GEAVET TRAINING PROGRAMME FOR CSA

GEAVET TRAINING PROGRAMME FOR CLIMATE-SMART AGRICULTURE (CSA):

KENYA

UNIT I.I FEED AND FEED MANAGEMENT

ENGLISH VERSION

GEAVET Project n° 101129027

Open Educational Resources

PART I – LEARNING MATERIAL

1. Introduction

Livestock production is a cornerstone of the Kenyan economy, supporting the livelihoods of over 10 million smallholder farmers and contributing significantly to the national agricultural GDP. However, this critical sector faces a severe and growing threat: climate change. Increased frequency and intensity of droughts have led to chronic feed shortages, diminishing pasture quality, and rising costs of commercial feeds. This not only jeopardizes farmer incomes and food security but also contributes to environmental degradation, including greenhouse gas emissions from livestock. This document addresses this challenge head-on. Its objective is to provide a comprehensive, practical, and locally relevant guide to Climate-Smart (CS) feed management. This approach focuses on maximizing productivity, building resilience against climate shocks, and mitigating environmental impact through innovative and sustainable feeding strategies tailored for the Kenyan context. By adopting these practices, Kenyan farmers can transform their livestock enterprises into more profitable, predictable, and environmentally sustainable ventures.

2. Knowledge

2.1. Defining Climate-Smart Feed Management

Climate-Smart Feed Management is not a single practice but a holistic approach to how we source, prepare, and provide feed to our livestock. It is a strategic framework that rests on three interconnected pillars, each critical for the future of farming in Kenya.

It rests on three pillars:

- **Increased Productivity:** This means using feed more efficiently to produce more milk, meat, or draught power from the same number of animals. For instance, by improving feed quality and balance, a farmer can increase milk yield from 5 to 7 litres per cow per day without increasing herd size, thereby directly improving household income and nutrition
- **Enhanced Resilience (Adaptation):** This involves implementing strategies that ensure a consistent supply of quality feed, even during prolonged dry seasons or droughts. This is achieved by diversifying feed sources away from a single type of grass and preserving surplus fodder when it is abundant.

- **Reduced Emissions (Mitigation):** This focuses on improving feed quality and digestibility to directly lower the amount of methane gas produced by animals during digestion. Methane is a potent greenhouse gas, and by managing feed intelligently, farmers can contribute to global climate efforts while often improving animal health.

By adopting Climate-Smart (CS) feed management, farmers can protect their investments, increase profits, and contribute to a healthier environment making their farms viable for generations to come.

2.2. The Critical Link Between Feed Quality and Methane Production

Understanding the science behind ruminant digestion is key to grasping how feed management mitigates climate change. Livestock like cattle, goats, and sheep are ruminants. They have a multi-chambered stomach, the largest of which is the rumen. The rumen acts as a fermentation vat, containing billions of microbes that break down tough plant fibres that monogastric animals cannot digest. The process of this microbial fermentation produces various gases, including methane (CH_4), which the animal belches out into the atmosphere.

The type and quality of feed directly control the efficiency of this process and the volume of methane produced.

- **Low-Quality Feed:** High-fiber, low-protein feeds (for example dry, mature grass) are difficult for microbes to digest. This slow, inefficient fermentation process produces large amounts of methane, which the animal belches out into the atmosphere.

- **High-Quality Feed**: Digestible, protein-rich feeds (for example young Napier grass, legume leaves) are broken down more efficiently by rumen microbes. This process produces more useful energy and protein for the animal and significantly less methane per unit of milk or meat produced.

Therefore, improving feed quality is a direct and effective way to fight climate change while improving animal performance.

2.3. Inventory of Local & Climate-Resilient Feed Resources in Kenya

A resilient feed strategy relies on diversifying sources to avoid over-reliance on one type of feed, especially those vulnerable to drought. The Kenyan context offers a variety of resources that can be harnessed effectively. The table below (Table 1) summarizes key resources available to smallholders.

Table 1: Common & Climate-Resilient Feed Resources in Kenya

Category	Examples	Key Benefits	Considerations
Grasses	Napier Grass, Rhodes Grass	High biomass yield, familiar to farmers, good source of energy	Requires reliable rainfall or irrigation; low in protein
Leguminous Fodder Trees & Shrubs	*Calliandra*, *Leucaena*, *Sesbania*	Drought-tolerant, high protein content (18-25%), improves soil fertility (nitrogen fixation), deep roots access water.	Requires careful management (pruning); some (*Leucaena*) contain mimosine and must be fed in limited quantities
Crop Residues	Maize Stover, Bean Haulms, Wheat Straw	Readily available after harvest, low cost	Very low nutritional value; requires processing (chopping, treatment) to be useful
Alternative Feeds	Urea-Treated Straw, Poultry Manure (properly composted), Kitchen Waste	Turns waste into valuable feed, reduces cost	Requires knowledge of safe handling and treatment processes

3. Skills

3.1. Identifying and Evaluating Feed Quality

A good farmer can assess feed quality rapidly using their senses, a skill that prevents waste and ensures animal health. This is a fundamental first step in climate-smart management.

For Napier Grass, quality is indicated by green, leafy stems harvested at a young stage (1-1.5m height). The leaves should be abundant and the stems tender. One should avoid feeding yellow, fibrous, and over-mature grass, as its nutritional value is low, and it will promote high methane production. When assessing hay, it should retain a greenish tint and have a sweet, pleasant smell. Brown, brittle hay with a

musty or mouldy smell is spoiled; the moulds can cause respiratory issues in animals and should never be fed.

Silage quality is determined by its smell and colour. High-quality silage has a firm, moist texture, an olive-green or brownish-green colour, and a strong, pleasant, sour, vinegar-like or sweet smell due to lactic acid. In contrast, black, slimy silage with a rotten, putrid smell is a sign of failure due to poor compaction and sealing; it is toxic and must be discarded.

- **Practical Exercise**: Trainers should provide learners with multiple samples of good and bad feed (hay, silage, Napier) to practice visual, tactile, and olfactory identification, discussing the reasons behind each quality indicator.

3.2. Basic Ration Formulation ("Thumb Rule" Method)

Animals have specific nutrient requirements. While complex software exists, a simple method is effective for smallholders.

➢ **Step 1:** Know the Animal's Weight. Estimate or measure.

➢ **Step 2:** Calculate Dry Matter (DM) Intake. A dairy cow eats 3-4% of its body weight in DM per day.
  - *Example:* A 400 kg cow needs 400 kg x 0.03 = 12 kg of DM/day.

➢ **Step 3:** Formulate the Ration. A milking cow needs a balance of roughage (e.g., grass) and concentrates (e.g., dairy meal).
  - *Common Ratio:* 60% Roughage, 40% Concentrate for moderate production.
  - *Calculation:*
    - Roughage DM: 12 kg x 0.6 = 7.2 kg
    - Concentrate DM: 12 kg x 0.4 = 4.8 kg

➢ **Step 4**: Convert DM to Fresh Weight. Feeds contain water.
  - If Napier grass is 25% DM, then to get 7.2 kg DM, you need: 7.2 kg / 0.25 = 28.8 kg of fresh Napier grass.
  - If dairy meal is 90% DM, then to get 4.8 kg DM, you need: 4.8 kg / 0.90 = 5.3 kg of dairy meal.

This simple calculation ensures the animal receives sufficient energy and protein for production, optimizes feed use, and minimizes the methane produced per litre of milk.

3.3. Improving Low-Quality Feeds (Urea Treatment)

Crop residues like maize stover are abundant but have a nutritional value too low to sustain productive animals. Urea treatment is a low-cost chemical process that breaks down the tough lignin and cellulose bonds, making the fibre more digestible and, crucially, increasing the crude protein content from a meagre 3-5% to a valuable 10-12%.

- Materials Needed: Maize stover, urea fertilizer, water, a plastic sheet, a weighing scale.
- Step-by-Step Process:
    1. Chop the stover into small pieces (2-5 cm) to increase surface area for treatment.
    2. Dissolve 4 kg of urea in 100 litres of water (this solution treats 100 kg of dry stover).
    3. Spread a layer of chopped stover on the plastic sheet.
    4. Sprinkle the urea solution evenly over the stover.
    5. Repeat the layering until all stover is treated.
    6. Cover the stack tightly with the plastic sheet to make it air-tight to trap the ammonia gas produced.
    7. Leave it to treat for 2-4 weeks depending on the ambient temperature.
    8. Open the stack and aerate for 1-2 days before feeding to allow ammonia gas to dissipate, making it safe for animals to consume.

3.4. Reducing Feed Wastage

Studies indicate that up to 30% of feed can be wasted on smallholder farms through spillage, selective feeding, and trampling. Preventing this wastage is one of the easiest and most cost-effective ways to improve feed efficiency.

Key practices include:

- **Use Feed Troughs:** Never feed valuable hay or concentrates on the ground. Using elevated troughs for concentrates and racks for hay prevents contamination and trampling.
- **Cut to Size**: Chop forage to 2-5 cm pieces to prevent selective eating and trampling.

- **Feed Little and Often**: Providing fresh feed twice daily instead of one large load ensures that feed is fresh and palatable, encouraging full consumption and reducing leftovers that spoil.

3.5. Making Pit Silage – A Step-by-Step Guide

Silage making is the art of preserving green forage under anaerobic (no-air) conditions through controlled fermentation. It is the cornerstone of building feed resilience for the dry season.

Prerequisites:

- **Forage**: Maize, sorghum, or Napier grass harvested at the right stage (e.g., maize at dough stage).
- **Moisture**: Ideal moisture is 65-70%. Test by squeezing a handful; it should hold its shape with only a few drops of water.
- **Site**: Choose a well-drained elevated area, away from trees to prevent root damage and waterlogging.

The Process:

1. Dig the Pit: Dig a trench to your required size (e.g., 2 m L x 1 m W x 1.5 m D for a smallholder).
2. Harvest and Wilt: Chop the forage and let it wilt in the sun for 4-6 hours to achieve correct moisture.
3. Chop: Chop the material into smaller pieces to ease compaction.
4. Fill and Compact: This is the most critical step. Spread layers of chopped forage (15-20 cm deep) in the pit and compact them thoroughly using feet, a tractor, or a wooden tamper. The goal is to expel as much air as possible to create anaerobic conditions.
5. Seal: Once the pile is about 0.5 m above ground level (to form a dome for drainage), cover it completely with a thick plastic sheet (150-200 microns). Ensure no air can enter.
6. Weight Down: Place old tires, soil, or a layer of manure on top of the plastic to hold it firmly in place and create an airtight seal.
7. Ferment: Leave undisturbed for at least 6-8 weeks.
8. Feed: Open one end of the pit, take out the day's requirement, and reseal the pit immediately.

4. Attitudes

The successful adoption of Climate-Smart Feed Management depends as much on mindset as on technical knowledge. Cultivating the right attitudes is crucial for long-term resilience.

- **Valuing Efficiency**: The learner will shift from seeing feed as a mere cost to understanding that efficient use is an investment. Saving 1 kg of wasted feed is money earned and a resource preserved.
- **Proactive Planning**: The learner will move away from a reactive crisis mode during drought to a proactive mindset of "planning for plenty". Preserving silage and planting drought-tolerant trees are acts of proactive resilience.
- **Innovation & Adaptation:** The learner will develop a willingness to experiment with new ideas, like treating straw or integrating trees, understanding that adapting practices is essential for surviving a changing climate.
- **Community Sharing**: The learner will recognize that challenges are best faced together. Sharing knowledge, establishing community seed banks for fodder trees, or collaborating on a large silage project can build stronger, more resilient communities.

5. Case Study from Kenya: Integrating Fodder Trees for Resilience in Murang'a County

Background: For decades, smallholder dairy farmers in Kigumo sub-county, Murang'a, relied primarily on Napier grass and purchased dairy meal. This system was highly vulnerable. Recurrent droughts led to catastrophic feed shortages. Napier grass would dry up, and the cost of dairy meal would become prohibitive. This caused milk production to plummet by over 50%, increased susceptibility to animal diseases due to poor nutrition, and pushed many families into economic hardship.

Intervention (2019-2021): To address this, a project implemented by Self Help Africa, in partnership with the Murang'a County Department of Agriculture, promoted the integration of drought-tolerant fodder trees as a primary, on-farm protein supplement. After agro-ecological assessments, *Calliandra calothyrsus* was selected as the focal species due to its proven adaptability to the local conditions, high protein content (22-25%), and ability to thrive with minimal rainfall. The project's strategy was multi-faceted: it first supported the establishment of 20 community-run *Calliandra* seedling nurseries, ensuring a sustainable and low-cost supply of planting materials. Then, over 500 farmers were trained through a series of participatory workshops. The training covered practical aspects: Planting (spacing trees at 0.5 m x 0.5 m in hedgerows, often along contours to

double as erosion control), Management (pruning trees to a bushy shape when they reached 1.5 m to encourage new, palatable leaf growth), and Feeding (harvesting leaves and pods to provide 2-3 kg per cow per day as a supplement to basal roughage). To sustain momentum, the project facilitated farmer-led exchange visits, creating platforms for peers to share successes and troubleshoot challenges collectively.

Results & Impact (2022 Evaluation): The impact was transformative.

Productivity: Farmers reported a consistent 15-25% increase in milk yield, directly attributed to the high-protein *Calliandra* supplement.

Economic Resilience: Dependence on expensive commercial dairy meals was reduced by 30-50%. For a typical farmer like John Kamau, this meant his annual feed costs dropped from approximately KES 30,000 to KES 15,000, drastically improving his profit margin.

Climate Resilience: The most significant change was psychological and practical resilience. As one farmer, Mary Wanjiku, eloquently stated, *"Before* Calliandra*, the dry season was a nightmare. My cows were skinny and produced blood instead of milk. Now, even when the grass is dry and yellow, my* Calliandra *is green. I have food, and my family has income throughout the year."*

Environmental Benefits: Beyond the farm gate, the trees reduced soil erosion on Murang'a's sloping landscapes, improved soil fertility through nitrogen fixation and leaf litter, and created habitats for pollinators and other beneficial insects.

Key Learning: This case demonstrates that a low-cost, biologically based solution—strategically integrating fodder trees into the farming system—can dramatically enhance productivity, economic stability, and environmental health. It is a foundational, "no-regrets" practice that embodies the principles of climate-smart agriculture and is readily scalable across Kenya's smallholder systems.

6. European Case Studies for Kenyan Learners and Farmers

6.1. PastureBase Ireland – Using Digital Tools to Plan Animal Feeding

In Ireland, many dairy farmers use a system called PastureBase Ireland, created by Teagasc (the Irish Agriculture and Food Authority). It is an online and mobile platform where farmers record how fast their grass is growing, how much feed they have available, and how much their cows are eating. The system turns this data into simple graphs that help farmers decide *when to cut grass, when to graze animals,* and *when to buy or store extra feed*. This helps them save money, plan ahead, and reduce methane emissions from livestock—because animals that eat the right quality and quantity of feed produce less waste and fewer gases.

➢ *Why this is useful for Kenya:*
In Kenya, smallholder farmers often face the same challenge—uncertain rainfall and not knowing how much feed they will have in the next season. Even without the internet all the time, farmers and VET learners can use simpler mobile apps like FeedCalc or FAO e-Feed to calculate dry matter intake and balance feed for cows and goats. By collecting basic data (for example: how many animals, what they eat, how much silage is stored), farmers can plan their feed supply before the drought arrives.

This teaches the same skills that Irish farmers use:

- Critical thinking (understanding feed data),
- Digital literacy (using apps for decisions), and
- Climate resilience (planning instead of reacting).

In short, Kenyan farmers can copy the Irish idea in a simpler way: *write down what you have, measure what you feed, and use that information to prepare for dry seasons*.

6.2. LIFE Green Sheep – Feeding Animals in a Climate-Smart Way

The LIFE Green Sheep project in Europe involved farmers in France, Spain, and Ireland who wanted to make milk production more climate-friendly. They worked together with scientists to test how different feeds affect both milk yield and methane emissions. By improving feed quality—using more legumes like clover and high-protein forages, and reducing low-quality dry feed—they managed to cut methane emissions by 10–15% per litre of milk, while keeping animals healthy and productive.

The farmers didn't just learn from experts; they also shared results among themselves through meetings, farm visits, and online dashboards. Every farmer could see what was working for others and copy or adapt it.

➢ *Why this is useful for Kenya:*
This project shows that *better feed means better profits and a cleaner environment*. Kenyan dairy and livestock farmers can follow the same principle by improving the quality of what animals eat. This can be done using fodder trees (like *Calliandra* and *Leucaena*), properly made silage, or urea-treated maize stover. Even small changes—like harvesting Napier grass at the right height or mixing it with legume leaves—can make a big difference. Farmers' groups and VET learners can form "feed improvement clubs", just like Green Sheep's pilot farms, to compare results: How much

milk was produced? Which mix worked better during drought? Using a shared spreadsheet or WhatsApp group, they can learn from each other, reduce feed waste, and build community resilience.

This develops the same competences as in Europe:

- Collaboration and knowledge sharing,
- Entrepreneurship (selling silage or fodder seedlings), and
- Green innovation (feeding smarter to protect the planet).

Key Takeaway for Kenyan Learners:
Both examples show that simple changes in feed management—guided by data, planning, and teamwork—can raise income, protect animals, and reduce climate impact.

Kenyan VET learners and farmers can replicate these ideas without expensive technology:

- By keeping small records on feed use and milk yield,
- Testing one new feed improvement at a time,
- And sharing results through local groups or digital platforms like the GEA_VET e-learning hub.

7. Digital Training Tools

Table 2: Digital Training Tools

Tool / Platform	Use in Module	Skills Reinforced
FeedCalc (FAO)	Mobile app for ration formulation; allows learners to calculate DM intake, balance energy/protein, and compare costs.	• Data Management & Interpretation • Critical Thinking & Problem Solving
FAO e-Feed / ClimMob	Digital platform for comparing feed trials and recording farm-level data; supports citizen-science approach.	• ICT for Agriculture • Climate Risk Assessment• Lifelong Learning
GEA_VET LMS (Moodle or local e-learning)	Hosts e-modules, video tutorials, quizzes, and peer forums for collaborative reflection.	• Digital Literacy • Communication & Knowledge Sharing • Cyber-awareness
WhatsApp / Telegram Learning Group	Facilitates ongoing discussion, sharing of silage photos, and Q&A with trainers.	• Digital Communication & Collaboration • Community Learning

Tool / Platform	Use in Module	Skills Reinforced
Mentimeter or Padlet	Used in class to probe misconceptions and collect ideas during problem-based learning.	• Critical Thinking • Digital Collaboration

8. References/Sources

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PART 2 – CURRICULUM

Learning Objectives:

KNOWLEDGE	SKILLS	ATTITUDES
Students will know: ● Defining Climate-Smart Feed Management ● The critical link between feed quality and methane production ● Inventory of local & climate-resilient feed resources in Kenya	*Student will be able to:* ● Identify and evaluate feed quality ● Do basic ration formulation ("Thumb Rule" Method) ● Improve low-quality feeds (Urea Treatment) ● Reduce feed wastage ● Make pit silage	*Student will develop the following mindset:* ● Valuing efficiency ● Proactive planning ● Innovation & adaptation ● Community sharing
TRANSVERSAL SKILLS INTEGRATED: ● **Critical Thinking & Problem Solving:** Analyse feed-quality issues, link feed composition to methane emissions, and design practical, low-cost improvements such as urea treatment or silage making ● **Collaboration & Community Learning**: Work in mixed farmer–student teams during farm exercises; share local knowledge and best practices ● **Entrepreneurship & Efficiency Mindset**: Recognise feed management as an investment; explore small business models for silage production or fodder tree nurseries ● **Communication & Knowledge Sharing**: Record, explain, and teach climate-smart feed techniques to peers and community members using simple language and visuals ● **Adaptability & Innovation:** Adjust feed strategies during droughts; experiment with new local feed resources or improved storage techniques.		
DIGITAL SKILLS INTEGRATED: ● **Digital Literacy / ICT for Agriculture (ICT4Ag)**: Use smartphones or tablets to access videos, job-cards, and GEAVET e-learning materials on feed management ● **Mobile-Based Advisory Tools**: Use SMS or mobile apps for weather forecasts, drought alerts, or market price updates to plan feed supply ● **Digital Communication & Collaboration**: Share photos, ration sheets, or silage		

records with peers and trainers via WhatsApp groups or LMS forums
- **Data Management & Interpretation**: Enter and analyse feed and animal-performance data using mobile apps such as FeedCalc, ClimMob, or FAO e-Feed
- **Cyber-awareness & Digital Responsibility**: Protect data privacy when uploading farm or livestock information; apply safe digital behaviours

GREEN SKILLS INTEGRATED:
- **Agroecology & Sustainable Land Management**: Integrate fodder trees and legumes that improve soil fertility and biodiversity
- **Climate Resilience & Risk Assessment:** Plan feed reserves and storage systems (silage pits, drought-tolerant forages) to cope with dry seasons
- **Circular Economy & Organic Waste Management**: Convert crop residues or kitchen waste into usable livestock feed through safe processing and composting

Implementation plan of pedagogical activities - Scheme of work

Duration: 3.5 hours (blended: 45 min online + 2 h 45 min onsite)				
Target: VET learners, smallholder farmers, and agricultural advisors (gender-balanced; mixed experience)				
No. of Activity	**Duration**	**Training Methods /Activity**	**What the trainers do**	**What the participants do**
1.	40 mins	Problem-Based Learning (PBL): "Feed for the Future"	● Present a drought-feed shortage scenario ● Guide learners to identify problems, analyse local feed options, and propose climate-smart solutions	● Work in small groups to calculate rations, select resilient feed sources, and present short solution pitches

2.	45 in	Hands-on Demonstration & Peer Coaching	● Demonstrate urea treatment, feed-quality assessment, and silage preparation ● Supervise "teach-back" mini-sessions	● Perform the activities ● Fill in job-cards ● Re-teach another group.
3.	30 min	Mini-Enterprise Challenge: "Feed Bank Startup"	● Demonstrate how to make silage in a small drum or pit using local materials	● Help prepare silage materials and learn the key steps of compaction and sealing
4.	25 min	Digital Simulation & Data Exercise (FeedCalc Practice)	● Demonstrate FeedCalc or FAO e-Feed ● Supervise data entry and comparison of manual vs digital results	● Input sample data on feed composition ● Interpret results ● Discuss methane reduction potential
5.	20 min	Collaborative Reflection Forum	● Facilitate wrap-up ● Instruct on uploading short reflections or videos on GEA_VET LMS or WhatsApp group	● Share one local innovation they will apply ● Comment on peers' posts

Materials (What trainers need to have prepared):
● Feed samples (Napier, *Calliandra*, maize stover, silage) ● PPE, urea, mixing tools, plastic sheeting ● Android devices with FeedCalc, FAO e-Feed, GEA_VET LMS, and WhatsApp group set-up ● Scenario brief, job-cards, and micro-business plan template ● Short video clips from PastureBase Ireland and LIFE Green Sheep
Other notes:

PART 3 – ACTIVITY GUIDE

DESCRIPTION OF THE ACTIVITIES

1. "Feed for the Future" – Problem Based Learning Activity

In this activity, learners receive a short story about a dairy farmer who is facing drought and a shortage of animal feed. Working in small mixed groups, they discuss what is happening, what the farmer can do, and which local feed sources can help (such as maize stover, Napier grass, or *Calliandra*). Each group thinks about how to plan feed for the next season and how to make sure animals keep producing milk even during dry periods. The trainer helps them ask the right questions and guides them toward practical and affordable ideas—like making silage, planting fodder trees, or treating stover with urea.

Why it's useful: It helps farmers and learners think critically, work together, and plan ahead instead of waiting for problems to happen.

European Example: In Europe, the LIFE Green Sheep Project showed that good-quality feed reduces methane and increases milk. Kenyan farmers can use the same logic with local plants and storage methods.

1. **Aim of the activity:** Develop critical thinking and collaborative problem-solving skills by applying local feed resources and planning strategies to improve dairy resilience during drought.

2. **Duration**: 40 min

3. **Material required:**

- Printed case story
- Flipchart paper
- Markers

4. **Step-by-step instruction of the task/practical exercise/case study:**

➢ Read and understand the farmer case story

- ➢ Identify the main feed and production challenges
- ➢ Discuss locally available feed options
- ➢ Propose short-term and long-term feed strategies
- ➢ Prepare and present group solutions
- ➢ Trainer-led discussion and refinement of ideas

References/Sources/Further materials:
https://life-green-sheep.eu/

2. Hands-on-Demonstration & Peer Coaching

This session takes place on the farm. The trainer shows how to check the quality of feeds by looking, touching, and smelling. Learners see examples of good hay, bad hay, and properly made silage. Then, the trainer demonstrates how to treat maize stover with urea and how to make and seal a silage pit step by step. Each group repeats the process while others watch and give feedback. After that, groups change roles—each team teaches the next one what they just learned ("teach-back").

Why it's useful: Learners see, do, and teach, which helps everyone remember. Women farmers gain confidence handling new tools and techniques.

European Example: In Ireland's PastureBase Project, farmers learn to test feed quality with simple tools and share results with neighbours. The same teamwork spirit can be used in Kenya with local feed samples and photos shared on WhatsApp.

1. **Aim of the activity:** Build practical skills and confidence in assessing feed quality and applying low-cost feed conservation techniques through hands-on practice and peer learning.
2. **Duration**: 45 min
3. **Material required:**

- Feed samples (good hay, poor hay, silage)
- Maize stover
- Urea, water, and mixing container
- Plastic sheets or silage pit materials
- Protective gloves
- Flipchart and markers

4. **Step-by-step instruction of the task/practical exercise/case study:**

- ➢ Demonstrate visual, touch, and smell assessment of feed quality
- ➢ Identify characteristics of good and poor feeds
- ➢ Demonstrate urea treatment of maize stover

- ➢ Demonstrate silage pit preparation and sealing
- ➢ Group practice with peer observation
- ➢ Teach-back and peer coaching
- ➢ Trainer feedback and clarification

References/Sources/Further materials:
https://teagasc.ie/crops/grassland/pasturebase-ireland/

3. Mini-Enterprise Challenge: "Feed Bank Startup"

Learners imagine that they want to start a small community business to help farmers store feed for dry seasons. The trainer explains what a "feed bank" is—where silage or fodder trees are grown, stored, or sold when other feeds are scarce. Groups list what they would need: materials, people, time, and costs. They make a small "business plan" on paper and present it to others. The best ideas can later become real group projects supported by cooperatives or training centres.

Why it's useful: It helps young people and women see that good feed can also be a business, not only farm work. It builds entrepreneurship and confidence.

European Example: In Spain and Portugal, the Dehesa Silvopastoral System combines trees, pastures, and livestock to make farms more profitable and resilient. In Kenya, planting and selling fodder trees can follow the same idea.

1. **Aim of the activity:** Encourage entrepreneurial thinking and demonstrate how improved feed management can become a viable community business.

2. **Duration**: 30 min

3. **Material required:**
- Flipchart paper
- Markers
- Simple business plan template

4. **Step-by-step instruction of the task/practical exercise/case study:**
- ➢ Introduce the concept of a community feed bank
- ➢ Identify local feed types and storage options
- ➢ List required resources (materials, labour, costs)
- ➢ Develop a simple mini business plan
- ➢ Present group ideas and receive peer feedback
- ➢ Discuss next steps for real implementation

References/Sources/Further materials:
.https://www.youtube.com/watch?v=HucLsijB87c

4. Digital Simulation & Data Exercise (FeedCalc Practice)

In this activity, learners use a simple mobile app called FeedCalc (or FAO e-Feed). The trainer shows how to enter information like animal weight, type of feed, and price. The app calculates how much feed each animal needs and whether it's balanced for energy and protein. Learners try the same calculation by hand and compare results. They discuss why using an app can save time and help reduce mistakes.

Why it's useful: It makes learners more comfortable using digital tools for farming. It also helps them understand how better feed means fewer emissions and healthier animals.

European Example: In Ireland's Smart Farming Programme, farmers use similar apps to plan feed and reduce costs. Kenyan farmers can do this on smartphones—even offline

1. **Aim of the activity:** Build practical skills in using digital tools to plan balanced rations and improve feed efficiency in livestock systems.

2. **Duration**: 25 min

3. **Material required:**

- Smartphones (with FeedCalc or FAO e-Feed installed)
- Printed manual calculation worksheet
- Calculator (optional)
- Flipchart and markers

4. **Step-by-step instruction of the task/practical exercise/case study:**

➢ Introduce the FeedCalc (or FAO e-Feed) application
➢ Demonstrate data entry and result interpretation
➢ Learners complete app-based feed calculations
➢ Perform the same calculation manually
➢ Compare results and discuss differences
➢ Reflect on benefits and limitations of digital tools

References/Sources/Further materials:
https://www.ifa.ie/resources/smart-farming-farm-apps/

5. Collaborative Reflection Forum

At the end of the unit, learners record a short 1–2 minute video or write a short message about one new thing they will try on their farm—for example, making silage, planting

fodder trees, or testing feed quality. They upload it on the GEA_VET e-learning platform or send it in the training WhatsApp group. Each learner watches or reads what others shared and writes one encouraging comment or suggestion. The trainer moderates, answers questions, and collects feedback.

Why it's useful: It helps learners reflect, share, and stay connected even after the training. Women and youth can show leadership by explaining practices in their own words.

European Example: The EIP-AGRI Knowledge Exchange Platform in Europe uses the same idea—farmers teach each other by sharing stories and short videos online.

1. **Aim of the activity:** Encourage reflection, peer learning, and continued engagement by linking training content to real on-farm action.
2. **Duration**: 20 min
3. **Material required:**

- Smartphones
- Internet access or WhatsApp
- GEA_VET e-learning platform access

4. **Step-by-step instruction of the task/practical exercise/case study:**

➢ Reflect on one new practice to apply on the farm
➢ Record a short video or write a brief message
➢ Upload or share the reflection on the platform or WhatsApp group
➢ View or read peers' contributions
➢ Write one supportive comment or suggestion
➢ Trainer moderates discussion and collects feedback

References/Sources/Further materials:
https://eu-cap-network.ec.europa.eu/support/innovation-knowledge-exchange-eip-agri_en