GEAVET TRAINING PROGRAMME FOR CSA

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

KENYA

UNIT 2.2 CLIMATE DATA FOR FARM DECISIONS

ENGLISH VERSION

GEAVET Project n° 101129027

Open Educational Resources

PART I – LEARNING MATERIAL

1. Introduction

For generations, Kenyan farmers have relied on the way things "used to be" — planting when the hills turned green, when a certain tree flowered, or when elders said the rains come. That approach worked when seasons were reliable. But now the climate is shifting. Rain may start late, stop early, come in heavy downpours, or fail altogether. Dry spells last longer. The uncertainty is increasing.

That change matters because much of Kenyan agriculture is rain-fed, meaning farmers depend on timing, amount, and distribution of rainfall for success. If you prepare land, buy seed, labour, and fertilizer (all expecting the usual rains) and those rains don't behave, you risk losing everything. On the other hand, imagine receiving a message on your mobile phone: "*Your county's forecast suggests below-normal rainfall this season. Delay maize planting; consider sorghum or cowpeas.*" That's not fantasy. It's now possible.

This unit is about how you, the farmer or VET-learner in Kenya, can use free and reliable climate information to plan smartly for crops and livestock. It's not about turning you into a meteorologist. It's about giving you tools so you can plan instead of just reacting.

2. Why climate data matters for your Kenyan farm

Kenya has two main rainy seasons: the "long rains" (March–May) and the "short rains" (October–December). Because so much depends on rainfall, any shift means higher risk. If you plant too early expecting the long rains and they come late, your seeds may rot or weak germinate. If rains stop early or you get dry spells mid-season, crops can die. For livestock, if pasture fails, water disappears, or heat intensifies, production drops. When you use forecast information you can reduce risks: delay planting, choose more drought-tolerant crops, prepare feed, save water, adjust labour. That shift from "reacting to what happens" to "planning for what's likely" is what gives you resilience.

3. Understanding basic terms

Here are key terms you must understand:

- **Seasonal Forecast:** A prediction for the next 2-3 months (or the coming season) about rainfall and temperature for your county or zone. For example: "Rainfall likely below-normal in your area in October–December."(Kenya Meteorological Department)
- **Onset of Rains:** Approximate date when the rainy season begins in earnest (not just one shower).

- **Dry Spell:** A pause of several days without rain during the rainy season that can harm crops or pasture.
- **Drought Alert:** An official warning from authorities that rainfall will be significantly below normal indicating you must change plans.
- **Rainfall Probability:** The chance (often expressed in percent) that rainfall will be above/normal/below-normal.
- **Above-normal/ Normal/ Below-normal:** Categories used in forecasts. "Below-normal" means less rain than usual.

When you receive a forecast in these terms, you should ask: *What decision must I make based on this? What planting date, what crop, what livestock plan?*

4. Where Kenyan farmers can access reliable climate information?

You do not need complex equipment. You need the right channel, be it SMS, mobile app, radio, or extension.

- The Kenya Meteorological Department (KMD) provides seasonal forecasts and updates. KMD
- KMD publishes county-specific advisories: e.g., for Siaya County the OND 2025 forecast shows "Normal tending to Below Normal rainfall, fair to poor distribution" for parts of the county. KMD
- Digital climate services for small-scale Kenyan farmers have been developed (translating raw climate data into farmer-friendly advice). Copernicus Climate Change Service+1
- Traditional media (radio bulletins in local languages), SMS services, farmer-group WhatsApp/SMS networks often distribute the forecasts or simplified versions.
- Extension officers and cooperatives usually have printed forecast summaries or can explain them during village meetings.

Important reminder: Use official or verified sources like KMD, trusted apps, local extension. Avoid unverified social media posts unless they come from trusted services.

5. How weather patterns affect crops and livestock in Kenya

Crops:

- If the onset is delayed, planting too early often fails.
- If rains stop early, crops may mature prematurely or yield less.
- Heavy, poorly distributed rainfall → soil erosion, washed seeds/seedlings, fertilizer leaching.
- Long dry spells during the rainy season → failure in maize, beans, vegetables.

Livestock:

- In pastoral or mixed areas, below-normal rainfall means poor pasture regeneration, more feed costs, weaker animals. For example, in the 2025 long-rains season, rangeland conditions improved in many parts: “March–May long-rains were 35 – 55% above long-term average” in northern-northeastern Kenya. FAOHome
- Heat stress reduces milk yield, fertility; floods increase disease risk in animals.

Recognising how forecasted weather links to these risks lets you adjust. For example: if below-normal rainfall is forecast, you might reduce the area under maize, switch to sorghum/cowpeas, or prepare feed reserve for livestock.

6. How to use a seasonal forecast for decision-making on your farm

You don’t need to be an expert. Focus on three clear questions:

1. Will rainfall likely be above-normal, normal or below-normal this season?
2. When is the onset of rains expected and how long will the season last (or when may it cease)?
3. Are there likely heavy storms, extended dry spells, or other extreme weather events?

Once you know the answers, you plan accordingly:

- **Crop choices:** If below-normal rainfall is expected, choose drought-tolerant crops (e.g., sorghum, millet, cowpeas) instead of long-cycle maize.
- **Planting timing:** Delay planting if onset appears late.
- **Input use:** Reduce seed rate or fertilizer if yield risk is high.
- **Livestock/Feed planning:** Store more feed, conserve water, reduce herd size if pasture will suffer.
- **Labour/equipment scheduling:** Mobilise work when onset is expected; avoid paying for land prep and labour too early.

7. Case study: How climate data transformed farming decisions in Makueni County

For many years, farmers in Makueni County struggled with unpredictable rainfall and frequent crop failures. Maize, the staple crop, was especially affected by false rainfall onsets and prolonged mid-season dry spells. Most farmers traditionally planted in early March as their parents and grandparents had done, even though rainfall patterns had shifted considerably over the last two decades. As a result, many households faced food insecurity, reduced incomes, and high dependency on relief food.

The situation began changing when the Kenya Meteorological Department (KMD), in partnership with the county government and several local cooperatives, introduced a program aimed at helping farmers use climate data in their decision-making. The program combined seasonal forecasts, weekly weather advisories, and SMS-based agricultural tips delivered through the USHAURI App and local radio stations.

Intervention: The intervention involved three major steps:

1. **Farmer training on how to read and interpret seasonal forecasts**
   Extension officers and climate specialists held village-based workshops where farmers learned what terms like "below-normal rainfall," "delayed onset," and "early cessation" meant. They also learned how to interpret rainfall probability maps and ask informed questions about expected patterns.

2. **Introduction of mobile climate advisory tools**
   Farmers were registered on the USHAURI App and iShamba platform, allowing them to receive personalized weather forecasts and crop management suggestions. For example:
   - "Delay planting until April 8–15 due to false onset likelihood."
   - "Expect a dry spell next week; irrigate vegetables early."
   - "Consider pigeon peas and sorghum due to below-normal seasonal rainfall."

3. **Application of climate data in farm planning**
   Farmers began adjusting planting dates, crop choices, fertilizer application timing, and irrigation schedules based on the data they received. Cooperative leaders used the forecasts to organize shared resources such as tractors, water pumps, and labor.

8. References

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PART 2 – CURRICULUM

Learning Objectives:

KNOWLEDGE	SKILLS	ATTITUDES
Students will know: ● The meaning of basic climate terms (e.g., seasonal forecast, drought alert). ● Where to access free and reliable climate information. ● How weather patterns affect crop and animal production in Kenya.	*Student will be able to:* ● Access weather updates via SMS or mobile apps. ● Interpret a simple seasonal forecast map or message. ● Create a simple farm calendar based on a seasonal forecast.	*Student will develop the following mindset:* ● Proactive Planning: Planning farm activities based on expected weather, not just reacting. ● Data-Informed Trust: Valuing weather information as a tool, not just relying on tradition.
TRANSVERSAL SKILLS INTEGRATED: ● **Critical Thinking and Problem Solving:** Analyzing forecast information to make planting and feeding decisions. ● **Adaptability:** Being ready to change farm plans based on new climate information.		
DIGITAL SKILLS INTEGRATED: ● **Digital Literacy:** Using a basic mobile phone to receive SMS alerts or a smartphone to use weather apps. ● **Mobile-Based Advisory Tools:** Using apps like *Kenya Met Department App* or *USHAURI*.		
GREEN SKILLS INTEGRATED: ● **Climate Resilience and Risk Assessment:** Using forecasts to reduce vulnerability to climate shocks like drought.		

Implementation plan of pedagogical activities - Scheme of work

Total Duration: 3 hours
Target: Farmers, youth VET learners, VET trainers

No. of Activity	Duration	Training Methods / Activity	What the trainers do	What the participants do
1.	45 min	Why Climate Data Matters (guided discussion + quick matching exercise)	● Give a short intro on changing seasons ● Explain 5 key climate terms ● Run a quick matching activity (weather situation → correct farm decision)	● Share how they usually plan seasons ● Learn terms ● Match cards ● Briefly justify choices
2.	60 min	Reading a Kenyan Forecast (hands-on interpretation)	● Give printed simplified KMD forecast + county advisory ● Show how to read onset/cessation/probabilities ● Assign small groups to interpret one forecast.	● Read the forecast ● Answer 3 key questions (rain level, onset, risks) ● Propose adapted crop/livestock decisions ● Present 2-minute summary.
3.	45-60 min	Build a Simple Farm Calendar (practical planning)	● Provide a 3-month farm calendar template + a forecast scenario ● Guide groups to fill it with planting, inputs, livestock feed/water	● Use forecasts to fill the calendar ● Adjust timing of planting/inputs ● Add feed/water plans

			based on the forecast.	● Share their calendar with class.

Materials (What trainers need to have prepared):

- Flipchart + markers.
- Weather situation cards + decision cards (Activity 1).
- Printed simplified KMD seasonal forecast + 1 county advisory.
- Short group task sheet with "3 key questions."
- Farm calendar template (3 months).
- Optional: phone screenshot of forecast / SMS sample.

Other notes:

- Keep explanations simple and visual.
- Push participants to say "what I would do differently on my farm" after reading forecasts.
- Ensure at least one digital action (SMS/app example) is shown.

PART 3 – ACTIVITY GUIDE

DESCRIPTION OF THE ACTIVITIES

1. From Tradition to Forecasts: Why Climate Information Improves Farm Decisions

This activity helps participants understand why relying only on traditional signs is no longer enough due to changing rainfall patterns in Kenya. Farmers compare old decision-making methods with today's realities and learn basic climate terms such as seasonal forecast, onset, dry spell, and drought alert. Through a simple matching exercise using situation cards and decision cards, participants practise linking climate events to suitable farm actions. The goal is to show clearly how climate information supports better planning, reduces losses, and complements farmers' existing knowledge.

1. **Aim of the activity:** To build awareness of why climate information is essential for modern farming and practise linking climate situations to correct decisions.

2. **Duration**: 45 minutes

3. **Material required:**
   - Situation cards
   - Decision cards

- Flipchart
- Markers

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

➢ Trainer introduces climate changes and key terms.
➢ Participants share quick experiences of past failed seasons.
➢ Groups receive situation + decision cards.
➢ Groups match correct pairs.
➢ Each group shares one example.
➢ Trainer summarises key learning.

References/Sources/Further materials:

No specific references or further materials are required.

2. Reading a Kenyan Seasonal Forecast (Interpreting a Seasonal Forecast: Onset, Rainfall Levels, and Risks)

This activity trains participants to read a simplified Kenyan seasonal forecast and a county advisory, focusing on rainfall categories, onset/cessation dates, and forecasted risks. In small groups, they analyse a real or adapted forecast and answer three essential questions: expected rainfall amount, timing of the rains, and possible threats such as dry spells or storms. They then propose practical farm decisions and share quick summaries, helping them move from simply receiving forecasts to actually using them.

1. **Aim of the activity:** To build confidence in interpreting real forecasts and turning them into practical farm decisions

2. **Duration:** 60 minutes

3. Material required:
    - Simplified KMD forecast map
    - County advisory sheet
    - Task sheet.

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

➢ The trainer explains how to read the forecast.
➢ Groups receive forecast + advisory.
➢ Groups answer 3 key questions.
➢ Groups propose decisions based on results.
➢ Groups present a 2-minute summary.

➢ The trainer clarifies and closes.

References/Sources/Further materials:
Further materials:

Kenya Met Department seasonal forecast pages

Short explanatory videos on rainfall variability (local NGOs)

Farmer-friendly leaflets on climate terms (county extension offices)

3. Building a Climate-Smart Farm Calendar (Designing a 3-Month Farm Calendar Using a Seasonal Forecast)

In this activity, participants use a forecast scenario (e.g., below-normal rainfall, late onset) to build a 3-month farm calendar that includes planting dates, input use, livestock feeding, and risk-reduction actions. Working in groups, they fill in a template and justify their choices based on the forecast. This helps them practise proactive planning and adapt farm operations to expected climate conditions rather than fixed traditions.

1. **Aim of the activity:** To train learners to convert forecasts into a practical, actionable farm plan.

2. **Duration**: 45–60 minutes

3. **Material required:**

- Farm calendar template
- Forecast scenario sheet
- Pens

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

➢ The trainer gives a forecast scenario.
➢ Groups receive blank calendars.
➢ Groups fill in activities based on forecast.
➢ Groups adjust timing for late onset/low rainfall.
➢ Groups present their calendar.
➢ Trainer reinforces proactive planning.

References/Sources/Further materials:
No specific references or further materials are required.