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The FarmForward Project: Sustainable and Transformative Strategies for Climate-Resilient Agriculture in VET

WP2

Climate-Resilient Farming Handbook

Handbook 8

Adaptive Farm Management Practices

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The FarmForward Project: Sustainable and Transformative Strategies for Climate-Resilient Farming in VET

(2024-1-LT01-KA220-VET-000248582)

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Introduction

Adaptive farm management practices are increasingly recognized as essential tools for enhancing the resilience and sustainability of agricultural systems in the face of climate variability, resource constraints, and socio-economic pressures. These practices emphasize whole-farm strategies that not only reduce exposure to environmental and economic risks but also accelerate recovery from adverse events. By integrating diverse approaches such as crop rotation, diversified livestock management, precision irrigation, and soil conservation, farmers can maintain productivity while safeguarding critical resources like water and soil.

Such strategies reflect the growing expectations of stakeholders, including policymakers, environmental organizations, and market actors, who prioritize sustainable resource management and long-term ecosystem health. At the same time, they address the practical needs of learners and emerging farmers, who seek actionable, hands-on solutions that build readiness for real-world challenges. By bridging strategic planning with operational flexibility, adaptive farm management offers a framework for resilient, resource-efficient agriculture that aligns environmental stewardship with economic viability.

Learning Objectives

- Build adaptive plans (Standard Operating Procedures – SOPs) for drought, flood, heat, and market shocks.
- Redesign farm layouts/operations for resilience and resource efficiency.
- Use basic climate finance/insurance tools in teaching farm planning.

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Risk Mapping & Contingency Planning

To systematically identify risks to farm operations, determine critical assets, define triggers, and plan responses to maintain resilience under climate, market, or operational shocks.

1. Risk Mapping

Risk Type	Critical Assets at Risk	Impact	Probability	Notes / Observations
Drought	Soil moisture, crops (wheat, maize, sunflower, vegetables), water reservoirs, livestock	Reduced yields, livestock stress, water scarcity	High in summer	Consider SPI monitoring
Flood	Fields, irrigation systems, storage barns, machinery, livestock	Crop loss, soil erosion, infrastructure damage	Moderate	Flash floods in valleys; river overflow
Heatwave	Sensitive crops, vineyards, orchards, livestock, farm workers	Leaf burn, reduced pollination, livestock stress, worker safety	High in July-August	Monitor NIMH heat alerts
Market Shocks	Crop/livestock revenue, input supply, storage, cooperative contracts	Revenue loss, cashflow shortages	Moderate	Price volatility, export restrictions
Pest/Disease Outbreak	Crops, livestock, stored produce	Yield loss, animal morbidity	Moderate	Monitor early signs, implement integrated pest management
Input Shortages	Seeds, fertilizers, feed, water	Reduced production capacity	Moderate	Diversify suppliers; maintain reserves

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2. Critical Assets

- **Crops:** High-value, perishable, or staple crops.
- **Livestock:** Dairy, poultry, pigs, or small ruminants.
- **Infrastructure:** Storage, barns, irrigation, drainage systems.
- **Water Resources:** Reservoirs, ponds, wells.
- **Financial/Market Access:** Cash reserves, cooperative agreements, insurance coverage.
- **Farm Workforce:** Skilled labor and farm managers.

3. Triggers

- **Drought:** $SPI \leq -1.0$ or soil moisture $< 50\%$ of field capacity.
- **Flood:** River levels within 1m of critical height, heavy rainfall $> 50\text{mm/day}$, NIMH warning Orange/Red.
- **Heatwave:** Air temperature $\geq 35^\circ\text{C}$, soil temperature $> 30^\circ\text{C}$, livestock showing heat stress.
- **Market Shock:** Price drop $> 20\%$ below seasonal average, input unavailability.
- **Pest/Disease:** Rapid crop damage, high mortality in livestock.
- **Labor/Equipment Shortage:** Reduced workforce or broken machinery during critical growth/harvest periods.

4. Response Trees (Decision Pathways)

Example: Drought Response Tree

Trigger: $SPI \leq -1.0$ or soil moisture $< 50\%$

Decision 1: Is irrigation available?

- **Yes:** Apply water-saving irrigation (drip, night irrigation)
- **No:** Prioritize high-value crops and livestock; ration water

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Decision 2: Are crops at critical growth stage?

- **Yes:** Apply mulch and protective covers, adjust fertilization
- **No:** Delay non-essential field activities

Decision 3: Is forage/feed sufficient?

- **Yes:** Maintain herd; monitor livestock closely
- **No:** Reduce herd size, source emergency feed

5. Contingency Actions by Risk Type

Risk	Immediate Actions	Medium-Term Actions	Long-Term Adaptation
Drought	Activate irrigation, ration water, prioritize crops	Mulching, cover crops, stockpiling	Drought-tolerant varieties, water storage expansion
Flood	Evacuate livestock, sandbag fields, secure machinery	Clear drainage, temporary repairs	Raised beds, flood-proof infrastructure
Heatwave	Provide shade, fans, water for livestock, reschedule work	Irrigate early/late, temporary shade nets	Heat-tolerant varieties, barn ventilation systems
Market Shock	Delay sales, access emergency funds, adjust production	Seek alternative markets, optimize storage	Diversify crops, cooperative agreements, value addition
Pest/Disease	Quarantine affected areas, targeted treatment	Implement integrated pest management	Crop rotation, resistant varieties
Input Shortage	Source alternative suppliers, ration inputs	Bulk storage, community sharing	Long-term supplier contracts, local seed systems

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6. After-Action Review (AAR)

Purpose:

Assess performance of the contingency plan, identify gaps, and improve adaptive capacity.

Process:

1. **Event Description:** Summarize what happened, duration, and intensity.
2. **Impact Assessment:** Record losses (crop, livestock, financial, labor).
3. **Response Effectiveness:** Evaluate which actions worked and which didn't.
4. **Lessons Learned:** Identify gaps in monitoring, resources, or decision-making.
5. **Plan Update:** Adjust triggers, critical assets, and response trees accordingly.
6. **Documentation & Sharing:** Share outcomes with cooperatives, extension services, and local authorities.

7. Implementation Tips

- Maintain real-time monitoring tools for climate and market indicators.
- Keep emergency resources ready: water tanks, sandbags, feed reserves, cash reserves.
- Train farm staff in decision-making under risk using response trees.
- Conduct annual simulation exercises for drought, flood, heat, and market shock scenarios.
- Integrate the SOP into cooperative or community-level contingency plans.

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Water Resources Planning

To optimize water availability, maintain crop and livestock productivity, and increase resilience to climate variability, especially droughts and heatwaves.

1. On-Farm Water Storage

Goal: Ensure reliable water supply for irrigation and livestock during dry periods.

Key Actions:

- Install water tanks, cisterns, and ponds on-farm.
- Use covered or shaded tanks to reduce evaporation.
- Regularly clean storage to prevent contamination.
- Connect tanks to irrigation lines and livestock troughs for efficient distribution.
- Monitor water levels using simple gauges or automated sensors.

Capacity Guidelines:

- Livestock: 50–100 liters per animal per day depending on species and season.
- Crops: Calculate irrigation requirement based on crop type, growth stage, and evapotranspiration.

2. Micro-Reservoirs

Goal: Capture and store rainwater or runoff for targeted use.

Key Actions:

- Construct small-scale earth banded reservoirs in low-lying areas or depressions.
- Use reservoirs to harvest rainwater from roofs or terraces.

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- Line reservoirs with clay or impermeable material to reduce seepage.
- Connect reservoirs to drip or sprinkler irrigation systems.
- Incorporate vegetative buffer strips around reservoirs to reduce sedimentation.

3. Water Reuse

Goal: Maximize efficiency by reusing available water safely.

Key Actions:

- Collect and reuse runoff from farm buildings, greenhouses, or washing operations for irrigation.
- Treat or filter water from ponds/reservoirs before applying to sensitive crops.
- Use tailwater recovery systems in furrow or surface irrigation.
- Avoid reuse of water contaminated with livestock waste unless properly treated.

4. Water Allocation Rules

Goal: Prioritize water use based on farm priorities, critical assets, and risk levels.

Rules & Guidelines:

1. Prioritize livestock drinking water first during droughts.
2. High-value crops (vegetables, orchards, vineyards) are next for irrigation.
3. Staple crops (maize, wheat, sunflower) receive remaining water.
4. Rotate irrigation between fields to optimize limited water supplies.
5. Reduce non-essential water use (e.g., cleaning, landscaping) during scarcity.
6. Record allocations daily and adjust according to weather forecasts and soil moisture.

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5. Monitoring & Maintenance

- Install water meters or level indicators for storage tanks and reservoirs.
- Schedule regular maintenance for pumps, pipes, and filters.
- Maintain a water balance log: inputs, consumption, losses, and reuse.
- Review allocations weekly and adjust based on crop growth stage, rainfall, and forecasted heat/drought events.

6. Contingency Planning

- Prepare emergency water sources: neighboring farm agreements, municipal supply, or trucking.
- Store additional feed and fodder to reduce water demand for irrigation-dependent crops.
- Include water resource planning in farm SOPs for drought and heat.

Expected Outcomes:

- Reliable water availability during droughts and heatwaves.
- Reduced water wastage and improved efficiency.
- Protection of livestock and high-value crops.
- Increased farm resilience and adaptive capacity.

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Infrastructure & Layout

To design farm infrastructure that protects crops, livestock, soil, and workers from climate hazards while optimizing operational efficiency.

1. Windbreaks

Goal: Reduce wind damage, soil erosion, and moisture loss.

Key Actions:

- Plant tree or shrub rows perpendicular to prevailing winds around fields and orchards.
- Choose native, fast-growing species for durability and low maintenance.
- Maintain 3–5 m wide windbreaks with staggered planting for maximum effectiveness.
- Inspect and prune regularly to maintain structure and airflow.
- Integrate hedgerows for biodiversity and habitat where possible.

Benefits:

- Reduced crop lodging (especially cereals).
- Protection for young orchards and vegetables.
- Improved microclimate and moisture retention.

2. Shade Structures

Goal: Protect livestock, workers, and sensitive crops from heat stress.

Key Actions:

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- Construct shade roofs, nets, or pergolas over greenhouses, nurseries, or high-value crops.
- Provide shaded areas for livestock in pastures or barns using trees or artificial structures.
- Ensure adequate ventilation under shade to prevent overheating.
- Use movable shade nets for seasonal crops.

Benefits:

- Reduced heat stress for livestock and workers.
- Minimized sunburn and leaf scorch on crops.
- Improved productivity during heatwaves.

3. Drainage Systems

Goal: Prevent waterlogging, soil erosion, and crop/livestock loss during heavy rainfall or flooding.

Key Actions:

- Install field ditches, surface drains, and culverts to redirect excess water.
- Maintain regular clearing of drainage channels to prevent blockages.
- Use raised beds or ridges in fields to improve surface water flow.
- Incorporate subsurface drainage for sensitive crops in flood-prone areas.

Benefits:

- Reduced crop and soil damage from floods.
- Protection of farm buildings and infrastructure.
- Enhanced efficiency of irrigation systems.

4. Erosion Control

Goal: Prevent topsoil loss, maintain soil fertility, and protect water quality.

Key Actions:

- Plant cover crops and maintain crop residues to protect soil surface.
- Build terraces, bunds, or check dams on sloped fields.
- Use grass strips or riparian buffers along waterways.
- Avoid excessive tillage; adopt conservation tillage or no-till practices.

Benefits:

- Maintains soil structure and fertility.
- Reduces sedimentation in waterways.
- Enhances water infiltration and retention.

5. Traffic & Farm Layout Planning

Goal: Minimize soil compaction, improve operational efficiency, and enhance safety.

Key Actions:

- Design field roads and paths for machinery and transport to avoid compaction of high-value areas.
- Establish dedicated routes for livestock movement, irrigation maintenance, and harvesting operations.
- Plan parking, storage, and loading areas to optimize workflow and reduce damage to crops.
- Separate high-traffic zones from sensitive crops and pasture areas.

Benefits:

- Reduced soil compaction and improved crop growth.
- Safer and more efficient farm operations.
- Easier access for irrigation, drainage, and maintenance.

6. Integration of Infrastructure

- Combine windbreaks with shade and erosion control (e.g., trees along slopes).
- Drainage systems should be integrated with field layout and traffic plans to prevent water accumulation in roads and paths.
- Consider multi-functional structures: shade trees that act as windbreaks and provide biomass.
- Maintain a master farm map showing infrastructure, field layout, and access routes for monitoring and emergency planning.

Expected Outcomes:

- Increased crop and livestock resilience to climate extremes.
- Reduced soil erosion and water damage.
- Optimized farm efficiency and workflow.
- Safer working environment for farm staff.

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Labor & Welfare Under Heat

To safeguard the health and productivity of farm workers and animals during heat stress events while maintaining operational continuity.

1. Work Schedules

Goal: Minimize heat exposure during peak temperatures.

Key Actions:

- Schedule fieldwork in early morning (5–9 am) and late evening (6–9 pm).
- Avoid heavy manual labor during peak heat hours (11 am – 4 pm).
- Rotate staff between high-exposure and shaded/indoor tasks.
- Implement shorter shifts with frequent breaks during heatwaves.
- Use heatwave alerts (NIMH) to adjust daily schedules dynamically.

2. Hydration & Nutrition

Goal: Prevent dehydration, heat exhaustion, and heatstroke.

Key Actions:

- Provide easy access to clean drinking water at multiple points in the field and barns.
- Encourage workers to drink water every 20–30 minutes, even without feeling thirsty.
- Supply electrolyte solutions during prolonged exposure.
- Include light, high-water-content foods (fruits, vegetables) in meals.
- Educate workers to recognize early symptoms of heat stress (dizziness, fatigue, cramps).

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3. Personal Protective Equipment (PPE)

Goal: Protect workers from sunburn, heat, and occupational hazards.

Key Actions:

- Use lightweight, breathable clothing in light colors.
- Provide wide-brimmed hats or caps, and UV-protective sunglasses.
- Use gloves and boots suitable for the task but breathable where possible.
- Apply sunscreen on exposed skin during extended outdoor work.
- Ensure PPE does not restrict airflow or trap heat.

4. Animal Shelter & Ventilation

Goal: Reduce heat stress in livestock and improve productivity.

Key Actions:

- Provide shaded areas in pastures using trees, shade nets, or roofs.
- Ensure barns have adequate ventilation (natural or mechanical fans).
- Install misting or sprinkler systems in high-density livestock areas.
- Provide continuous access to clean water, especially for dairy and poultry.
- Adjust feeding times to cooler hours (morning/evening).
- Monitor animals for panting, drooling, or reduced feed intake.

5. Monitoring & Early Warning

Goal: Anticipate heat stress and take preventive measures.

Key Actions:

- Track daily temperature and humidity forecasts (NIMH).

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- Use heat index thresholds to trigger protective measures:
 - **Moderate risk:** 30–34°C → implement hydration & schedule adjustments;
 - **High risk:** 35–38°C → limit outdoor work, provide shade, use PPE;
 - **Extreme risk:** >38°C → suspend non-essential field activities.
- Record any incidents of heat-related illness for review and improvement.

6. Post-Heatwave Recovery

Goal: Restore health, evaluate impact, and improve future resilience.

Key Actions:

- Provide rest and recovery periods for workers after heatwave events.
- Evaluate livestock productivity and health impacts; provide electrolytes or supplements as needed.
- Review effectiveness of schedules, hydration, PPE, and ventilation.
- Update SOPs and training materials based on lessons learned.

Expected Outcomes:

- Reduced risk of heat-related illness for workers.
- Maintained productivity during heatwaves.
- Livestock protected from heat stress.
- Improved farm-wide awareness and preparedness.

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Record-Keeping for Resilience

To systematically monitor farm performance, resource use, and environmental indicators, enabling adaptive management and long-term resilience.

1. Key Performance Indicators (KPIs)

KPI	Purpose / How to Measure	Target / Notes
Yield Stability	Track crop yields across seasons to identify trends and variability	Compare actual yield vs. historical average; goal: minimize fluctuations
Water Use Efficiency (WUE)	Crop yield per unit of water used	kg/m ³ or tons/ha per m ³ ; includes rainfall + irrigation
Soil Organic Matter (%)	Indicator of soil fertility and resilience	Aim for ≥3–5% for arable soils; test annually
Livestock Health & Productivity	Milk, meat, egg production, mortality rates	Monitor monthly or per production cycle
Input Efficiency	Fertilizer, seed, and feed usage per unit yield	Reduce wastage, increase efficiency
Crop Diversification Index	Number of crops / total farm area	Higher index = greater resilience to market/climate shocks
Irrigation Coverage	% of fields receiving timely irrigation	Goal: maximize coverage with minimal water use
Pest/Disease Incidence	Number of affected plants/animals	Early detection allows rapid response

2. Record-Keeping Templates / Dashboards

A. Crop & Yield Log (Monthly/Seasonal)

Field / Plot	Crop	Planting Date	Harvest Date	Yield (kg/ha)	Notes (weather, pests, irrigation)
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Tip: Use color-coded circles:

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-  Yield on target
-  Slightly below average
-  Significantly below target

B. Water Use & Irrigation Log

Field / Plot	Irrigation Date	Method (drip/sprinkler)	Water Applied (m³)	Soil Moisture	Notes
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Tip: Track **WUE (kg/m³)** next to each field for quick efficiency monitoring.

C. Soil Health Dashboard

Field	Sample Date	Organic Matter %	pH	Nutrient Notes	Action Taken
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Color indicators:

-  OM ≥4%
-  OM 3–4%
-  OM <3% → apply compost or green manure

D. Livestock & Welfare Log

Animal Type	Number	Health Status	Feed/Water Provided	Mortality	Notes
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Tip: Include **shade/ventilation status** during heat events.

E. Market & Income Tracking

Product	Quantity Sold	Price / kg	Revenue	Input Costs	Net Income	Notes
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Quick check:

-  Profitable

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- ⚠ Break-even
- ✖ Loss

3. Simple Dashboard Concept

- **Color-coded indicators:**
 - ✓ Green = On target
 - ⚠ Yellow = Attention needed
 - ✖ Red = Action required
- Visual bars for **yield, water use, and organic matter trends**
- Monthly trend charts for **crop performance vs. rainfall/temperature**
- Quick summary table of **high-risk fields or livestock groups**

KPI	Target	Current	Status
Yield Stability	±10% from average	—	✓ ⚠ ✖
Water Use Efficiency	>1 kg/m ³	—	✓ ⚠ ✖
Soil Organic Matter %	≥3–5%	—	✓ ⚠ ✖
Crop Diversification	3+ crops/ha	—	✓ ⚠ ✖
Pest/Disease Incidence	<5%	—	✓ ⚠ ✖

4. Implementation Tips

- Use notebooks, spreadsheets (Excel/Google Sheets), or farm apps for easy recording.
- Update daily/weekly to maintain accuracy.
- Review KPIs monthly or per season to adjust irrigation, planting, or livestock management.
- Share dashboards with cooperatives or extension officers for support and benchmarking.

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- Update weekly for crops, monthly for soil & KPIs.
- Use markers or stickers to quickly indicate status in the field.
- Keep a master sheet for annual summary for finance, insurance, or extension services.

Expected Outcomes:

- Improved decision-making based on real farm data
- Early detection of stress (climate, market, pest)
- Better resource use efficiency (water, fertilizers, feed)
- Enhanced farm resilience and record for insurance/finance purposes

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Climate Finance & Insurance Basics

To enable farmers to access financial tools that reduce climate-related risks, improve farm resilience, and ensure sustainable investment in adaptive practices.

1. Index-Based Insurance

Definition:

A type of insurance that pays out automatically based on measurable climate parameters (rainfall, temperature, drought index) rather than actual crop loss.

How it Works:

- Payouts triggered when an index exceeds a defined threshold (e.g., $SPI \leq -1.0$ for drought).
- Reduces delays, fraud, and complex loss assessments.

Benefits:

- Quick financial support after extreme events.
- Protects income from droughts, floods, and heat stress.
- Encourages farmers to invest in adaptive practices without fear of total loss.

Considerations:

- Must match index closely to actual farm risk.
- Premiums can be subsidized through government or donor programs.

2. Grants & Subsidies

Definition:

Non-repayable financial support from **government, EU programs, or NGOs** to implement adaptation or climate-smart practices.

Examples:

- **EU CAP (Common Agricultural Policy)** subsidies for water-efficient irrigation, agroecology, or renewable energy.
- **National adaptation grants** for micro-reservoirs, soil conservation, or drought-tolerant crops.
- **NGO or donor funding** for training, equipment, or pilot projects.

Benefits:

- Reduces upfront investment costs for adaptation.
- Encourages adoption of sustainable practices.
- Improves farm resilience and compliance with environmental regulations.

Tips for Farmers:

- Keep records of climate risks and farm investments.
- Document expected benefits (yield stability, water savings) to strengthen applications.

3. Return on Investment (ROI) of Adaptation

Definition:

ROI measures **financial benefits of adaptation measures** relative to the investment cost.

Key Steps:

1. **Calculate Costs:**
 - Investment in infrastructure, irrigation, shade, soil amendments, or insurance premiums
2. **Estimate Benefits:**
 - Yield stability (less loss during drought/flood)
 - Reduced livestock mortality or feed costs
 - Water savings, energy savings, or improved market prices
3. **ROI Formula:**

$$\text{ROI (\%)} = \frac{\text{Financial Benefits} - \text{Costs}}{\text{Costs}} \times 100$$

Example:

- Installing drip irrigation costs 5,000 BGN
- Expected additional revenue/protection = 7,500 BGN
- ROI = (7,500 – 5,000) / 5,000 × 100 = **50%**

Why It Matters:

- Helps prioritize adaptation measures with **highest financial and resilience impact**
- Justifies grant applications or loan requests

4. Key Takeaways for Farmers

- **Combine tools:** Use **index insurance + subsidies** to lower risk and cost.
- **Track benefits:** Document yield, water use, and cost savings to measure ROI.
- **Plan for affordability:** Even small investments in adaptation can have high ROI when targeted at high-risk areas.

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- **Leverage cooperative support:** Cooperatives can negotiate better insurance rates and access grant programs.

5. Practical Implementation Tips

- Check **national and EU funding portals** regularly.
- Maintain **farm records, climate data, and asset inventories** for insurance and grants.
- Evaluate adaptation measures with **simple ROI calculations** before investment.
- Consider **bundled approaches**: drought-tolerant crops + micro-reservoir + index insurance.

Expected Outcomes:

- Increased farm resilience against climate extremes.
- Reduced financial loss from droughts, floods, or heatwaves.
- Optimized investment in adaptive practices.
- Improved access to government and donor funding.

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Self-Assessment Questions

To enable farmers and trainees to evaluate understanding, identify knowledge gaps, and practice decision-making in climate-smart farming scenarios.

1. Self-Check Questions

(Quick yes/no or confidence-based questions for immediate reflection)

1. Do I regularly monitor weather forecasts and climate alerts? ☒ / ☒
2. Have I mapped critical farm assets vulnerable to drought, flood, or heat? ☒ / ☒
3. Do I have on-farm water storage and micro-reservoirs? ☒ / ☒
4. Are my crops diversified to reduce risk from market and climate shocks? ☒ / ☒
5. Do I have plans for labor and livestock management during heatwaves? ☒ / ☒
6. Do I maintain simple records for yield, soil health, water use, and livestock welfare?
☒ / ☒
7. Am I aware of climate finance tools like index insurance or grants/subsidies? ☒
/ ☒
8. Have I reviewed or updated my farm's SOPs for drought, flood, heat, and market shocks? ☒ / ☒

Interpretation: More than 3 “No” answers indicate **areas to prioritize for training or improvement.**

2. Knowledge-Based Questions

(Multiple-choice or short-answer questions to test understanding)

1. What is the main benefit of planting windbreaks around fields?

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- a) Increase soil fertility
- b) Reduce wind damage and moisture loss
- c) Provide shade for workers
- d) None of the above

2. Which irrigation method is most water-efficient during drought conditions?

- a) Flood irrigation
- b) Sprinkler irrigation
- c) Drip irrigation
- d) Manual watering

3. What is the trigger for index-based insurance payouts?

- a) Observed crop loss
- b) Measured climate parameter exceeding threshold
- c) Market price drop
- d) Farmer request

4. Why is crop diversification important for resilience?

Short answer: _____

5. Name two key indicators for livestock heat stress.

Short answer: _____

3. Application-Based Exercises (Short Scenarios / Mini-Cases)

Scenario 1 – Drought Response

Your maize field shows soil moisture below 50% in July, and SPI indicates moderate drought. Irrigation is limited.

Exercise: Describe the step-by-step actions you would take to protect yield and livestock.

Self-Check: Did you prioritize irrigation for high-value crops? Did you ration water for livestock?

Scenario 2 – Flood Event

A sudden heavy rainfall causes 30 cm of water on low-lying fields, and river levels are near critical.

Exercise: Draw a simple response tree showing actions for people, livestock, machinery, and crops.

Self-Check: Did you secure livestock and equipment? Did you communicate with authorities?

Scenario 3 – Heatwave Labor Management

Forecast predicts 38°C for three consecutive days. You have 5 farmworkers and a dairy herd.

Exercise: Plan work schedules, hydration, PPE, and animal shelter use.

Self-Check: Did you reschedule work to cooler hours? Are shaded areas and water points adequate?

Scenario 4 – Market Shock

Tomato prices drop 25% below seasonal average for two weeks, and you have limited storage.

Exercise: Decide which crops to sell, which to store, and how to access cooperative support.

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Self-Check: Did you consider alternative markets or value-added products? Did you track cashflow impact?

4. Scoring & Reflection

Self-Check: Count “Yes” answers; identify areas for improvement.

- **Knowledge-Based:** Score 1 point per correct answer.
- **Application Exercises:** Reflect on practical decisions; discuss with peers or extension officers.

Tip: Keep a notebook or digital log to track **progress over seasons**.

Expected Outcomes:

- Improved understanding of climate-smart practices
- Enhanced decision-making in real farm scenarios
- Identification of training needs or gaps in adaptive capacity
- Ability to link knowledge to practical actions

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Annexes

Glossary

After-action reviews: Structured evaluations conducted after an event or project to analyze what happened, why it happened, and how performance can be improved in the future.

Critical assets: Essential resources, infrastructure, or components whose protection or maintenance is vital for the continued operation and success of a system or organization.

Investment: Allocation of resources, such as time, money, or effort, into activities or assets with the expectation of generating future benefits or returns.

Response trees: Visual decision-making tools that map out possible actions and outcomes in response to specific events, helping guide timely and effective interventions.

Stakeholders: Individuals, groups, or organizations with an interest in or influence over a project, system, or decision, whose needs and perspectives are important for success.

Strategy: A high-level plan or approach designed to achieve specific goals or objectives by coordinating resources and actions effectively.

Triggers: Predefined events, conditions, or thresholds that prompt a specific action or response within a plan or system.

Welfare: The health, safety, and well-being of individuals, communities, or populations, often considered in planning and policy decisions.

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Abbreviations

KPI – Key Performant Indicators

OM – Organic Matter

PPE – Personal Protective Equipment

ROI – Return on Investment

SOP – Standard Operating Procedures

SPI – Standardized Precipitation Index

WUE – Water Use Efficiency

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