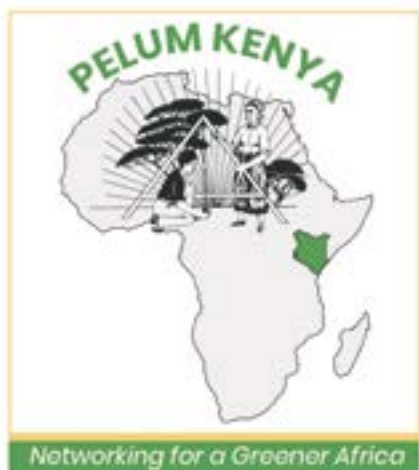




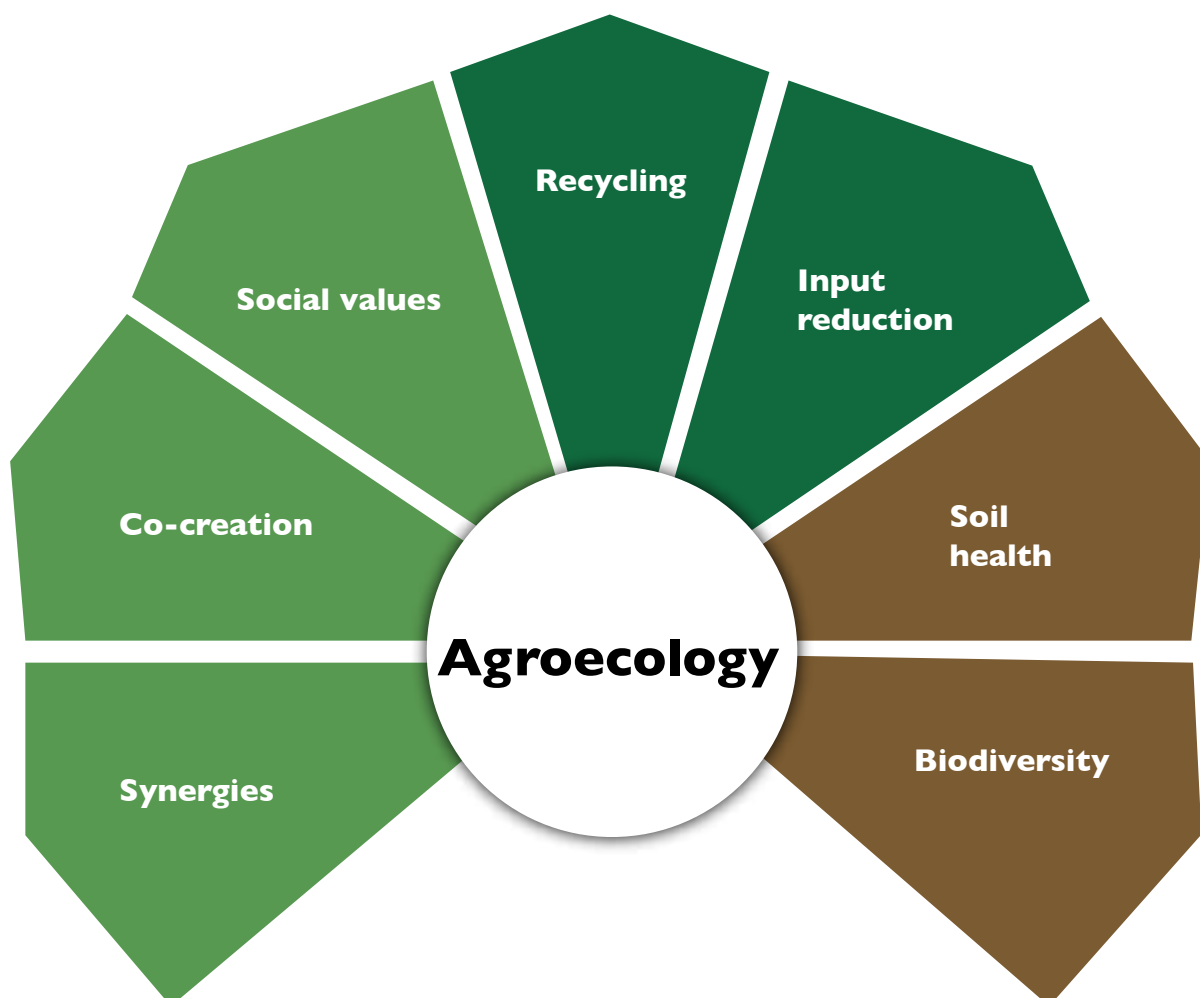
Agroecology



A TRAINING GUIDE FOR SCHOOLS

Promoting Agroecology for School Feeding (PASF) Project
Murang'a County, Kenya | Revised Edition 2026
A joint activity of PELUM Kenya and Implementing Partners

Core Principles of Agroecology



Recycling

Use waste as resource, Compost, animal manure, crop residues go back to soil



Biodiversity

Grow many different plants and raise animals together for balance



Soil Health

Healthy soil = healthy food. Feed the soil with organic matter always

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Preamble

A step by step guide for Agroecology training in Schools and communities: Guide for facilitators

The harmonization of this manual is a joint activity of PELUM Kenya and its six (6) Implementing Partners for the Promoting Agroecology for School Feeding (PASF) Program.

This manual is a revised version of the Schools and Colleges Permaculture programme (SCOPE) Agroecology training guide updated for contextualization within the PASF project.

This manual has been made possible thanks to SCOPE for sharing their training manual for review and contextualization within the PASF project, PASF implementing partners for providing input on the revised manual and Rockefeller Foundation for funding the review, designing and development of this manual.

All the information contained in this manual has been compiled to the best of the team's knowledge.

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ABOUT THE TRAINING GUIDE

This training guide is designed to assist facilitators to effectively deliver step-by-step training in agroecological practices and technologies. It provides a framework, relevant information, and tools to equip learners - especially school-going children - with practical knowledge in sustainable farming, nutrition, water management, economic literacy, and community living.

How to use this guide

Each topic includes a Training Objective, Expected Learning Outcomes, Key Content, Activities, and Training Aids.

Facilitators should adapt lessons to the local context, season, and available resources.

Prioritize hands-on activities, group work, and field visits over lectures.

Visual aids, diagrams and demonstrations make learning more effective for children.

Allow learners to share their own knowledge — they bring valuable experience!

LEGAL AND POLICY FRAMEWORK

The training guide informs the Government of Kenya commitment to improving the livelihood of its citizens, as demonstrated by the various policies and legislative steps that have been undertaken by ministries in recent years. Article 43 of the Constitution of Kenya, 2010 provides for the right of every person to health, education, food of acceptable quality and decent livelihoods. Article 53 guarantees every child the right to free and compulsory basic education and to basic nutrition, shelter and health care. While Sustainable Development Goal 4 explicitly focuses on inclusive and equitable quality education and life-long learning for all, goals 1, 2, 3, 5 and 6 have direct implications for school meals and nutrition.

However, child hunger is one of the biggest challenges to regular school attendance. The double burden of malnutrition weighs heavily on Kenya's school-age children and adolescents, who make up 36% of the population.

The National School Meals and Nutrition Strategy in Kenya, particularly the 2017-2022 version, provides a framework for implementing school meal programs, aiming to improve nutrition, health, and educational outcomes for students. It focuses on providing nutritious meals, promoting nutrition education, and connecting smallholder farmers with the program. The strategy aligns with national goals like Vision 2030 and is supported by various policies and laws related to education, health, and nutrition.

Vision 2030 aims to transform Kenya into a newly industrialized middle-income country, providing a high quality of life to all its citizens by the year 2030. Under its economic and social pillars, Vision 2030

further emphasizes the enhancement of productivity of crops and livestock, incomes, and food security and nutrition.

In order to enhance nutrition education in schools, the Government of Kenya commits in the National food and nutrition security policy 2011 to:

1. Review curricula to enhance nutrition information that can be included in existing classes, activities and learning materials; and
2. Extend the school garden concept to every school, including container gardens in urban schools, with a focus on using the gardens to teach and demonstrate not only safe food production, but also food preservation and preparation.

The guide is also informed by the National School Meals and Nutrition Strategy for Kenya (2017-2022), developed by the School Health, Nutrition and Meals Coordination Unit at the Ministry of Education, with inputs from partnering ministries, counties, sub-counties, schools, development agencies, Non-Governmental Organizations (NGOs), educationists and other development partners. This strategy takes into account the policies formulated by sectors with cross-cutting interests in school meals, such as education, health, social protection and agriculture.

ABOUT PELUM KENYA

Participatory Ecological Land Use Management (PELUM) Kenya is a national network currently comprising 68 Member Organizations (MOs) working in all 47 Counties. The MOs are distributed in four(4) PELUM Kenya zones: Nairobi and Central, Rift and Western, Lower Eastern and Coast, and Upper Eastern and Northern Kenya.

Vision: Empowered, prosperous, healthy and resilient communities.

Mission: To champion agroecological principles and practices for sustainable and resilient livelihoods among smallholder farmers, pastoralists and fisherfolk.

Slogan: Networking for a Greener Africa

ABOUT PROMOTING AGROECOLOGY FOR SCHOOL FEEDING (PASF) PROJECT

Promoting Agroecology in School Feeding (PASF) is a programme that aims at improving food security, nutrition and retention of pupils in public primary schools for livelihood improvement in Muranga County by 2028. Contributing to this goal are the following outcomes: improved attendance and retention of pupils in thirty (30) public primary schools, enhanced local food systems through market access for agroecological farmers, increased adoption of agroecological practices among the local and school communities, improved child nutrition through diverse, nutritious meals and increased incomes of smallholder farmers linked to schools and local markets in Murang'a County.

The programme will be implemented by six(6) PELUM Kenya Member Organizations; Resources Oriented Development Initiatives (RODI) Kenya, Sustainable Agriculture Community Development Programme (SACDEP), Organic Agriculture Centre of Kenya (OACK), Effective Integrated Pest Management Association (EIPMA), Community Sustainable Development Programme (COSDEP) and Institute for Culture and Ecology (ICE) Kenya who have been working in Murang'a County in other different agroecological programmes. The programme will focus on establishing agroecological school kitchen gardens to supply vegetables, pulses, fruits and eggs to the pupils in thirty (30) public primary schools that already have an existing school feeding programme. The programme aims to utilize the existing 4K clubs as the custodians of the programme by training them on different agroecology practices and principles in setting, nurturing and maintenance of the school kitchen gardens. The programme will also train 2,700 smallholder farmers around the schools on agroecological principles and practices and works closely with the Kenya Organic Agriculture Network (KOAN) to train and certify them on Participatory Guarantee Systems (PGS) then link them up with the school's procurement systems to ensure that only the certified farmer groups are supplying safe and healthy foods to the schools.

ABOUT THE AGROECOLOGY TRAINING GUIDE

This training guide is designed to assist facilitators to effectively understand the step by step training in agroecological practices and technologies. It provides a framework, relevant information and tools to equip learners - especially school-going children with practical knowledge in sustainable farming, nutrition, water management, economic literacy, and community living, according to specific needs of learners.

The agroecology course is designed for schools to address various ecological, social, cultural and economic issues such as:-

1. Increased environmental degradation and effects of climate change
2. Increased Food and nutrition insecurity
3. Inadequate practical and life skills orientation among learners
4. Erosion of local and indigenous knowledge
5. Increased unemployment levels among the youth

The guide tries to address key areas of concern for school meals provision in Kenya under the National School Meals and Nutrition Strategy 2017 to 2022, namely:

- Hunger, malnutrition and unfolding negative impacts among school-age children;
- The need for sufficient and stable financial sources for school meals at all levels;
- The need for stable school meal governance and management structures; a transition to home-grown school meals models;
- Adequate capacity-development support for food procurers and smallholder farmers to provide suitable and diverse production for school meals;
- Participation of governments at all levels as well as communities and parents;
- The need for adequate infrastructure and environmental safety in schools.

The course provides the necessary principles to enable the learners to acquire knowledge, skills and attitudes related to agro-ecology, social, cultural and economic practices towards improved living standards and livelihood.

This Facilitator's Guide is a product of the experiences and lessons learned by PELUM Kenya member organisations while implementing agroecology projects in Kenya.

TRAINING GUIDE PURPOSE AND OBJECTIVES

The purpose of this facilitator guide is to provide a guide for facilitators in agroecological training in schools, institutions and communities. The training guide provides an overall outline of the lesson to guide the facilitators in preparation and implementation of the training course.

The training guide is aimed at enhancing the facilitator's knowledge, skills and technologies in passing on information on agroecology, training to play an active role in enhancing food security, income generation and environment conservation for improved livelihood among learners.

The Facilitators guide provides:

- Title of the session
- Length of the session
- Aim(s) of the session
- Learning outcomes
- Overall content, including guiding notes
- Training method(s) and aids to be used.

FACILITATION SKILLS

The Role of a Good Facilitator

A facilitator's role is to guide a process and ensure effective flow of information within a learning session, so that learners can share information, gain skills and knowledge. The facilitator should help participants to master skills, presented in the training course. The facilitator spends most of the time with participants: individually or in small groups.



*You are a **FACILITATOR** and your mission is to deliver training in this course*



The facilitator should have an understanding of the duration of each session, activities to be involved and what type of materials will be needed to effectively conduct the session. Most sessions should begin with a short introduction involving an explanation or presentation. The facilitator should ask learners what they know about the topic and then add

information if necessary. To make these sessions more effective, the facilitator is encouraged to use visual aids and demonstrations. Pictures help people remember more than words. The introduction should be followed by an implementation activity, a demonstration or a group exercise.

The training methodologies provided in this guide are not exhaustive and restrictive and the facilitator is free to employ creativity and innovativeness accordingly.

To encourage learning, facilitators should enhance their relationship with learners by:-

- ♦ Getting to know each other (establish a good rapport with learners)
- ♦ Always treating all the learners with respect irrespective of culture, age, or sex differences.
- ♦ Use of right language (brief and clear)
- ♦ Create an environment conducive to learning
- ♦ Encourage full participation
- ♦ Display/depict good morals and be a role model
- ♦ Avoid gender bias and accept genuine criticism
- ♦ Keep abreast with new technologies

An effective facilitator should:

- Design the training lesson based on the needs and interests of participants;
- Value, respect and acknowledge participants' skills, abilities and knowledge;
- Be prepared to listen to and learn from participants;
- Know when to stand back and let the participants lead but also knows when to step in and stimulate learning and group discussion;

As a facilitator, you should perfectly know the teaching material. Your task is to present the module, conduct demonstrations, answer the questions, discuss with the participants their answers to the exercises, lead role-play exercises and group discussions, organize and supervise practical sessions, and generally provide any assistance to participants that they may require for successful completion of the training course.

The Facilitator is expected to introduce the course, its objectives and pick the learners expectations

FACILITATOR'S ROLE

A facilitator must fulfill the following 3 functions in the learning session:

1. TEACH:

- Ensure that every participant understands how to work with the training materials and knows their own assignment in each module.
- Answer participants' questions as they appear.
- Explain the information which may be unclear to the learners and help them grasp the goal of each exercise.
- Conduct group exercises, like group discussions, game exercises to verify if training objectives have been met.
- Assess each participant's work and give correct answers.
- Provide additional explanations or practice opportunities to improve skills and understanding.
- Help the participant understand how acquired skills can be applied in his/her in real life experience

2. MOTIVATE:

- Compliment the participant for correct answers, improvements or progress.
- Watch for any serious disturbances which may hinder training (e.g. loud noise or poor lighting).

3. FACILITATE:

- Plan beforehand and receive all the materials needed for each training day, so that they are available in the classroom or in the field if necessary.
- Monitor each participant's progress.
- Be responsive to questions and requests of each participant. Encourage the participants to turn to you with questions or comments.
- Observe participants' work and offer individual help if you notice that a participant is nervous, stares at one point, does not answer questions or does not turn pages – this indicates that a participant requires help/assistance.

- Encourage friendly, mutually beneficial relationships.
- Answer all questions in a positive way (e.g. “I see your point.” or “That’s a good question”). Listen to questions and try explaining issues which are unclear to a learner in detail, rather than quickly giving a correct answer.
- Always allocate sufficient time to provide full answers to all questions of each participant (i.e. so that both you and the participant are satisfied with the answers).

Things to AVOID as a facilitator...

- While in discussion with the participants avoid facial expressions or comments which may make them feel uncomfortable.
- Do not talk too much. Encourage participants to voice their opinions.
- Do not be shy, nervous or anxious when you speak.

This Facilitator’s guide will help you remember what you have to say. Use it!

TRAINING METHODS

Method	How It Works
Group Work	Learners work in teams to build cooperation, trust and confidence. Try to get learners to work in groups as much as possible. Groups teach co-operation, build trust and confidence. They encourage participants to learn from each other. Make sure that any over-assertive individuals are not dominating the group work. Make sure that the passive participants have the confidence to try out the techniques and ask questions when they do not understand something. Make sure that the same people do not present the results of the group work each time.
Brainstorming	Learners shout out ideas freely. All ideas are written up - none are wrong! With this method, participants are asked to give answers or ideas to a question or on a topic. For example learners could be asked to brainstorm the causes of food insecurity. Participants are encouraged to shout out any ideas which come to them. All of the ideas should be written up on the flip chart – none must be considered incorrect or unrealistic. This type of activity promotes a feeling of confidence and trust amongst participants. A few of the ideas listed can then be selected for further discussion.
Demonstrations and Practicals	Hands-on sessions where learners practice real techniques on the farm. Where time and amount of available materials permits, it is ideal to get each participant to practice a technique but in many cases demonstrations are a more realistic way of getting information across to a large group. Make sure that you have all of the materials which you require for each session prepared beforehand. If you are demonstrating a new technique, practice the technique yourself before the training to make sure that the demonstration runs smoothly when it is time to show the participants. Participants can also be presented with case studies to discuss.
Field Visits	Outdoor lessons where learners observe and experience nature directly. The facilitator plans outdoor lessons to enable learners to introduce the concepts, experiences, and ideas that cannot be given in a classroom environment. Schools outdoor lessons can be considered as short-term learning activities providing students the opportunity to observe and learn outside of a classroom setting.

Role play and Stories	Act out scenarios to understand real-world situations and solutions.
Energizers	Short fun activities (songs, dances) to re-energize a tired group. If you notice that participants are looking tired or are keeping very quiet it could be time to introduce an energizer. These are short 1–2-minute, fun activities to get all of the workshop participants to stretch, move around, laugh and regain some of their energy. You can make up your own energizers (such as getting participants to sing a song, do a dance or perform silly actions) or ask participants if they know any energizers which they would like to perform

LEARNING METHODOLOGIES

Learning methodologies are the different ways in which the learner receives and elaborates (makes sense of) the message sent by the facilitator. Individuals learn in different ways and use different languages to understand and express what they have learned. Messages can be conveyed in different ways through different languages. Communication can happen:

- Through speech, called oral/verbal communication
- Through music, sounds, songs, stories, etc.
- Through pictures, drawings, photographs, etc. This is called visual communication.
- Through body movements, dance, signs, gestures, etc.
- Through written words, poetry, literature, books, etc.
- Through behavior, for example a slap, a smile, a hug, an angry reaction, etc. This is called nonverbal communication

“If I hear it, I forget it; if I see it, I remember it; if I do it, I know it.” Chinese proverb

Learning happens inside and outside the classroom. The way we interact with the environment we live in provides important knowledge and skills relevant for our future survival. For example children who live in rural areas without direct access to water most likely know how to find the nearest water source. Children who live in big cities know how to move in the city using local transportation.

There are many theories about learning processes according to different schools of thought. The ‘multiple intelligences’ theory is introduced here as a reference to understand the importance of using different languages when teaching

TRAINING AIDS

The facilitators guide, provides diversified materials and teaching aid, this should be learner based. The training aids help develop learning corners and also support a more efficient and interactive layout of the physical environment.

Tips for Child-Friendly Teaching

-  Use colourful charts, flashcards, drawings and real objects as teaching aids. These can be achieved by making your own teaching aids, using low-cost local materials. When making teaching aids, use and build on skills learners already have. Try not to make the aids for the learners, but rather involve them in making aids themselves. Turn the making and inventing of teaching aids into a challenge and an adventure.

	Let children touch, smell and taste — especially in the garden!
	Use songs, rhymes and stories to help children remember key concepts.
	Celebrate every contribution — there are no wrong answers in exploration.
	Repeat key messages in different ways: say it, show it, do it together. Use teaching aids that do not simply show or explain something, but that help the learners to think things through and discover solutions for themselves and exercise the powers of observation and reason.
	Keep sessions short (30-45 min) with breaks and movement activities.
	Connect lessons to real life — what children see at home and in the community. Teach new ideas or skills by comparing them with familiar objects or activities. Look for ways to use real objects instead of just drawing things. Make training aids as natural and lifelike as you can, especially when detail is important. Make training aids as fascinating or fun as possible.

Following are some ideas on how to build teaching aids that can be useful in the classroom. Your creativity and initiative will help to make stimulating and vibrant learning environments.



Wall display

A wall display is a collection of many different types of items and materials put up on a wall to make an interesting and informative display.

Washing-line display

A washing-line display or string display looks exactly like a washing-line – a string tied between two poles or trees. It can be used to display or organize information during teaching and is particularly useful for explaining the order of a process.

Pocket boards

The pocket board is made of cotton fabric. It is about 3 meters long and 1.5 meters wide. It has several pockets for storing different teaching aids. Flash cards, toys and drawing materials can be stored in the pockets.

Wall Chart

Wall chart is a large flat sheet of paper or cardboard, which records and displays related sets of information. A wall chart is useful for recording information like daily attendance of the pupils. Attendance can be done in a fun way by having the pupils themselves ticking on the wall chart at the beginning of each day. Charts are very useful in monitoring exercises.

Flashcards

Flashcards are small cards with a picture or symbol on them. In the classroom flashcards are commonly used to teach reading. A picture, for example, of an elephant may be drawn or stuck on a card and the word 'elephant' is written underneath it. The students are encouraged to associate the pictures and the words through 'look and say' and 'look and write' activities and games.

TRAINING GUIDE OUTLINE

TOPIC	TOPICS COVERED	LESSONS INCLUDED
Topic 1	Introduction to Agroecology	Lesson 1: What is Agroecology? Lesson 2: Agroecology vs. Conventional Farming Lesson 3: Agroecology Principles
Topic 2	Agroecological Practices	Lesson 1: Natural Resources Management (NRM) & Environmental Conservation Lesson 2: Nursery Establishment & Management Lesson 3: Soil & Water Conservation Lesson 4: Soil Fertility Management Lesson 5: Agroforestry Lesson 6: Biodiversity & Wildlife Management Lesson 7: Crop Production & Management Lesson 8: Integrated Pests Management (IPM) Lesson 9: Seed Management Lesson 10: Small Livestock & Fish Production Lesson 11: Diversification of Farm Enterprise
Topic 3	Participatory Land Use Design and Planning	Lesson 1: Farm Design & Layout Lesson 2: Integrated Land Use Design & Planning Lesson 3: School Garden and Food Forest Lesson 4: Innovative Gardening (Vertical Gardens Etc)
Topic 4	Food and Nutrition	Lesson 1: Key Nutrients and Their Sources Lesson 2: Food Handling & Preparation Lesson 3: Herbs & Spices Lesson 4: Local and Indigenous Knowledge-Food and Herbal Medicine Lesson 5: Post-Harvest Handling & Food Storage
Topic 5	Water Harvesting, Management and Storage	Lesson 1: Introduction to Water Harvesting Techniques Lesson 2: Water Treatment & Safe Storage Lesson 3: Sanitation & Hygiene (WASH) Lesson 4: Solid & Liquid Waste Management
Topic 6	Economic Literacy	Lesson 1: Entrepreneurship & Marketing Lesson 2: Financial Literacy & Record Keeping Lesson 3: Savings & Loaning
Topic 7	Conflict Management	Lesson 1: Introduction to Conflict Lesson 2: Forms & Causes Lesson 3: Common Approaches to Conflict Resolution

TOPIC 1: INTRODUCTION TO AGROECOLOGY

	Introduction to Agroecology
	Duration: 2.5 hours
	Objective: To introduce learners to agroecology principles and practices, and their implementation in schools and communities.
	Expected Outcome: By the end of the session Learners will have a good understanding of the current social, economic and environmental situation, how it affects their education and livelihood and the need to make interventions. Learners will have gained valuable understanding on the agroecology principles and practices and how to apply and implement them at schools, household, and community level to address the issues, and also how agroecology addresses these challenges at school, household and community level.

Lesson 1. What is Agroecology: 30 mins

The facilitator to give a brief overview on agro-ecology to the learners

The word “Agroecology” comes from three words:

- “Agro” = farming / agriculture
- “Eco” = ecology / the natural environment
- “Logy” = the study of

So agroecology means: “studying how farming and nature work together!”

Agroecology is the application of ecological concepts and principles to the design and management of sustainable agro-ecosystems’ – has three facets. It is:

- a scientific discipline involving the holistic study of agro-ecosystems, including human and environmental elements
- a set of principles and practices to enhance the resilience and ecological, socio-economic and cultural sustainability of farming systems
- a movement seeking a new way of considering agriculture and its relationships with society.

The concept of agroecology has evolved as a scientific discipline, a set of practices and a social movement. As a science, it studies how different components of the agro-ecosystem interact.

As a set of practices, it seeks sustainable farming systems that optimise and stabilise yields.

Principles and elements of Agroecology

Generally speaking, agroecological practices consist of farming approaches that are inspired by some or all the principles outlined below:

Planning: Use a holistic and integrated approach to the land use planning, design, and utilisation.

Resource use: Recycle and optimize the use of nutrients and energy on the farm. E.g., Enhance the recycling of biomass, minimize losses of energy, water, nutrients and genetic resources by enhancing the conservation and regeneration of soil and water resources and of agro-biodiversity, avoid the unnecessary use of agrochemical and other technologies that adversely affect the environment and human health and minimize the use of external, non-renewable resources (including fossil fuels)

Farm and landscape management: Enhance beneficial

biological interactions and synergies among the components of agro-biodiversity, thereby promoting key ecological processes and services, rather than focusing on individual species. Such practices involve diversify species and genetic resources in the agro-ecosystem (i.e. at farm and landscape level) over time, Strengthen the 'immune system' of agricultural systems by enhancing functional biodiversity (natural enemies, antagonists, etc.); pests and diseases should be managed and prevented rather than controlled, Use local crop varieties and livestock breeds so as to enhance genetic diversity and adaptation to changing biotic and environmental conditions, Provide the most favorable soil conditions for plant growth, particularly by managing organic matter and by enhancing soil biological activity



Lesson 2: Why Agroecology? - Comparing Farming Systems

Why Agroecology: as an alternative to conventional agriculture | 1 hour,

What Makes Agroecology Special?

- It builds healthy soils using compost and organic matter instead of chemicals.
- It grows many different crops together (biodiversity) rather than just one crop.
- It harvests and conserves water efficiently.
- It controls pests naturally using plants, insects and good farming practices.



It involves the whole community — elders, women, youth and children.



It saves local seeds and preserves traditional food knowledge.



It recycles everything — waste becomes a resource!

Training aids- Flip chart, pictures, posters, sticker cards, hand outs

The facilitator to explain to learners the various principles and practises involved in agro-ecology as alternative to conventional agriculture:

The core principles of agroecology, and have the immediate objectives of:

- Building soil structure, improving soil health, recycling nutrients and ensuring local sourcing
- Conserving and using water efficiently
- Sustaining and improving functional diversity

Agro-ecology practises

Conservation Tillage- minimal tillage and soil disturbance
 Mixed crop farming- different types of crops on a farm
 Crop rotation
 Use of cover crops, Mulching
 Crop livestock integration
 Integrated nutrient management
 Integrated pest management
 On farm water harvesting
 Agro-forestry
 Use of local resources and renewable energy
 Composting and waste recycling

Conventional farming practises

Mechanical tillage- use of tractors
 Mono Cropping- one type of crop on the farm
 No crop rotation
 Use of synthetic mulch- e.g. plastic sheets
 No integration of crops and livestock
 Relies of synthetic/chemical fertilisers such DAP, CAN
 Relies of synthetic –chemical pesticides to control pests and diseases
 Limited on farm water harvesting, relies on irrigation
 No agroforestry systems
 Use of external resources
 No composting and waste recycling

Agroecology vs. Conventional Farming

AGROECOLOGY

- ✓ Uses natural compost & manure
→ No chemical fertilisers needed
- ✓ Grows many crops together
→ Intercropping & diversity
- ✓ Uses natural pest control
→ Plants, insects & birds help
- ✓ Saves and uses local seeds
→ Preserves food heritage
- ✓ Harvests rainwater efficiently
→ Terraces, ponds & swales
- Result: Healthy land, food security & strong communities

CONVENTIONAL

- ✗ Relies on chemical fertilisers
→ Pollutes soil & water
- ✗ Grows single crops (monoculture)
→ More vulnerable to pests
- ✗ Sprays chemical pesticides
→ Harms health & environment
- ✗ Buys expensive hybrid seeds
→ Creates dependency
- ✗ Wastes or depletes water
→ Leads to drought impact
- ▲ Result: Soil degradation, food insecurity & pollution

Discussion Activity - Group Exercise

Ask learners: “What farming practices do you see your parents or community using in the farms?”
Write each practice on a card and stick it on the wall.
As a group, sort the cards into two groups: Agroecological OR Conventional.
Discuss: What are the benefits and challenges of each type?
The facilitator guides the group and clarifies which practices belong where.
Training aids needed: Cards/sticky notes, marker pens, wall/board space.

Group Exercise 2

The facilitator to share a hand-out/ posters/ photo with a mixture of activities for conventional agriculture and agro-ecology. Allow Learners to hold group discussion to identify conventional practises and agro-ecology practises.

On completion of the two exercises, the facilitator to clarify which farming practises fall under agro-ecology and which fall under conventional agriculture

The facilitator should also help learners to understand the negative effects of conventional farming to the ecology, economy and human well-being.

Lesson 3: The Principles of Agroecology

Agroecology is guided by key principles that help farmers and communities design better food systems. These principles are like the rules of nature that we follow to make farming work with the environment.

Principle	What It Means
1. Recycling	Use farm waste (crop residues, manure) as compost and feed — zero waste!
2. Input Reduction	Reduce use of external chemical inputs; use what you grow and find locally.
3. Soil Health	Feed the soil with organic matter; healthy soil = healthy crops and people.
4. Biodiversity	Grow many different plants and animals together for balance and resilience.
5. Synergies	Build connections between crops, trees, animals and soil for mutual benefits.
6. Economic Diversification	Diversify income — sell, add value, and build community food systems.
7. Co-creation of Knowledge	Learn together — combine farmer wisdom with scientific knowledge.
8. Social Values & Diets	Reconnect food systems with culture, tradition and community values.

TOPIC 2: AGROECOLOGICAL PRACTICES

The facilitator to introduce learners to various agroecological practices:

This topic covers the practical skills learners need to implement agroecology in their school gardens, homes and community farms. Each lesson focuses on a specific practice with hands-on activities.

-  **Natural Resource Management**
-  **Duration:** 2.5 hours
-  **Objective:** To equip learners with knowledge and practical skills in natural resource management and understand the role of renewable energy in agroecology.
-  **Expected Outcome:** Learners will acquire knowledge and skills to apply in energy saving, watershed management and other natural resource management practices.

Lesson 1: Natural Resource Management & Environmental Conservation

Introduction to Natural Resource Management- 30mins

In an open discussion, the facilitator introduces learners to various forms of natural resources and how best we can manage them

Natural resources are the gifts of nature that we use for our daily lives — soil, water, forests, sunshine, and air. Good management means using these resources wisely so that future generations can also enjoy them.

- Soil — the foundation of food production. Must be protected from erosion and degradation.
- Water — essential for all life. Must be harvested, stored, and used efficiently.
- Forests & Trees — provide food, medicine, timber, shade, and protect watersheds.
- Biodiversity — the variety of life forms that keep ecosystems in balance.
- Air — clean air depends on good land management and reducing burning.

Renewable Energy in Agroecology

Agroecological farms can use clean, renewable energy sources that reduce costs and pollution:

Energy Source	How It Helps
Solar Energy	Solar panels power water pumps, lighting and electric fences.
Biogas	Animal manure is fermented in a biodigester to produce cooking gas.
Improved Cookstoves	Use less firewood; reduce deforestation and indoor air pollution.
Wind Energy	Wind turbines can pump water in open areas.
Biomass	Crop residues used as fuel in efficient stoves instead of burning in the field.

Activity: Walk and Learn – Natural Resource Tour

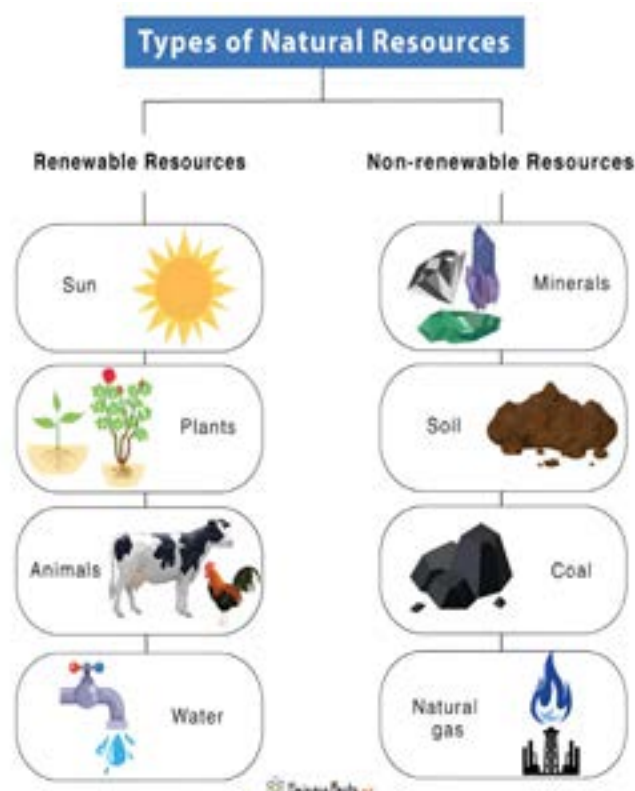
Take learners on a walking tour around the school compound and nearby areas.
Ask learners to identify: soil erosion spots, trees, water sources, bare land, etc.
Discuss: Why is soil washing away there? What can we do to protect this area?
Learners sketch a simple map of what they observe for class discussion.
Connect observations to solutions: terracing, tree planting, composting, mulching.

Natural resource management deals with creating sustainable solutions for conserving natural resources such as clean water, energy, minerals and biological resources.

It also deals with managing the way in which people and natural landscapes interact. It recognizes that people and livelihoods rely on the health and productivity of our landscapes and their actions as stewards of the land play a critical role in maintain this health and productivity.

Renewable energy sources in Agro-ecology- 1hr

- The facilitator introduces learners to forms of renewable energy and how the farmer can benefit from such in his operations
- Through posters, videos, observations- learners are exposed to various forms of renewable energy saving technologies

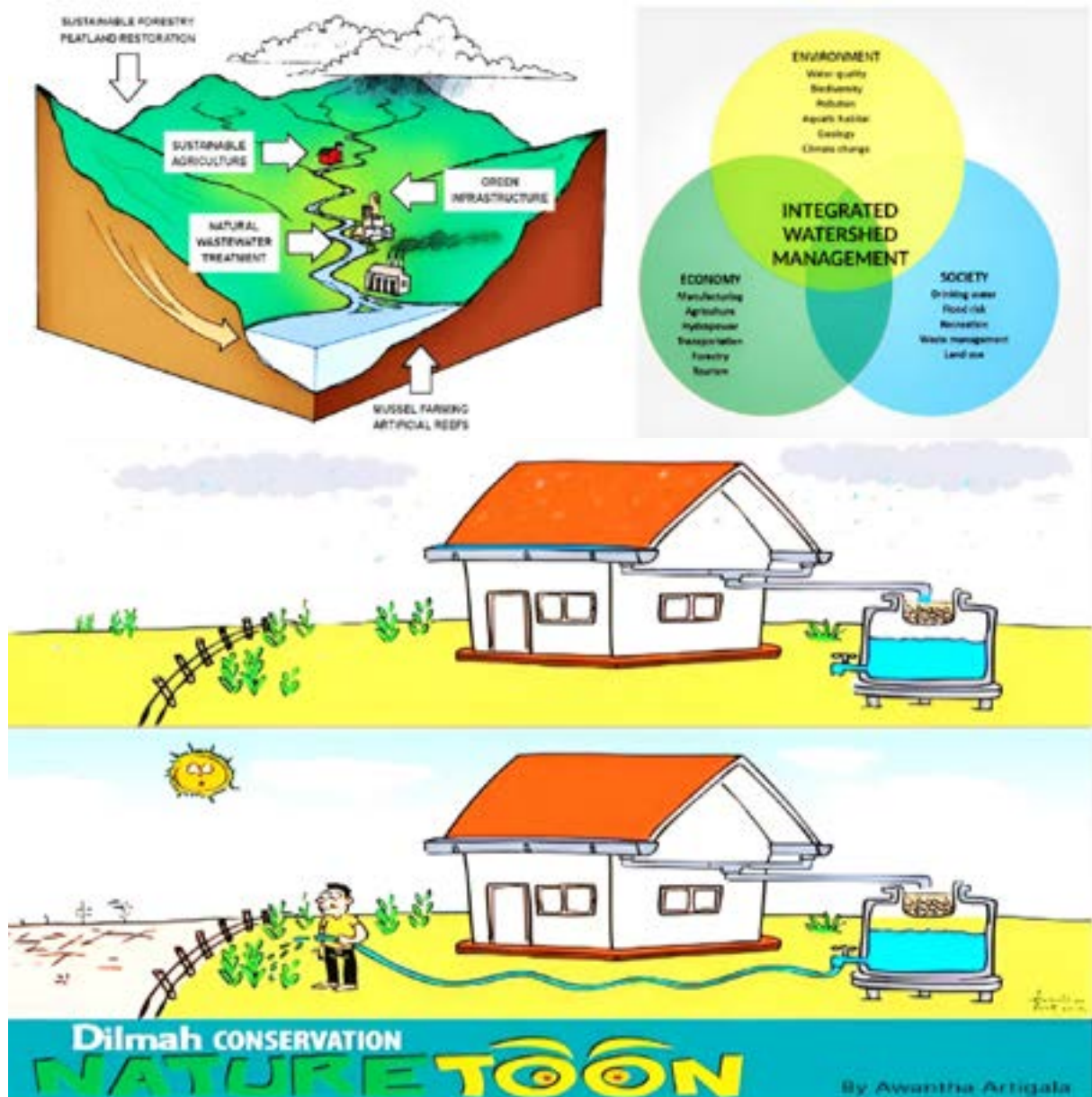


Participatory and Integrated watershed management- 1 hr

- Through field visits and excursions, learners are exposed to various water shed management practices.
- The facilitator can project a video clip to enhance learning in water shed management
- The facilitator to take the learners through ecologically suitable trees for watershed rehabilitation
-

Watershed managements integrate practices such as water management, soil protection, as well as health and socio-economic topics into a process, ideally leading to a sustainable and economically viable environment and to sufficient household income.

A watershed is defined as any surface area from which all rainwater is drained into the same water catchment. Small streams merge to larger streams, continuously growing to a river or filling up a lake. The watershed resembles a tree, where leafs lead to small branches and these small branches lead to larger branches and so on, eventually reaching the trunk of the tree. Watersheds include both biophysical and socio-economic characteristics, i.e. climate, drainage and water, soil, vegetation, topography as well as population, farming systems, social setups, economic activities, vulnerability profile, gender, etc



Participatory community watershed management involves local farmers, other land users, schools and the wider community into the process of watershed management. The process is guided by the following principles in integrated watershed management

- **Participatory** - The communities of the respective watershed need to be involved in all stages of the watershed development process, i.e. planning, implementation, and management.
- **Gender sensitive** - Mostly women suffer from the condition of uncoordinated water management, since they have to gather the water for the household use. They are the key to ensure the sensibility and sustainability of the process.
- **Build on local experience, and strengths** - Local knowledge is essential to improve existing technologies and adapt new ones. Best practices should be identified and disseminated.
- **Realistic, integrated, productive, and manageable** - Watershed development planning should be realistic and build on local capacity and locally available resources. Integrated management of the local natural resources and optimal use of social resources are essential parts of watershed development. Production and conservation aspects should be included, so households quickly receive benefits for their engagement.
- **Watershed logic and potential respected** - The watershed development activities have to follow the logic of the watershed. Simple land use and features descriptions can help to adapt to the local conditions.

- **Flexibility at different levels** - Flexibility and adapted management is needed for a pragmatic implementation and management of a watershed development plan.
- **Cost-sharing and empowerment/ownership building** - Cost-sharing by stakeholders contributes to the sustainability of a project. Also, other forms of local contributions are possible.

Benefit of watershed management

- Water harvesting opportunities
- Sustainable source of safe drinking water
- Land rehabilitation, reclamation and productivity enhancement
- Protection, development and sustainable management of forests
- Sustained, long lasting and effective use of rural infrastructure
- Promotion of income generation activities
- Watershed development and conflict resolution

Waste management-1 hr

- The learners to hold discussions on the various forms of waste they generate from their homestead, schools and its effects to the environment
- The facilitator to demonstrate through illustration and practicals on the forms of waste management practices applicable in schools and homesteads

Waste management is defined as the discipline associated with the control of generation, storage, collection, transport, processing, recycling or disposal and monitoring of waste materials in a manner that is in accord with the best principles of public health, economics, engineering, conservation, aesthetics and other environmental considerations. The term usually relates to materials produced by human activity and is generally undertaken to reduce their effect on health, environment or aesthetics.

Waste management is also carried to recover resources from it. Waste management can involve solid, liquid, gaseous or radioactive substances.

Solid waste means all bio-degradable or non-bio-degradable materials including but not limited to garbage, rubbish, refuse, ashes, and sludge from sewage treatment, construction and demolition wastes, dead animals, discarded home and industrial appliances, wood products and by products and other inert

Liquid waste-This is any waste in liquid state of matter. Liquid waste can contaminate land and pollute waters and needs to be managed in a way that protects the environment and the community. This can be prevented by appropriate handling and storage of the liquid waste. Liquid waste also poses a serious threat to human health and environment because of their ability to enter watersheds, pollute ground water and drinking water

Waste prevention, waste reduction and avoidance

One of the mainly used concept is the “3 Rs” approach/waste hierarchy

- Reduce-prevents the generation of waste from the source
- Re-use- involves directly re-using raw materials for manufacturing and re-processing
- Recycle-turns waste into a valuable resource

This remains the cornerstone of most waste minimization strategies.

The preferred way to reduce waste is not to make it in the first place. Meaning, less waste you have to start with, the less you will to recycle, compost, reuse and so on. Writing on both sides of a sheet of paper, using products that last longer, using voice or email messages

Other waste recycling ideas include using mulching lawn mower, buying products with minimal packaging, removing your name from mailing lists etc

Some methods of waste avoidance include reuse of second-hand products e.g. use of plastic containers for water treatment (solar treatment)

Repairing broken items instead of buying new

Designing products to be refillable or reusable (such as cotton instead of plastic shopping bags)

Encouraging consumers to avoid using disposable products (such as disposable cutlery)

Lesson 2: Nursery Establishment & Management

	Nursery Establishment
	Duration: 3 hours
	Objective: To equip learners with skills and knowledge on nursery establishment and management.
	Expected Outcome: Learners will be able to prepare and manage different types of nurseries and plant materials for transplanting.

Training aids: Flip charts, Pictures, Photos, Posters

A nursery is a special place where young plants (seedlings) are carefully grown before they are transplanted to the main garden or field. Growing seedlings in a nursery first gives them a strong start and increases survival rates after transplanting.

Introduction to nursery management- 30 mins

The facilitator to introduce learners to what is a nursery, allow learners to brainstorm and share their thoughts of what they understand by a nursery in farming.

A Nursery is a protected environment /seedbed for the production of planting materials before establishing them in the main field. Nurseries differ in size and diversity: some nurseries diversify, while others specialize in growing crops specific or suitable for certain geographic region.
Nurseries are necessary in conditions where:
Seeds are too small to be sown directly in the main field

Site selection- 30mins

The facilitator to introduce the learners to the topic through open discussion on suitable site selection to establish a nursery.

Considerations in selecting a site for a plant nursery-

Located in an area climatically suitable for the species being propagated

Near a source of water- The continuity of water supply is essential for seedling production in the nursery

Should be easily accessible

It should be located away from tree shade and strong run off channels- no extreme condition (very hot, very cold, strong wind, dry or flooding etc.), and if possible close to the planting sites

Most nursery plants are grown in a mixture of materials. The site should be accessible to a source of good growing mixes.

the area is relatively flat

Area selected should be well drained, and free from water logging

Types of nursery beds- 30 mins

- The facilitator to expose learners to observe various types of tree nurseries through photos, posters, and video clips.

Nursery preparation and management- 1 hr

- The facilitator takes learners through practical sessions to demonstrate on the various nursery preparation practices
- The facilitator takes learners through practical sessions to demonstrate the preparation of planting materials.
- The facilitator to expose learners to various nursery management practices through observation,



- illustration and practical sessions to demonstrate various management practices

Transplanting Seedlings

1. Water seedlings 1-2 days before transplanting to reduce transplanting shock.
2. Transplant in the evening or on a cloudy day to avoid heat stress.
3. Dig a hole slightly larger than the seedling's root ball.
4. Remove the seedling carefully from the bag, keeping roots intact.
5. Place in the hole, firm the soil gently around the roots.
6. Water immediately after transplanting and provide shade for 2-3 days.

Training Aids

- ♦ Polythene bags or biodegradable pots
- ♦ Watering cans
- ♦ Shade net or dried grass
- ♦ Compost and good topsoil
- ♦ Seeds of local vegetables, trees, legumes
- ♦ Labels/popsicle sticks and permanent markers

Lesson 3: Soil & Water Conservation

TRAINING OBJECTIVE-

- To equip learners with knowledge and skills on practices that conserve soil and water for improved farm production and sustainability.
- To equip learners with hands on experience on sustainable farming tillage and soil conservation techniques

EXPECTED LEARNING OUTCOME

- Learners to gain knowledge and skills in soil and water conservation techniques to apply in their farming practices at school and at home.

CONTENT

Causes and effects of soil degradation- 30mins

- The facilitator gives a brief overview of the topic
- Learners to have a walk and learn tour around the school compound to identify various forms of soil erosion
- The learners brainstorm various cases of soil degradation.
- Learners are engaged to share their experiences on soil degradation in the school and their farms
- The learners are taken through posters observation session to differentiate between a degraded land and non-degraded land and the effects

Soil is one of our most precious natural resources. It takes hundreds of years to form just a few centimetres of good topsoil, but human activities and rain can erode it very quickly. Protecting our soil means protecting our food security!

Causes of Soil Degradation

There are many causes of land degradation, however the main causes are:
Soil erosion (by water and wind)
Fertility degradation- loss of plant nutrients, chemical, Physical and biological degradation
Degradation of vegetative cover
Degradation of water resources

- Continuous tillage (plowing) that breaks up soil structure over time.
- Burning crop residues that destroy organic matter and soil organisms.
- Excessive use of chemical fertilisers that harm soil microorganisms.

Soil & Water Conservation Techniques

Technique	How It Helps
Terracing	Build level steps on slopes to slow water runoff and prevent soil loss.
Mulching	Cover soil with dry grass, straw or leaves to retain moisture and prevent erosion.
Cover Cropping	Plant fast-growing plants between crops to cover bare soil and add nitrogen.
Contour Bunds	Ridges of soil or stones along the slope to trap water and sediment.
Agroforestry	Plant trees alongside crops to hold soil, provide shade and add nutrients.
Composting	Add organic matter to soil to improve structure, fertility and water retention.

Practical Activity: Build a Compost Heap

This is a hands-on activity to be done in the school garden.

Collect: dry leaves (browns), fresh grass/kitchen waste (greens), animal manure, water.

Layer in a 1m x 1m heap: 15cm browns, 5cm greens, thin layer manure. Repeat.

Water the heap so it is moist but not soggy.

Turn the heap every 1-2 weeks. After 4-8 weeks, rich dark compost is ready!

Apply compost to garden beds before planting — it feeds the soil naturally.

Soil and water management practices- 2hrs

- Learners to hold open discussions to share and brainstorm on best interventions/practices to manage soil and water
- Facilitator to expound on various soil and water conservation techniques using diagrams and illustrations.
- The Facilitator should take the learners through practical sessions to demonstrate various soil and water conservation methods.

The first step consists of conserving the soil, soil organic matter and soil water from loss. Applied measures aim at protecting the soil surface from being exposed to the sun and drying out, and from being carried away by wind or washed down by rain. The aim is to establish a stable and less vulnerable soil as the foundation to managing its fertility.

This provides a good foundation for building fertile soil. Soil conservation can be achieved through the following practices:

Preventing soil erosion by reducing the movement of water with contour ridges and bunds, grass strips and terraces/swales, and application of mulch to the soil surface.

Protecting the soil with mulch and cover crops.

Harvesting water with pits and water catchments.

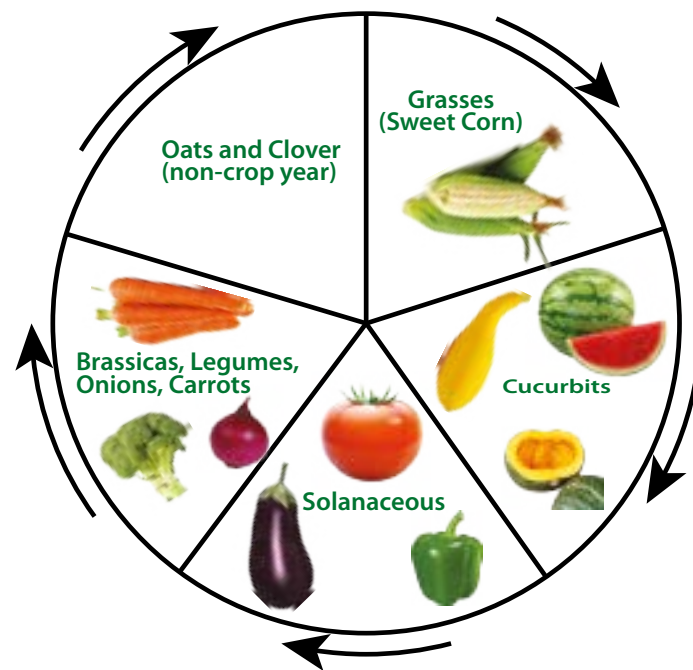


Figure 1



Compost mulch



Straw mulch



Bark mulch



Newspaper mulch



Wood chips mulch



Sawdust mulch



Plastic mulch film



Black plastic mulch



LDPE plastic

Different methods of mulching

Lesson 4: Soil Fertility Management

TRAINING OBJECTIVE

To equip learners with skills in soil fertility management practices.

EXPECTED LEARNING OUTCOME

By the end of the training, learners will be able to effectively use skills in soil fertility management

Training aids: Flipchart, mark pen, Posters, Animal manure, plant residue, water, panga

CONTENT

Introduction to soil fertility- 30 mins

The facilitator to introduce learners to an understanding of soil fertility, by demonstration different types of soil samples of different fertility.

Soil Fertility is defined as the ability of soil to provide all essential nutrients in adequate quantities and in the proper balance for the growth of plants independent of direct application of nutrients when other growth factors like light, temperature and water are favorable.

Soil Structure

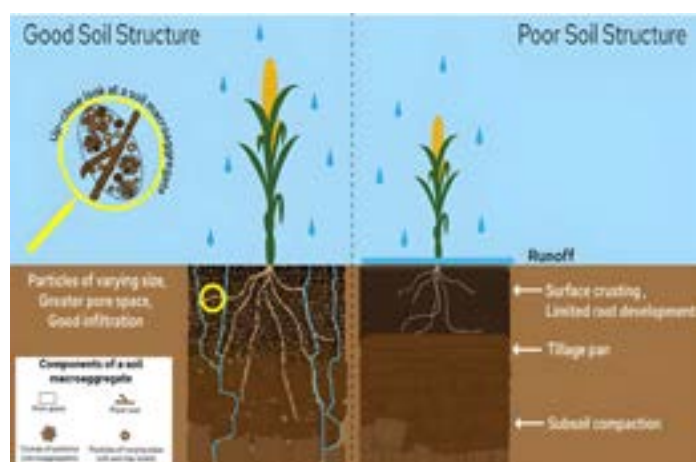


Diagram 1

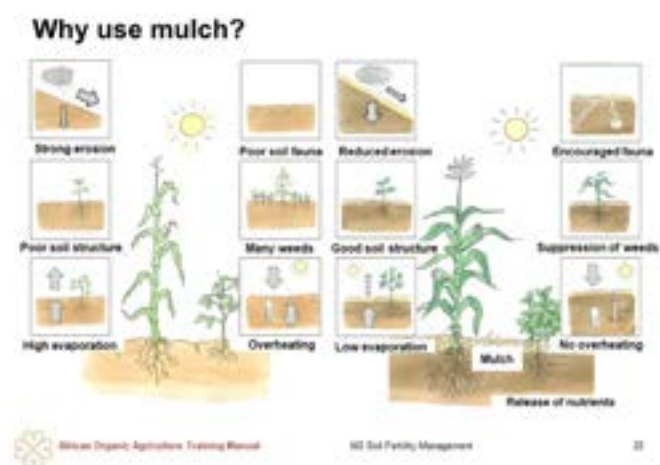


Diagram 2

Soil fertility management practices- 2hrs

- The facilitator to introduce the session by use of posters and illustrations on the various soil fertility management practices
- The trainer should take the learners through practical sessions to demonstrate various soil fertility management practices- such as composting, making of bio-fertilizers etc

How soil loses fertility

- Soil erosion
- Poor tillage practices
- Insufficient organic matter and mining of the soil.
- Excess use of chemical fertilizers
- Leaching.
- Overgrazing
- Poor cropping systems

Properties of a fertile soil

A fertile soil is rich in nutrients necessary for basic plant nutrition (including nitrogen, phosphorus, potassium, calcium, magnesium and sulphur);

A fertile soil contains sufficient micronutrients for plant nutrition (including boron, copper, iron, zinc, manganese, chlorine and molybdenum);

A fertile soil contains an appropriate amount of soil organic matter;

A fertile soil has a pH in a suitable range for crop production (between 6.0 and 6.8);

A fertile soil has a crumbly structure;

A fertile soil is biologically active;

A fertile soil has good water retention and supply qualities

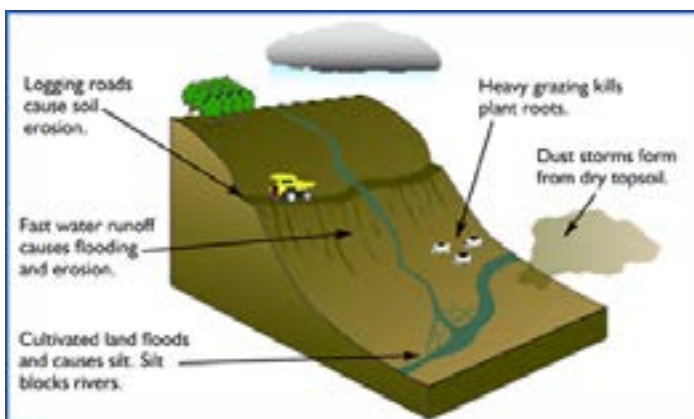


Diagram 3: Effects of Soil Erosion



Diagram 4: Effects of Soil Erosion



Diagram 5: Effects of Overgrazing

Approaches in soil fertility management

1: Soil and water conservation

The first step consists of conserving the soil, soil organic matter and soil water from loss. Applied measures aim at protecting the soil surface from being exposed to the sun and drying out, and from being carried away by wind or washed down by rain. The aim is to establish a stable and less vulnerable soil as the foundation to managing its fertility.

This provides a good foundation for building fertile soil. Soil conservation can be achieved through the following practices:

Preventing soil erosion by reducing the movement of water with contour ridges and bunds, grass strips and terraces, and application of mulch to the soil surface. Protecting the soil with mulch and cover crops. Harvesting water with pits and water catchments. Application of reduced tillage to minimize soil disturbance.

2: Improvement of soil organic matter

The second step consists of improving organic matter content and enhancing biological activity in the soil. The aim here is to identify appropriate organic resources that can build an active soil with good structure which can hold water and supply plant nutrients.

These practices aim at enhancing the organic matter content of the soil as the basis of soil fertility and for efficient management of plant nutrients and water. The practices related to it include:

Producing own compost or supplying compost

or other organic materials from outside the farm supplies stable humus substances to the soil and thus improves its structure and water holding capacity contributing to improvement of soil organic matter content on a long term.

Growing green manures to produce large quantities of fresh plant material, which are incorporated into the soil, feed the soil organisms and mineralize rapidly to provide nutrients to the crop that follows.

Recycling of valuable animal manures for composting or fertilization of the crops. Soil fertility is best improved through combined implementation of the different practices. One practice alone may not be sufficient to maintain or even improve fertility of soils.

Step 3: Soil fertility supplements

The third step consists of supplementing the nutrient requirements as well as improving the growing conditions by applying some soil amendments. In situations of heavy nutrient depletion or un-favourable growing conditions such as extreme pH levels, there can be a great shortage of macro- and micronutrients. Specific measures may be necessary to speed up improvement of the growing conditions for plants. These supplementary measures include:

Use of self-made liquid manures that are easily available to plants.

Use of soil amendments such as lime to correct soil pH and microbial inoculations to enhance biological activity of the soil and nitrogen fixation in the soil.

Use of irrigation to supplement water requirements.

Use of commercial organic and selected mineral fertilizers to satisfy specific nutrient needs.

Lesson 5: Agroforestry

	Agroforestry
	Duration: 2 hours
	Objective: To equip learners with skills on various agroforestry practices in agroecological agriculture.
	Expected Outcome: Learners will gain knowledge and skills in agroforestry practices to apply in their farming systems at school and at home. Training aids: Flip chart, Marker pens, Posters, Farm tools, Polythene bags/ Biodegradable grow bags, Poles, Dry plant residue

Introduction to Agroforestry- 30 mins

Through an open discussion, learners share their understanding on agroforestry

The facilitator briefly introduces agroforestry as a key component in agroecological agriculture.

Agroforestry is the practice of growing trees and shrubs together with crops and/or livestock on the same piece of land. Trees are essential partners in agroecological farming — they do much more than just provide shade!

Tree Type / Example	Role in Agroforestry
Nitrogen fixing trees (Calliandra, Leucaena, Sesbania)	Fix nitrogen from the air into the soil, enriching it for neighbouring crops.
Fruit trees (mango, avocado, banana, guava)	Provide nutritious food for families and income from excess harvest.
Fodder trees (Napier grass, mulberry, Calliandra)	Provide animal feed, especially during dry seasons when grass is scarce.
Boundary trees (Grevillea, Cypress, Eucalyptus)	Mark farm boundaries, provide windbreaks, and reduce soil erosion.
Medicinal trees (Neem, Moringa, Prunus)	Provide traditional medicines and health benefits for the community.

Agroforestry Systems — Types

AGRO-SILVICULTURE: Trees + crops grown together (e.g. Grevillea + maize).

SILVO-PASTORAL: Trees + livestock (e.g. Calliandra fodder trees + dairy cattle).

AGRO-SILVO-PASTORAL: Trees + crops + livestock all together on the same farm.

BOUNDARY PLANTING: Trees planted on the edges of fields for protection.

HOMESTEAD GARDENS: Mixed fruit, vegetable and tree gardens around the home.

Agroforestry is intensive land use management combining trees and/or shrubs with crops and/or livestock. It involves the deliberate retention, introduction, re-introduction or management of trees or shrubs in agricultural systems where ecological, economic or social benefits result from interaction between agriculture and /or livestock and tree husbandry

Agroforestry practices help

- Diversify products, markets, and farm income;
- Improve soil and water quality;
- Reduce erosion, non-point source pollution and damage due to flooding.

The integrated practices of agroforestry enhance land and aquatic habitats for fish and wildlife and improve biodiversity while sustaining land resources for generations to come. In a changing climate, agroforestry practices can be designed and strategically located to provide greater resiliency in agricultural landscapes so farmers can meet production objectives when faced with extreme weather (e.g., drought, floods).

Trees and shrubs for agro forestry

- The trainer introduce learners/farmers to the characteristics of agro-forestry trees

- Learners/farmers brainstorm of the various agro forestry trees they know,
- The trainer to give more details on the various types of agro forestry trees.
- The trainer to expose learners on best practices for nursery establishment for agro-forestry trees. Both theory and practicals

Desirable characteristics of an agroforestry tree species.

- Marketable. This includes both the wood itself and other products such as nuts or fruit, which would provide another source of income.
- Compatible with the companion crops or forage you choose. Some trees produce growth-inhibiting chemicals which may effect what you can grow.
- High quality.
- Fast growing or of such a high value that a species of medium growth rate is acceptable.
- Deep-rooted so the trees do not compete with the crops or forage for moisture.
- Have rapidly decomposing foliage.
- Be properly matched to the site. Site tolerant, suited to either a wet or dry site.
- The leaves should produce a light, rather than a heavy shade. This will be especially important as the trees mature and the canopy closes. The lighter the shade that is produced, the longer you can grow crops or forages.
- Capable of producing the products you desire.

Following species were found to perform well, in terms of survival, growth, and wood and foliage production, across diverse agro-ecological zones:

Moringa oleifera	Sesbania sesban	Senna siamea	Senna spectabilis
Acacia auriculiformis	Leucaena leucocephala (except in acidic soils)	Casuarina	
Calliandra	Gliricidia sepium		

6.2. Role of agro-forestry trees

Improvement of soil fertility. Trees provide mulch when their leaves, fruits and branches fall down and decompose. This results in an increase of organic matter and recycling of nutrients from deep in the soil, and leguminous trees fix nitrogen that can benefit food crops.

Effects on soil moisture and microclimate. Shading and windbreak effects of trees influence microclimate and help to conserve soil moisture. Shade helps reducing the soil temperature and the amount of water that evaporates into the air. Though their roots may also deprive crops of moisture.

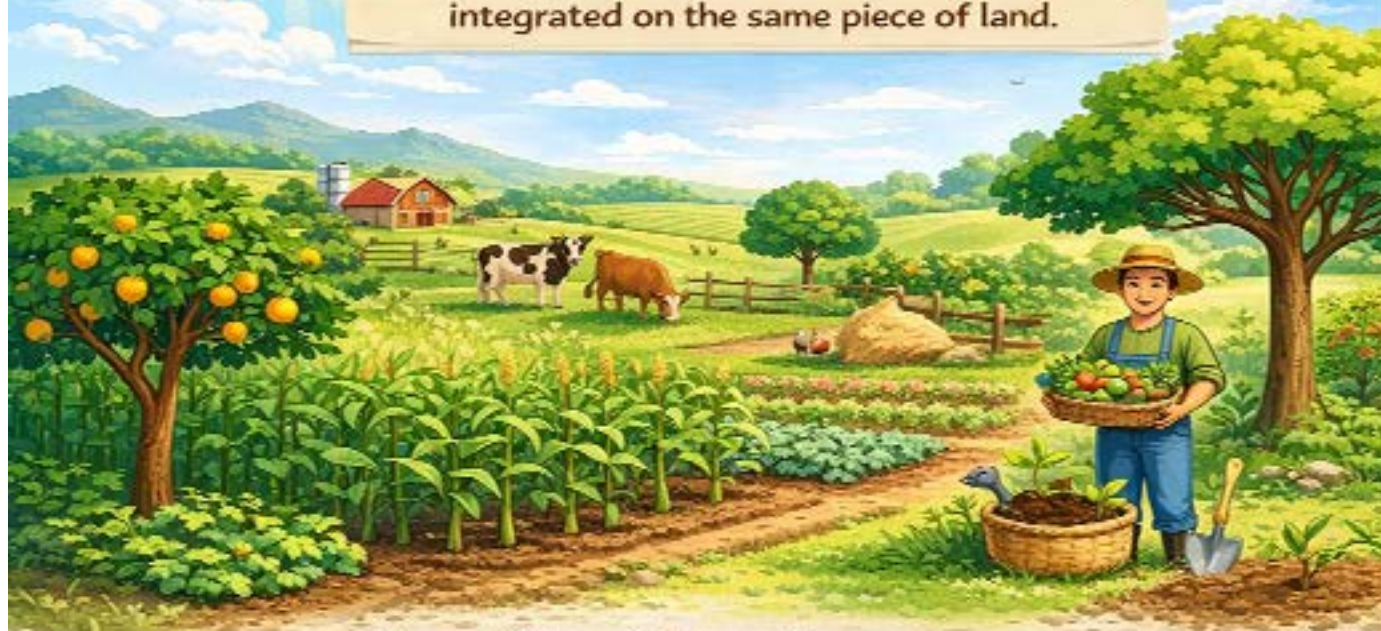
Soil conservation. Trees can conserve the soil in many ways. They cushion the impact of raindrops on the soil and reduce the amount of rain-splash erosion. Their roots bind/stabilise the soil. Planted along contours, they can interrupt the flow of water running off the surface. They can act as windbreaks protecting the soil against wind erosion

Improvement of biodiversity. Agroforestry systems improve diversity and quantity of animals/wildlife by offering a greater variety of habitats

What is Agroforestry?



Agroforestry is a land use system where trees, crops, and/or livestock are intentionally integrated on the same piece of land.



Benefits of Agroforestry

Improves Soil Quality



Trees and plants enrich the soil

Diverse Income



Provides multiple products to sell

Supports Biodiversity



Benefits of Agroforestry

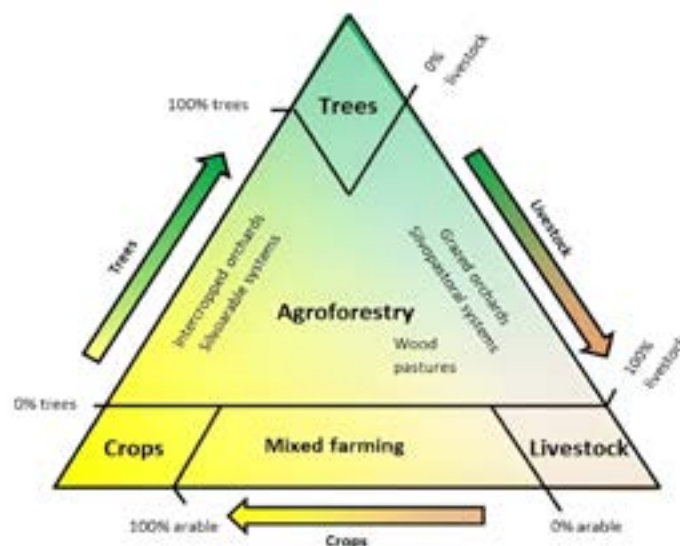
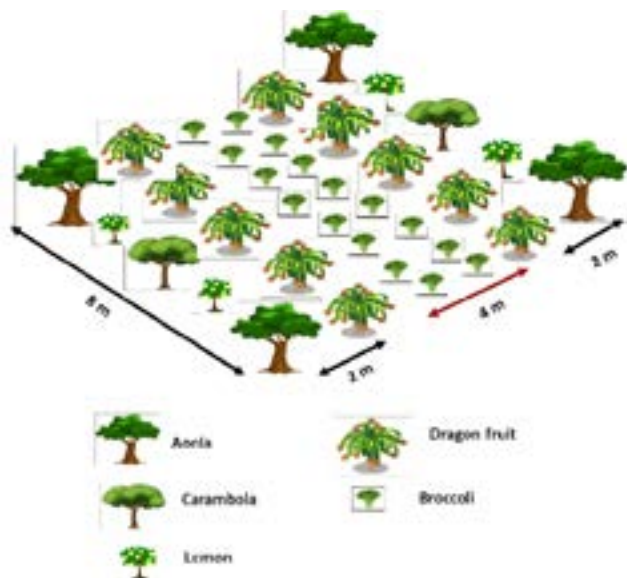


Trees and plants enrich the soil



Agro forestry systems/methods- 30 mins

- The trainer to expose learners to various agro forestry systems through observation, pictorial illustration, photos



Agroforestry System

Lesson 6: Biodiversity and Wildlife Management

	Biodiversity Management
	Duration: 2 hours
	Objective: To equip learners with knowledge on biodiversity in agroecology and its role in sustainable food systems.
	Expected Outcome: Learners will gain knowledge in biodiversity importance and management at school and at home.

TRAINING OBJECTIVE

To equip learners with knowledge on and biodiversity in agro-ecology

EXPECTED LEARNING OUTCOME

Learners to gain knowledge on biodiversity importance and management in school and at home

CONTENT

Introduction and Biodiversity

- Allow learning to brainstorm and share their understanding of wildlife and biodiversity
- In a learning session, take learners through a farm tour to identify various forms of wildlife and biodiversity.

Biodiversity is the variety of plants, animals, insects and micro-organisms on earth. It is the web of ecosystems that they make up. Can you begin to imagine if we had only human companions on our planet?

We can think of biodiversity on three levels:

Genetic diversity

Species diversity

Ecosystem diversity.

- Different plants attract different insects, including beneficial ones that eat pests.
- Varied root depths mean plants access different soil layers for nutrients and water.
- Flowering plants attract pollinators (bees, butterflies) that increase yields.
- When one crop fails, others survive — diversity is our insurance policy!

Practical Biodiversity Activities

1. Farm Biodiversity Walk: Walk around the school garden and identify as many living things as possible — plants, insects, birds, worms, fungi, etc.
2. Biodiversity Count: Count how many species of plants are in your school garden vs. a nearby conventional farm. Compare and discuss.
3. Insect Hotel: Build a small “insect hotel” from bamboo tubes, dry grass, and wood to provide homes for beneficial insects like bees and ladybugs.
4. Seed Library: Start a school seed library where students collect, dry, label and store local variety seeds to preserve genetic diversity.

Wildlife refers to mammals, birds, fishes, frogs, lizards and snakes, flies and beetles, crabs and lobsters, sponges and jellyfish, and all the little bacteria and microbes
 Could we even survive with only human on our planet?— All of the wildlife on our planet needs plants and other wildlife to survive. They depend on each other for food and habitats. We can call this mix of wildlife and plants ‘biodiversity’.

Importance of wildlife and biodiversity management – (1hr.)

- The facilitator to take learners through the importance of wildlife and biodiversity.

‘If all the insects on earth disappeared, within 50 years all life on earth would disappear. If all humans disappeared within 50 years all species would flourish as never



Insect Biodiversity



Animal Biodiversity



Environmental Biodiversity

Lesson 7: Crop Production & Management

	Crop Production & Management
	Duration: 3 hours
	Objective: To equip learners with knowledge and skills in sustainable crop production for improved yields and healthy food.
	Expected Outcome: Learners will understand and apply sustainable crop production techniques at school and at home.

Good crop production in agroecology uses natural methods to grow healthy food. We plan carefully, work with the soil, and grow a variety of crops that support each other.

Introduction to crop production- 1hr

- The facilitator to introduce learners to the basics in crop production and to define the scope of the topic
- The facilitator to take the learners thorough practical demonstration on field crop management of a crop of choice by farmers. -e. g planting, spacing,
- The trainer to explain the importance of various agronomic practices and the effects in crop production.
- By using posters illustrating the difference between a well-maintained crop and another one that is neglected, learners note the importance of carrying out timely weeding, thinning, and mulching.
- Through a practical exposure, the trainer to demonstrate weeding, thinning, mulching, pruning

Key Crop Production Practices

Practice	Benefit
Intercropping	Grow 2+ crops together (e.g. maize + beans + pumpkin) for mutual benefits.
Crop Rotation	Change crops in each bed every season to prevent pest build-up and improve soil.
Companion Planting	Plant specific neighbours that help each other (e.g. basil near tomatoes repels pests).
Mulching	Cover soil with organic material to retain moisture and suppress weeds.
Organic Fertilisation	Use compost, manure, and green manures instead of chemical fertilisers.
Staggered Planting	Plant crops at different times so you have food throughout the year.

The Three Sisters – A Classic Intercrop

The “Three Sisters” is a traditional Native American and African intercropping method:

 **MAIZE** — grows tall and provides a climbing structure for beans.

 **BEANS** — climb the maize stalks and fix nitrogen in the soil for all three plants.

 **PUMPKIN/SQUASH** — spreads across the ground, shading out weeds and retaining moisture.

Together they produce more food, use space efficiently, and need fewer inputs!

This is a perfect activity for your school garden — plant and observe the three sisters together.

Planting and cropping systems-2hrs

Crop management practices

Crop husbandry deals with the various aspects of crops from seed sowing, on field and off-field operations, harvesting, threshing, storage and marketing of the products. It can be further divided into the following main sub-divisions:

Planting/Transplanting

The time of planting and methods used are very important. Delays in planting can cause farmers to have poor harvests.

Weeding

Weeding is another crucial activity in crop husbandry. To minimize competition from weeds and unwanted plants, farmers should do weeding at various stages of plant growth. Effective weed control is a must for good crop production. Weeds reduce crop yields.

Importance for Weeding

There are several reasons why farmers should do weeding.

To reduce the competition for plant food, water and sunlight with our crops. The plant food and water needed for plant growth, development and maturity are found in the soil (in varying quality depending on the soil type and other factors). Like our plants, weeds use the food and water from the soil that is being used by our crops. These weeds, once removed, will in healthier plant growth and larger increases in crops yields.

To improve the quality of the harvest. Weeds produce a lot of seeds. If left in the field during harvest, weed seeds can mix with produce and reduce the quality of the harvest. Weeds are unwanted plants that grow amongst crops in the field. If not weeded, they will produce seeds and can be accidentally harvested with the crops. Some weeds arrive with seeds transported from other areas.

Weeding must be done during early stages of seed growth. It is important to start weeding 2-3 weeks after crop germination. Crop plants will be healthier if weeds are eliminated as early as possible.

Weeding can/should be done 2-3 times prior to harvest depending on the intensity of weeds and crop growth.

Sustainable crop farmers focus on ensuring that their farming practices can be sustained over

time and do not cause undue damage to the environment. These include:

Mono cropping

This involves growing of individual crop or one type of crop in the farm

Advantages:

Easy to weed (it is possible to mechanize farming)

Easy to control pest and disease

Multi-cropping

Multi-cropping is an agricultural method of planting multiple species on one piece of land, either during the same growing season or in successive growing seasons. Multi-cropping can involve:

Crop rotation: the practice of changing what is planted in a particular location on a farm from season to season. This is changing of crops seasonally. The farm is always divided into plots and crops are rotated after every harvest.

Rotating crops is one of the most basic techniques gardeners and farmers can use to assure plant crop success. Everyone farmer should consider rotating their crops, because it helps maximize productivity while minimizing pests and disease.

Intercropping: a method of planting two or more crops of differing characteristics in close proximity to reduce weeds; to encourage plant diversity in order to avoid insect and pest infestation; and to provide shade, nitrogen fixation, or other benefits to the plants being grown. Intercropping includes companion planting and the use of cover crops.

Companion Planting

This system offers a considerable degree of preventive protection, which occurs naturally for the following reasons:

Some plants produce aromatic smell, which confuse pests from discovering their food. Plants like onions; Mexican marigold act as repellants therefore reduces the spread and prevalence of pests.

Biological pest control will occur because pest-to-pest control will take place i.e. pest that affects beans will attack pests that affect maize and vice versa.

Examples:

Mixture of maize and beans reduces infestation from armyworm.

Tomatoes planted in rows between cabbages reduce damage by the diamond black moth.

Potatoes planted in conjunction with onions, beans, and Soya beans reduce damage caused by potato tuber moth.

Some plants release (exude) chemicals from the roots, which stimulate growth of their companions or perhaps protect it from soil pest.

Cucumber and beans/peas

Cucumber and maize

Spinach and strawberries

Kales and onions

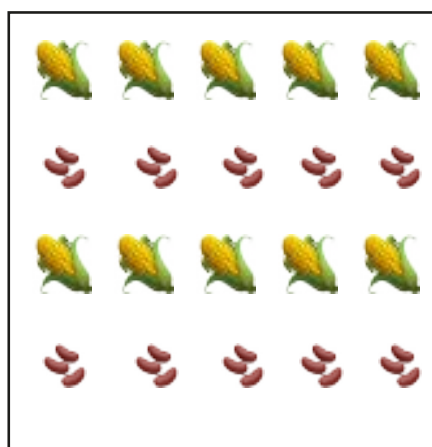
Turnips and peas

Gapping/thinning

Thinning involves the removal of part of the crop in order to concentrate future volume growth on fewer and better quality stems. Thinning is especially important to provide good crop spacing. It helps to reduce plants competition for water, nutrients and space which could lead to weak plants. Thinning should be done at first weeding or after first weeding. Thinning under moisture stressed dry soils affects the root system of the remaining plants. Thus, it is recommended that thinning should be done when the soil is moist. Gapping is useful in some crops by transplanting seedlings to fill the space gaps. This is encouraged when thinning is done with



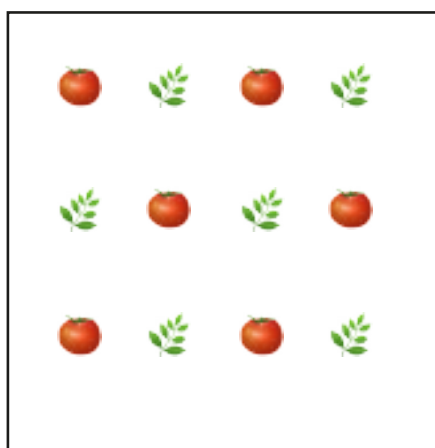
Mono cropping



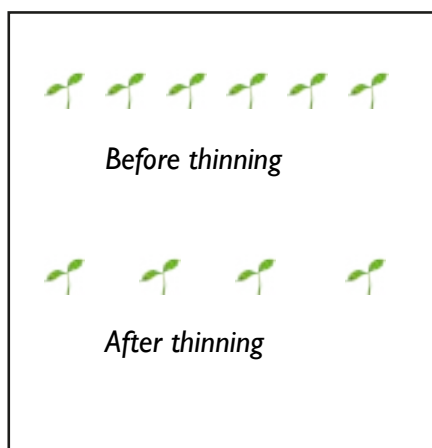
Inter cropping



Multiple cropping



Companion cropping



Before thinning

After thinning



Gapping

After gapping

Lesson 8: Integrated Pest Disease Management (IPDM)

	Integrated Pest Disease Management
	Duration: 3 hours
	Objective: To equip learners with knowledge and skills on crop pest and disease management to reduce associated losses using natural methods.
	Expected Outcome: Learners will understand IPM practices and be able to manage pest and disease problems independently. Training aids: Posters, Flip charts, Felt pens, Illustrations

In agroecology, we do not use harmful chemical pesticides that hurt people, animals, and the environment. Instead, we use Integrated Pest Disease Management (IPDM) — a combination of natural methods that work together to keep pest and disease problems at a manageable level.

The IPDM Pyramid (Most Preferred to Least Preferred)

- Prevention (First!): Healthy soil, diverse crops, crop rotation, and resistant varieties.
- Cultural control: Remove infected plants, practice good farm hygiene, use mulch.
- Biological control: Encourage natural predators — ladybugs eat aphids, birds eat caterpillars.
- Botanical/natural pesticides: Neem leaf spray, garlic spray, chilli pepper solution.
- Approved organic pesticides: Used only as a last resort if natural methods fail.

Natural Pest Control Recipes

Simple Neem Leaf Spray

Neem (Muarubaini) leaves contain natural insect-repelling compounds.

1. Collect 1 kg fresh neem leaves.
2. Soak in 5 litres of water overnight.
3. Strain through a cloth to remove leaves.
4. Add a few drops of soap (to help it stick to leaves).
5. Spray on affected plants early morning or evening.
6. Repeat every 7-10 days. Effective against aphids, whitefly and leaf miners.

Garlic & Chilli Spray

1. Crush 10 garlic cloves and 5 hot chilli peppers.
2. Mix with 1 litre of water. Let sit for 24 hours.
3. Strain and dilute with 4 litres more water.
4. Add a few drops of soap. Spray on plants (avoid spraying during hot sun).
5. Effective against caterpillars, aphids, and some soil pests.

Introduction to pest and diseases (30 min)

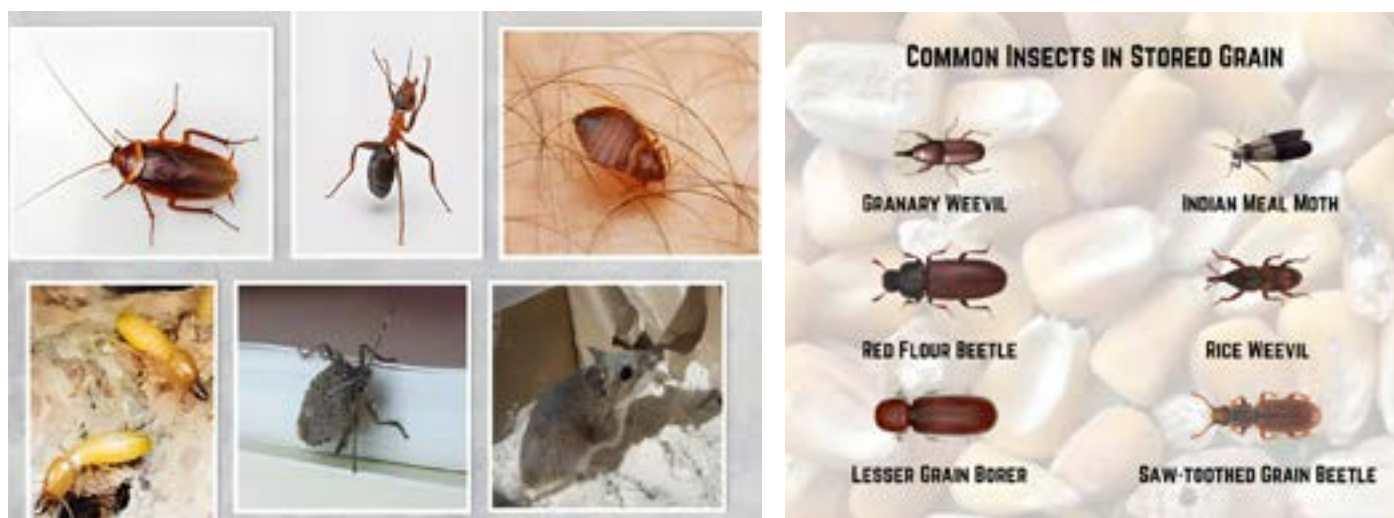
- Through a brainstorming session, learners state the various pests and diseases that affect particular crops.
- The trainer introduces the topic by explaining what pests and diseases are and their effects in crop production

A pest is any organism that hinders the proper growth of a crop and causes reduced production (insects, nematodes, other animals, fungi, weeds, and virus)

Presence of these organisms in crop fields is not a problem until their numbers increase beyond a level where they attack, and cause substantial reduction in field crop yields or quality of harvested and stored produce.

Classification of Pests and identification (1 hr.)

- Through a field excursion, learners to be tasked to collect all forms of pests and disease samples within the school farm
- The trainer takes learners through an identification exercise for pests and diseases sampled- using life sample, posters and photos
- The learners to hold discussions to reflect on the damages the pests and diseases cause on their crops



Use agro chemicals and its effects in crop production (30mins)

- Leading to an introduction to integrated pest and disease management, the trainer to brainstorm with learners on the effects in use of in-organic chemicals in control of pests and diseases

Pesticides are substances that destroy various agricultural pests, including weeds (herbicides), insects (insecticides), bacteria (micro biocides), and fungi (fungicides).

Unfortunately, pesticides can cause health problems in farm workers who apply the chemicals and who harvest the crops, and in consumers who eat foods with pesticide residues. Various pesticides have been linked to certain types of cancer, to neurological problems, and to other health problems. Pesticides also cause environmental damage such as water pollution and soil contamination. The use of pesticides can also make pest control more difficult; as in the case of insect control, insecticide use can have the unintended consequence of eliminating insect predators that prey upon pest insects, and can also increase pesticide-resistance in pest insects.

In addition, pesticides have been shown to cause declines in pollinators and other beneficial insects that are critical to the health of agricultural systems. Sustainable crop production greatly reduces pesticide use; in fact, many sustainable farmers do not use commercial pesticides at all.

Alternative pests and disease control methods (1hr)

- In an open discussion, the facilitator to take the learners through alternative methods of pest and disease management
- The facilitator demonstrates on the various pest and disease management measures including IPM.
- The trainer to introduce the topic of weed management practices



Handpicking Pests



Eaten
natural predator



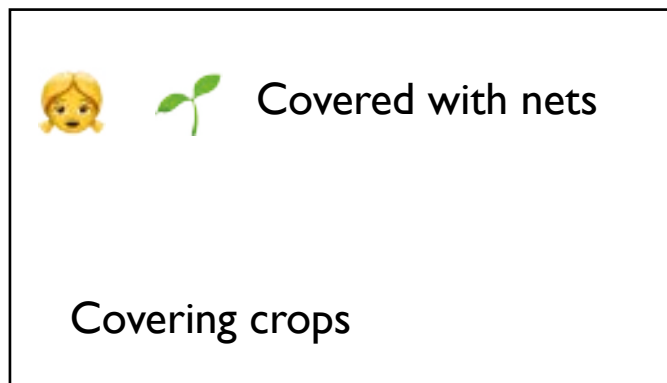
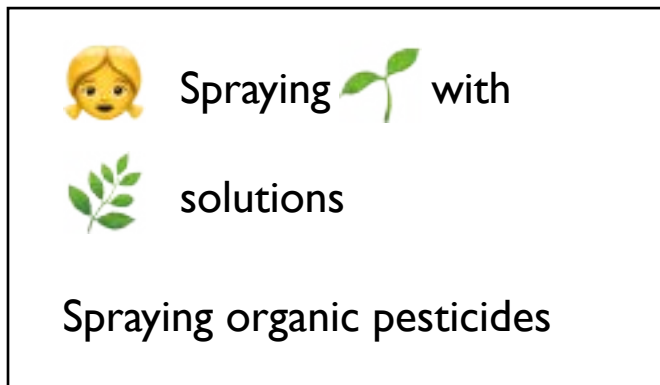
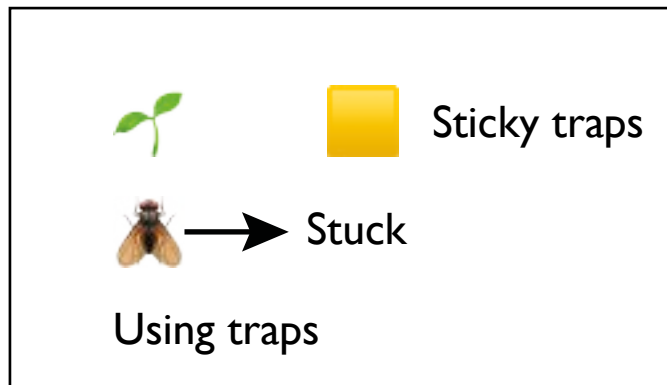
Pulling
grows happy
Removing weed



Season 1  (pests)

Season 2  (pests gone)

Crop rotation



Lesson 9: Seed Management

	Seed Management
	Duration: 1.5 hours
	Objective: To equip learners with knowledge and skills on how to handle and preserve seeds, seed selection, saving and storage for food security.
	Expected Outcome: Learners will be able to handle, select, save, and preserve quality seeds from local varieties.

Seeds are the beginning of all food! In agroecology, we celebrate local and indigenous seed varieties that are adapted to our climate, resist local pests, and hold the flavours and nutritional value of our traditional foods. Introduction to seed management 30mins

The facilitator to introduce learners to various form of seed, seed handling and storage

Proper seed management is critical to maximize yield, longevity, vigour, and overall quality of the seed crop. At maturity, seed must be harvested, threshed, cleaned, and fully dried before storage. Each of these steps requires proper timing, skills, and in some cases, equipment. Investing in the long growing season of a seed crop, only to lose it with improper harvest and post-harvest handling, is an incredibly frustrating experience

Seed processing

Threshing- Seeds and plant materials should be dry before threshing. Threshing is the process of removing seeds from the plant and breaking up remaining plant materials (e.g., stems and leaves), into what is called chaff. The dry seed heads attached to the plants are rubbed or crushed to release the seed and break down the plant material.

Drying Seed received from farmer's field is dried to required moisture content.
Cleaning-All foreign material should be removed by sieving, winnowing and other methods.
Seed Treatment- seed must be treated to protect it during storage and also in the initial stages after planting. Seed is treated with fungicides and insecticides for protection.
Bagging or Packaging-The seed should be packaged in bags and Labeled, providing necessary information.

Seed Selection - Choosing the Best Seeds

- Select seeds from the healthiest, most productive plants in your garden.
- Choose plants that show resistance to pests, drought or diseases.
- Never select seeds from sick, weak, or under-producing plants.
- For fruits and vegetables: let the fruit fully ripen and dry on the plant before harvesting.

Seed Saving Steps

1. Harvest mature seeds and spread them to dry in shade (not direct sun).
2. Dry fully until seeds snap rather than bend — moisture causes mould.
3. Clean seeds by winnowing or hand-picking to remove chaff and debris.
4. Store in airtight glass jars or sealed paper envelopes in a cool, dry, dark place.
5. Label each container: crop name, variety, date, and location grown.
6. Test germination before planting: place 10 seeds on damp cotton. If 7+ sprout, seeds are viable!

Seed packaging, bulking and storage

Seed is living matter and if not handled and stored properly seeds “die”

The main reasons for seed deterioration are as follows:

High temperature in the seed store

High humidity in the storage area.

Handling & storage of seed

High moisture content of the seed itself.

Storage in improper packaging that cannot

Prevent moisture from entering the package.

Use of incorrect chemicals for seed treatment.

Storage of un-cleaned and untreated seed.

Presence of pests and diseases.

Extreme temperature (too hot or too cold) can lead to serious seed damage.

High humidity in the store can lead to serious seed damage through mold formation.

High humidity also encouraged growth of insects and pests in the store.

Measures to avoid seed deterioration during packaging and storage.

Seed bags should not be thrown carelessly.

Seed bags should be stored in dry, well ventilated stores.

Always use slatted wooden pallets or PVC sheets spread on floor.

Recommended moisture contents for seed storage is 12%.

Avoid storage of seeds together with chemicals, especially those that emit vapors.

Avoid the sale of seed from open bags or containers.



Seed Storage

Period	crop
1-2 years	Green bean, lettuce, onion, pepper
3-5 years	Broccoli, cabbage, cucumber, peas
>5years	Beet, tomato

Lesson 10: Small Livestock & Fish Production

	Small Livestock & Fish Production
	Duration: 3 hours
	Objective: To equip learners with knowledge and skills to effectively manage small livestock and appreciate their role in agroecological farming as well as maximize production and profits
	Expected Outcome: Learners will gain knowledge and skills in small livestock management to improve production, income, food security and living standard, as well as acknowledge the role played by livestock in agro-ecological agriculture.

Introduction to livestock management (30 mins)

- ♦ In an open discussion, learners to state the various livestock they keep in their farms and in school
- ♦ The facilitator leads an open discussion on the various types of livestock suitable for rearing at school and at home.

This is a broad area that encompasses all major areas in animal production. It ranges from the rearing of young animals which will become adults in later years. Animal husbandry relies on understanding the needs of both the farmers and the animal welfare. It is based on four main pillars which when followed ensures profitability and sustainability.

These 4 pillars are:-

- Nutrition i.e. feeding with proper feeds in terms of quality and quantity.
- Breeding i.e. use of the right breeds for reproduction.
- Animal health and welfare (housing, stress-free environment)
- Marketing of products.

In agroecology, small animals are important farming partners. They provide manure for composting, eggs, meat, and milk for nutrition, and can even control pests by eating insects and weeds. The best animals for school farms are small and easy to manage!

Animal	Benefits
Poultry (Chickens, Ducks)	Eggs = nutrition & income. Manure = excellent compost. Eat insects and pests.
Rabbits	Fast-breeding, small space needed. Manure is an excellent garden fertiliser.
Bees	Honey = food and medicine. Bees pollinate crops — more fruits and seeds!
Fish (Tilapia)	High protein food. Small ponds can be dug on most school farms.
Goats	Milk = nutrition. Can graze on crop residues. Manure improves soil fertility.

Types of small livestock

The following animals may be kept for diversity:

Pigs – for pork, bacon, manure

Shoats – mutton, milk, fur, manure

Chicken – for meat, eggs, manure

Rabbits – for fur, meat, manure

Ducks – for meat, manure, eggs

Fish-

Animal	Cartoon Idea	Label & Use
Rabbit 	Cute fluffy rabbit in a small hutch	Rabbit: Meat, Fur
Goat 	Goat grazing near a tree	Goat: Milk, Meat
Sheep 	Sheep with fluffy wool	Sheep: Wool, Meat
Pig 	Happy pig in mud	Pig: Meat
Chicken 	Chicken near eggs in a nest	Chicken: Eggs, Meat
Duck 	Duck swimming in a pond	Duck: Eggs, Meat

Role of livestock in ecological agriculture (1 hr.)

- The facilitator leads an open discussion on the role of livestock in farming

Many farm animals have a multi-functional role:

Produce dung which is of great importance for soil fertility.

Yield products such as milk or eggs for sale or own consumption continuously.

Recycle by-products such as straw or kitchen waste.

Serve as draught animals for tillage or transport.

Produce meat, hides, feathers, horns etc.

Serve as an investment or a bank.

Help in pest control (e.g. dugs) and weed management (e.g. grazing on barren fields).

Have cultural or religious significance (prestige, ceremonies etc.).

Produce young stock for breeding or sale.

The significance of each role will vary from animal to animal and from farm to farm. It will also depend on the individual objectives of the farmer.

How livestock helps us

		
Food Source	Income	Manure help crops
		
Work and Transport	Protection and Friends	Culture and Tradition

The Manure Cycle – Animals Help the Garden

1. Farm animals eat grass, crop residues and kitchen scraps.
2. They produce manure, rich in nitrogen and other nutrients.
3. Manure is collected and added to the compost heap with crop residues.
4. After 4-6 weeks, it becomes rich compost fertiliser.
5. Compost is applied to the garden beds, enriching the soil.
6. The improved soil grows better crops that feed people AND animals.
7. The cycle continues — every piece of waste becomes a resource!

Livestock parasites and diseases prevention and control-(1hr)

- The trainers takes the learners through an illustration and observation session to see the various parasites and diseases
- Learners engage in an interactive group discussion session to share their experience in disease and parasites management practices

Similar as in crop health, sustainable animal husbandry puts the more emphasis on preventive measures in order to keep animals healthy, rather than on curative methods.

Keeping robust breeds rather than high performing but very susceptible ones.

the conditions in which the animals are kept should be optimal ones: sufficient space, light and air, dry and clean bedding, frequent exercise (e.g. grazing) and proper hygiene.

The quality and quantity of fodder is of crucial importance for the health of the animal. Instead of feeding commercial concentrates which make animals grow faster and produce more, a natural diet appropriate to the requirements of the animal should be achieved.

Where all these preventive measures are taken, animals will rarely fall sick. Veterinary treatment thus should play only a secondary role in sustainable farming. If treatment is necessary, alternative medicine based on herbal and traditional remedies should be used. Only if these treatments fail or are not sufficient, synthetic medicines (e.g. antibiotics, parasiticides, and anaesthetics) may be used

The main principle for sustainable animal health is: get to know the causes of (or factors that favour) diseases in order to enhance the natural defence mechanisms of the animal (and to prevent its manifestations in the future).

On the other hand, there are natural herbal remedies and traditional treatments used in animal treatments. These remedies are easily available and cheap.

They include:

Dietary additives like vitamins and minerals.

Botanical dewormers such as garlic, pumpkin seed and worm wood (*Artemisia* spp.) that can be added in animal feed to manage gastrointestinal nematodes, and lung and liver parasites.

Neem seed oil, tephrosia or pyrethrum to control ticks.

Fodder establishment and management – (1hr)

Expected learning outcome

1. At the end of the training, learners will have gained valuable knowledge and skills to apply in small livestock management to improve production, income, food security and their living standards
2. By the end of the training, learners will be able to identify livestock parasites and diseases as well as decide on the appropriate preventive and control measures
3. Upon the completion of their course learners will be able to understand the basic principles of fodder and forage production, preservation and management

Training aids: Flip charts, Videos, posters, Field visits, farm Tools

- Learners are asked to share the various feeds they know through an interactive session
- The facilitator takes the learners to observe the various samples of various fodder for livestock and explains their nutritional value to specific livestock
- Learners are taken through a field excursion to observe the various fodder and management practices
- The facilitator demonstrates on the various fodder and pasture establishment practices through practical sessions

Fodder crops are grown specifically for feeding livestock. Fodder is fed in either green (fresh) or dry state. Below are some examples fodder crops:

Grass

Nappier grass (*penisetum purpureum*)

Bana grass- a cross between p.purpureum and p.typhoides

Setaria

Rhodes(chloris gayana)

Guinea grass

Star grass

Thatching grass

Columbus grass

Sudan grass

Kikuyu grass

Legumes

White clover

Desmodium

Lucerne

Green parts of the tree, shrub for example leaves or sometimes flowers and pods, eaten by browsing or grazing animals.

Acacia,

Leucaena,

Prosopis

Calliandra,

Sesbania

Gliricidia etc

So if you want them to deliver the best, you should also give them the best in return. It is therefore worth nothing that the production from the animals is directly proportional to the quality and quantity of the feeds allocated to them.

The type of fodder given to the animal is grouped into three main categories:-

Dry feeds e.g. hay, crop residues after harvesting (stalks etc) Dry feeds include the use of hay. The best type is that from Boma Rhodes, star grass, desmodium or Lucerne.

Green feeds e.g. pasture (grass, Lucerne, desmodium etc.

Silage

Criteria for selection of fodder species:

Edible to livestock and rich in protein

Easy to manage

Drought tolerant

Tolerant of trampling if to be grazed

Able to resprout easily

Farmers should try to manage healthy farm animals to produce satisfyingly over a long period of time. To achieve this goal, various needs of farm animals have to be considered:

Fodder in adequate quality and quantity; for non-ruminants: diversity in fodder is usually required.

Sufficient access to clean drinking water.

Clean sheds of sufficient size and with adequate light and fresh air.

Sufficient freedom to move around and perform their natural behaviour.

Healthy conditions and veterinary follow-up, when needed.

Sufficient contact with other animals, but no stress due to overcrowding.

For herd animals: an appropriate age and sex distribution within the herd



Lesson 11: Diversification of Farm Enterprises

TRAINING OBJECTIVE-

- To expose learners to different forms of farm enterprise diversification in schools and communities

EXPECTED LEARNING OUTCOME

By the end of training session, learners will have gained skills to apply in making decisions on appropriate farm enterprises to implement in schools and their farms

Introduction to farm diversification- 30 mins

- In an open discussion, learners to give examples of various forms of farm diversification they practice In school and at home

In general, diversification refers simply to an increase in the number of enterprises operated on the farm. In practice, this may take several forms.

Benefits for farm diversification

- The facilitator to give a brief overview of farm enterprise diversification and its importance

The benefits of diversifying a farm include:

making better use of your farm's physical resources and characteristics

finding new uses for your existing skills

If you are only engaged in one enterprise and have a crop failure, it will be more devastating than if you grew more crops. By diversifying, you are spreading the downside risk over more than one enterprise. Increased revenue- by taking on new activities you and your family are likely to enjoy an increased farm income and a better quality of life.

Adaptability- branching out encourages you to be willing to change and look out for other opportunities. By adding a new activity you will learn what works for you and your farm and be better able to make further changes in the future and respond to new opportunities as they arise.

Security- by moving into new activities, a farm can provide you and your family members with a long term future and greater stability. By branching out you will increase the number of sources of revenue for your farm ensuring that you are less susceptible to any one income source letting you down.

Develop new skills- running a new venture will provide the opportunity to increase your skills and expand your network of business contacts. From management to marketing and finance to customer service diversifying will develop your business style.

Possible farm enterprise for schools and homesteads

- ♦ The facilitator to lead learners to brainstorm on various farm enterprise options in schools.
- ♦ The facilitator to lead learners in a sharing forum on success stories and case studies on various enterprises
- ♦ The facilitators leads an open discussions on possible viable farm enterprise options for schools and homesteads

In schools and homestead, there are few limits on the kind farm enterprises you can diversify into.

livestock or livestock products – dairy goats, rabbits, sheep poultry, fish farming, pigs, dairy cow and their products

food crops and their products either in raw or in processed form- eg vegetables, fruits, cereals and legumes etc-

Farm Shop

To find out if diversification is the right choice for you, you should be ready to analyze:

why you want to diversify

the implications on your time, your core farm business activities, cash-flow, workforce, potential liabilities etc

information about skills, resources and market conditions that you have gained from other local farmers who have diversified

how much the diversified business will cost to set up

how you will finance it

how profitable it will be

how to market it

The key steps involved in farm diversification are:

Identifying an idea that will work for you. You will need to research your local market and ensure that your idea is viable.

Shaping a suitable business plan. Planning is essential to your success and will be critical to obtaining financial support.

Working out how much is required to finance the idea and how to ensure it is secured.

Working out what is involved in producing and delivering the new product or service from your rural enterprise.

Working out how you will market and sell your product/service.

Ensuring you meet any legal requirements.

Get training to build up your understanding of what is involved in running your own farm business.

TOPIC 3: PARTICIPATORY LAND USE DESIGN & PLANNING

Lesson 1: Farm Design & Layout Planning

TRAINING OBJECTIVE

To equip learners with knowledge and skills on how to plan, establish and manage sustainable farm enterprises.

EXPECTED LEARNING OUTCOME

Learners to understand the principles and importance of farm design and planning and to effectively apportion all the enterprises in their farms

CONTENT

3.1. Introduction to farm planning and layout- Principles and techniques- 30 mins

- Through Illustrations and open discussions, the facilitator to take learners through a planning session of a farm layout

3.2. Steps in Farm planning - 1hr

- The facilitator to take learners through the key steps involved in farm layout and planning

Farm planning is the process of preparing a set of interrelated activities to be implemented within a specific time frame and the allocation of necessary resources, needed to achieve the desired situation. The aim is to have an organized and consistent way of allocating resources among the different enterprises to achieve the best results and minimize wastage and redundancy

The result of the planning process is the 'farm plan', which acts as a guide for carrying out the required activities to achieve desired results and effect desired change.

There are three elements in farm planning

Objective setting

The major objective in planning is maximization of profit under the given circumstances. Without objectives, there is nothing to guide the learners course of action

Statement of suitable enterprise

Enterprises make use of resources and there are many enterprises that one can implement in a farm.

We have to rate and prioritize them based on their economic returns on resources. Data collection and analysis will give us the necessary information to make informed decisions on the suitable enterprise. Such decisions may be based on the prevailing ecological conditions, available technology, prevailing social and cultural aspects, economic positions and local or national policies. The enterprise statement will include both the returns and requirements.

Statement of available resources

These details the available resources from the planning framework. They are at the same time regarded as constraints which to a large extent determine the implementation of activities.

A statement of resources will include –type, quantity, quality and timing of utilization. NB. We have to identify the most scarce resource so that we can maximize returns from them e.g. if you have land shortage we select labour intensive enterprise with high returns /ha , if labour is in short supply we select an enterprise and technology with higher returns on labour.

The exercise of resource mapping helps learners to:

Identify the kind of resources available on their farms.

Realize how much of the resources are currently being utilized.

Understand quantities of resources entering (inputs) and leaving (outputs) the farm every season.

Plan how to benefit more from utilized and unutilized resources in order to improve the farm, for example allocating labour more efficiently to various farm enterprises

Evaluation of the present farm status and setting goals/objectives

Having identified the general problem(s) to be addressed, and all resources available on the farm, its present status can be evaluated in relation to what farmers may want to achieve.

By comparing the characteristics of an ideal ecological farm and the current situation of the farm, farmers are able to set both short- and long-term goals for their farms.

The most important part of the farm plan is to be clear of what the farmer, the group of farmers or the community wants to achieve. That is, the purpose and expected outcome over a specific period of time. It includes the expected change that the farmer or group of farmers wants to achieve, after analysing the present situation.

Without a goal, we have nothing by which management can be guided. Therefore, the goals/objectives should be made specific and achievable within the farm situation and the given time frame.

The long-term goals can refer to any of the following general criteria:

Diversifying sources of income

Minimizing dependency on external inputs

Increasing farm yields

Efficient use of resources such as labour and area.

Value addition on the farm

Improving profitability of the farm

Examples of specific short-term goals include:

Introducing other crops on the farm to meet crop rotation and intercropping requirements.

Expanding on the area under production of crops and to utilize labour more efficiently through better planning.

Introducing animals to the farm in order to have an on-farm source of manure, and increasing income sources on the farm.

Establishing enough on-farm sources of food, feeds, seeds, manure, pesticides or firewood/energy sources so as to minimize off-farm purchases.

Constructing a farm store in order to add value to farm products so as to increase income and profitability.

Initiating on-farm or off-farm non-agricultural activities that will increase income.

Lesson 2: Integrated Land Use Design and Planning



TRAINING OBJECTIVE-

To equip learners with skills for effective integrated land use planning.

EXPECTED LEARNING OUTCOME

By the end of the training, learners will be able to plan and design an integrated land use to meet social, economic and environmental needs

Training aids: Flip charts, Marker pens, Posters, Farm tools, Polythene bags/ Biodegradable grow bags, Poles, Dry plant residue.

Introduction to Integrated Land Use Design- 30mins

The facilitator to introduce learners to Integrated land Use Design

Integrated land-use planning involves the allocation of land to different uses across a landscape in a way that balances economic, social and environmental values. Its purpose is to identify, in a given landscape, the combination of land uses that is best able to meet the needs of stakeholders while safeguarding resources for the future.

Key steps in Integrated Land Use Design (ILUD).- (2hrs)

The facilitator to take learners through various steps involved in integrated land use planning:

In the ILUD process we try to encourage a participatory approach where teachers, learners and parents discover, explore, innovate and create sustainable landscapes for their school together. Children learn best in an environment where their ideas are respected and valued. Their learning must be related to their own real-life situations and experiences.

A participatory approach will help the learners gain useful skills and knowledge through practical, action and inquiry-based learning

Key steps and activities for land-use planning include:

Initial engagement -Identify key stakeholders and stakeholder groups with an interest in the land-use planning exercise and its outcomes



Zoning in integrated land use design.

- The facilitator to take learners through a farm zoning exercise

Understanding the principles of zoning in integrated land use design helps us to plan the garden and its elements smartly, in a functional way and enables the use of natural ecosystems principles.

In this way, our school garden will be easier to use and with fewer of the problems that gardeners usually face. The design will help to provide optimal conditions for the plants and to keep the life in the garden in balance, thus discouraging pests and diseases. When our school garden has been designed in such a way, we can make the pupils understand the principles of ecosystem-based agriculture: how they work and what are their benefits. This is actually the most important reason to implement the zoning in the best possible way.

The design principle of zones is related to efficient energy planning. We strive to place the garden elements (plants such as herbs and vegetables, shrubs, trees, etc.; and structures and buildings such as tool shed, watering well, sitting area, etc.) in such a way that we can achieve the most efficient use of energy. Elements which we need to visit most frequently should be closer and those which we visit less frequently can be further away. This is related both to the use of the elements as well as to their maintenance. For example, herbs are used daily so they should be the closest to the school while fruit shrubs and trees can grow further away.



Zone 0 -In the case of the school garden, Zone 0 is the school itself, with all its internal areas and parts of the building. This includes window sills where some stages of the gardening can already take place, namely the raising of seedlings. In our scheme, we identify those elements of the school building which are important in relation to the school garden, such as the kitchen, dining room, waste separation and collection, etc.

Zone 1: is the immediate area around the school building. Apart from the driveways and paths, parking lot, etc., this is the zone in which we should place the most frequently visited elements of our school garden. These are herb and vegetable beds; a composter for the collection of organic waste; some smaller fruit shrubs; the shed or place for the garden tools; water sources (tap water as well as water collection tanks for rain water and/or grey water); and an insect shelter. Here we also plan the outdoor classroom/sitting area, a creation and leisure area with playground and playground equipment. We can also add a solar clock and different sculptures.

Zone 2: is the area just beyond Zone 1, in case the school has enough land. Here we will eventually have a larger vegetable and herb garden, larger fruit trees and shrubs, and perhaps even some forest trees. This is also the area for the place for composting (which can happen in the compost heaps or in different composters), eventual further water collection tanks, a fishpond, and so forth.

A welcome addition is a beehive. If we want to include some domestic animals, such as poultry and small ruminants, this is the right zone. In this case we would also plan a shelter for the animals and a fodder storage. Further leisure areas are possible.

With regard to the water, you can see that this element is represented both in Zone 1 and Zone 2, Which demonstrates the importance of water for the garden. More about this is covered in section on

Zone 3: Less intensive visit a few times a week. E.g. Farm zone, commercial crops, habitat feed storage, larger animals, Barns, windbreaks, hedges, nut trees, grain fields, pasture. Water: Larger dams, infiltration swales, larger scale water harvesting/ Keyline.

Zone 4-5: Minimally Managed Zone (Forests, woodlots, coppice groves, wilderness, wildlife habitat. Water: Natural area, same as Zone III.

Water sources.

For our needs we will not go beyond Zone 2, although in permaculture design, there can be (and usually are) further zones. Of course these are suggestions based on the permaculture design principles, but their implementation depends on the concrete situation in our school, especially on the land available, its current use, and the possibilities of adapting the existing uses in order to accommodate the school garden with all its key elements.

Lesson 3: School Garden/Kitchen Garden and Food Forest

TRAINING OBJECTIVE

To equip learners with skills in establishing a school garden /food forest.

EXPECTED LEARNING OUTCOME

- By the end of the training, learners will be able to effectively establish and manage a school garden

CONTENT

1. Introduction to establishment of a school garden -30mins

- The facilitator to introduce learners to the importance of a school garden.

A school garden/food forest can be an innovative education and learning tool that provides a holistic experience for pupils. All the senses get involved and social interactions are stimulated and enhanced. By setting up this interactive learning space, school gardening literally opens the possibilities for new education methods and contents. School gardens are prolific food systems producing enough fresh, organic fruits and vegetables to incorporate in school meals.

Food forests are cutting-edge sustainable food growing systems. Instead of traditional raised-beds, the Food Forests abound with perennial, edible trees, bushes, herbs, vines, and ground covers provide an abundance of fruits and vegetables.

Growing edible plants in school gardens enables the development of a deeper understanding of food production and the importance of sustainable management of agro-ecosystems. It further helps children to develop their food-related senses, especially taste and smell, and the ability to recognize the quality of the products they buy and eat. It teaches them about the diversity of vegetables, fruits, herbs, and foods in general and the importance of obtaining nutrition from a wide variety of foods, particularly plants, for their health, well-being, and enjoyment.

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2. Establishing a school garden- 1hr

- The facilitator to take learners through the key steps and activities in establishing a school garden/food forest:

Starting a school garden depends on the situation at the specific school. Every situation is specific in many aspects – from the land area available, to the characteristics of the site, to the social situation.

In establishing the school garden, stakeholders should consider some key issues such as:

Define your primary aims of the school garden: what do you want to achieve with the school garden, what are your top priorities? of course we are pleading for a largely “edible garden” where vegetables, fruits, herbs are the core plants to grow, whenever possible!

Describe and assess your physical possibilities for setting up the garden (the type and the dimensions of the area/surface available; availability of direct sunlight).

Assess your social situation: existing or expected support/opposition of the relevant parties –colleagues – teachers, management, and other school staff for the school garden project.

Keep in mind that it is better to start small and grow gradually, in line with the growing experiences and support.

Prepare an implementation plan – define actions and stakeholders.

It is important to note that setting up a school garden is not only a technical but also a social project.

The planning and designing of the actual school garden should start from the location. An ideal location for a school garden would have at least these features:

best possible growing conditions for the plants, - eg availability of sunlight, good quality soil, availability of water

best possible accessibility of the garden for the pupils and the teachers – close to the school building,

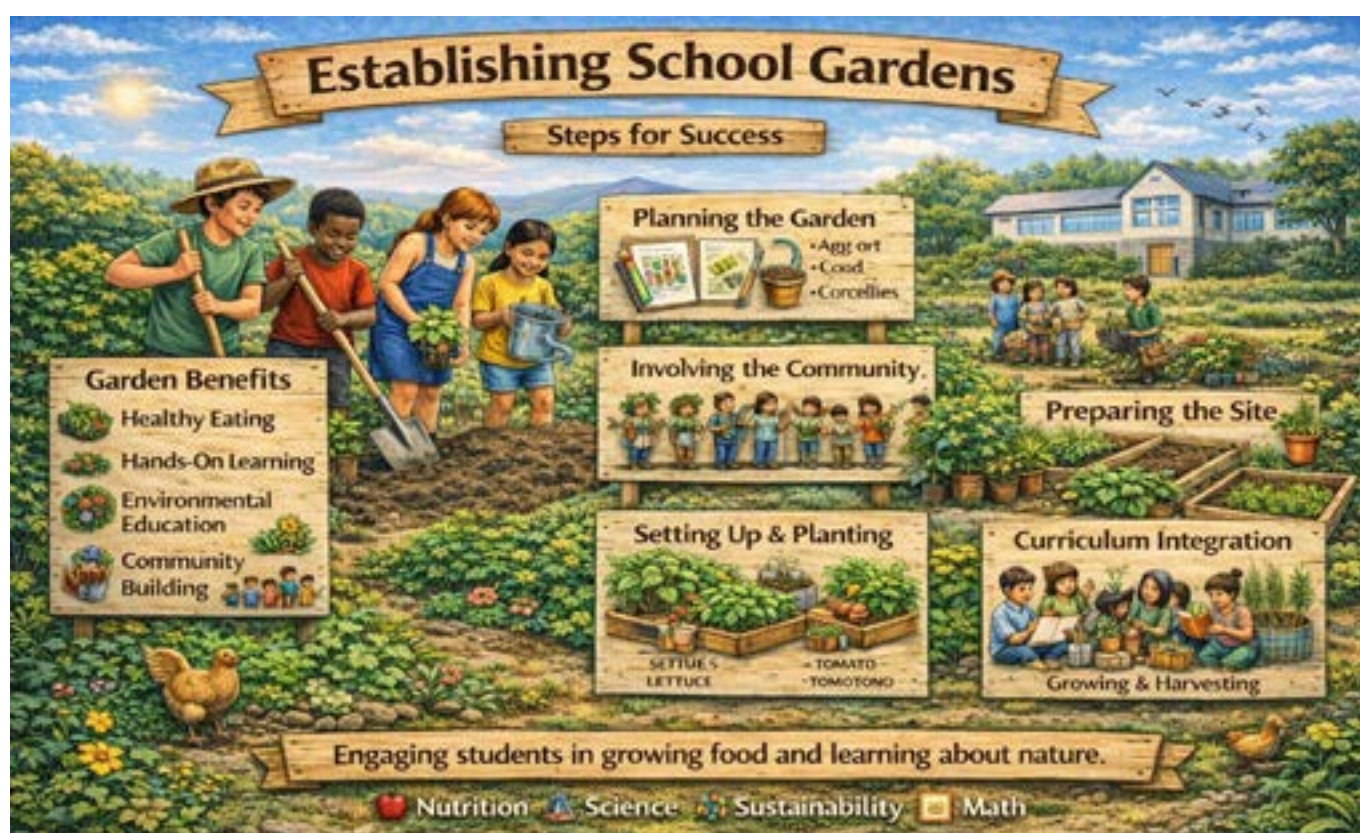
Protection from traffic and other sources of air and noise pollution.

The school garden should be used as an educational tool; therefore, we need to be able to integrate it easily into the daily education and learning process. It shouldn't be too far from the classrooms so that it can be reached in a (very) short walking time.

A school garden consists of several elements.
Actual beds for the plants, as well as the areas for shrubs and trees if we have enough space.
Composting site.
store the gardening tools.
source of water for watering the plants –
.

Basic rules for school gardening

Use principles and methods of organic gardening/ agro-ecology, permaculture and agro-forestry; including organic animal husbandry, in case we rear any animals.
Strive to use local resources whenever possible.
Aim to implement or contribute to circular economy in soil management, waste management, water management, or any other relevant activity.
Actively enhance agro-biodiversity and biodiversity in the school garden and in its surroundings.
In the garden we plan and develop only as much as we can handle at a certain point and we enlarge gradually in line with our abilities – “start small and grow organically”.



3. School garden sustainability factors- 1hr

One of the most common mistakes made in relation to a school garden is insufficient awareness about the importance of the social support for such project. A school garden can become a long-term success if it's not carried by a single person or few individuals: we need the support of other teachers, non-teaching staff, and sometimes even the local community.

- The facilitator to brainstorm with learners on the various factors to consider to ensure sustainability of the school garden.

Sustainability factor include:

Social support

Management- It is clear that there's no chance of sustaining a school garden if the person(s) responsible for the management of the school are not supportive. On the other hand, the initiative for the school garden may also come from the management itself. If we have to warm up the management of the school for the project, it is important that we clearly describe both the benefits and the challenges and the ways the school could deal with them. We need to be positive but realistic

Teachers- Some teachers may immediately see the benefits of a school garden. They will have ideas about how they could use it to diversify, improve or deepen their teaching. Others will perhaps see it as a potential source for increased work. And many teachers may be rather neutral to the idea. We need to show potential benefits of school garden as an innovative teaching and educational tool.

Pupils- In the first place, a school garden is intended to benefit the pupils. In general, pupils have a positive attitude towards the school garden. The vast majority of them welcome the opportunity to leave the four walls of the classroom and spend time outside, and to experience the world with all their senses.

The parents- Learning from experience, parents largely support the development of a school garden. They are sometimes also the first to suggest that the school should set up a garden for their children. Occasionally it is even possible to benefit from hands-on support from the parents. They may offer to provide voluntary help or even contribute some materials.

The local community- A school garden project is a good way to better link the school with the local community. The school may organize an Open Day event related to the school garden for the local community and invite representatives of the local administration and the general public.

School garden management - We may be able to organize the work in the garden during the weeks when children are in school, but we need to consider:

What about during the holidays?

Who will water the plants, if there's going to be a period of drought and we haven't (yet) found a solution for providing enough water for the plants?

Will teachers, parents and the community embrace the garden as an inspiration, or will they reject it fearing additional work and "complications"?

Will the cleaning staff complain every time when a bit of dirt will find its way into school areas where this is not desired?

Who will help us with the occasional more specific or more demanding works?

Will the kitchen staff support us in, for example, preparing cookery lessons, or will they categorically refuse to get involved?

If we have done our grounds work of developing social support for the school garden project well, we've already ensured a substantial part of the social sustainability. However, a support (or at least lack of opposition) on theoretical level will to a certain degree have to translate into more practical support.

Key issues to note to ensure sustainability

Need to develop school garden project in a participatory process

Need to show the benefits for each stakeholder

Actively involve partners and stakeholders- e.g through open days

Lesson 4 : As Innovative Gardening (Vertical Gardens etc)

TRAINING OBJECTIVE

To equip learners with skills in urban gardening.

EXPECTED LEARNING OUTCOME

By the end of the training, learners will be able to effectively use skills in urban gardening

CONTENT

1. Introduction to urban gardening 30mins

- The facilitator to introduce learner to urban gardening and application in agro-ecology.

Urban agriculture, urban farming, or urban gardening is the practice of cultivating, processing, and distributing food in or around urban areas.

Urban agriculture can also involve:

Animal husbandry,

Aquaculture,

Agro-forestry,

Urban beekeeping

Horticulture.

Urban farming also involves one or more of the following agro-ecological practices

Vermiculture

Growing of vegetables, herbs and spices

Water harvesting

Production and use of bio- fertilizers

Production and use of bio – pesticides

Integrated pest management

Agro-processing and value addition

With a growing awareness of the quality of food we eat, urban gardening is one of the most promising agriculture trends on the rise. Urban gardening not only provides families with fresh food right from their own homes, but also reduces food miles that are associated with transporting produce for hundreds of miles from the farms to the urban areas. You can also save substantial amounts of money growing your own fruits and vegetables instead of buying them from your local grocery.



Verticle gardens

2. Why urban gardening

- The facilitator to introduce participants to the importance of urban gardening

Urban farming is increasingly become a popular system of farming in urban areas and rural areas due to:

- Limited land spaces- with increased land fragmentation
- Increased population in urban areas

With a growing awareness of the quality of food we eat, urban gardening is one of the most promising agriculture trends on the rise.

When you grow your own food, you can avoid this problem. You don't need to spend a lot of money to get the healthy and nutritious fruits and vegetables that you need. If you're able to grow a lot of food, you can even sell it to other people. This can help you set up a small business and make money. It can also create jobs for other people in your neighbourhood.

TOPIC 4 : FOOD AND NUTRITION

TRAINING OBJECTIVE-

- To introduce learners to the role of key nutrients and the connections between diet and health.
- To explore aspects of food composition, food preparation and food as a medicine

EXPECTED LEARNING OUTCOME

- Learners to understand and acquire knowledge on food and nutrition.

CONTENT

1. An overview of nutrition, diet and health, and food as medicine- 30mins

- The trainer to lead an open discussion with learners on their understanding of food and nutrients

Nutrition is the science of how food nourishes our bodies. A DIET is what we regularly eat and drink. A BALANCED DIET means eating the right amounts of different food groups every day.

Children need a balanced diet especially because they are growing — their brains, bones, muscles and immune systems are all developing rapidly. Poor nutrition can lead to stunting, weakness, difficulty concentrating in class, and increased risk of illness.

2. Key nutrients of concern in food and nutrition- 1 hr

Food is that which nourishes our body and keeps us healthy. It can be defined anything eaten or drunk, when swallowed, digested and assimilated in the body, keeps it well. When we take food, we ensure good health which could be evident in our physical appearances, work efficiency and emotional well-being.

The term 'nutrition' broadly covers all processes through which we obtain, prepare and eat food. It further describes what different foods are made of (i.e. nutrients) and the processes through which our bodies make use of the nutrients to enable us to perform daily activities such as work.

Apart from focusing on what we should eat, nutrition is also concerned with promoting aspects of personal and environmental hygiene and sanitation, promoting health seeking behaviours and providing care for all household members so that they are healthy.

In other words, to be 'food secure' at individual, household, village, or community level, food should be:

Available: refers to the physical presence of food, be it from own production or from the market or shops

Accessible: refers to households and all individuals within those households having sufficient resources such as money, labour, time and knowledge to obtain appropriate foods for a nutritious diet

Utilizable: Individuals should be able to eat and absorb in their bodies the available and accessible food. There should be no diseases or ailments like diarrhoea, malaria, worm infestation that limit individuals from benefiting from the eaten food

Sustainable: Individuals should feel confident that they will have enough food to feed their family tomorrow, the next week, month and year. Food should therefore be available, accessible and utilizable at all times.

- Through Open discussions, illustrations, diagrams, posters, the trainers demonstrates the importance of various nutrients in the body

Nutrients are the chemical substances found in food. They are extracted from food as it passes through our digestive system and are used by the body to perform its functions. Nutrients contained in food are needed in the right amounts and combinations for the body to function properly. There are six basic nutrients required by human body for a healthy life. These are: Carbohydrates, Vitamins, Proteins, Minerals, Fats and Water

Lesson 1: Key Nutrients & Their Sources

3. Source of different nutrients-plant, animal etc- 1hr

- The facilitator illustrates the sources of various nutrients.
- Learners are exposed to see the various types of foods that supply various nutrients
- Through an open discussion, the trainer introduced the learners to various food categories and their importance.

Food can be classified based on the key nutrients it supplies to the body.

According to this classification there are four major categories:

Energy giving foods

Body building foods

Protective foods

Water (essential for nutrient absorption and the human body to function properly).



We need a balanced diet to stay healthy. Children also need it to grow well, both physically and mentally. Eating a diverse diet means eating many different foods each day so that we consume lots of different nutrients. These nutrients keep us healthy in different ways: e.g. iron helps the body make red blood cells (which carry around oxygen and therefore give us energy), vitamin C helps fight off illnesses and protein is the body's primary building block for muscles, bones, skin and hair. Most foods provide more than one nutrient. We need to eat all of the following in the right amounts:

TYPES OF NUTRIENTS	FOODS THAT CONTAIN THESE NUTRIENTS	BENEFITS OF THESE NUTRIENTS
Proteins	Animal-based: fish, meat (includes poultry), eggs, milk, yoghurt, grasshoppers and white ants Plant-based: beans (including soy beans) peas, nuts, seeds	Build and repair our bodies
Carbohydrates	Millet, Irish potatoes, sweet potatoes, cassava, Ugali, sorghum, yams, rice, plantain (matooke) and bread	Give us energy
Fats and oils	Sunflower oil, vegetable oil, ghee, butter etc	Give us energy
Vitamins &		
Minerals	Fruits: mango, orange, pineapple, avocado, passion etc vegetables: amaranth (dodo), spinach, Kale, pumpkin leaves, cowpea leaves, carrots, cassava leaves, green pepper, green beans, tomato, sweet potato	Protect against illness Help produce energy Maintain water balance
	CLEAN WATER and other drinks	Hydration
N.B- Nutritious diets do not have to be expensive; key is to consume a variety of locally available/grown food on a daily basis.		

Lesson 2: Food handling and preparation- 2hrs

- The facilitator leads learners through a brainstorming session on the various food handling and preparation methods
- The learners are taken through demonstrations on food handling and preparation practicals

Healthy eating involves preparing food to preserve nutrients and prevent disease, as well as paying attention to food production issues.

Safe food handling and preparation

Food-borne illnesses don't just come from restaurants. In fact, they usually come from bad food preparation, serving, and storage at home.

Follow the guidelines below to keep your food as safe as possible:

Wash hands and surfaces often using hot, soapy water. Wash your hands before and after you handle food or utensils, especially raw meat, poultry, fish, or eggs.

Wash all fruits and vegetables before eating.

Separate raw, cooked, and ready-to-eat foods. Keep raw meat, poultry, fish, or eggs away from other foods to prevent cross-contamination. If possible, use separate cutting boards for these foods. If not, be sure to wash cutting boards carefully with soap between uses.

Cook foods to a safe temperature. Uncooked or undercooked animal products can be unsafe. When in doubt, throw it out. If you are not sure that food has been prepared, served, or stored properly, throw it out.

Healthy cooking

When preparing food, aim to preserve the nutrient value of the food and utilize healthy fats, reasonable portions, and whole foods.

Here are a few tips:

Use healthy cooking methods such as steaming, boiling, grilling and roasting; frying requires adding fat to achieve the desired results.

Cook foods in as little water and for a short period of time as possible to preserve all water soluble vitamins(B and C)

Use a variety of herbs and spices for additional flavor rather than relying on salt alone

Avoid packaged or processed foods which contain added salt, sugar and fats

4. Human health in relation to food and nutrition- 30mins

- The learners to participate in an open discussion of some health and nutritional issues related to foods
- The facilitator provides details on the various nutritional related diseases and disorders

When people are healthy, they are more efficient at work. This increases productivity and brings economic prosperity. Health also increases longevity of people and reduces infant and maternal mortality. Balanced diet, personal hygiene and regular exercise are very important to maintain good health. Increasingly, poor dietary patterns make the greatest contribution to the burden of non-communicable disease. If we take too much food, or food that gives our bodies the wrong instructions, we can become overweight, undernourished, and at risk for the development of diseases and conditions, such as arthritis, diabetes, and heart disease.

5. Food processing and preservation- for fruits, vegetables, root crops and animal products- 30mins

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Reasons for processing of fruits and vegetables

Reduce bulk and perishability leading to ease in transportation and marketing.

Add value to the fruits and vegetables thus improve family income.

Reduce post-harvest losses and vegetables throughout the year.

Support local cottage industries through creating demand for equipments required in processing

Principles and methods of preservation of fruits and vegetables

Preservation: Preservation means just protect the foods against the spoilage decay or spoilage

Why do we preserve the food?

To increase the shelf life of the food for increasing the supply.

To make the seasonal fruits available throughout the year.

To add the variety to the diet.

To save time by reducing preparation, time and energy by fire.

To stabilize the prices of the food in the market.

To improve the health of the population.

There are three main principles:

Prevention / delay the microbial decomposition of the food.- by keeping out micro-organisms by maintaining general cleaning, removing microorganisms, killing microorganisms,

Prevention / delay the shelf decomposition of the food by blanching and use of anti-oxidants

Prevention of damage by insects, animals, mechanical causes etc.

Blanching:

It is a primary treatment which have to soften the tissues to facilitate packaging.

To preserve the original colour and flavour

To destroy the certain enzyme which are undesirable

Elimination of the air

Mostly for vegetables

Remove micro-organisms

Remove astringent taste and toxins

Methods of preservation of fruit and vegetable:

There are basic methods:

Solar drying of foods

Use of low temperature

Pasteurization

Cooking

Canning

Lesson 3: Herbs and Spices

TRAINING OBJECTIVE

To equip learners with adequate knowledge and skills in herbs and spices production and utilisation.

EXPECTED LEARNING OUTCOME

By the end of training, learners will gain knowledge and skills on herbs and spices production.

CONTENT

1. Introduction to herbs and spices 30mins

- The facilitator to take learners through a brainstorming session in identification of various herbs and spices used at home.

Herbs -generally refers to the leafy green or flowering parts of a plant (either fresh or dried) used in cooking, while Spices are usually dried and produced from other parts of the plant, including seeds, bark, roots and fruits. Both are used to flavor food, but research shows they're full of healthy compounds and may have health benefits.



2. Herbs -1hr

- Using a presentation, photos, images, field tour help learners to identify various herbs
- In a practical session, learners practice propagation and planting of various herbs in the school garden

A herb is a whole or part of plant that is used to flavor food. This is usually the softer stems or leaves of plants and can be whole, ground, fresh, or dried.

Herbs have a variety of uses including culinary, medicinal, and in some cases, spiritual.

Common herbs:

- Rosemary
- Sage
- Basil
- Peppermint
- Chives
- Mint
- Coriander
- Lemon grass
- Dill
- Fennel
- Parsley
- Thyme
- Chamomile
- Lavender
- Stevia
- Aloe Vera

Dried herbs are best used in recipes where there is plenty of time for them to cook in as they need enough time to soak up some of the water to rehydrate. They first need to regain some of the water before releasing their essential oil and flavor compounds.

Herbs such as oregano, thyme, parsley, rosemary, and sage should be added towards the beginning of a cook so there is time to extract the oils which allow the flavors to fully develop.

Delicate varieties such as marjoram, dill, and basil should be added closer to the end as their flavoring and oils will evaporate and leave a mild off-taste.

Over cooking all herbs and spices will lead to a loss of flavor and they should be added towards the end of slow cooking or long and slow braising.

Conditions for growing herbs

1. Herbs can be grown in any reasonably fertile, well-drained soil. Where drainage is questionable, create raised beds or plant your herbs in pots.
2. Good, all weather access is vital to growing herbs. If a hard path of light-colored, reflective paving can be created, so much the better. Pebble/concrete panels are used in the herb garden, which reflect light back into the plants, and create warmth to ameliorate chilly nights.
3. Herbs generally need little fertilizer and crop well without much feeding. Over feeding can in fact decrease the concentration of flavours.
4. Most herbs need a neutral to alkaline soil.
5. High levels of sunlight is particularly important for obtaining good herb flavour, and so herbs should be planted in the best lit area of the garden.

In picking a place to grow your herbs, keep in mind that they need a good four to six hours of sun daily. There are many herbs that you can grow to enhance your cooking. When you plant a kitchen garden, don't only plant the herbs you know, take a chance on something else.

A spice is a substance that is used to flavor food and is derived from a dried plant and usually a seed, bark, or root part and is normally ground and powdered; although in some cases they may be whole seeds

Spices play a significant role in the way we cook and consume food around the world. Every spice has its own flavoring and essence, and its addition or omission can literally make or break a dish. There are many spices we use in our day to day cooking, these include popular ones like cumin, black pepper, turmeric and coriander seeds

Spices come with notable nutritional values and provide some major health benefits

Lesson 4: Local and Indigenous Knowledge – Food and Herbal Medicine

TRAINING OBJECTIVE

To enhance learners understanding on Indigenous Knowledge in food and herbal medicine

EXPECTED LEARNING OUTCOME

At the end of the training, learners will have gained valuable understanding on the importance of indigenous knowledge

CONTENT

Introduction to indigenous knowledge in food and herbal medicine

Food as Medicine – Traditional Wisdom

-  MORINGA leaves: One of the most nutritious plants known — rich in vitamins A, C, iron and calcium.
-  GARLIC: Natural antibiotic; helps fight infections and boosts the immune system.
-  LEMON/CITRUS: Rich in Vitamin C; prevents scurvy and boosts immunity.
-  TURMERIC: Powerful anti-inflammatory; used in cooking and traditional medicine.
-  HONEY: Natural energy source and wound healer with antibacterial properties.
-  SWEET POTATO (orange): Rich in Vitamin A; prevents night blindness.
-  BEANS & LEGUMES: High in protein and iron; prevent anaemia, especially girls.

💡 Remember: Many of the most nutritious foods grow right in our own gardens!

Indigenous Knowledge (IK) can be broadly defined as the knowledge that an indigenous (local) community accumulates over generations of living in a particular environment.

This definition encompasses all forms of knowledge – technologies, know-how skills, practices and beliefs – that enable the community to achieve stable livelihoods in their environment.

Traditional knowledge includes mental inventories of local biological resources, animal breeds, and local plant, crop and tree species. It may include such information as trees and plants that grow well together, and indicator plants, such as plants that show the soil salinity or that are known to flower at the beginning of the rains. It includes practices and technologies, such as seed treatment and storage methods and tools used for planting and harvesting. Traditional knowledge is also the belief systems of indigenous community that play a fundamental role in a people's livelihood, maintaining their health, and protecting and refilling the environment.

- The facilitator to introduce learners to various indigenous practices in food use and herbal medicine

1. Indigenous food crops

The facilitator takes learners through various indigenous food crops, their production and uses.

In Kenya, traditional food crops play an important role in food and nutritional security, especially in the dry parts of Kenya.

The relative importance of traditional food crops differs from one area to another and, while some are produced for subsistence use; others, like sweet potatoes, are grown for commercial purposes

Lesson 5: Post-Harvest Handling & Food Storage

	Post-Harvest Handling
	Duration: 2 hours
	Objective: To equip learners with knowledge on handling, preserving and storing food safely to reduce waste and maintain nutritional value.
	Expected Outcome: Learners will understand how to reduce post-harvest losses and preserve food safely for longer use.

Up to 30-40% of food grown in Kenya is lost after harvest due to poor handling and storage. Reducing these losses means more food for families, less waste, and more income for farmers. Post-harvest handling starts the moment you pick the food!

Post-Harvest Best Practices

- Harvest at the right time — not too early, not overripe. Handle produce gently.
- Sort produce — remove damaged, diseased or pest-affected items immediately.
- Clean produce with clean water to remove soil and contaminants.
- Dry properly — moisture causes mould and rot. Dry grains, legumes and seeds fully.
- Store in clean, dry, cool conditions away from pests and direct sunlight.
- Use traditional grain stores (granaries) improved with ventilation and pest-proofing.

Method	How It Works
Sun Drying	Dry fruits, vegetables, fish and grains in the sun to extend shelf life naturally.
Smoking	Smoke fish, meat or maize to preserve and add flavour without chemicals.
Fermentation	Traditional fermentation of milk (mursik, yoghurt) and vegetables adds nutrition.
Pickling	Preserve vegetables in vinegar or brine for longer storage.
Boiling & Canning	Boil and seal fruit in jars to make jams and preserves.
Cooling in Clay Pots	Zeer pot (clay pot coolers) keep vegetables and fruit fresh without electricity.

TOPIC 5: WATER HARVESTING, TREATMENT, MANAGEMENT AND STORAGE

TRAINING OBJECTIVE

To equip learners with knowledge on different types of water harvesting methods for domestic use

EXPECTED LEARNING OUTCOME

By the end the training, learners will have acquired skills and knowledge to practice in water harvesting for domestic use

CONTENT

1. Introduction to water harvesting and management 30 mins

The trainer to give an overview of water harvesting and importance of water harvesting

- The trainer to lead learners into open discussions on various water harvesting techniques.
- Through observations, illustrations, and practicals, learners to be exposed to various on-farm water harvesting practices
- The trainer explains the importance of water harvesting and its use

Water is life! Without water, no plant can grow, no animal can survive, and no human can live. In many parts of Kenya, water is scarce — especially during dry seasons. Agroecology teaches us to harvest, store and use water very wisely.

Water harvesting refers to for a range of methods of concentrating and storing rainwater run-off, including from roofs (roof harvesting), the ground (run-off harvesting) and from channel flow (floodwater harvesting).

In ground run off harvesting, the run-off from surfaces of roads and farmland is diverted into ponds and earth dams by soil bunds sloping towards the water reservoir

Rainwater harvesting is the practice of collecting the water produced during rainfall events before it has a chance to run off into a river or stream or soak into the ground and become groundwater.

A school/homestead should preferably have the following variety of structures/technologies for harvesting rainwater to avoid water shortages during dry seasons:

A roof catchment system for clean domestic water that consists of gutters fixed to a roof of galvanized roofing sheets which drains rainwater into a storage tank.

The size of a storage tank depends mainly on the financial capacity of the owner and to a lesser degree on the size of the roof and the volume of rainfall. Also the reliability to supply sufficient water during dry months should be considered if affordable.

A pond or an earth dam for livestock can be excavated by hand or animal draught at a low place in the farm where rainwater flows, or accumulates, during rainy seasons. Ponds and dams can be built small initially and enlarged during the following dry seasons until they might supply water throughout the years. In situ harvesting of rainwater in farm land increase the yield of crops, and what often determine whether there will be anything to harvest at all. Most farmers know and apply the techniques of soil conservation, which consist of:

Contour planting in horizontal lines to prevent rainwater running off the land

Contour grass and trash lines with grass and trees to stop rainwater running off
Level bunds ridges which develop into terraces into which rainwater percolated
Bench terraces developed slowly from level bunds ridges
Micro basins with U and V shaped soil bunds for growing crops and trees
Cutoff drains to discharge surplus rainwater run-off into gullies and streams
Check dams made of stones and vegetation to prevent erosion in gullies

Lesson 1: Introduction to Water Harvesting

Water is one of the most valuable resources on Earth. Water and sanitation have a great effect on human health, food security and quality of life.

Two types of waste water are created in a home: grey-water and black-water.

Grey-water is wastewater from non-toilet plumbing fixtures such as showers, basins and taps.

Black-water is water that has been mixed with waste from the toilet. Because of the potential for contamination by pathogens and grease, water from kitchens and dishwashers should be excluded from grey-water and considered as black-water.

Each wastewater type must be treated differently and can be used in various ways.

Grey-water is ideal for garden watering, with the appropriate precautions, such as using low or no sodium and phosphorus products and applying the water below the surface. Appropriately treated grey-water can also be reused indoors for toilet flushing and clothes washing, both significant water consumers.

Black-water requires biological or chemical treatment and disinfection before reuse. For single dwellings, treated and disinfected black-water can be used only outdoors, and often only for subsurface irrigation. Check with your local council or state health department on local requirements. Many different indoor locations generate wastewater.

For grey-water:

Minimise the use of cleaning chemicals. Use natural cleaning products where possible.

Use low or no sodium laundry detergents, soaps and shampoos.

Use a lint filter. Clean and replace as necessary to ensure water can flow through it easily.

Do not dispose of household chemicals down the sink. Contact your local council or water authority for information on chemical collection services.

For black-water:

Minimise the use of cleaning chemicals. Use natural cleaning products where possible.

Do not dispose of household chemicals down the toilet.

Use a sink strainer in the kitchen to help prevent food scraps and other solid material from entering your wastewater.

Technique	How It Works
Rooftop Rainwater Collection	Gutters on roofs direct rainwater into storage tanks. Can provide 1,000s of litres per rain!
Zai Pits	Small planting pits dug in dry soil that collect rainwater around plant roots.
Terracing & Bunds	Level steps cut into slopes slow runoff and allow water to soak into the soil.
Farm Ponds	Dug depressions that collect runoff for irrigation and livestock watering.
Half-Moon Catchments	Semi-circular earth bunds that capture rainfall in semi-arid areas for tree planting.
Sand Dams	Stone walls built across seasonal rivers to collect sand and store water underground.



Lesson 2: Water Treatment & Safe Storage

- The trainer exposes learners to various water treatment practices through observation, illustration and demonstration.

	Water Treatment & Storage
	Duration: 1.5 hours
	Objective: To equip learners with knowledge on treating and safely storing water for domestic use.
	Expected Outcome: Learners will know how to treat water using simple, affordable methods and store it safely.

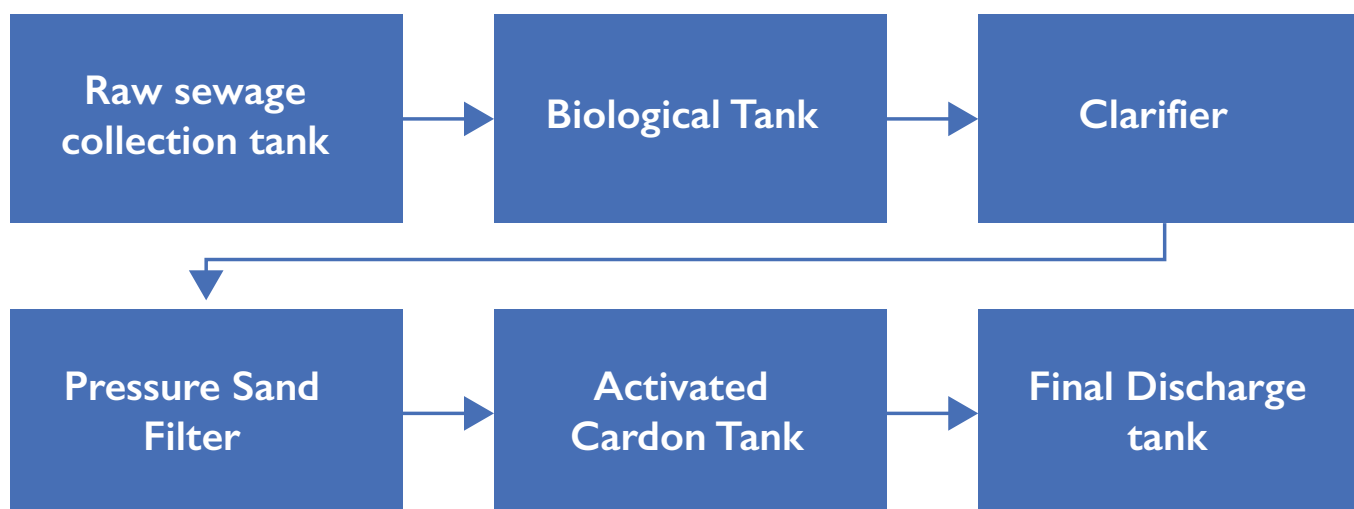
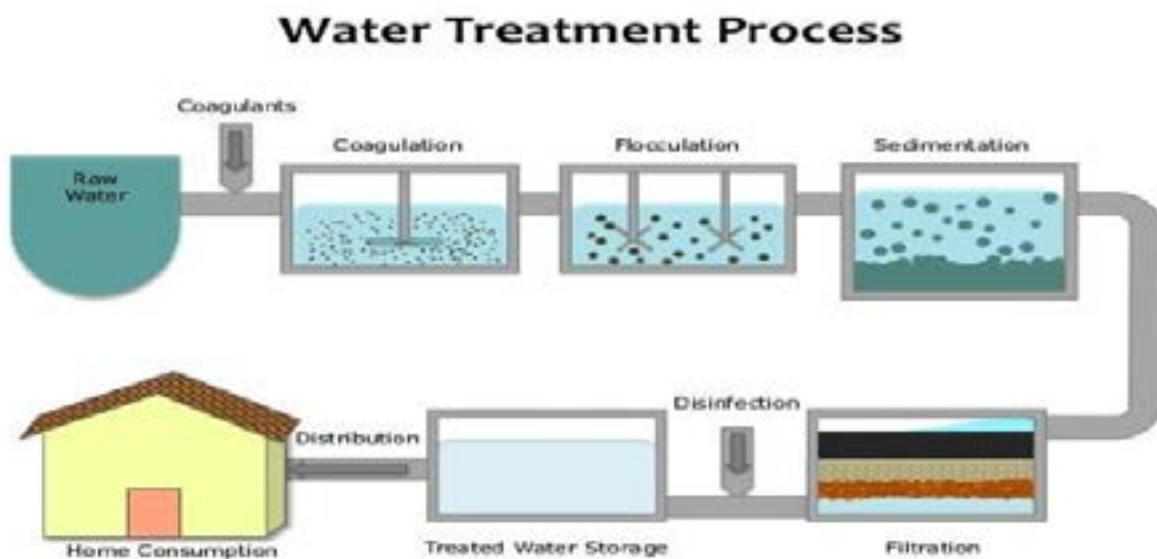
Not all harvested water is safe to drink without treatment. Water may contain bacteria, parasites, or chemicals that cause disease. We must always treat water before drinking it!

Water Treatment Methods

- Boiling:** The most reliable method. Boil water for at least 1 minute and let it cool in a clean, covered container.
- Solar Disinfection (SODIS):** Fill clear plastic or glass bottles with water. Leave in direct sunlight for 6 hours (1 day if cloudy). UV rays kill bacteria.
- Ceramic/bio-sand filters:** Water passes through layers of sand and gravel that filter out bacteria and particles.
- Chlorine tablets:** Small tablets available in chemists that kill bacteria. Follow instructions for dosage.
- Moringa seed powder:** Crushed moringa seeds added to water can cause particles to settle; remove particles then boil.

Safe Water Storage

- Store treated water in clean, covered containers (jerry cans, clay pots, tanks).
- Never put your hands or cups directly into the storage container — use a clean ladle.
- Keep storage containers in the shade — sunlight can promote algae growth.
- Clean and dry storage containers regularly (at least weekly)



Contaminated water can be treated with physical or chemical methods.

Physical methods contain sedimentation, filtration, boiling, and solar water disinfection.

Chemical methods disinfect with chlorine, iodine, silver, or potassium-permanganate.

Most of the time, several of those methods are combined to get safe drinking water. The first step is normally to clean the water optically, i.e. sediment or filter the solid particles. Then, chemical or biological contamination can be removed by disinfection or chemical treatment.

As you design your rainwater treatment and treated-water storage facilities, you need to keep a few things in mind.

The harvested water must be treated before it reaches the points in your home where it is consumed.

The treatment system must be able to protect you and your family from a variety of chemical and microbiological contaminants.

The treated-water storage tanks must prevent the treated water from being re-contaminated.

The treatment and storage facilities must supply enough water to meet your family's needs at the instant that they need it.

Water treatment Technologies

Sedimentation

The first step of water treatment is often sedimentation, especially in the cases of turbid water. Generally, the methods used are very simple. The goal is to let the silt sink down and decant the clear water. Since this takes some time, the sedimentation process takes up to two days. Within this time, even pathogen bacteria can be reduced by 97%. Sedimentation can be done in simple, covered containers. Also simple flow-through sedimentation tanks can be built.

Although the water is normally fairly clear after the sedimentation process, it is not treated enough for drinking. At least one further step, the filtration, is required.

Filtration technologies

Filtration is the next step after sedimentation. It is an easy and cheap way to treat contaminated water. Depending on the type of filter, up to 100% of bacteria and most of the viruses as well as all bigger organisms (cyst, worm eggs, etc.) are being removed. There are multiple types of filters: sand filters, ceramic filters, and cloth filters.

Slow Sand Filtration-Two types of sand filters can be compared: pressure filters and gravity filters. Pressure filters are often used in industrial water treatment. We will look at the gravity filters, which are much cheaper in set-up and maintenance, for small scale farmers.

Ceramic filters-Ceramic filters have a pore diameter of about 200nm, which means that it can filter bacteria (usually bigger than 300nm) and reduce but not totally filter viruses (which can be as small as 20nm). One simple form of ceramic filters is clay pots. The ceramic filters often have a coating of colloidal silver, which acts as bactericide and enhances in that way the purification effect. Furthermore, the silver hinders bacteria to grow on the ceramic filter surface.

Also ceramic filters remove 90-99% of bacteria as well as other pathogens. But compared with slow sand filters, their through flow is much smaller, so they are suitable only for household use. Ceramic filters need regular cleaning and proper handling, so they don't break.

Cloth filters-Cloth filters, mostly made of cotton also filter particles with the size of their pores. Since microorganisms are associated with plankton or other bigger particles, they can also be removed by filters with bigger pore sizes than the size organisms themselves. Cloth filters showed to be effective against cholera or the Guinea worm.

Cloth filters should only be used as a last means if no other way of water purification is available since its effectiveness is lowest compared with the other described filter methods.

Boiling

Boiling is the simplest method to remove all pathogens from water. Water needs to be boiled shortly at least 70°C. If the water is heavily contaminated, a boiling duration of 3 minutes is recommended. The water should not be poured in another vessel since it could be re-contaminated.

- **Chlorination-** Free chlorine is very effective against viruses but is virtually ineffective against *Cryptosporidium*. In addition, it is easy to maintain and measure free chlorine residual in your plumbing system.



Lesson 3: Sanitation & Hygiene (WASH)

	Sanitation & Hygiene
	Duration: 1.5 hours
	Objective: To promote good hygiene and sanitation practices at school and at home linked to water safety and health.
	Expected Outcome: Learners will adopt good handwashing, sanitation and hygiene behaviours that prevent disease.

WASH stands for Water, Sanitation and Hygiene. Good WASH practices prevent diseases like diarrhoea, cholera, typhoid and intestinal worms — diseases that keep children out of school!

The Five Critical Times to Wash Hands with Soap

1. Before eating or preparing food.
2. After using the toilet or latrine.
3. After touching animals or animal waste.
4. After handling garbage or waste.
5. After blowing your nose, coughing or sneezing.

How to Wash Hands Properly

1. Wet hands with clean water.
 2. Apply soap — rub all surfaces including between fingers and under nails.
 3. Scrub for at least 20 seconds (sing “Happy Birthday” twice!).
 4. Rinse thoroughly with running clean water.
 5. Dry with a clean cloth or air dry.
- 💡 Make a tippy tap: A jerrycan on a stick that provides a hands-free handwashing station!

Lesson 4: Solid & Liquid Waste Management

	Waste Management
	Duration: 2 hours
	Objective: To equip learners with knowledge and skills in solid and liquid waste management for a healthy environment.
	Expected Outcome: Learners will gain knowledge and skills to manage solid and liquid waste effectively at school and at home.

In agroecology, there is no such thing as “waste” — it is just a resource in the wrong place! When we manage our waste well, we protect our environment, prevent disease, and create valuable resources for our gardens.

The 3Rs of Waste Management

- **REDUCE:** Produce less waste in the first place — buy only what you need, avoid single-use plastics.
- **REUSE:** Use things again — plastic bottles become planters, old tyres become garden beds.
- **RECYCLE/COMPOST:** Organic waste becomes compost; paper can be recycled; plastics separated for collection.

Waste Type	Agroecological Solution
Organic waste (food scraps, leaves)	Compost or feed to animals — returns nutrients to the soil.
Paper and cardboard	Compost or use as mulch around plants to suppress weeds.
Plastic bottles	Reuse as planters; or collect and sell for recycling.
Metal cans	Reuse as seedling pots or bird feeders; or sell for scrap.
Human waste (from latrines)	Contained in well-maintained pit latrines; never near water sources or gardens.
Waste water (from kitchen/wash)	Direct grey water to banana circles or kitchen garden — plants love it!

TOPIC 6: ECONOMIC LITERACY

TRAINING OBJECTIVE

To enhance learner's skills in financial literacy, entrepreneurship, marketing and saving for income generation from agroecological activities.

EXPECTED LEARNING OUTCOME

By the end of the training, learners will have increased their understanding on financial management and be able to apply entrepreneurship skills in their farming activities.

Economic literacy means understanding money, business, and how to make your farming activities financially sustainable. Agroecology can be a source of income — not just food — when we add value, market well, and manage money wisely.

Lesson 1: Entrepreneurship & Marketing

The trainer introduces entrepreneurship as a component to help learners invest wisely in entrepreneurial activities

Entrepreneurship is a process of identifying and starting a business venture, sourcing and organizing the required resources and taking both the risks and rewards associated with the venture.

Entrepreneurs are innovators who use a process of changing the current situation of the existing products and services, to set up new products and new services.

Pillars of entrepreneurship success-What makes a successful entrepreneur?

An idea and market

Skills/knowledge and experience

Resources

Motivation and hard work

Successful entrepreneurs have these four attributes. Without any of them, your business will be unstable.

An idea and market: An idea is the kind of business you want to do and market is the people who will buy your products or services.

Skills/knowledge: This refers to several business skills. Do we know how to produce quality products for our market? We also need business management skills. Do we know how to keep basic records so that can assess the profitability of our business? In addition we know something about our market. Do people want our service or product? How are we going to inform people that we have what they want? Who will be our customer? And how will our goods get to the market?

Hard work: working consistently every day. Making money in business largely depends on you. Are you there to open your business every day? Can people rely on you? Do you sell a quality product or service?

Resources: How much money do you need to start your business? The money you use to start your business is called your capital. Starting small is the key for great entrepreneurs. Most people only talk about the business they want to start. Take some time and reflect on these things before you start.

Characteristics of a good entrepreneur (good business practices)

Keeping daily records: With cashbooks, we should always know how much money we have and how much we spend.

Keeping money safe: It should be banked frequently and cash locked up safely while it is within the business premises.

Avoid giving credit as much as possible: There will be exceptions to this, but if the base line is 'no credit', then the business can establish records to track credit and practices to collect money owed to the business.

Collecting long standing debts.

Routinely preparing a profit/loss statement to look at the expenses and income. At the beginning, this is done weekly, then monthly or quarterly.

When the business grows large enough, look for professionals like financial officer or treasurer to maintain daily records and check cash receipts against the records.

As an entrepreneur this are important business skills to learn

Keep a daily record - This record will track where the money comes from and where it goes. This record is called a cash book and it will help you to know how your business is doing. Without records, you can never know whether we are making a profit or a loss.

Put money in savings regularly - You should not wait till the end of the month to start saving. By then there is usually nothing left to save. Try to set aside a small amount each day. This becomes very useful during emergencies. Banks can be a safe place for your savings, but in some of the bank fees may be more than the interest to be earned. In that case, a look for cheaper options available to you.

Avoid selling your products /services on credit- If someone has no money and cannot pay for the item, some entrepreneurs are afraid they will lose the sale if they do not give credit. But it is not a sale until it is paid for. In such a case you lose both the money you invested and the profit. Giving people credit does not make them friends. When you give so much credit to your customers that you do not have enough cash to restock, the customers will go to other enterprises and your business will fail.

Don't allow long standing debts - Money owed to you by people is yours, and you need it to support your enterprise. Sometimes business is done with credit, but this leads to delayed payments. You need to set your terms up front and have a plan to collect payment. Sometimes you can sell your product on credit and wait for the payment for a very long time as a result you lack products to sell to other customers. Check if you are making a profit or loss- This should be done on a regular basis. This can only be possible if you keep records.



Opportunity	How to Generate Income
Fresh vegetables & herbs	Sell excess kale, spinach, tomatoes and herbs to parents or local market.
Seedling sales	Grow and sell seedlings of popular vegetables and tree seedlings.
Honey & beeswax	Keep 1-2 beehives; sell honey and beeswax products.
Dried herbs & spices	Dry and package traditional herbs like rosemary, thyme, lemongrass for sale.
Fresh eggs	Keep chickens; sell eggs to school canteen or parents.
Composting service	Make and sell compost to neighbours and community gardens.

Steps to Start an Agroecological Enterprise

1. IDENTIFY: What can you grow or make that people in your community need?
2. PLAN: Calculate the costs (seeds, water, labour) and expected income.
3. PRODUCE: Grow high-quality products using agroecological methods.
4. ADD VALUE: Process or package the product to increase its selling price.
5. MARKET: Find buyers — local markets, schools, restaurants, shops, neighbours.
6. SELL & TRACK: Keep records of every sale, expense, and profit.
7. SAVE & REINVEST: Save a portion and reinvest in expanding the business.

Marketing Your Products

- Quality first: Buyers return when your product is consistently good.
- Presentation matters: Clean, well-packaged products sell at higher prices.
- Know your customers: Understand what they need and when they need it.
- Fair pricing: Calculate your costs and add a reasonable profit margin.
- Build relationships: Trust and reputation are your most valuable marketing tools.

Lesson 2: Financial Literacy & Record Keeping

- ♦ The trainer to lead a brainstorming session on learners understanding of financial literacy
- ♦ The learners are introduced to how they can maintain their financial records

Financial literacy refers to the set of skills and knowledge that allows individuals to make informed and effective decisions regarding money matters. For a small-scale farmer, being financially literate means that you understand the basic financial principals such as:

Why it is important to save your money.

How and where to open an account with eg. Financial institution, SACCO or VSLA, so that you can save your money.

Keeping proper records of your financial transactions so that you can manage your income and expenses wisely.

How to access financial assistance in forms of loans so that you can sustain and grow your business

When people are not financially literate, there is a big chance that they will make poor decisions that can harm their families and their businesses

Financial Literacy

Essential Skills for Managing Your Money

1. Budgeting (Managing Your Money)

— 50/30/20 Rule —



Saving

Emergency & Future Needs



- ✓ Build an emergency fund: 3-6 months of expenses
- ✓ Save regularly to reach your goals
- ✓ Keep money in safe places
- ✓ Earn interest on your savings

2. Debt Management

(Using Credit Wisely)

- ✓ Understand interest rates
- ✓ Learn loan terms
- ✓ Pay off debts quickly
- ✓ Check your credit score



3. Debt Management

(Using Credit Wisely)

- ✓ Investing means buying assets that can grow:

- Stocks
- Real Estate
- Bonds



- ✓ Higher risk often means higher potential rewards
- ✓ Diversify your investments to manage risk

4. Financial Planning

(Setting Goals for Your Future)

- ✓ Avoid unnecessary debt
- ✓ Build savings for emergencies
- ✓ Invest for growth



5. Financial Planning

(Setting Goals for Your Future)

- ✓ Save for education
- ✓ Buy a home someday
- ✓ Start or grow a business
- ✓ Plan for retirement



Financial Literacy Leads to

- ✓ Avoid unnecessary debt.
- ✓ Build savings for emergencies
- ✓ Invest for growth
- ✓ Achieve your long-term goals



Key Financial Concepts

Concept	Simple Definition
Income / Revenue	Money received from selling products or services.
Expenses / Costs	Money spent on seeds, tools, water, labour, packaging, transport.
Profit / Net Income	Income MINUS Expenses. This is what you have earned!
Budget	A plan for how you will earn and spend money over a period.
Investment	Money spent now will generate more money in the future.
Savings	Money kept aside for future use, emergencies, or reinvestment.

Simple Record Book — What to Write Every Day

DATE: Write the date of each transaction.

DESCRIPTION: What did you sell or buy?

INCOME: How much money came IN?

EXPENSE: How much money went OUT?

BALANCE: Add income, subtract expenses — this is your running total.

💡 Review your records every week. Are you making a profit or a loss?

💡 Set a savings goal — e.g. “Save KES 500 this month for new seeds and tools.”

Lesson 3: Saving & Loaning

	Saving & Loaning
	Duration: 2 hours
	Objective: To equip learners with knowledge on community-based savings and credit systems that support agroecological enterprises.
	Expected Outcome: Learners will understand the principles of savings and how they can access funds to invest in their farms.

The trainers engage learners to share through an open discussion on the forms of savings schemes they know and how one can benefit from the savings.

Saving money is a habit that can take time to build, and even some adults have yet to master it. With that in mind, here are some things you can do to get your kids and perhaps yourself on saving

Discuss Wants vs. Needs

The first step in teaching kids the value of saving is to help them distinguish between wants and needs. Explain that needs include the basics, such as food, shelter, and clothing, and wants are all the extras. The first step is to explain important concepts like savings, a budget, and goals—then keep the conversation on-going.

Giving children an allowance can teach them the value of money and the importance of hard work. Children can learn the importance of living within their means, which is one of the basic tenets of saving.

Let Them Earn Their Own Money

If you want children to become savers, allowing them to earn and save money provides them with the opportunity to learn how to use it. When you offer allowances in exchange for chores, they're also learning the value of their hard work.

Set Savings Goals

To a kid, being told to save, without explaining why, may seem pointless. Helping children define a savings goal can be a better way to get them motivated. If they know what it is they want to save for, help them break down their goals into manageable bites. For example, if they want to buy a Kshs 3000 radio and they get a Kshs 100 allowance each week, help them figure out how long it will take to reach that goal, based on their savings rate.

Provide a Place to Save

Once your children have a savings goal in mind, they'll need a place to save their cash. That way, they can see how their savings are adding up and how much progress they're making toward their goal.

Have Them Track Spending

Part of being a better saver means knowing where your money is going. If your children get an allowance, having them write down their purchases each day and add them up at the end of the week can be an eye-opening experience. Encourage them to think about how they're spending and how much faster they could reach their savings goal if they were to change their spending patterns.

Offer Savings Incentives

For example, if your child has set a big savings goal, say a Kshs 15,000 tablet, you could offer to match a percentage of what has been saved. Alternately, you could offer a reward when your kid reaches a savings milestone, such as a Kshs 2000 bonus for hitting the halfway mark.

Leave Room for Mistakes

Part of putting kids in control of their own money is letting them learn from their errors. It's tempting to step in and steer kids away from a potentially costly mistake, but it may be better to use that mistake as a teachable moment. In that way, they'll know in the future what not to do with their cash.

Act as Their Creditor

One of the basic tenets of saving is to not live beyond your means. If your child has something he or she wants to buy and is being impatient about saving for it, becoming your kid's creditor can help to teach the value of saving. For instance, if your child wants to purchase something that costs Kshs 5000, you could "lend" the money and require payment from the allowance you provide, with interest. The lesson you want to teach is that saving may mean delaying gratification longer, but the thing you want to buy won't end up costing more if you wait.

Talk about Money

If you want kids to learn about saving, it must be an ongoing discussion. Whether you schedule a regular weekly check-in to talk about money or make money chats part of your daily round, the key is to keep the conversation going.

Set a Good Example

If you want your children to become savers, being one yourself can help. You could also decide to save for something together, such as a family vacation.

TOPIC 7: CONFLICT MANAGEMENT

TRAINING OBJECTIVE

To equip learners with knowledge on conflict management in schools and community

EXPECTED LEARNING OUTCOME

Learners to gain knowledge and skills effective in conflict management

CONTENT

I. Introduction to conflict management -30mins

- Facilitator to lead a brainstorming session with learners to get their understanding of “Conflict” and “conflict Management”
- The facilitator to explain to the learners what is conflict and conflict management through use stories and case studies of conflict management
- Allow learners to think of various examples of conflicts that occur in school, at home and at community, how best they can help solve the conflict.

Lesson 1: Introduction to Conflict Management

A CONFLICT is a disagreement or dispute between two or more people or groups who have different interests, needs, or goals. Conflict is not always bad — it can lead to change and better solutions if managed well!

CONFLICT MANAGEMENT is the process of identifying, addressing, and resolving conflicts in a fair, peaceful and constructive way.

The word ‘conflict’ carries negative connotations. It is often thought of as the opposite of co-operation and peace, and is most commonly associated with violence, the threat of violence or disruptive (nonviolent) disputes. This view of conflict as negative is not always helpful. In non-violent settings it can often be seen as a force for positive social change.

Everyday life is full of conflict and none of us can escape conflict. Whether over boundaries, or between people and wildlife; within or between families; among villages; between businesses or government units – even within one individual – conflict is inevitable.

Although it may be uncomfortable, conflict can ultimately be helpful. A well-managed conflict where all parties are interested in resolution can:

help people understand each other’s needs and desires;

mend or enhance relationships through understanding and healthy, sometimes structured, communication;

push people to devise options they might not have otherwise considered; and

Result in solutions where all parties benefit – known as a “win-win” solution.

Common Conflicts in Schools and Communities

-  Land and boundary disputes — Who owns this piece of land? Where does my farm end?
-  Water resource conflicts — Who has the right to use the river, borehole or water pan?
-  Tree and forest conflicts — Can I cut this tree? Who owns the fruits?
-  Livestock conflicts — Animals eating crops, overgrazing on shared land.
-  School conflicts — Disagreements between students, or between students and teachers.
-  Family conflicts — Disagreements over chores, resources, or responsibilities.
-  Business conflicts — Disputes over payment, profit sharing, or labour in group enterprises.

Lesson 2: Forms & Causes of Conflict

- Allow learners to think of various examples of conflicts that occur in school, at home and at community.

Most disputes involving people, livestock and wildlife stem from scarcity of resources – a real and difficult challenge. But tensions often intensify because people hold different attitudes and values, and fail to understand each other's views. Most conflicts have deeper causes than the obvious ones, and are complicated by emotional needs, fears and desires as well as material needs and wants. In addition, rumours or lack of communication

Forms of conflicts

Type	Description & Example
Interpersonal Conflict	Between two individuals — e.g. two students arguing over a tool.
Inter-group Conflict	Between two groups — e.g. two classes competing for the garden space.
Community-Level Conflict	Conflict involving many community members — e.g. land or water disputes.
Resource-Based Conflict	Disputes specifically about access to and use of shared natural resources.

Root Causes of Conflict

- Scarcity: Competition for limited resources (land, water, food).
- Inequality: Unfair distribution of resources or decision-making power.
- Miscommunication: Misunderstandings, rumours or poor communication.
- Different values or beliefs: Cultural or religious differences.
- Historical grievances: Past injustices that were never resolved.
- Climate change: Drought, floods and unpredictable seasons increase resource competition.

Activity: Role Play – Resolving a Water Conflict

Scenario: Two families share a water source on the school farm. Family A uses most of the water early morning, leaving little for Family B.

Roles: Family A representative, Family B representative, a Mediator (community elder).

Instructions: Act out the conflict. The mediator guides both sides through the 5 steps: Stop & Cool Down → Listen → Share Feelings → Find Solutions → Agree.

Discussion: What solutions did you find? Were they fair to both sides?

Real-world lesson: Many water conflicts can be solved by simple agreements — turns, timing, and fair sharing of maintenance responsibilities.

Lesson 3: Common Approaches to Conflict Resolution

- Take learners through a brainstorming session to think of the various approaches to conflict management.

There are many ways to resolve a conflict. The best approach depends on the severity of the conflict, the relationship between the parties, and the resources available for resolution.

Approach	How It Works
Negotiation	The conflicting parties talk directly to each other and negotiate a mutually acceptable solution.
Mediation	A neutral third party (mediator) helps the conflicting parties communicate and reach agreement.
Arbitration	A neutral party (arbitrator) listens to both sides and makes a binding decision.
Community dialogue	Community elders, leaders or members come together to discuss and resolve shared conflicts.
Legal mechanisms	For serious conflicts, formal legal systems (courts, land tribunals) may be used as a last resort.

Steps to Peaceful Conflict Resolution



Conflict Management — Steps to Peace

Types of Conflicts at School & Home

- Land or boundary disputes between community members
- Sharing of water or other resources
- Disagreements between classmates or siblings
- Disputes about chores, responsibilities or roles in the garden



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Agroecology

A small, stylized plant icon with three leaves and a central stem, positioned above the letter 'o' in the word 'Agroecology'.

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