rainy season for better establishment. This strategic integration ensures that plots remain productive and ecologically balanced throughout the year.

Principles for Mixed-Intercropping

Mixed-intercropping systems are widely practiced by Haitian small-scale farmers, who often forego formal row planting in favor of less structured patterns. While this flexibility can enhance productivity, applying key principles ensures optimal use of space, resources, and crop yields.

1. **Maintain appropriate plant spacing**

- Proper spacing between plants is critical to prevent overcrowding, reduce competition for nutrients, and optimize airflow.
- Regardless of planting patterns, ensure that plants have enough room for root development and canopy expansion.

2. Understand light requirements and shading effects

- Each crop has unique light requirements, and taller plants can shade smaller ones. Use this to your advantage by positioning sun-loving crops where they get adequate exposure and shade-tolerant crops under taller ones.
- **Example**: Grow leafy greens like spinach or amaranth under taller crops like bananas or papayas to reduce heat stress.

3. Maintain optimal crop density

- Balance the number of plants in the system to maximize productivity while avoiding overuse of resources. Too many plants can lead to competition, while too few may underutilize the land and facilitate the development of weeds.
- **Example:** Intercrop cassava (low density, slow growing) with peanuts (high density, fast-growing) to utilize space effectively without resource depletion.

4. Manage root competition and synergy

- Diverse crop combinations interact below ground, either competing for nutrients or water or working synergistically to improve soil health.
- **Example:** Intercrop sweet potatoes (shallow roots) with pigeon peas (deep roots) and other cover crops like clover to maximize resource use while enriching the soil with organic matter and fostering beneficial microbial activity.

5. Understand companion planting (complementary crops)

Certain crops benefit from being planted together, improving growth, deterring pests, or enhancing soil health. Below are a few examples of beneficial companionships:

- **Support partnership:** Corn + Climbing Beans + Squash (Three Sisters)
- Corn provides a natural pole for beans
- Beans fix nitrogen for corn's growth
- Squash covers ground and reduces weeds
- Together they maximize space and nutrients
- **Pest management pairs**: Cassava + Pigeon Peas
- Pigeon peas deter cassava mealybugs
- Both are drought resistant
- **Soil enhancement group:** Peanuts + Sweet Potatoes
- Both cover soil but use different layers
- Peanuts add nitrogen while sweet potatoes add organic matter
- Space-maximizing combination: Plantain + Beans + Taro
- Different heights and root depths
- Continuous harvests throughout year
- Complete soil coverage
- Traditional Haitian combinations: Corn + Pigeon Peas (beans) + Sweet Potatoes
- Proven local combination
- Year-round food production
- Drought resistant
- Soil improving

Tree Integration and Management

Trees are an essential component of the Haitian farming system, offering a wide range of ecological, economic, and social benefits while protecting the land.

Fruit trees such as mango, citrus, papaya, and avocado provide nutritious food for households and additional income through sales. Their presence in farming systems diversifies production and reduces economic risks by offering long-term yields.

Forest trees play a vital role in stabilizing soils, reducing erosion, and enhancing water retention, particularly in hilly areas. These trees act as windbreaks, protect crops, and provide timber and firewood, essential resources for rural households.

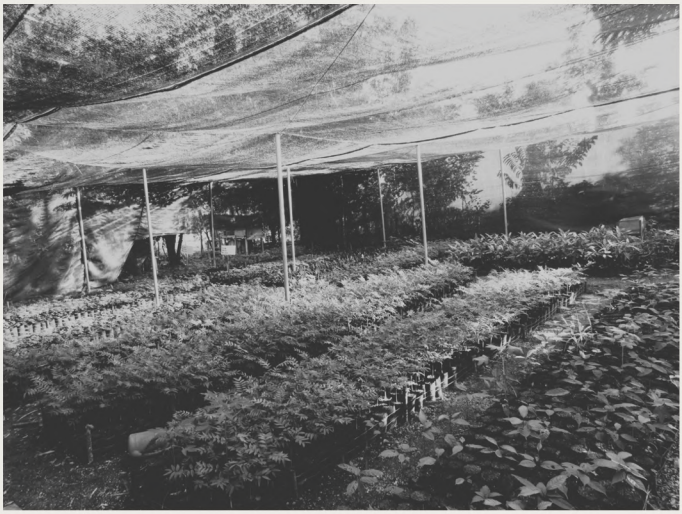
Nitrogen-fixing trees, such as moringa and leucaena, enrich the soil by naturally adding nitrogen, reducing the need for chemical fertilizers. These trees also support biodiversity, improve crop productivity, and can serve as fodder for livestock, ensuring a sustainable source of feed. Additionally, multi-purpose trees like Gliricidia and Calliandra contribute to both soil fertility and animal nutrition.

By strategically planting and managing these trees, farmers can ensure long-term sustainability and productivity.

Strategic Tree Placement

Incorporating trees into agricultural systems requires careful planning to ensure their benefits are maximized. Traditional wisdom and local knowledge play a crucial role in guiding these practices. Key principles include:

- **Select appropriate tree species:** Choose species that align with the farm's needs—fruit trees (e.g., mango, citrus) for nutrition and income, timber trees (e.g., mahogany, cedar) for construction, and nitrogen-fixing trees (e.g., moringa, leucaena) to enhance soil fertility.
- **Maintain proper spacing:** Ensure adequate distance between trees and crops to prevent competition for sunlight, water, and nutrients while optimizing shade and airflow.
- **Manage tree-crop interactions:** Monitor and adjust for shading, nutrient sharing, and water use to ensure crops and trees coexist harmoniously.
- **Position trees for protection:** Place trees strategically to serve as windbreaks, reduce soil erosion, and protect crops during heavy rains.
- **Create multifunctional live fences:** Use trees like moringa or Gliricidia for boundary fencing, which also provides firewood, fodder, and organic matter.
- **Adapt local knowledge:** Incorporate traditional practices and cultural preferences, including planting sacred or culturally significant tree species to foster community buy-in and respect for local heritage.



Community-managed tree nurseries provide seedlings to farmers.

Tree Management Techniques

Proper management of trees ensures their long-term health and maximizes their contributions to the farming system. Techniques include:

- **Pruning for better production**: Regularly prune fruit trees to maintain shape, encourage healthy growth, and improve fruit yield. For nitrogen-fixing and fodder trees, pruning stimulates regrowth and organic matter production.
- **Sustainable harvesting:** Harvest timber, firewood, fruits, or leaves carefully to avoid over-exploitation, ensuring the tree's survival and ongoing productivity.
- **Shade management:** Adjust tree canopies seasonally to regulate shading, ensuring optimal sunlight for crops while preventing excessive heat or water stress.
- **Maintaining fruit trees:** Regularly remove dead branches, apply organic mulch, and provide adequate watering during dry seasons to sustain productivity.
- **Propagation and grafting:** Propagate desirable tree varieties through seedlings or cuttings. Apply grafting techniques to combine the strengths of different varieties, such as disease resistance and high yield.

These techniques, combined in different ways, allow farmers to develop "model farms" that increase productivity and incomes, ensure food security by producing food that farmers can harvest from their plots throughout the year, and increase resilience to climate change. Farmers in different peasant associations name this type of model farming in ways that is meaningful to them (for example, 'chouk' or rooted farms, 365 day a year farms, etc.).

Facilitator Tips and Guide

Facilitators play a vital role in helping farmers understand and adapt these techniques for effective integration and management of trees on their farms. Their responsibilities include:

Preparation

Help farmers understand local farming practices and crop preferences and tailor guidance to the specific agroecological context and farmers' needs. Use simple tools and locally available materials to ensure replicability.

Demonstrating best practices

Lead hands-on field exercises, such as marking planting distances or preparing compost-enriched seed holes.

Encouraging participatory learning

Use questions to stimulate group discussions on crop choices, emphasizing their nutritional and economic benefits. Encourage farmers to share their experiences and ideas to foster peer learning.

Promoting experimentation

Encourage farmers to experiment with intercropping combinations and agroforestry layouts in small sections of their plots.

Field exercise ideas

1. **Crop selection exercise:** Provide a list of crops with their benefits (e.g., soil improvement, nutrition, market value). Ask farmers to choose combinations for their plots based on their needs.
2. **Seed planting practice:** Demonstrate planting seeds in holes with proper depth and compost application. Have farmers plant seeds in designated plots, practicing spacing and density.
3. **Intercropping demonstration:** Set up a small demonstration plot or use a farmer's field to demonstrate examples of compatible crop combinations. Discuss how these combinations benefit each other and the soil.
4. **Crop rotation mapping**: Guide farmers in sketching a rotation plan for three seasons, considering pest control and soil health.
5. **Agroforestry group learning walk:** Visit a farm or plot with successful tree integration into crops. Discuss benefits like erosion control, shade, and income generation. Ask farmers to identify practices that could be replicated on their own plots.
6. **Pruning demonstration and practice:** Demonstrate effective pruning techniques for productivity and growth. Example: Conduct a live demonstration of pruning on a fruit or nitrogen-fixing tree. Provide pruning tools and have each farmer practice under supervision.

4. Plot Maintenance

Key practices:

- Careful weed management
- Routine inspection and upkeep of conservation structures
- Mulch renewal and maintenance
- Tree and shrub pruning
- Soil fertility management
- Disease prevention and natural pest management

Plot maintenance, in the context of farming, refers to the continuous care and management of agricultural plots to ensure their productivity, sustainability, and resilience over time. For Haitian small-scale farmers, maintenance involves routine actions to protect soil and water resources, control weeds, manage pests and diseases, and sustain soil fertility with minimal external inputs. Effective maintenance minimizes crop losses, improves yields, and strengthens the farm's ability to withstand environmental challenges such as erosion and drought. It involves regular observation and timely intervention to address problems before they become severe. This chapter outlines practical maintenance practices tailored to local conditions, emphasizing simple, cost-effective techniques.

Careful weed management

- Regularly remove weeds to minimize competition for water and nutrients. Focus on critical growth periods (example. Before seeding).
- Practice mulching to suppress weed growth naturally.
- Keep areas around young plants clean.
- Keep soil covered throughout the year with cover crops, mulching, etc.

Routine inspection and upkeep of conservation structures

- Regular checks of conservation barriers such as terraces, contour lines, and barriers for damage after heavy rains. Repair erosion control structures promptly to prevent further degradation.
- Maintain sediment traps.

Mulch renewal and maintenance

- Regularly replenish mulch around crops to conserve soil moisture, regulate temperature, and suppress weeds.
- Use locally available materials such as dried leaves, grass, or crop residues.

Tree and shrub pruning

- Regularly prune trees and shrubs to improve air circulation, prevent shading of crops, and promote healthy growth.
- Use pruned branches as firewood, mulch, or organic matter for compost.
- Soil fertility management
- Incorporate organic matter, such as compost or manure, to enrich the soil.
- Rotate crops and include legumes to restore soil nutrients naturally.

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Disease Prevention and Natural Pest Management

This section outlines integrated techniques to prevent plant diseases and manage pests sustainably. By combining traditional knowledge with ecological methods, farmers can maintain healthy crops, reduce losses, and minimize chemical pesticide use.

Disease Prevention Techniques

1. Promote healthy plant growth: Healthy plants are more resistant to diseases. Focus on:

- **Plant spacing:** Ensure proper spacing for airflow to reduce humidity-related issues.
- **Soil health:** Enrich soil with compost and organic matter to strengthen plants.
- Disease-resistant varieties: Use local, resilient crop varieties adapted to the environment.
- **Timely planting:** Align planting with local weather patterns to avoid peak disease periods.

2. **Early detection and management**

- **Recognize disease symptoms:** Look for yellowing or spotted leaves, wilting, unusual growth patterns, or pest damage.
- **Remove infected plants:** Promptly remove diseased plants or parts to prevent the spread.
- **Clean tools:** Disinfect tools between plots to avoid transferring pathogens.

3. Ecological practices for disease prevention

- **Crop rotation:** Rotate crops annually to disrupt disease cycles, following traditional patterns.
- **Companion planting:** Use plants like marigolds or garlic to deter pests and minimize disease.
- **Avoid handling wet plants:** Reduce fungal spread by avoiding crop handling during wet conditions.
- **Habitat for predators:** Attract natural predators like birds or beneficial insects to maintain ecological balance.

Natural Pest Management Techniques

Repellent plants and local techniques

- **Repellent species:** Plant lemongrass, marigolds, or garlic to deter insects naturally.
- **Ash application:** Sprinkle ash on leaves to discourage pests.
- **Crop diversity:** Use intercropping or crop rotation to confuse and limit pest populations.
- **Moon phase planting:** Align planting schedules with lunar phases to reduce pest activity based on traditional knowledge.

Encourage beneficial insects and animals

- Attract predators: Use sunflowers or dill to attract ladybugs, predatory wasps, and spiders.
- Support biodiversity: Create habitats for lizards, birds, and ants that naturally control pests.

Preparing and utilizing natural insecticides (see Appendix B for more)

Create effective, low-cost sprays using local ingredients:

- **Hot pepper and garlic spray**: Deters caterpillars and aphids.
- **Neem leaf solution**: General pest control.
- **Papaya leaf extract**: Targets specific leaf-eating pests.
- **Tobacco leaf spray**: Effective against soft-bodied insects.
- **Ash and lime mixture**: Repels crawling pests.

Application guidelines:

- Apply early in the morning or late in the evening.
- Spray before infestations become severe.
- Reapply after rain and test on a small area first.
- Rotate sprays to prevent pest resistance.

Facilitator Tips and Guide

Field demonstrations:

- Show farmers how to prune trees effectively, inspect and repair conservation structures.
- Demonstrate mulching techniques using locally available materials.
- Show how to create and use compost to improve soil fertility
- Organize a workshop to prepare natural pesticides using local ingredients.

Participatory learning:

- Walk through a field to identify healthy and unhealthy plants, discussing symptoms and solutions.
- Involve farmers in identifying common pests and diseases in their plots.
- Identify and discuss beneficial insects in the field, emphasizing their role in pest control.
- Facilitate discussions on successful local weed and fertility management strategies.
- Facilitate knowledge-sharing sessions where farmers exchange traditional pest management techniques.
- Compare well maintained vs unmaintained plots.
- Review effectiveness of different practices.

Encourage regular maintenance:

- Stress the importance of routine inspections and upkeep for long-term benefits.
- Develop simple checklists with farmers to track maintenance tasks.

Adapt to local contexts:

Use examples relevant to the region's common crops, soil conditions, and available resources.

5. Harvest and Post-Harvest

Key practices:

- Harvest techniques
- Timely harvest
- Seeds selection
- Post-harvest operations
- Storage techniques

Effective harvest and post-harvest management are crucial for ensuring high-quality produce, minimizing losses, and securing seeds for future planting. Haitian small-scale farmers often rely on traditional practices that align with their resources and cultural context. This chapter provides practical guidance on harvesting, seed selection, post-harvest processing, and storage techniques.

Harvest Techniques

- Organize collective harvest activities: Use kombit (communal labor) to complete harvests efficiently during peak periods.
- Gentle handling: Prevent crop damage by using proper tools and careful techniques, such as handpicking fruits and cutting grains.
- Crop-specific techniques: Harvest tubers like cassava or sweet potatoes with digging tools to avoid bruising.

Timely Harvest

- Monitor crop maturity to harvest when crops reach peak ripeness for optimal quality.
- Avoid harvesting during rainy weather to prevent moisture-related damage.

Seed Selection

- Healthy plant selection: Choose seeds from vigorous, high-yielding plants free of pests or diseases.
- Cleaning and drying: Wash seeds, remove debris, and dry thoroughly before storage.
- Proper labeling: Store seeds in clearly labeled containers, noting crop type and harvest date.

Post-Harvest Operations

- Sorting and cleaning: Remove damaged or diseased crops and clean produce to maintain quality.
- Processing: Shell and winnow grains like corn and beans. Dry tubers and peel them for long-term preservation.
- Packaging: Use breathable bags or baskets for crops and airtight containers for seeds.

Storage Techniques

Traditional Storage Methods

- "Gleen": Hanging dried corn in bundles from trees or house beams to protect from pests.
- Granary (Galat): Elevated wooden structures (granary) that keep crops dry and away from animals.
- Clay pots and gourds ("Calabash"): Used for storing beans and grains in cool, shaded areas.
- Underground storage: Ideal for tubers like yams, buried in pits lined with straw or ash.

Modern Storage Solutions

- **Metallic silos:** Airtight and pest-proof containers built locally for grain storage
- **Plastic barrels:** Durable and sealed containers for bulk storage.
- **Woven bags:** Placed on raised platforms to protect from moisture and pests.

Best Practices for All Methods

- Ensure crops are clean and completely dry before storage
- Clean and dry containers thoroughly before use.
- Store in cool, shaded areas with good ventilation.
- Keep containers off the ground to avoid moisture.
- Inspect stored products regularly to remove spoiled or infested items.
- Use local pest control methods like ash or neem leaves.

Facilitator Tips and Guide

- **Combine traditional and modern techniques:** Highlight the strengths of both systems and encourage farmers to adapt based on their resources.
- **Demonstrate storage practices:** Show how to construct and maintain traditional structures like gleen and granary or use modern silos effectively.
- **Emphasize drying and inspection:** Teach farmers the importance of thoroughly drying crops and conducting regular checks.
- **Promote collective storage solutions:** Facilitate discussions on establishing community storage systems for shared resources and improved access.

Field exercises ideas

- Harvest and sorting demonstration: Show farmers how to handle crops carefully, sort for quality, and select seeds.
- Traditional storage construction: Guide farmers in building gleen or granary structures using local materials.
- Demonstrate the use and maintenance of metal silos or plastic barrels.
- Train farmers on moisture testing methods.
- Inspection and monitoring practice: Visit a storage station and train farmers to check for pests, mold, and other storage issues.
- Identify early warning signs.

6. Evaluation, Sharing and Continuity

Key practices

- Monitor progress: Observe and evaluate the results
- Adjust and adapt to local reality
- Knowledge sharing
- Continue the process

The process of establishing an agroecological farm takes time. Evaluation, knowledge sharing, and continuous improvement are essential for the long-term success of agroecological practices. For Haitian small-scale farmers, this process involves reflecting on their progress, adapting to local realities, and sharing lessons learned to inspire others. This chapter provides a framework for monitoring progress, consolidating successes, and building on efforts to create resilient and sustainable farming systems.

Monitor progress

- Assess crop performance, soil health, and overall productivity compared to previous seasons.
- Work with farmer leaders (agriculture) and support technicians to evaluate results and identify improvements.

Adjust and adapt to local reality

- *Strengthen successful practices and address challenges.*
- *Expand efforts by:*
- *Adding perennial plants (e.g., bananas, papayas).*
- *Planting fruit and nitrogen-fixing trees.*
- *Enhancing soil fertility with organic matter.*
- *Reinforcing soil conservation structures.*
- *Protecting plots with improved fencing.*

Knowledge sharing

- *Exchange lessons, challenges, and successes with other farmers through meetings and workshops.*
- *Use model plots to demonstrate effective practices and inspire community adoption.*

Ensure continuity

- *Consolidate progress by maintaining and improving successful techniques.*
- *Gradually incorporate or expand agroecological practices and involve community members for sustainability.*

Facilitator Tips and Guide

- **Evaluation walk**: Visit the plot with farmers, observing progress, identifying challenges, and discussing improvements.
- **Group reflection:** Host a meeting where farmers share their experiences and brainstorm solutions for shared challenges.
- **Action planning:** Work with farmers to outline specific steps for the next season, including planting, conservation, and maintenance activities.
- **Community showcase:** Organize a field day where successful farmers demonstrate their practices and inspire others.

6 Conclusion

This guide represents a living document that should grow and adapt with your experience. Agroecology is not a recipe, but a social process of ongoing experimentation, innovation and solidarity by farmers—working with nature instead of against it. Remember that the best practices are those that work for farmers and are cost-beneficial to them in their specific contexts, based on their priorities, while respecting both the environment and local culture. Through collective action and mutual support, communities can create resilient, productive farming systems that honor Haiti's rich agricultural heritage while ensuring a sustainable future. Together we can create a movement to transition to healthy, agroecological farming and food systems in Haiti.

Appendix A:
“21 VERSES”
OR PRINCIPLES OF A MODEL FARMER

Since 2009, PDL has facilitated participatory dialogue with successful peasant agroecological farmers to synthesize, from farmers’ perspectives, the key principles that characterize a “model farmer.” These principles allow peasant farmers to distinguish between those practicing subsistence farming, and those who seek to continuously experiment and develop practices to improve their yields and the quality of their land. This list of “21 verses” or principles is summarized below. The language reflections the perspective of farmers.

1. A Model Farmer should work with much care. He/She must take care of his/her garden like a child in his/her custody. The model farmer will prepare the soil before sowing and planting, care for the crops as they grow, during and after harvest.

2. A Model Farmer should produce enough food . To be able to meet his/her family's nutrition needs and send the remaining portion to be sold to the market and generate income.

3. A Model Farmer should not be a seasonal worker. Which means, he/she should never stop working. He/she must always be ready for sowing and planting, by maintaining the land in good condition through the seasons. For a model farmer there will not be times of abundance and times of shortage, but food will be secured, throughout the year.

4. A Model Farmer should have the capacity to effectively manage all biological waste and animal manure on his/her land (maximize use of organic matter). He/she should use these materials to improve the land. He/She must always have compost ready to be used on the land.

5. A Model Farmer should seek the best appropriate techniques. To apply to his/her work to optimize the land yields.

6. A Model farmer should work to be a model, wherever he/she goes. Be a good example. It should be obvious to recognize when a land has been cared for by a model farmer. His/her working methods should be examples to follow. Whether the land is his/her own or not, a model farmer should maintain it in the best conditions.

7. A Model Farmer should always seek to improve the yield capacity of the land. He/she should never be too satisfied and always seek higher levels of yield. He/she should harvest a lot without being exhausted by work. He/she should plan his/her work properly and keep busy all the time, while acknowledging satisfactory results.

8. A Model farmer should use chemical products only with caution. He/she will make available natural fertilizers and materials to improve the land and fight insects and other plagues that would affect his/her plants and crops. He should store seeds for to get through bad agricultural seasons, use as much manure as possible, and compost to nurture the land.

9. A Model Farmer should know what kind or type of seeds he/she plants. He/she should know well how to select superior quality seeds in order not to waste his/her time planting bad quality seeds.

10. A Model Farmer should be aware of the right number of seeds to plant. Avoid waste of seeds and resources. He/she should not put too many seeds in the same hole, and apply the proper techniques and standards to determine the distance between holes and seedlings for better management of his/her surface area. He/she will then learn how to plant and sow by complying with proper standards, for maximum yield, according to the capacity of the land. For instance, a model farmer knows he/she should put 2 or 3 seeds in the same hole when sowing corn. He/she should have good control over the projected harvest.

11. A model farmer should be a good advisor for other farmers. He/she should raise awareness of his/her neighbors to help them apply appropriate techniques for their land and garden, to be rewarded in time. That is, the model farmer is a leader and should support others to learn from him/her. He/she should share knowledge and learning with other peasants so that they may become model farmers too.

12. A Model Farmer should grow diverse types of crops in his/her garden. He/she should grow all types of available plants or crops that can be developed on his/her land. A model farmer should foster and participate in all activities promoting the diversification of agricultural production.

13. A Model Farmer is a peasant with a vision. He/she aims to reach high ground, and will undertake positive actions to acheive his/her goals. He/she plans not only for today, but also for tomorrow and for the future, to be always ready and to manage the risks.

14. A Model Farmer should always adequately plan his/her agricultural production. As states the proverb: "One must make his/her bed before falling asleep," so they aren't pressured by unexpected things. He/She will be aware of what he/she wants to achieve, how he/she will do it, how much time it will take, when to do it, where to do it and what resources he/she will need to do it. The model farmer should plan the whole production process from land preparation, to seed selection, crops maintenance, until harvest, and after harvest.

15. A Model Farmer should not only grow crops but also raise animals. Raise animals in a place where he/she will be able to sell them and generate income. On the other hand, the animals will help him work and restore the land, as needed. This is the reason the model farmer will not tie animals to a specific part of their land.

16. A model Farmer should fight against free-grazing of animals. He/she will not let his/her animals go free through other people's land and garden. He/she keeps his/her animals tied to his/her own land and motivates his/her neighbors to act the same.

17. A Model Farmer should grow medicinal plants in his/her garden. He/she should have some medicinal plants available in his/her garden to be used in case a member of his/her family or him/herself has a fever or a flu and needs natural treatment. Those are useful things to have at hand.

18. A Model Farmer should have fruit trees on his/her farm or backyard. This is a way to secure food and income opportunities for the future generation, as our fathers and grandfathers did in former times, for us to enjoy today.

19. Model Farmers should show respect for their living environment. He/she should respect not only the physical environment, but also the social one. He/she should live in harmony with his/her living environment, encourage other people to do the same, and to respect one another. A model farmer should not be involved in deforestation activities or burn his/her land. He/she should instead cover the land with stable plant residue and litter, plant trees, and maintain the land in good condition. He/she should engage in reforestation in the area where he/she lives and help raise other people's awareness of the issue.

20. A Model Farmer should know how to communicate with the land and handle it in such a way to get the best from it. He/she should find a way to 'talk' to the land and make the land 'answer.' He/she should care for the land to keep it healthy so the land may produce and, in return, give him/her what he/she needs to care for his/her family, meet their needs, and improve their living conditions.

21. A Model Farmer is a person who fights to change the living conditions of the poor and help them practice improved farming in remote rural areas. He/she will do so by encouraging them to change the way they used to work, have a vision for their future, and eradicate poverty and famine in rural areas.

Appendix B:
Practical guide for Natural Insecticides Preparation

Ingredient	Preparation	Target Pests/Diseases
Neem seeds/Leaves, soap	Crush ¼ pound of neem seeds or leaves and soak in 1 gallon of water for 2 days. Grate 30 grams (1 small bar) of soap into the solution, dilute with water to make 20 liters, strain, and spray on crops.	Insects and mites
Papaya Leaves	Crush 2 handfuls of papaya leaves, mix with 1 liter of water, and let sit for 24 hours. Strain and apply.	Leaf-eating insects
Banana Leaves	Chop a handful of banana leaves, boil in 2 liters of water, let cool, and strain.	Aphids
Hot Pepper and Garlic	Crush 50 grams of hot peppers and 2 garlic cloves, mix with 5 liters of water, and add 1 tablespoon of liquid soap. Let sit for 1 hour, strain, and spray.	General-purpose insect repellent
Soap and Oil Spray	Mix 2 tablespoons of liquid soap with 2 tablespoons of vegetable oil in 1 liter of water.	Soft-bodied insects like aphids and mealybugs
Garlic	Crush 100 grams of garlic (about 4 cloves) and mix with 10 liters of water and a small amount of liquid soap.	Insects and mites
Onion	Chop 100 grams of onion (1 medium onion or a handful of onion leaves) and mix with 10 liters of warm water.	Preventive treatment
Garlic + Onion	Combine 75 grams of onion and 1 medium garlic bulb, chop finely, and mix with 10 liters of water.	Insects, mites, and fungi
Tobacco	Boil 100 grams of tobacco leaves (about a small bundle) in 5 liters of water for 20 minutes. Strain and add a small amount of liquid soap.	Insects and mites
Tomato Leaves	Crush 1 gram of tomato leaves, mix with 2 liters of water and 1 liter of warmed alcohol, and let sit for 8 days. Alternatively, use 2 handfuls of tomato leaves, mix with 1 liter of water, and let rest for 2 hours.	Coleopteran larvae
Chili Peppers	Crush 3 chili peppers and mix with 1 liter of water and 1 tablespoon of liquid soap.	Insects and worms
Wood Ash	Mix 2 handfuls of wood ash with 1 liter of water. Let it rest for 1 day and strain before use.	Insects
Vinegar	Mix 1 liter of vinegar with 10 liters of water.	Caterpillars
Neem Leaves	Soak 40 neem leaves in 1 liter of water overnight. Strain and mix with a small amount of liquid soap.	Insects