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SCALE
Strengthening Capacity in Agriculture Livelihoods and Environment

Resilience Design in Smallholder Farming Systems Approach

Technical Checklist Guidance

October 2021

About SCALE

SCALE (Strengthening Capacity in Agriculture, Livelihoods, and Environment) is an initiative funded by USAID's Bureau of Humanitarian Assistance (BHA) and implemented by Mercy Corps in collaboration with Save the Children. SCALE aims to enhance the impact, sustainability and scalability of BHA-funded agriculture, natural resource management, and off-farm livelihood activities in emergency and non-emergency contexts.

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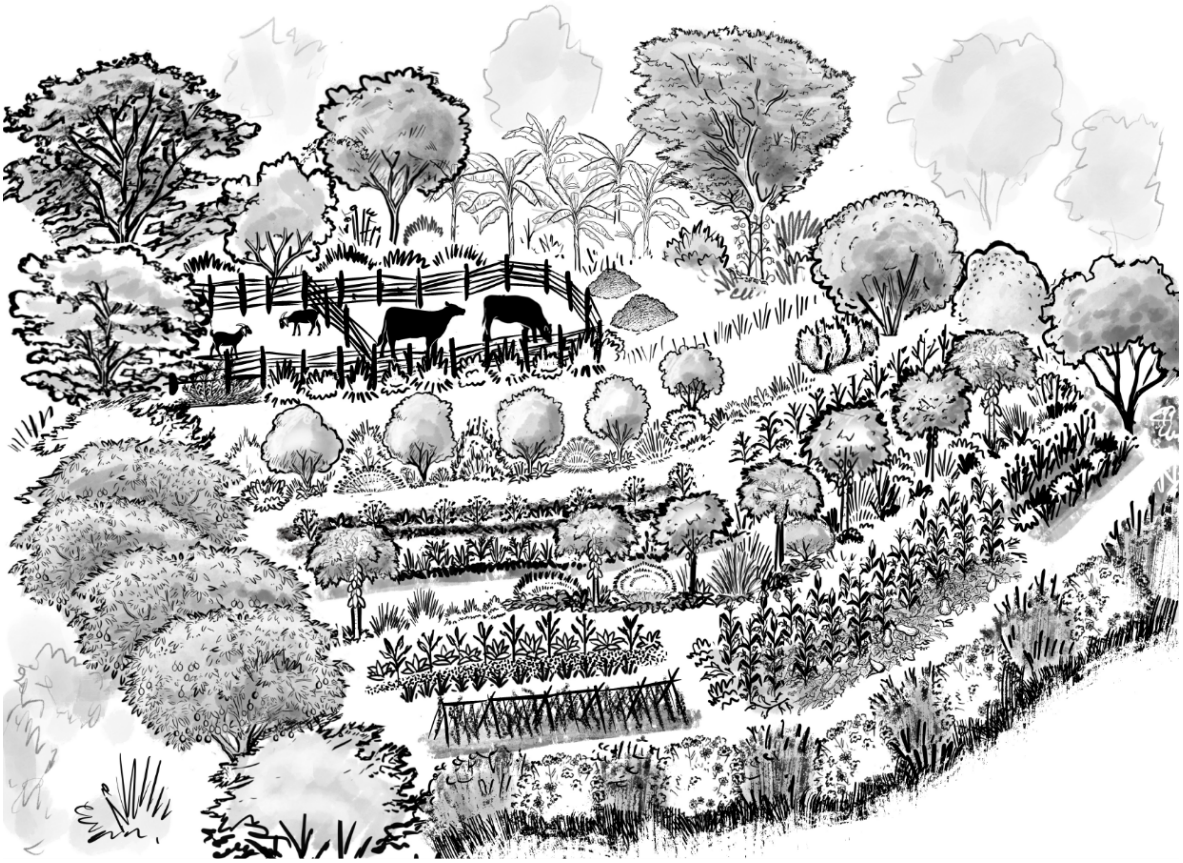


Quick Facts

WHAT:

A quality monitoring and management tool for enhancing the implementation of the Resilience Design (RD) in Smallholder Farming Systems Approach.[1] The checklist is based on the RD Minimum Standards and is focused on six core technical elements of the approach that are readily observable and should be monitored frequently. These relate to: resources, design, water, soil health, biodiversity and protection.[2]

WHY:

To ensure technical accuracy, track progress and inform adjustments that lead to more productive and sustainable agricultural systems.

To gather baseline data before starting implementation of the RD approach.

WHO:

Practitioners applying the RD approach on their own land or supporting others to implement it.

WHERE:

Anywhere the RD approach is implemented, including fields, hills and other landscapes.

HOW:

The checklist can be completed by a single person building and managing their own RD site or it can be part of the monitoring and evaluation plans of a food security program.

For programs, there are five key steps that guide the use of the checklist:

- Complete a Resilience Design checklist user training
- Engage local partners
- Identify site routes and fields for sampling
- Collect data
- Analyze, reflect and adapt

[1] The Resilience Design (RD) in Smallholder Farming Systems Approach Manual, Measurement Toolkit and Tip Sheets are available at: www.fsnnetwork.org/resilience-design-smallholder-farming-systems-approach

[2] The RD Minimum Standards include additional process-related elements that are not readily observable and therefore not captured in this checklist: *community-led* and *adaptation*. Additional information on the Standards is available here.

Introduction to the Checklist

Derived from the general Resilience Design for Agroecological Production Minimum Standards, the checklist is based upon six core technical elements of the approach that are readily observable on an RD site and should be monitored frequently to ensure technical accuracy:

RESOURCES: The RD site maximizes the use of locally available natural and man-made materials and waste streams to increase and diversify production and reduce dependence on external inputs. *Because resource use is a cross-cutting issue, it is woven into the five other indicators rather than treated as a stand-alone indicator.*

DESIGN: The RD site has a context-specific design that optimizes resources and external influences for improved efficiency, production, resilience and regeneration.

WATER: The RD site has multiple strategies to slow, spread, sink and manage rainwater and other water resources.

SOIL HEALTH: The RD site creates a healthy soil food web that supports sustained production and regenerative growth.

BIODIVERSITY: The RD site has plants, trees and animals that work together in ways that support the overall health and production of the growing environment.

PROTECTION: The RD site includes strategies to protect soil and plants from any negative effects of people, animals and external influences.

Any site that is applying the RD approach must, at a minimum, have these components in place. Through the use of this quality monitoring checklist, program staff will be able to identify whether the practices on a site meet these minimum standards, where practices are falling short, and where there are opportunities to enhance the practices to create a more productive and resilient site.

Two RD minimum standards are not included in the RD checklist, as they are process-related elements that are not readily observable on a monitoring visit. These are:

COMMUNITY-LED: The design, establishment, and maintenance of the RD site is farmer-led and informed by community members to ensure local relevance and ownership; and

ADAPTATION: Farmers continually observe and record feedback from the RD site and surrounding environment and adapt their practices to improve production and resilience to shocks and stresses.

Additional details on how to integrate these elements in your permagarden approach are available in the Resilience Design (RD) in Smallholder Farming Systems Approach Manual.

Pre-Training and Stakeholder Engagements

Complete a Training on How to Use the Checklist

Consistent and objective observations and scoring are essential for the checklist to produce accurate data. All programs planning to use the checklist should begin with a short training to ensure users understand the indicators and scoring criteria and agree on how to adapt it to context-specific circumstances.

Tips for Organizing a Successful Resilience Design Checklist User Training

- Conduct the training outside on a site where the RD Approach is being implemented to provide real-life examples of the checklist indicators. If an on-site training is not possible, use photos or drawings to illustrate key techniques or refer to diagrams in the RD Approach Manual.
- Review each indicator and its scoring criteria as a group. Ensure the descriptions and techniques are clear, referring to photos or on-the ground examples. If the program team agrees that locally-used terms are preferred to those in the standard checklist, adjust the wording as needed.
- Include multiple examples for each of the indicators, varying their quality and other characteristics, such as the location in which the technique is applied, the crops and trees involved and the shape and size of water harvesting structures. This will help the program team learn how observations should be made in different contexts and situations.
- After reviewing all the indicators in the checklist, do a practice scoring. Have each program team member individually score the same set of interventions, then compare scores and discuss observations with one another. Repeat with a few different examples until the team begins to reach a shared consensus on their scores.

- Remember that training is not a one-time event. As each program team member starts using the checklist on their different sites, the team lead should make time to provide regular review and feedback to maintain consistent scoring and to reinforce skills.

Engage Local Partners

The checklist can be a powerful tool for enhancing the observational skills, monitoring capacities and resilience understanding of local partners including farmers, extension agents and other community leaders. With the proper training, these partners may begin to carry out monitoring visits on their own and farmers may start to use the checklist to record their own observations to inform adjustments in their fields. For this reason, program team members should engage local partners early and often in monitoring visits.

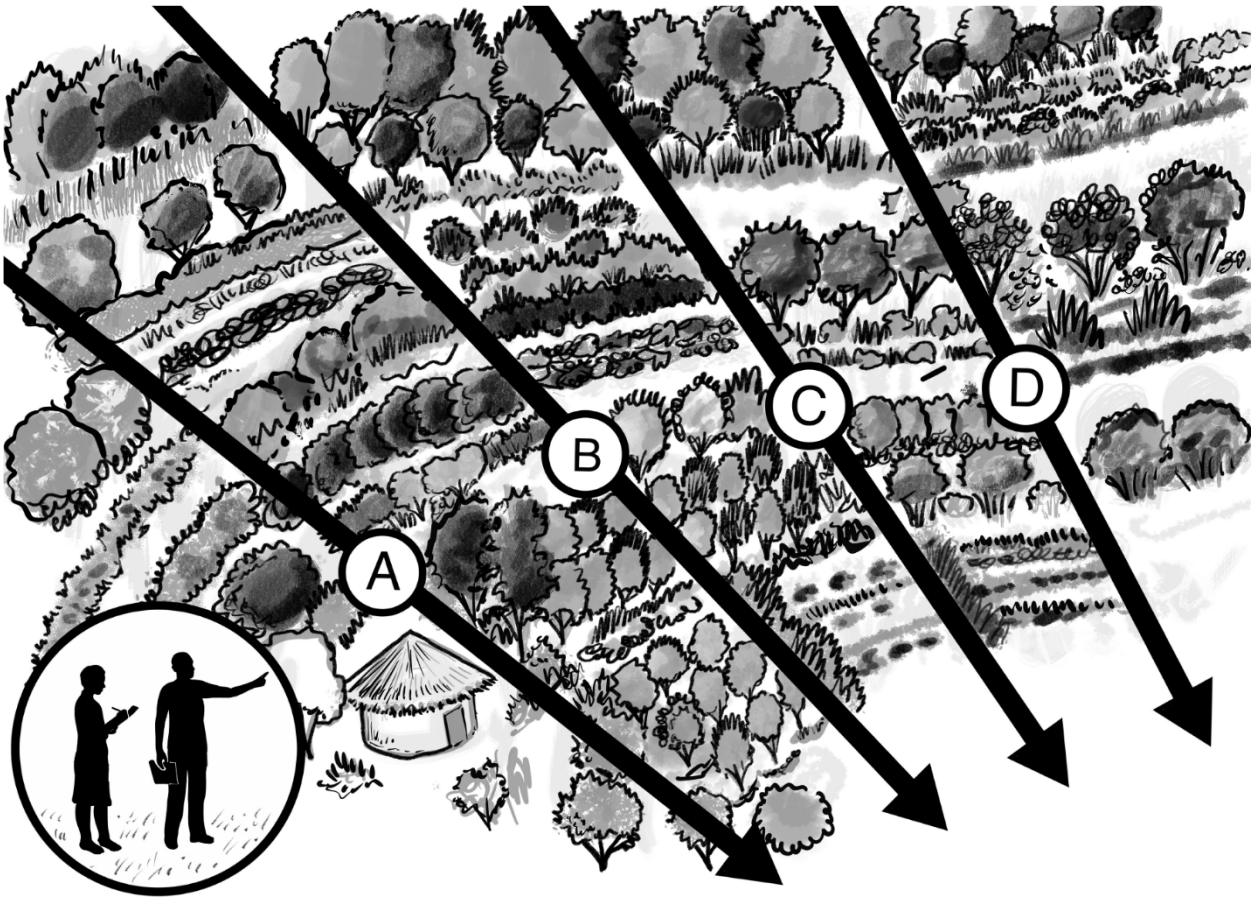
Tips for Engaging Local Partners and Building Monitoring Capacity

- Before a monitoring visit, program team members should notify those managing the field (farmers, field agents, community leaders) and determine a time when they can accompany you on the monitoring walk.
- Explain the purpose of the checklist, emphasizing that it is a tool for improving and learning not for critiquing or highlighting mistakes.
- Discuss the indicators, their descriptions and how the scoring criteria is assigned. As you complete the monitoring walk, point out examples and explain what you are noticing. Invite local partners' insights, explanations, questions and thoughts.
- Feedback and mentoring is key to building partners' capacity to use the checklist. In time, program teams may choose to share or delegate monitoring responsibilities to local partners. Steps for capacity strengthening could include:
    - Local partner shadows program team member, who leads the monitoring walk. The team member discusses what they are observing and how they are scoring, with the partner providing some inputs.
    - Local partner and program team members score sites together, then share their scores and discuss any discrepancies.
    - Local partner leads the monitoring walk and completion of the checklist, with program team member walking alongside in a supervisory role. Team member reviews the scoring, discusses any problem areas and advises on any adjustments.
    - Local partner leads scoring and monitoring walks alone, contacting program team member for reviews and assistance as needed.

Using the Resilience Design Monitoring Checklist

Identify Evaluation Routes

Every landscape has its own unique characteristics, including substrate, slope, aspect to the sun and wind, available resources, and designated use. These characteristics inform your Resilience Design strategy and the way you use the checklist.



Guidance for Identifying Site Evaluation Routes

- Determine which routes you will walk in collaboration with local partner(s) managing the site. This decision can be aided by maps, photographs and other site data. Ensure you select routes that will produce data that is representative of the entire site and provides the greatest diversity.
- How many routes? The number of routes you select will depend on several factors, including the size of the land area, the diversity of the landscape, the number of different activities and individuals working on the site, and the time and resources you have available. The goal is to have an overall picture of the landscape being evaluated and its various interventions. These decisions should be determined in collaboration with the program team lead.

- Where to start? For a hill site, you might start by standing at the top of the hill from which you can observe the slope and the diversity of the landscape in each direction. On a flatland, you might make the same observations from walking the perimeter of the land or standing at a nearby point of elevation that grants you a clear view.
- From your point of observation, mentally note the variations you see on the site: differences in slope, planting areas, rainwater harvesting structures, topography, vegetation, farming practices and trouble spots (such as areas prone to erosion). Once you have made these observations, you can determine which paths you might take from the top to the bottom of the hill or across the flatland that will allow you to observe these variations.
- Pick a visual marker to guide your direction of walking.
- Mark your path as you go to ensure you know the direction to take for your next observational visits. Ways to mark the path include using colored stakes, sticks or stones. You might also record the path using GPS or phone apps.

Guidance for Identification of Fields

The checklist includes indicators related to activities taking place within particular agricultural fields. Gathering this information will require you to identify a number of fields that are representative of the overall diversity of agricultural activities on your site.

- Ideally, you will select fields that are close to the path you chose in the previous step.
- In making your selection, consider the types of crops being grown, variations in soil type and topography, different groups of farmers that might be working on the fields, and variations in the agents or local leaders overseeing the fields.
- The number of fields you select will depend on the amount of variation across the site as well as time and resource limitations.
- The fields you select are ones you will return to at regular intervals, so be sure to mark them on your GPS or with indicators such as colored stakes or stones.

Further guidance on collecting representative samplings within fields is included in the relevant indicators below.

Collecting Data

The checklist is designed to be completed through on-site monitoring visits during which you traverse the routes you identified in the previous steps. Repeat these visits at regular intervals, walking and observing the same routes over time so that you can identify changes and trends.

- Key components of the checklist:
  - Fill out basic information at the top left (name, date, location).
  - Note the indicators and scoring criteria are in the first column.
  - Each checklist sheet has room to score and take notes on four routes. Within each route, you are likely to encounter multiple examples of the techniques described in each indicator. For instance, you might come across multiple rainwater harvesting structures and several fields. The checklist has space to score up to five examples of each technique.
  - For larger sites with longer transects, you may choose to adjust this checklist (in consultation with the team lead) to allow space to record more examples. An editable version of the checklist is available to make these adjustments.
  - The last column is available to record notes. For example, you could make a note of any factors that might have influenced your observations, such as whether it recently rained, what the temperature was, whether cattle grazed over the land the last week, and other relevant events. Or you might record priority actions for follow up or questions to ask the farmers managing the site.
- Complete the checklist in collaboration with your local partner.
- Complete your observations of all the routes on a given site on the same day.
- Photograph key interventions on the site for record.
- Photograph any trouble areas you might want to discuss further with your team lead or other partners and colleagues.
- Share the data with your program monitoring team as agreed upon with your team lead and in line with your M&E protocol. This might include transferring scores into a database, geolocating on a map, typing up notes, and uploading and labeling photos.

Analyze, Reflect and Adapt

After team members have completed their monitoring visits, the team lead should analyze the data collected; identify areas and/or people that need further support or training; and convene the team for a meeting to reflect on the data together.

Tips for Effective Reflection Meetings

- Ensure all team members have access to the data from the monitoring visits. You might summarize the data in a table, distribute printed copies, or have each team member briefly present the key takeaways from their visits.
- Facilitate a discussion with the team to analyze and reflect on the data. Key questions to guide the discussion include:
    - What major trends do we see? Are our sites generally progressing in a positive direction or negative direction?
    - What variations do we see between sites? Why might that be the case?
    - What conflicting information exists that needs more analysis? How can we get that information?
    - What weak spots do we see and how can we address those?
    - Where did we find innovation? How can we learn from those farmers? Farmers showing innovative work and creative problem-solving on their farms can be positive influencers to others in their communities. Team members should seek opportunities to elevate these farmers as leaders and to support them in sharing their knowledge with others, such as through community site visits to their fields or by requesting their assistance on monitoring trips.
- Provide targeted follow up mentoring. If certain sites are consistently scoring low for the same technique, it might mean that additional skills or training are needed for the team member assigned to that site or for the farmers they support. The team lead should determine what is needed in conjunction with the relevant program team members and develop a targeted plan to address and track capacity development.
- Team leads should continue to follow up to ensure problem areas are rectified, work plans and interventions are adapted as needed, and RD roll-out continues smoothly.

Scoring Key

The following table describes the tick scoring method users should apply in completing the checklist. This simple scoring method is recommended because of its ease of use, familiarity across cultures and simplicity in quickly revealing trends and trouble spots.

Score	Description
√-	Practice is of low quality or not present.
√	Practice is in place and of adequate quality, meeting the RD Minimum Standard. Every field site applying the RD approach is expected to achieve at least a √ for each practice listed below.
√+	All practices in the √ field have been met or exceeded, plus additional Resilience Strengthening practices are in place. This is ideal Resilience Design.
*	All practices in the √ and √+ fields have been met or exceeded. Practices demonstrate innovation and problem solving in ways that enhance production and smooth water, food and nutrition gaps throughout the year. All practices on demonstration sites should meet the * level.

If useful for transferring this information into M&E databases, programs may choose to also assign numerical values to this approach (for example, a √- may be entered into software as a "1", a √ as a "2," etc.). Do not average the scores across indicators; the scores identify where improvements are needed for specific interventions and should not be combined.

Descriptions of Indicators and Further Guidance

Design

The RD site has a context-specific design that optimizes resources and external influences for improved efficiency, production, resilience and regeneration.

RD sites are informed by an integrated analysis and design process that is tailored to its specific context. At a minimum, an RD site should be situated and designed such that it maximizes energy efficiency and resource use, and optimizes natural and man-made external influences (such as sun, wind, slope, aspect, roads, agricultural policies and incentives). The analysis of the resources should consider ways to maximize the beneficial influences (e.g., water flowing into a field) and minimize negative ones (e.g., hot afternoon sun), as well as opportunities to integrate waste streams for productive use. Evaluation of each resource's potential impact on issues related to gender, equity and social inclusion must also be included. The design of the site should always start at the highest point and intentionally link interventions in ways that enhance production for household nutrition and income potential as well as resilience to environmental, economic and social shocks and stresses.

Observational Evaluation

√-

No site design. The site design does not appear to work with the local context or to use external influences for enhanced benefit (e.g., no water harvesting structures, planting not on contour). In observing the overall site, only very basic techniques are apparent. For example, the farmer has planted crops and prepared the soil by simply turning or plowing but has adopted no other improved practices to enhance soil fertility or water use.

√

The site includes multiple interventions to strengthen resilience. This includes at least one functioning on-contour water harvesting structure, such as a swale or a terrace. Crops are planted on contour. Mulch is present but does not fully cover the soil. The site has basic protection from the negative impacts of wind, sun, animals, or people. Farmer has used local organic resources to boost production, such as organic fertilizer, mulch and fencing.

√+

Multiple interventions are well connected across the site to strengthen resilience and extend production into the dry and lean seasons. For example, there are spillways between on-contour water harvesting structures; fodder, trees or other perennial crops are growing along the on-contour berms; and mulch covers most of the soil where crops are planted. The farmer uses biological fertilizers and integrates animals into their system for nutrient cycling and pest management. Market and domestic food crops are growing in fields. Trees are planted or maintained along the west side of crops to extend their growth into the dry season, and trellises over the water harvesting structures provide dry season protection from evaporation.

*

This is a highly resilient system. Water harvesting structures are well vegetated, with living mulches (cover crops) growing, such as desmodium or other spreading plants. Trees and other perennial plants are integrated in the system. The farmer demonstrates innovation and creative problem solving. The farmer is self-motivated to observe feedback and adjust their methods to enhance the long-term productivity of the site.

Water

The RD site has multiple strategies to slow, spread, sink and manage rainwater and other water resources.

An RD site has multiple strategies to slow, spread, sink and manage water resources. At a minimum, the site must incorporate 1) interventions that prevent runoff and erosion from heavy rain, and 2) interventions that capture and manage rainwater, wastewater and water from boreholes, streams or ponds for use during drier periods. A well-designed and managed water harvesting strategy will ensure plants have multiple ways to access water for irrigation throughout the year.[3]

Observational Evaluation

√- **Water harvesting structures are either not present on the site or are not functioning correctly** (e.g., draining water from site due to off-contour terraces).

√ **Water harvesting interventions are seen at the highest point of the site.** At least one water harvesting structure is present (e.g., a berm, basin, swale or terrace) to bank or store water below the surface in the soil. All structures are on-contour, functional and have an overflow spillway. Mulch is on the water harvesting structures and surrounding field. Cropping pattern is on contour.

√+ **Multiple water harvesting structures are in place, on-contour and functional.** The structures are well covered in living mulches and diversely planted. The overflow spillways are present and armored. Berms are compacted at pathways. There is minimal erosion. Shade plantings are strategically placed to minimize over-exposure to intense sun. Every tree within the system has a water harvesting structure.

***** **Multiple water harvesting structures are linked across the site and all water overflows are put into production.** Structures are completely vegetated and well-shaded with trellises, trees, etc. Overflow spillways are supported with rocks and grasses, and heavily mulched with living and dead materials. Strategies exist to slow the speed of surface water moving down the field, to spread the water out over the site and to infiltrate water in an appropriate manner for the degree of slope. All surface water is harvested, banked and protected within the soils. Water harvesting structures are present for all plants on the site.

[3] Examples of water harvesting interventions include: on-contour berms, swales and terraces, on-contour fields and growing beds, one-rock check dams, smile berms (demi-lunes) for trees and other larger high value plants, infiltration basins and greywater mulch basins, amongst many others. Refer to the Technical Guidance: Water Management section of your RD Manual for more information on these practices.

Soil Health

The RD site creates a healthy soil food web that supports sustained production and regenerative growth.

An RD site incorporates multiple strategies to improve soil health. At a minimum, these strategies should include deep soil preparation, the use of natural fertilizers, minimal soil disturbance, and protection from negative external influences such as intense sun, wind and rain. Healthy soils will increase production and support the growth of higher nutrient crops that are more resilient to pests, diseases and climatic stresses.[4]

Observational Evaluation

√-

No apparent deep soil preparation or fertility management on the sites. Fields have a shallow soil profile of < 30 cm (note: a long stick can be used to measure the depth). Signs of heavy tillage and chemical use. Plants show weak growth. Poor fertility and soil structure, with very little organic matter in the soil. Bare soil is hot to touch. Signs of erosion observed within the growing area.

√

At least 2 soil fertility amendments (such as cow manure, ash, compost, charcoal dust, etc.) are applied to the whole field. At least ½ the field has been mulched. Planting rows are on contour. Plants look healthy. Organic matter is present in soil. No visible erosion.

√+

Living and dry mulch covers more than 1/2 the field. Farmer uses green manures and biofertilizers. There are fertility plants and biomass growing on on-contour berms and the edges of fields. Soil structure is not compacted and soil under the mulch is cool to touch. Vibrant growth of plants. Different types of organic matter are visible in the soil. No visible erosion. > 30 cm deep soil preparation.

*

No bare soil in field (field is completely vegetated or mulched). Animals are integrated responsibly on the site. Farmer makes and uses compost. Soil structure is high in organic matter. Soil is minimally disturbed after initial deep soil preparation. Deep and healthy soil structure. Perennial plants (trees, fertility plants) contribute to ongoing soil fertility inputs on site.

[4] Refer to the Technical Guidance: Healthy Soil section of your RD Manual for more information on these practices.

Biodiversity

The RD site has plants, trees and animals that work together in ways that support the overall health and production of the growing environment.

An RD site should incorporate a diversity of plants, trees and animals. It should mimic healthy and resilient living systems nearby to support regenerative growth and to provide multiple nutrition and income-generation opportunities year-round. At a minimum, the RD site should integrate perennial plants, such as trees, shrubs, herbs, ground covers and vines, including support species that enhance nutrient availability, protect soil resources, encourage pollination and deter pests.

Observational Evaluation

√-

The site is monocropped. Most or all of the trees were removed for crop production and/or the field was burned.

√

There is intercropping on the site with at least two crop species. At least two support species are present (e.g., fertilizer plants and ground covers). The farmer does not burn the field. Trees and/or shrubs are present within the site. Vegetation is planted on water harvesting structures. Farmer receives income from more than one crop species growing on the farm. No chemical fertilizers, pesticides, herbicides or fungicides applied on site.

√+

There is intercropping on the site with at least three main crop species. Other annual and perennial crops, trees, shrubs, ground covers and vines are present and integrated within the production system. There is a mix of annual and perennial crops, trap crops (which attract pests away from the high value crops), and multipurpose plants which can be used for food, fuel, fodder, fencing, fertility and other material needs. The farmer uses biopesticides and biofertilizers when applicable. The farmer has seasonal planting strategies and their crop mixture intentionally accounts for dry season, lean food and economic cycles.

*

There is intercropping or alley cropping of 10+ species of plants and year-round production of both nutritious and marketable plants. Fertility plants are integrated and grown within and on the edges of the site. There are approximately 30 trees per hectare. Farmer uses biopesticides and biofertilizers that they have produced themselves or sourced locally. There is vertical plant diversity in their site including plants that grow as root crops, spreaders, fungi, herbs, leafy plants, shrubs, taller crops, vines, and overstory trees. Farmer has strategies to grown own seed, seedlings or vegetative propagation (e.g., productive tree and seedling nursery). Integrated animal production including bees, poultry, and seasonal grazers.

Protection

The RD site includes strategies to protect soil and plants from any negative effects of people, animals and external influences.

An RD site should protect soils and plants from the harmful effects of people, animals and external influences. At a minimum, the site should incorporate protection strategies such as mulching, fencing, well-maintained pathways, protective berms, water diversion drains, integrated pest management (IPM) and trees or trellises that provide shade and wind protection.[5]

Observational Evaluation

√-

The ground is bare and unprotected (absent of mulch and/or shade from intense sun). Damage is visible from water flowing on to the site. Wind damage is visible and there are no strategies present to minimize the impact. There are no protective structures to guard against animals; and no measures to guard against pest or disease.

√

One functional water harvesting structure is in place up-slope from crop systems to protect farm from excessive water flows. Water harvesting structures are within the farm to minimize water from moving across the site and causing damage. Soils have mulch and trees that provide protection from intense sun, wind and loss of soil moisture. There is a fence established or a community strategy to limit animal access (for example, the community agrees to keep animals out of growing areas and enforces that agreement). Intercropping discourages pests.

√+

There are multiple, functioning strategies to protect the farm from water damage and loss of nutrients. There is also a range of strategies to protect soil resources, such as the combination of mulch, shade, dense plantings and groundcovers. There are at least 30 trees/hectare planted and maintained to protect against intense west sun exposure and/or from damaging winds. The site has a living fence. Trap crops planted around edges of field. Use of biopesticides and biofertilizers for pest deterrent and disease suppression.

*

The site has complete mulch coverage. Trellises are built to protect the water harvesting ditches/swales from losing water to evaporation. Site has a living and productive fence including food, fodder, fertility, and other plants that meet the farmers' material needs. Community agreements on grazing, water resource management and tree conservation are established to protect collective and individual resources. Actively intercropping aromatic plants to repel and trap pest. Push-pull system in place. [6]

[5] Refer to the Technical Guidance: Healthy Soil section of your RD Manual for more information on these practices.

[6] The Resilience Design in Smallholder Farming Systems Approach Manual, Tip Sheets and Measurement Guide are available at: www.fsnnetwork.org/resource/resilience-design-smallholder-farming-systems-approach.

To view resources for applying the RD principles at a smaller scale, refer to the Permagarden Toolkit available at: www.fsnnetwork.org/tops-permagarden-toolkit