



Kenya Climate Smart
Agriculture Project



Climate Smart Agricultural Technologies, Innovations and Management Practices for Finger Millet Value Chain

TRAINING OF TRAINERS' MANUAL



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March 2020

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LIST OF ABBREVIATIONS

TIMP	Technology, Innovation and Management Practices
FFBS	Farmer-led Field Business Schools
GAP	Good Agricultural Practices
CSA	Climate Smart Agriculture
ASAL	Arid and Semi-Arid Lands
PME	Participatory Monitoring and Evaluation
KALRO	Kenya Agricultural and Livestock Research Organization
KCSAP	Kenya Climate Smart Agricultural Productivity
MoALF	Ministry of Agriculture, Livestock, and Fisheries
NPCU	National Project Coordination Unit
CPCU	County Project Coordination Unit
CCT	County Coordination Teams
LFs	Lead Farmers
CIG	Common Interest Group
CTT	Core Team of Trainers
ToT	Training of Trainers

Foreword

Kenya Climate-Smart Agriculture Project (KCSAP) tasked the Kenya Agricultural & Livestock Research Organization (KALRO) with the implementation of the project Component 2, on ‘Strengthening Climate-Smart Agricultural Research and Seed Systems’. The component activities are geared towards the development, validation, adoption and delivery of context specific climate smart agriculture (CSA) technologies, innovation and management practices (TIMPS). The other responsibility was development of sustainable seed production and distribution systems for priority value chains to enhance availability and access to seed, breeds and fingerlings by target beneficiaries under Components 1 (Up scaling Climate-Smart Agricultural Practices). Against this background, KALRO and her NARS partners have developed, validated and availed CSA TIMPS for dissemination and adoption. The TIMPS have further been unpacked during the development of Training of Trainers (ToT) Manuals for use in training public and private extension service providers and lead farmers.

The ToT Manuals are instructional guides to be used for teaching and learning step-by-step procedures of implementing CSA innovations for each of the 13 value chains being addressed. The training content is drawn from the CSA TIMPS that support respective value chains. The content are arranged in progressive modules supported by extensive information from research information and background data drawn from the TIMPS. Their relevance are based on the needs teased out of the value chains and the project objectives. The ToT Manuals training design takes into consideration the delivery system, the partners and their roles, the duration of training and logical flow of the sessions. Similar content requiring similar delivery systems are grouped together while the roles of the partners are tapped in the training and planning of the training sessions.

The Manual is divided into modules, which have a uniform outline that ensures every aspect of the TIMPs are fully covered in way that the trainees can absorb and relate to. Various delivery methods are deployed and where possible demonstrations and practical work are incorporated to enable the trainees learn by participating in the actual field activities. Furthermore, to ensure that the training across various groups is standardized, trainers guidelines, detailed descriptions of the trainees, program, training methods and a training evaluation have been provided in the manual. Adhering to these guidelines, therefore, enables possibility to replicate the training in several locations without loss of details regardless of whether conducted by different trainers.

It is highly advised that the ToT Manuals should be used in conjunction with the respective value chains’ TIMPs documents and facts sheets in order to provide valuable resource for both public and private extension service providers. The use of this Manual is expected to spur increased productivity and resilience by farmers, while mitigating climate change impacts in the value chains to deliver the envisaged ‘Triple Wins’.

I am greatly indebted to the value chain leaders and all those who participated in the preparation of the Manual, which is expected to herald a new way of delivering training content in a changing agricultural environment.

Eliud K Kireger, PhD, OGW
Director General, KALRO

Preface

The Kenya Climate-Smart Agriculture Project (KCSAP) is a Government of Kenya project with support from both the World Bank and the government. It is a five-year project implemented in 24 counties, mainly in the arid and semi-arid lands (ASALs), at a cost of KES. 25B. The project development objective (PDO) is “*to increase agricultural productivity and build resilience to climate change risks in the targeted smallholder farming and pastoral communities, and in the event of an Eligible Crisis or Emergency, to provide immediate and effective response.*” This objective is to be achieved through the implementation of five key components, which are 1) Up scaling Climate-Smart Agricultural Practices, 2) Strengthening Climate-Smart Agricultural Research and Seed Systems, 3) Supporting Agro-weather, Market, Climate, and Advisory Services, 4) Project Coordination and Management and 5) Contingency Emergency Response.

Component 1 involves facilitating the empowering of farmers and communities to adopt technologies, innovations and management practices (TIMPs) to achieve the Climate Smart Agriculture (CSA) triple-wins of; increased productivity, enhanced resilience (adaptation), and reduced Greenhouse gas (GHG) emissions (mitigation). Component 2 is charged with the responsibility of providing the TIMPs. Therefore, it supports the development, validation, and adoption of context specific CSA TIMPS to target beneficiaries under Components 1 and 3 as well as development of sustainable seed production and distribution systems.

To catalyze uptake of TIMPs, Kenya Agricultural & Livestock Research Organization (KALRO) in conjunction with partners in the National Agricultural Research Systems (NARS) and Consultative Group for International Agricultural Research (CGIAR) compiled inventories of TIMPs for each of the 13 prioritized value chains (cassava, Millets, sorghum, millet, pigeon peas, bananas, tomatoes, potatoes, apiculture, indigenous chicken (meat and eggs), dairy (cattle and camel), red meat (cattle, sheep and goats) and aquaculture and 3 cross cutting disciplines(natural resource management, pastures and fodder and animal health). The TIMPs were categorized into those ready for up scaling, those that needed validation and gaps that required further research. Training of Trainers’ (ToT) manuals focusing on TIMPs that are ready upscaling for each of the value chains were subsequently developed and form the basis of training county extension staff, service providers and lead farmers. They are in turn expected to cascade this training to beneficiaries in the targeted smallholder farming, agro-pastoral and pastoral communities in the 24 project counties of Marsabit, Isiolo, Tana River, Garissa, Wajir, Mandera, West Pokot, Baringo, Laikipia, Machakos, Nyeri, Tharaka Nithi, Lamu, Taita Taveta, Kajiado, Busia, Siaya, Nyandarua, Bomet, Kericho, Kakamega, Uasin Gishu, Elgeyo Marakwet and Kisumu.

KALRO having the mandate of implementing of activities under Component 2, has been instrumental in using its information resources and those of partners and collaborators to come up with the inventories of TIMPs and corresponding ToT Manuals. The use of these information resources coupled with the accompanying training and the contribution of the other project components, will go a long way in enabling the KCSAP to meet its development objective.

The National Project Coordination Unit is grateful to all who participated in the development and production of this *Training of Trainers Manual for Climate Smart Agricultural*

Technologies, Innovations and Management Practices for Millet Value Chain. It is my hope that counties and other users will put this resource to good use as they transform and reorient their agricultural systems to make them more productive and resilient while minimizing GHG emissions under the new realities of a changing climate.

Francis Muthami

National Project Coordinator

Kenya Climate-Smart Agriculture Project



PART I

This part consists of four sections including the Background of the Finger Millet value chain, Content of the Training, Training Design and Facilitator Guidelines.



SECTION 1: BACKGROUND

1.1 The Role of Finger Millet Value Chain in the Kenyan Economy

Finger Millet (*Eleusine coracana* (L.) Gaertn. ssp. *coracana*) is a hardy crop that can be grown in diverse environments. The grains can be stored for years without insect damage, which makes it a valuable crop for famine-prone areas for subsistence and food security. It has high nutritive and cultural value. The plant and grain is resistant to drought, pests, and pathogens. In Kenya, the crop is now estimated to be planted on 85,000 ha annually, mostly in the western part of the country (west of the rift valley). The grain yield is low on farmers' fields, ranging between 500 and 750 kg ha⁻¹, against research average yields of 2,500 kg ha⁻¹, and potential of over 5,000 kg ha⁻¹. The low yields have led to low production, low trade, and low consumption, resulting in curtailment of the potential of the crop to contribute to enhanced livelihoods of communities living in Finger Millet producing areas and the country at large.

1.2 The Role of Finger Millet in Food and Nutrition Security

Finger Millet is a high nutritive value small grain crop with excellent storability. It is an important food and nutrition security crop, playing a major role in traditional foods – Ugali and uji (porridge). The grains are a rich source of calcium, iron, dietary fibre, essential amino acids and are free from gluten. There is evidence that foods from Finger Millet are good for diabetic patients. Decortication, puffing, extrusion, and expansion are some of the value addition potentials for the grain. Sprouted grains are recommended for infants and elderly people. Finger Millet is also used to make liquor and local beer - used in many social functions, which yields by-products used for livestock feeding. Apart from the grains, Finger Millet provides sufficient straw, which make good fodder for animal husbandry, containing up to 61 per cent total digestible nutrients.

1.3 Climate Smart Perspectives in Finger Millet

Climate change and increasing global average temperatures have a direct impact on crop yields, productivity and overall sustainability of the food systems. Climate change can directly influence the quality and availability of agricultural production resources such as water and soil, thereby adversely affecting food systems and crop productivity of, especially major cereals such as maize, wheat and rice. Finger Millet provides an alternative cereal due to its inherent ability to grow in adverse conditions which include low-quality soils and low soil moisture. Finger Millet can be cultivated in arid and semi-arid lands (ASALS) for food and income generation because of its tolerance to biotic and abiotic stresses and substantial yield in low-quality lands with minimal inputs.

1.4 Objectives of the Training

The purpose of this training is to enhance the capacity of farmer trainers to provide and promote knowledge and skills among farmers for increased Finger Millet productivity through adoption of appropriate and climate smart technologies, innovations and management practices (TIMPS). Specifically, the objectives of this training are:

- a) Provision of new and relevant knowledge, technologies and skills in Finger Millet farming as a business and market assessment techniques for market led production
- b) Providing farmer trainer's knowledge on improved Finger Millet varieties, good agricultural practices (GAP), including establishment and management of Finger Millet fields
- c) Providing farmer trainers with knowledge and skills in the potential of finger millet value addition at individual or group level
- d) Providing farmer trainers with knowledge and skills in participatory techniques for effective facilitation of adult learning processes through FFBS and developing inclusive stakeholder partnership for sustainable up scaling
- e) Provide trainees with a common understanding of factors around Finger Millet value chain (challenges, opportunities, and policy).

After the training, the trained trainers, as facilitators, will train Lead Farmers (LF) for a season long FFBS session on Finger Millet GAP. The FFBS training will involve providing the LF with techniques in participatory preparation, mobilization, planning, implementation, monitoring and evaluation of training sessions.

The lead farmers shall thereafter up scale the adoption of GAP through farmer groups in their villages and those in the neighbourhood.

SECTION 2: TRAINING MODULE CONTENT

1.1 Orientation of the Modules

The training content is organized in 13 modules which are targeted and orientated to ensure Climate Smart Agriculture practices for Finger Millet are adopted and up scaled to improve productivity, resilience to climate change, and mitigation of harmful greenhouse gases through application of context specific climate smart technologies, innovations, and management practices (TIMPS).

The purpose of this module is to enhance the knowledge and capacities of trainers in understanding and disseminating the climate-smart Finger Millet practices to the intended beneficiaries, who are primarily the farmers.

1.2 Module Outline

Each of the 13 modules consist of eight parts, including:

- a) **Introduction to the module** – context and background to training needs, as well as knowledge and skills gaps being addressed
- b) **Module learning outcomes** – what trainees are expected to learn
- c) **Module target group** - trainee categories
- d) **Module users** – facilitators, Master Trainers
- e) **Module duration** – minimum number of hours of exposure to materials
- f) **Module summary** – sequence of sessions, training methods, materials and duration
- g) **Facilitator’s guideline** – detailed sessions, training methods, materials and session guides
- h) **Participant’s handouts** – detailed notes and reference materials for trainees.

The outline of the 13 modules is presented in Table 1:

Table 1: Summary of the 12 Modules of Finger Millet Value Chain

No	Module Name	Need Addressed	Expected Training Outcomes	Duration
1	Climate Change and climate smart agriculture	Awareness on climatic trends and effects on Finger Millet production Awareness on climate smart technologies for Finger Millet value chain	Trainees made aware of potential impact of climate change on Finger Millet production Trainees updated on climate smart techniques for Finger Millet value chain	4 hours 20 minutes
2	Farmer Field Business School (FFBS) approach	General understanding of FFBS extension approach	Trainees general appreciation of FFBS approach and its transformational potential	
2.1	FFBS Methodology	Sustainability and Effectiveness of Extension Approaches	Identification and Use of participatory monitoring and evaluation (PME) Tools Understood	4 hours 20 minutes
2.2	Facilitation and Communication Skills	Ineffective Communication Between Trainer and Beneficiary	Effective Communication skills understood Roles of A Facilitator in FFBS Clearly understood	3 Hours 25 minutes
2.3	Curriculum Development For FFBS	Lack of Involvement of Beneficiary in Learning Process Planning	Beneficiaries demonstrate ability to develop FFBS Curriculum Based on the 6 Helpers (What, When, How, Where, By Whom,)	3 hours 35 minutes
2.4	Participatory Monitoring and Evaluation of FFBS	Lack of Involvement of Beneficiary in M&E	Ideal notification of PM&E Tools understood Development and use of PM&E Plans understood	4 hours 25 minutes
2.5	Upscaling and Sustaining FFBS	Failure of past projects to plan for up scaling	Lead Farmers and Stakeholders understand Upscaling Adoption of GAP in Finger Millet Through FFBS Model	3 hours 55 minutes

3	Finger Millet production in Kenya and its production niches	<p>Awareness of the status of Finger Millet in Kenya</p> <p>Knowledge on areas of production and crop needs/ suitability maps</p> <p>Awareness of Challenges and opportunities in Finger Millet production in the light of the project triple wins (productivity, resilience, and mitigation)</p>	<ul style="list-style-type: none"> · Common understanding of current production versus the potential production of Finger Millet · Common understanding of current and potential Finger Millet adaptability in Kenya · An appreciation of possibilities to overcome production challenges and take advantage of opportunities in Finger Millet production. 	4 hours
4	Finger Millet Variety Selection and Seed Systems	Awareness of improved Finger Millet varieties	<ul style="list-style-type: none"> · Knowledge of Sources of improved Finger Millet varieties Seed demonstrated · Knowledge of Access to sources of improved Finger Millet varieties Seed demonstrated 	5 hours
5	Finger millet climate-smart agronomic Practices	Understanding Relationship Between Field Operations (timeliness of operations, land preparation, planting, thinning, weeding, and harvesting) Productivity	<ul style="list-style-type: none"> · Awareness on Field Management Practices for increased Productivity. · Exposure to improved Finger Millet field operations 	4 hours
6	Integrated Soil and Water Management Practices for Finger Millet production	<p>Understanding Finger Millet Nutrient Requirements and Management</p> <p>Understanding soil water management (erosion control, water harvesting, and irrigation) for Finger Millet production</p>	<ul style="list-style-type: none"> · Soil Sampling and Results Interpretation Techniques understood. · Understanding of Finger Millet nutrient requirements · Knowledge in Soil Fertility Management Improved knowledge in soil water management for Finger Millet production · Exposure to soil and water management practices 	4 hours

7	Finger Millet Crop Health	Knowledge on Management of Pests (shootfly, stem borers, Striga, etc.) and Diseases (blast, etc.) and safe use of pesticides	<ul style="list-style-type: none"> · Trainees able to identify important finger millet pests and their symptoms, and economic importance. · Trainees able to identify important finger millet diseases, their causes, symptoms and economic importance on productivity. · Trainees able to recommend appropriate pest and disease management practices including IPDM, for increased productivity. · Trainees able to recommend safe use and handling practices of pesticides and other control measures 	5 hours
8	Finger Millet Post Harvest Management	<p>Understanding the importance of Post-harvest crop management for reduced yield and quality losses</p> <p>Improved understanding of Finger Millet harvest processing and storage</p> <p>Awareness of opportunities for value addition in Finger Millet</p> <p>Awareness of available Finger Millet value added products</p> <p>Awareness of the nutritive value of Finger Millet value added food and feed products</p>	<ul style="list-style-type: none"> · Enhanced knowledge on management of post-harvest yield and quality losses · Enhanced knowledge on Finger Millet harvest processing and storage 	4 hours
9	Finger Millet Value Addition		<ul style="list-style-type: none"> · Identification and Prioritization of Post-Harvest Value Addition Opportunities demonstrated · Enhanced understanding of available Finger Millet value added products and their nutritive value 	5 hours

10	Mechanization in Finger Millet Production	Awareness of current and potential mechanization opportunities along the Finger Millet value chain	Enhanced awareness of current and potential mechanization opportunities along the Finger Millet value chain	5 hours
11	Finger Millet Business and Marketing	Understanding Finger Millet business planning, markets, marketing and profitability Awareness on credit and finance opportunities for Finger Millet value chain activities	Enhanced understanding of Finger Millet business planning, markets, marketing and profitability. Enhanced awareness on credit and finance opportunities for Finger Millet value chain activities.	4 hours
12	Finger Millet Cross Cutting Issues (i) Innovation Platforms	<ul style="list-style-type: none"> • Limited knowledge on and understanding of an innovation platform • Limited capacity to mobilize and sensitize stakeholders • Limited knowledge and understanding of initiation and establishment of Agricultural Innovation Platforms • Limited knowledge and understanding of Agricultural Innovation Platform management and sustenance of actors' innovation capacity. 	<ul style="list-style-type: none"> • Trainee knowledge on and understanding of an innovation platform enhanced • Trainee capacity to mobilize and sensitize stakeholders enhanced • Trainee knowledge and understanding of initiation and establishment of Agricultural Innovation Platforms enhanced • Trainee knowledge and understanding of Agricultural Innovation Platform management and sustenance of actors' innovation capacity. enhanced 	5 hours

<p>(ii) Gender mainstreaming and social inclusion</p>	<ul style="list-style-type: none"> • Trainee limited understanding of the concept of gender mainstreaming and social inclusion in Finger Millet. • Trainee limited understanding of youth empowerment in Finger Millet value chain. • Trainee limited understanding of women empowerment in Finger Millet value chain. • Trainee limited understanding of the strategies for inclusion of vulnerable and marginalized groups in Finger Millet value chain. • Trainee limited understanding of socio-cultural barriers in Finger Millet value chain. • Trainee limited Knowledge and understanding of Environmental and social management framework (ESMF) tool. 	<ul style="list-style-type: none"> • Understanding of the concept of gender mainstreaming and social inclusion in Finger Millet value chain enhanced • Understanding of youth empowerment in Finger Millet value chain increased • Understanding of women empowerment in Finger Millet value chain increased • Understanding of the strategies for inclusion of vulnerable and marginalized groups in Finger Millet value chain increased • Understanding of socio-cultural barriers in Finger Millet value chain increased • Environmental and social management framework (ESMF) tool understood and appreciated 	<p>5 hours</p>
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	<ul style="list-style-type: none"> Limited appreciation of the role of agricultural policy frameworks in Kenya Limited appreciation of Climate-smart agriculture practices, policy options and approaches Limited recognition of Climate-smart-sensitive policy cycle. Unrealized implementation of the climate-smart-sensitive policy at the county level. Unevaluated Financing and Investments for Climate-smart Agriculture. Limited appreciation of the need for a Technology Policy. 	<ul style="list-style-type: none"> The role of agricultural policy frameworks in Kenya appreciated Climate-smart agriculture practices, policy options and approaches appreciated Climate-smart-sensitive policy cycle recognised Implementation of the climate-smart-sensitive policy at the county level realized Financing and Investments for Climate-smart Agriculture evaluated The need for a Technology Policy appreciated 	5 hrs
Total Duration			79hours

SECTION 3: TRAINING DESIGN

3.1 Delivery System

The delivery system designed for this training consists of two stages:

1. Establishment of a team of facilitators

- a) A Core Team of Trainers (CTT) will be established to train farmer Master Trainers (service providers) using this manual
- b) Each of the Master trainers will facilitate trainers of farmers and other stakeholders to acquire knowledge and skills in facilitating Farmer-led Field and Business Schools through practical demonstrations.

2. Up scaling

This will be done by selecting lead farmers (LF) to be trained on facilitation skills.

3.2 Partners and their Roles

The partners envisioned in this training plan are:

- a) **Core Team of Trainers** – Master Trainers drawn from KALRO, Universities, and Tertiary Institutions and State Department of Agriculture, MoALF&C. KALRO/NPCU/CPCU will facilitate initial training of farmer trainers who will later be trainers of farmers and other stakeholders. They will also backstop farmers’ trainers during the first year of LF trainings. They should also be available in the evaluation of the first round of LF trainings.
- b) **County Government Department for Crops and Livestock** County Coordination Teams (CCT) including technical departments and service providers will play specific roles of LF trainers, mentors and coordinators at sub-county level. They will assist FFBS’s to form partnership with stakeholders for sustainability. They will also support LF’s to form their training and Finger Millet TIMPs up scaling networks.
- c) **Lead Farmer Networks**-association of LFs in the counties to take up farmer trainings and up scaling in the future. Lead farmer networks and groups will conduct exchange visits to learn best practices in other project implementing counties.
- d) **Private Sector Service Providers** – Inputs suppliers, financial and business development service providers, market players and processors will partner and support growth of individual or Finger Millet farmer groups.

3.3 Training Duration

The proposed initial TOT course for Master trainers for the 13 modules in the Finger Millet value chain shall take a total of **ten days** training period. Programs and

timetables will be developed and will cater for break hours of mid-morning, afternoon and lunch breaks.

1.2 3.3 **Logic of Design and Flow of Sessions**

The logic of design and flow of each module is that the facilitator, paying attention to the proposed methods and sessions guidelines shall: (i) introduce the module; (ii) draw out the trainees' expectations; (iii) relate trainees' expectations with module objectives or learning outcomes; (iv) explore the concept and content, switching to different methods of delivery of the content (group exercise, brainstorming, excursions, plenary discussions, role plays) as the session progresses; (v) review the module at the end using participatory approaches like one trainee reads one summary message and its application; and, (vi) distribute the participants' handouts.

SECTION 4: FACILITATOR GUIDELINES

Guidelines to the Facilitator

- a) Preparation of the trainings materials
- b) Preparation of training venues and sites
- c) The trainees
- d) Training program
- e) Training methods
- f) Planning schedule and guideline for ToT preparation
- g) Evaluation of the training

4.1 Preparation of Training Materials

The training materials suggested require adequate preparations and should be available before the actual training dates. Further:

- a) The facilitators should familiarize themselves and internalize the guidelines provided by this manual prior to the training;
- b) The stationery required should be available within the training institution 3 days before the training. These include name tags, writing materials, paper punch and medium size box files for participants' handouts filing;
- c) Flip charts and good quality felt pens could be used interchangeably with LCD projections. Each trainee will require one felt pen while the trainers will require two sets of felt pens;
- d) Visual aids like field equipment and tools should also be arranged in time before the sessions start;
- e) There should be adequate copies of participants' handouts (one per trainee) to be distributed at the end of each session or as may be suitable; and
- f) Copies of the modules are distributed at the end of each module.

4.2 Preparation of Training Venue and Sites

The training venue will include the training room, field demonstration sites and market areas.

- a) **Training Room** – should have adequate space for 25 trainees seated in a semi-circle or U shape arrangement ensuring access and unobstructed view of the front. There should be adequate space for a desk and seats for 3 trainers preferably at the sides or at the back of the training room. There should also be a desk for the

trainer, their training materials and LCD projector, a flip chart holder and white wall to act as a projector screen.

- b) **Demonstration Site** – Should be within walking distance with at least two plots for practical sessions during field preparation and management exercises.
- c) **Market Sites** – these include Finger Millet retail outlets (Kiosks, stalls, shops and supermarkets), wholesale and aggregation points and processing sites, if any. The operators should be informed in advance about the visits. These should not be very far away, preferably less than 10 minutes' drive distance

4.3 *The Trainees*

The trainees who will participate are extension officers, lead farmers, educators, and researchers with elaborate training background in extension and advisory services. They will be drawn from public and private sector based on considerable experience in training farmers but with minimal facilitative advisory or technology transfer approaches. The facilitator should therefore act more of a facilitator than a lecturer and draw out and build on their knowledge, skills and experience that they shall bring in. As a golden rule, do not lecture them but facilitate and listen and let them feel like equals to each other and the CTT team members.

4.4 *Training Program*

The training program proposed consists of the actual training modules. Health breaks should be considered when drawing the training program. The training program should preferably be based on the outline presented in **Annex 1** to allow flow of ideas and topics. However, should the situation demand; the sequence and day of coverage for whole or parts of the modules can be modified to suit emerging requirements. The training program assumes that the trainees report on Sunday evening as the first day and leave ten days later, on Friday afternoon or Saturday morning.

4.5 *Training Methods*

The training methods proposed for each session are suitable for adult learners and appropriate for addressing knowledge, skills and attitudes of the trainees. The choice of the methods has been informed by the competency issues being addressed, time available and experiences of the author of this manual. Depending on time available, the facilitator can modify these training methods but as a golden rule no presentation by the facilitator should take more than 30 minutes continuously; but should be separated by the other participatory training methods. Table 2 below presents a list of available training methods.

Table 2: Description of training methods

Training Method	Description of Method
Plenary presentations	Use of PowerPoint or flip charts and plenary discussions in situations where knowledge and opinion or consensus is required
Group exercises, buzz groups, visits and brainstorming sessions	To be considered where skills are an issue requiring sharing and trying
Role plays and problem-solving exercises	Plenary discussions have been considered as training methods where attitude is an issue
On-farm practical demonstration and exchange visits	To be considered where hands-on practical skills are acquired through sharing and demonstration

4.6 *Training Sites*

- a) **Demonstration Site** – should be a 5 minutes walking distance with at least five distinct finger millet plots for practicals during pests, diseases and seed selection exercises. a clear but furrowed seed bed should also be available for demonstrations on planting techniques.
- b) **Market Sites** – these include Finger Millet retail outlets (Kiosks, market stalls, pavement sale points, shops and supermarkets), wholesale and aggregation points and processing sites if any. The operators should be informed in advance about the visits. These should not be very far away preferably less than 10 minutes' drive distance will do.

4.7 *Planning Schedule and Guidance for ToT preparation*

While planning for this training, the CTT leader will ensure the following activities before the training as outlined in Table 3.

Table 3: Duration of activities to be done before training

Duration to Training	Activities to be Done
Six weeks	Recruit Master Trainers, compose CTT, identify the practical demonstration sites
Four weeks	Send out invitation letters to trainees and special guests detailing purpose, venue and program. Follow up on demonstration sites. Brief CTT members
Two weeks	Confirm names of trainees; reproduce training materials for facilitators and package, confirm preparedness of the field sites to be visited. Hold briefing of CTT members to finalize training plan. Confirm special guests if any

Four days	Confirm training sites preparedness, prepare sitting arrangements and stationery, and brief assistants
One day	Arrange training room furniture, place materials, equipment and stationery on the tables. Arrange for the reception of trainees at residence proposed
On first day	Arrange for the reception of trainees at the training venue. Ensure climate setting is done before the course is officially opened. This includes: (i) registration, (ii) welcome to the venue by host; (iii) elaborate introduction of CTT and trainees; setting of ground rules; and (iv) formation of groups.

4.8 *Evaluation of the training*

A half day has been allocated for planning for way forward and evaluation of the ToT on the last day of the training. This is as presented in the program just presented in Section 4.4

The evaluation strategy should take two directions the first being the individual trainees evaluate through evaluation forms without conferring or refereeing to each other. The evaluation forms are then collected and analyzed by the CTT members.



Table 4: Individual Sample Evaluation Form

Aspect / Module	Rating		
	Very Useful (3 marks)	Useful (2 marks)	Of Limited Use (1 mark)
1. Climate Change and climate smart agriculture			
2. Farmer Field Business School (FFBS) approach			
3. Finger Millet production in Kenya and its production niches			
4. Finger Millet Variety Selection and Seed Systems			
5. Finger Millet climate-smart agronomic Practices			
6. Integrated Soil and Water Management Practices for Finger Millet production			
7. Finger Millet Crop Health			
8. Finger Millet Harvesting and Post-Harvest Management			
9. Finger Millet value addition			
10. Mechanization in Finger Millet production			
11. Finger Millet Business and Marketing			
12. Finger Millet Cross Cutting Issues			
(i) Innovation Platforms			
(ii) Gender mainstreaming and social inclusion			
(iii) Policy			

The second direction for evaluation is trainee's group evaluation. They retreat to one room and elect a chair and a secretary. Ask them to objectively and constructively evaluate the training in about 45 minutes in the absence of the CTT members. They then present their evaluation to the CTT members and as they present, the CTT members should only give points of clarification if any misunderstanding occurred but not try to be defensive. The CTT members then use the two evaluation results to write a report highlighting

aspects that went on well and can be replicated, challenges that were encountered, and opportunities for future ToT's improvement.

4.9 *Participant's Training Notes and Reference Materials*

4.9.1. List of Finger Millet Publications

The list of Finger Millet publications are divided into two. The detailed list of all publications is summarized in Annex 2:

4.9.2 Guide on the use of the information

The trainers are advised to provide farmers with at most 2 publications for each of the training sessions. This is because if they go away with 10 publications, for example, in one visit they may be overwhelmed with the material load and thus limit knowledge uptake. Also, some will just take away as many as they can if allowed.

The list of all individual publications will be stored and available as electronic copies – mainly PDFs. The service providers are strongly advised to keep these electronic copies on a memory stick, or portable hard drive to enable farmers easily access and, if necessary, print out any of them at a local Cyber Café.

Trainers will be advised to issue a General Millet Farming Manual to be accompanied by two (2) other publications e.g. information sheets, brochures, factsheets, posters, etc. With subsequent training modules, they can develop their collection of publications.



PART II

This part presents the content for the 13 modules of training namely: Climate Change and Climate Smart Agriculture; Farmer Field and Business School Methodology; Finger Millet production and production niches in Kenya; Finger Millet variety selection, Finger Millet seed systems, Good Agronomic Practices, Integrated soil and water management; Crop Protection and Safe and Effective Use of Pesticides; Post Harvest Management; Value added products; Mechanization of Finger Millet production; Agribusiness and marketing; and finally cross-cutting issues in Finger Millet production. Cross cutting issues module cover three aspects, namely (i) Agricultural Innovation Platforms; (ii) Gender, Vulnerable and Marginalized Groups (VMGS), Socio, Environmental Concerns and Cohesion in Finger Millet Production, and (iii) Policy.

All the modules are divided into the following:

- 1.1 Introduction to the Module
- 1.2 Module Learning Outcomes
- 1.3 Module Target Groups
- 1.4 Module Users
- 1.5 Module Duration
- 1.6 Module Summary
- 1.7 Facilitator's Guidelines
- 1.8 Participant's Handouts





MODULE 1

CLIMATE CHANGE AND CLIMATE SMART AGRICULTURE

1.1 Introduction to the module

The potential impacts of climate change and variability in agriculture, food systems and food security is a serious concern. Kenya's agricultural production systems are highly impacted due to the low adaptive capacity and the high exposure to climate related risks. The major agricultural activities are prone to risks and uncertainties of nature which are affected by climate change either in intensity, scope or frequency. Climate change is expected to modify risks, vulnerabilities and the conditions that shape the resilience of agriculture systems as well as introducing new uncertainties. Adoption of climate smart agriculture (CSA) through application of tools and technologies and effective communication of weather information reduces the negative impacts of climate change and enhances access to food security in a changing environment. Thus, there is need to mainstream suitable climate resilient technologies, innovations and management practices (TIMPs) to increase agricultural productivity, resilience to climatic shocks and mitigate the causes of climate change.

1.2 Module Learning Outcomes

By the end of the module training, the following outcomes must be achieved:

- Concept of climate change and variability defined and understood
- Impacts of climate change and variability on agriculture and food security identified and understood
- Concept of climate smart agriculture (CSA) explained and understood
- Future climate scenarios and how to manage them projected and impressed upon trainees.

1.3 Module Target Group

This module targets agricultural extension service providers dealing directly with farmer groups at community level or community facilitators.

1.4 Module Users

This module is intended for use by master trainers who are members of the Core Team of Trainers (CTT). The trainers using this module should thoroughly familiarize themselves with the participants' handouts or training materials

1.5 Module Duration

The Module is estimated to take 4 hours and 20 minutes

1.6 Module Summary

Climate Change and Climate Smart Agriculture in Finger Millet value chain			
Sessions	Training Methods	Training Materials	Time
1. Introduction to climate change and variability	<ul style="list-style-type: none"> · Power point · Presentation · Case study videos · Plenary discussions 	<ul style="list-style-type: none"> · Videos · Flip charts · Handouts 	<ul style="list-style-type: none"> · 20minutes · 20 minutes · 20minutes
2. Impacts of climate change and variability on agriculture and food security	<ul style="list-style-type: none"> · Power point · Presentation · Case study videos · Plenary discussions 	<ul style="list-style-type: none"> · Projector · Videos · Flip charts · Handouts 	<ul style="list-style-type: none"> · 20minutes · 20 minutes · 20minutes
3. Concept of Climate smart agriculture (CSA)	<ul style="list-style-type: none"> · Power point · Presentation · Case study videos · Plenary discussions 	<ul style="list-style-type: none"> · Projector · Videos · Flip charts · Handouts 	<ul style="list-style-type: none"> · 20minutes · 20 minutes · 20minutes
4. Projected future climate scenarios and how to manage	<ul style="list-style-type: none"> · Power point · Presentation · Case study videos · Plenary discussions 	<ul style="list-style-type: none"> · Projector · Flip charts · Handouts 	<ul style="list-style-type: none"> · 20 minutes · 20 minutes · 20 minutes
7. Module review	<ul style="list-style-type: none"> · Trainees' questions and comments · Facilitator summary 	<ul style="list-style-type: none"> · Module review 	<ul style="list-style-type: none"> · 20 minutes
TOTAL			4 hours 20 minutes

1.7 Facilitators Guidelines

1. Introduction and Levelling Expectations (10 minutes)	Session Guide
<p><i>(The facilitator introduces the trainees to this module of climate change and climate smart agriculture and its important linkages in the achievement of KCSAP project objectives).</i></p> <p>The facilitator then presents the module objectives)</p> <p>Module Objectives</p> <p>(The facilitator presents modules objectives on power point)</p> <p>By the end of the training module the trainee should be able to:</p> <ul style="list-style-type: none"> • Explain climate change and adaptations. • Define ‘climate smart agriculture.’ • Describe available climate smart crop management practices in finger millet production. • Project and impress upon trainees future climate scenarios and how to manage them. • Explain the benefits of selected climate smart crop management practices in finger millet production. 	<p>PowerPoint presentation</p> <p>Distribute Participants’ Handouts on Module Objectives and expectations.</p>
2. Introduction to climate change and climate variability (60 minutes)	Session guide
<p><i>(The facilitator proceeds to introduce the module basics).</i></p> <p>Plenary Presentation/ Discussion</p> <ul style="list-style-type: none"> • Basic terminologies used in the module • Explain climate change and climate variability • Causes of climate change • Climate risks impacting agriculture • Proposed adaptation measures (captured in TIMPs) 	<p>PowerPoint presentation</p> <p>Flip chart sketches</p> <p>Discussion on the session; Field experiences, coping and adaptation mechanisms adopted by farmers</p>
3. Concept of Climate smart agriculture (CSA) – 60 Minutes	Session Guide
<p><i>(The facilitator presents to the trainees the principles underpinning CSA)</i></p> <p>Plenary Presentation/Discussion</p> <ul style="list-style-type: none"> • Definition of the CSA approach and their characteristics • The three pillars of CSA (productivity, Adaptation, and Mitigation) • Why CSA is needed 	<p>PowerPoint presentation</p> <p>Handouts</p> <p>Plenary discussion.</p>

4. Projected future scenarios that will impact productivity (60 minutes)	Session Guide
<p><i>(The facilitator leads the trainees in discussing future climatic projections focusing on rainfall and temperature which directly impacts on crop yields)</i></p> <p>Plenary Presentation/Discussion</p> <ul style="list-style-type: none"> • Long term rainfall and temperature projections as impacted by climate change • Project impacts on food production and needed adaptation measures • Short Video on projections of rainfall and temperature 	<p>PowerPoint presentation</p> <p>Video presentation</p> <p>Plenary Discussion</p>
5. .Module Review (10minutes)	Session Guide
<p>(The facilitator leads the trainees in summarizing the key points discussed in the module)</p> <p>Plenary Discussion</p> <p>Lead the trainees to summarize the module. Guide them to evaluate which new areas they covered and also seek to find out which of their expectations were met</p>	<p>Plenary discussion</p>

1.8 Participants’ Handouts

Esilaba, A.O.*et al.* (2019). KCEP-CRAL Climate Smart Agriculture Extension Manual. Kenya Agricultural and Livestock Research Organization, Nairobi, Kenya.

MODULE 2

The Farmer Field and Business School Approach in Finger Millet Production

2.1 Introduction to the module

This module is designed for training and exposing trainees of Farmer Field and Business Schools (FFBS) to the Field school approach and concepts. In addition, practitioners of FFBS need to have knowledge of this methodology in order to mainstream various Technologies, Innovations and Management Practices (TIMPs) in Millet production. The trainees will thereafter facilitate farmers in the Common Interest Groups (CIGs) to enable them share and learn by doing, try available technologies and innovations as they implement them on their farms. FFBS also empowers the learners with various skills such as leadership, communication and business. Since the methodology is participatory, it improves the learners' observation skills and creates linkages with other value- chain players thereby making Millet production profitable and sustainable.

2.2 Module Learning Outcomes

By the end of the module the following should be achieved:

- The concept, characteristics and principles of Farmer Field and Business School (FFBS) as a 'learning by doing approach' described and understood
- The differences between teaching and facilitation explained and understood
- The Agro systems Analysis (AESAs) on Millet crop understood and applied
- Knowledge on Participatory Technology Development (PTD) in Millet TIMPs imparted and applied

2.3 Module Target Group

This module targets agricultural extension service providers based at sub-county and ward level. It will also be useful for private extension service providers dealing directly with farmer groups at community level.

2.4 Module Duration

The Module is estimated to take 7 hours

2.5 Module Summary

Module 2: Farmer Field and Business school (FFBS) Approach in Millet Production			
Sessions	Training Methods	Training Materials	Time
2.6.1 Introduction and levelling of expectations	<ul style="list-style-type: none"> • Group discussions • Presentation 	<ul style="list-style-type: none"> • Module objectives • Marker pens, flip chats • Power point 	1 hour
2.6.2 Introduction to FFBS	<ul style="list-style-type: none"> • Brainstorming • Plenary presentation 	<ul style="list-style-type: none"> • Flip charts • Power point • Pictorials 	1 hour
2.6.3 Designing an FFBS program	<ul style="list-style-type: none"> • Plenary presentations • Group Discussions and presentation 	<ul style="list-style-type: none"> • Power point • Participants' handouts 	1 hour
2.6.4 Key activities in FFBS	<ul style="list-style-type: none"> • Plenary session • Group discussions 	<ul style="list-style-type: none"> • Power point • Flip charts • Handouts 	1 hour 30 Minutes
2.6.5 Introduction to communication and facilitation skills	<ul style="list-style-type: none"> • Brainstorming • Plenary sessions • Group discussions 	<ul style="list-style-type: none"> • Power point • Flip charts 	1 hour
2.6.6 Organization, management and leadership in FFBS	<ul style="list-style-type: none"> • Brainstorming • Plenary sessions • Group discussions 	<ul style="list-style-type: none"> • Power point • Flip charts • Handouts 	1 hour
2.6.7 Module review	<ul style="list-style-type: none"> • Participants' questions and comments • Facilitator' summary 	<ul style="list-style-type: none"> • Participants' handouts • Module review 	30 minutes
TOTAL			7 Hours

2.7 Facilitators Guidelines introduction to FFBS

Module 2: Farmer Field and Business School (FFBS) Approach Millet Production	
2.7.1 Introduction and Levelling Expectations (1 hour)	Session Guide
<p>Introduction (15 Minutes) <i>(The facilitator welcomes trainees to the module on FFBS Approach in Millet Production and introduces him/herself stating his profile and experience of working with farmers)</i></p> <p><i>The facilitator invites the trainees to state their expectations and thereafter presents module objectives.</i></p> <p>Module Objectives (45 Minutes) By the end of the module the trainees should be able to:</p> <ul style="list-style-type: none"> • Describe the concepts, characteristics, principles and plans of Farmer Field and Business School (FFBS) as a ‘learning by doing’ approach • Identify main differences between teaching and facilitation • Be able to conduct Agro systems Analysis (AESA) on Millet crop • Successfully lay Participatory Technology Development (PTD) in Millet TIMPs 	<ul style="list-style-type: none"> • Summarize Trainees’ “Expectations” on a flipchart and make displays. • PowerPoint presentation
2.7.2 Introduction To FFBS (1 hour)	Session Guide
<p><i>(The facilitator introduces FFBS by defining it and sharing its benefits with the trainees)</i></p> <p>Plenary Presentation (1 hour)</p> <ul style="list-style-type: none"> • History of Farmer Field and Business Schools • Principles of FFBS • Characteristics of FFBS • Concepts of FFBS • Objectives of FFBS • Benefits of FFBS 	<ul style="list-style-type: none"> • Powerpoint presentation • Participants handouts • Q&A Session
2.7.3 The Key FFBS activities Steps in conducting FFBS (1 hour)	Session Guide
<p>Plenary Presentation (15 Minutes)</p> <ul style="list-style-type: none"> • The concept of Agro Ecosystem Analysis (AESA) • Participatory Technology Development • Group Dynamics • Special Topics in FFBS • Field daily Guide • Millet curriculum matrix <p>Group work (45 Minutes) Each group comes up with probable special topics to be covered within the learning period</p>	<ul style="list-style-type: none"> • Powerpoint presentation • Participants handouts • Group Discussion • Q&A Session

2.7.4 Designing an FFBS program (1 hour 30 Minutes)	Session Guide
<p><i>(Facilitator guides discussions on the steps of preparation and establishment of FFBS)</i></p> <p>Plenary Presentation (30 Minutes)</p> <p>The classical steps</p> <ul style="list-style-type: none"> • ground working • Training of Facilitators • Establishing PTDs at the FFBS • Season long FFBS sessions • Evaluation of PTDs • Field days • Graduation • Establishment of Lead Farmer FFBS • Follow ups <p>Group Exercise (1 hour) Steps in establishing FFBS in the community. Within the groups follow facilitator instructions</p>	<ul style="list-style-type: none"> • Distribute Participants' Handouts • Hand out on Procedure of ground working • PowerPoint presentation • Group Exercise • Q&A Session
2.7.5 Communication skills (1 hour)	Session Guide
<p>Plenary presentation (15 Minutes) <i>The facilitator introduces the topic on communication and why effective communication</i></p> <ul style="list-style-type: none"> • What is effective communication? • Purpose of communication • Barriers to effective communication • Maintaining communication within group (FFBS) <p>Group work (45 Minutes) Group exercise on communication</p>	<ul style="list-style-type: none"> • PowerPoint presentation • Q&A Session • Group Exercise
2.7.6 Facilitation skills (1 hour)	Session Guide
<p>(The facilitator introduces the topic on Facilitating adult learners)</p> <p>Plenary presentation (1 hour)</p> <p>Facilitating Millet CIGs</p> <ul style="list-style-type: none"> • Definition of Facilitation, facilitate and effective facilitator • Qualities of a good facilitator • Golden rules of facilitator • Roles and responsibilities of FFBS Facilitators • Adult Non- formal learning techniques 	<ul style="list-style-type: none"> • Powerpoint presentation • Handout on adult learning techniques • Q&A Session

2.7.7 Organization, management and Leadership of FFBS (1 hour)	Session Guide
<p>Plenary presentation (30 Minutes) The facilitator introduces the topic by asking the trainees how their groups are organized, managed and leadership structures</p> <ul style="list-style-type: none"> • Leadership continuum- subjects, environment and leader • Existing leadership structure • Roles & responsibilities of leaders • Leadership and sustainability in groups 	<ul style="list-style-type: none"> • Power point presentation • Plenary discussion • Q&A Session
2.7.8. Module Review (30 minutes)	Session Guide
<p><i>(The facilitator leads the trainees in reviewing the module)</i></p> <ul style="list-style-type: none"> • What new things did you learn from this Module? • What are some of the problems and issues that you have become more aware of? In FFBS, problems are seen as challenges, how would we identify the priority problem in the community? • How would we address it? Why farming business proposition? • Are there unanswered questions? <p><i>Let the trainees recall the new items they have learnt in this module.</i></p>	<ul style="list-style-type: none"> • The last participants' Handouts/training materials • Summarize the main points of the module on a flip chart and display • Module Evaluation

2.8 Participants' Handouts

References

1. FAO Government Cooperative Program: Farmer Field and Farm Business Schools Manual for Preparation and Establishment of Farmer Field and Farm Business Schools
2. Khisa Godrick: Farmer Field School Methodology, Training of Trainers Manual.
3. FAO: Farmer Field School Methodology, a TOT Manual
4. Sustainet East Africa: Farmer Field School, A Technical Manual
5. Training Manual on Good Agricultural Practices in Potato using Farmer Field and Business School Approach: KALRO AND GiZ NuSePP

MODULE 3

FINGER MILLET PRODUCTION IN KENYA AND ITS NICHES

3.1 Introduction to Module

This module is intended for use in training of Master trainers on finger millet crop status in Kenya. It is necessary that the FFBS facilitators have knowledge on areas producing finger millet in Kenya; suitable environmental conditions; challenges and opportunities; social, economic, and food and nutritional security value of the crop.,

Finger Millet has very wide agro-ecological adaptability, growing at altitudes ranging from sea level to about 2,500m above sea level (masl). It does best under moderate rainfall of between 750-900mm annually, temperature range of 15- 28°C and in a fertile, well-draining sandy loam soil with a pH between 5 and 8.

Finger millet is mainly grown in Western counties of Busia, Kakamega, Bungoma, and Vihiga; Nyanza counties of Kisumu, Migori, Kisii, Siaya, Homa Bay, and Nyamira; and Rift Valley counties of Kericho, Bomet, Baringo, Uasin Gishu, Elgeyo Marakwet, Trans-Nzoia, West Pokot, Nandi, Nakuru, and Narok. The crop is produced on approximately 85,000 ha in Kenya on small scale farms with yields ranging between 500 and 750kg ha⁻¹. The crop is important for its nutritional, cash, and traditional value (Duke, 1978).

Finger millet production constraints include *Striga*, blast disease, low soil fertility, low yielding varieties, drought, and generally poor attitude to the crop. It is necessary that the FFBS facilitators have knowledge on the background of finger millet production so that they can relate to situations in their target FFBS areas.

3.2 Module Learning Outcomes

By the end of the module, the following outcomes should be achieved:

1. Current production versus the potential production of finger millet appreciated
2. Current and potential finger millet adaptability described and understood
3. Possibilities of overcoming production challenges and take advantage of opportunities in finger millet production appreciated.

3.3 Module Target Group and Categories

This module targets Private service and county governments' extension service providers and lead farmers in the targeted finger millet value chain counties.

3.4 Module Users

This module is intended for use by Master Trainers who are members of the Core Trainers Team (CTT) and Lead Farmers in the millet value chain in the target counties. The trainers using this module should thoroughly familiarize themselves with the participant's handouts (training materials).

3.5 Module Duration

The Module is estimated to take 4 hours

3.6 Module Summary

Sessions	Training Methods	Training Materials	Time
1. Leveling of expectations	<ul style="list-style-type: none"> • Discussion • Plenary PowerPoint presentations 	<ul style="list-style-type: none"> • Flip charts and marker pens • Projector 	<ul style="list-style-type: none"> • 30 minutes • 30 minutes
2. Status of Finger Millet in Kenya	<ul style="list-style-type: none"> • Discussions of experiences • Plenary presentation and participatory review of PowerPoint presentation 	<ul style="list-style-type: none"> • Projector • Flip charts • Marker pens 	<ul style="list-style-type: none"> • 50 minutes
3. Areas of production and crop needs and suitability maps	<ul style="list-style-type: none"> • Open discussion • Plenary PowerPoint presentation 	<ul style="list-style-type: none"> • Projector • Crop suitability maps 	<ul style="list-style-type: none"> • 50 minutes
4. Challenges and opportunities in Finger Millet production in the light of the triple wins (productivity, resilience, and mitigation)	<ul style="list-style-type: none"> • Plenary discussion • Plenary PowerPoint presentations 	<ul style="list-style-type: none"> • Projector • Note books 	<ul style="list-style-type: none"> • 50 minutes
5. Module review	<ul style="list-style-type: none"> • Trainees' questions and comments • Facilitator's summary 	<ul style="list-style-type: none"> • Trainees' Handouts • Module review 	<ul style="list-style-type: none"> • 30 minutes
TOTAL			3 hours

3.7 Facilitators Guidelines

3.7.1 Welcome And Levelling Expectations (5 minutes)	Session Guide
<p><i>(Facilitator welcomes trainees to the module and introduces him/herself by stating his profile and experience of working with farmers).</i></p> <p>The facilitator invites the trainees to state their expectations.</p> <p>Module Objectives</p> <p>The facilitator presents modules objectives</p> <p>By the end of the module the trainee should be able to:</p> <ul style="list-style-type: none"> • Appreciate current production versus the potential production of Finger Millet. • Describe and explain current and potential Finger Millet adaptability. • Appreciate way of overcoming production challenges and take advantage of opportunities in Finger Millet production. 	<p>Distribute Participants' Handout on Module Objectives.</p>
3.7.2 Status of Finger Millet in Kenya	Session Guide
<p>Discussion on participants' experience (10 minutes)</p> <p><i>(The facilitator leads trainees discuss status of Finger Millet in Kenya)</i></p> <p>Plenary Discussions</p> <ul style="list-style-type: none"> • Counties growing finger millet in Kenya <p>Plenary discussion</p> <ul style="list-style-type: none"> • “Which counties grow finger millet in Kenya?” • “Which counties grow most finger millet?” Indicate production levels of each. <p>Present trainees with the issues to be discussed on status of finger millet production:</p> <ul style="list-style-type: none"> • Economic value of finger millet • Cultural value <p>Use Plenary presentation and Discussions</p> <p><i>Nutritive Value</i> - What are nutrients available in finger millet in comparison to other cereals and what is their value?</p> <p><i>Cultural Value</i> – Allow for proclamation of various cultural values attributed to finger millet by different communities in Kenya for food, brewing, gifts and others)</p>	<p>List activities and challenges on flip chart and display for reference later in the module</p> <p>Present on flip chart</p> <p>After discussions distribute Participants' Handouts on value of finger millet</p>

3.7.3 Areas of production and crop needs/suitability maps	Session Guide
Presentation and Discussion: 10 minutes	
<ul style="list-style-type: none"> • Key Finger Millet cultivation counties and their agro-ecological conditions • After presentation, discuss potential areas for Finger Millet production in Kenya. 	<p>List the answers on a flip chart.</p> <p>Presentation on flip chart or power point</p>
3.7.4 Challenges and opportunities in Finger Millet production in the light of the project triple wins (productivity, resilience, and mitigation)	Session Guide
Presentation and Discussion: 10 minutes	
<ul style="list-style-type: none"> • Challenges and opportunities in Finger Millet production in the light of the project triple wins (productivity, resilience, and mitigation) 	PowerPoint presentation
<p>Discussion on Challenges and Opportunities in Finger Millet production – biotic, abiotic, social, cultural, and economic challenges</p> <p>Present on power point the challenges and opportunities in Finger Millet production</p>	<p>List Challenges and Opportunities on a flip chart and paste on the wall for future reference</p> <p>After the presentation distribute Participants' Handout on challenges and opportunities in Finger Millet production.</p>
3.7.5 Review of Module	Session Guide
Participants' Questions, Presentation (5 minutes)	
<p>Facilitator to lead review discussion by asking the questions:</p> <ul style="list-style-type: none"> • What new things did you learn from this module? • What are some of the problems and issues that you have become more aware of in Finger Millet production? • What questions do you still have about Finger Millet production? <p>This the last Participants' Handout summarizes the main points from the Module.</p>	Distribute Participants' Handouts summarizing main points from the module

3.8 Participants' Handout

Handout on Module Objectives

Handouts on value of finger millet

Handout on challenges and opportunities in Finger Millet production

Handouts summarizing main points from the module

References

Audi, P.O., M. Odendo, C.A. Oduori, A.B. Obilana, E.O. Manyasa, S. Ajanga, J. Kibuka, and S. Sreenivasaprasad. 2003. Finger Millet production and blast disease management: participatory appraisal results from Busia, Teso and Kisii districts, western Kenya. A report of activity 2.7 of project document to accomplish the DFID funded HRI/ SAARI/ ICRISAT/ QUB Finger Millet Blast Project.

Duke, J.A. 1978. Eleusine coracana (L.) Gaertn. Poaceae Ragi, Kurakkan, African millet, Finger Millet. *In Handbook of Energy Crops*. [on-line] Available: http://www.hort.purdue.edu/newcrop/duke_energy/Eleusine_coracana.html#Uses (verified 07 Oct. 2008)

Mitaru, B.N. J.T. Karugia and C. Munene. 1993. Finger Millet production and utilization in Kenya. p. 247-254. *In* Riley K.W., S.C. Gupta, A. Seetharam and J.N. Mushonga (eds), *Advances in Small Millets*. Oxford & IBH Publishing Co. Pvt. Ltd, New Delhi.

NRC, USA. 1996. Finger Millet. p. 39-57 *In* Lost crops of Africa: volume I: grains. Board on Science and Technology for International Development. National Academy of Sciences, National Academy Press, Washington D.C..

Oduori C.O.A. 2005. The Importance and Research Status of Finger Millet in Africa. A Paper Presented at The McKnight Foundation Collaborative Crop Research Program Workshop on Tef & Finger Millet: Comparative Genomics of the Chloridoid Cereals at the Biosciences for East and Central Africa (BECA) ILRI, Nairobi, Kenya, 28 – 30 June 2005

Takan, J.P., S. Muthumeenakshi, S. Sreenivasaprasad, B. Akello, R. Bandyopadhyay, R. Coll, A. E. Brown, & N.J. Talbot. 2002. Characterisation of Finger Millet blast pathogen populations in East Africa and strategies for disease management. [online] Available: www.bspp.org.uk/archives/bspp2002/bspp02postertitles.htm (verified 07 Oct. 2008).

MODULE 4

FINGER MILLET VARIETY SELECTION AND SEED SYSTEMS

4.1 Introduction to the Module

This module is intended for use in training Master Trainers on finger millet variety selection, sourcing and maintenance of quality seed so as to empower farmers with skills and knowledge necessary for improving production.

Inadequate supply and access to Finger Millet seed of appropriate varieties is one of the key constraints to finger millet production. Small holder farmers mainly source grain from neighbor's farms and/or markets and use them as seed. These type of seeds are of unknown genetic potential and may harbour seed borne diseases and pests thus undermine production. Suitable Finger Millet varieties are available but adoption is low due to limited farmer exposure to the varieties. Such improved varieties include P-224, Kak-Wimbi 1, Kak-Wimbi 2, Kak-Wimbi 3, Kak-Wimbi 4, Maridadi, Nakuru FM-1, and KAT FM-1. It is therefore necessary to provide knowledge on varieties and sources of quality seed to farmers to improve productivity.

4.2 Module Learning Outcomes

By the end of the module the following outcomes should be achieved:

- Finger Millet varieties available and their adaptation described and explained
- Sources of quality seed for adapted finger millet varieties identified.

4.3 Module Target

This module targets Private service and county governments' extension service providers and lead farmers in the targeted finger millet value chain counties.

4.4 Module Users

This module is intended for use by Master Trainers who are members of the Core Trainers Team (CTT) and Lead Farmers in the Millet value chain in the target counties. The trainers using this module should thoroughly familiarize themselves with the participant's handouts (training materials).

4.5 Module Duration

The Module is estimated to take 5 hours

4.6 Module Summary

FINGER MILLET VARIETY SELECTION AND SEED SYSTEM			
Sessions	Training Methods	Training Materials	Time
1. Leveling of expectations	<ul style="list-style-type: none"> • Discussion • Plenary presentations 	<ul style="list-style-type: none"> • Flip charts and marker pens • Projection of Module Objectives 	<ul style="list-style-type: none"> • 20 minutes • 20 minutes
2. Introduction to Finger Millet varieties	<ul style="list-style-type: none"> • Discussions of experiences • Plenary presentation and participatory review of displays 	<ul style="list-style-type: none"> • Participants' Handouts • Flip charts • Not less than six Finger Millet variety fact sheets • Variety photographs • Packaged, descriptor labelled seed 	<ul style="list-style-type: none"> • 30 minutes • 30 minutes
3. Sources of quality Finger Millet variety seed	<ul style="list-style-type: none"> • Open discussion • Plenary presentation • Preparation for field excursion 	<ul style="list-style-type: none"> • PowerPoint presentation • Note books 	<ul style="list-style-type: none"> • 20 minutes • 30 minutes • 20 minutes
4. On-farm seed selection and Post-harvest seed management	<ul style="list-style-type: none"> • Field group exercise • Plenary presentations 	<ul style="list-style-type: none"> • Seed samples • 4 different but neighboring Finger Millet plots • Note books 	<ul style="list-style-type: none"> • 60 minutes • 40 minutes
5. Module review	<ul style="list-style-type: none"> • Participants' questions and comments • Facilitator's summary 	<ul style="list-style-type: none"> • Participants' Handouts • Module review 	<ul style="list-style-type: none"> • 30 minutes
TOTAL			5 hours

4.7 Facilitators Guidelines

4.7.1. Welcome And Levelling Expectations (15 minutes)	Session Guide
<p><i>(Facilitator welcomes trainees to the module Finger Millet seed selection and handling and introduces him/her-self by stating his profile and experience of working with farmers).</i></p> <p>The facilitator invites the trainees to state their expectations</p> <p>Module Objectives</p> <p>The facilitator presents modules objectives</p> <p>By the end of the module the trainees should be able to:</p> <ul style="list-style-type: none"> • Select varieties suitable for their localities and acquisition of desired varieties seed • Maintain seed on-farm after acquisition 	<p>Distribute Participants' Handout on: Module Objectives</p> <p>Session guide</p>
4.7.2. Introduction to Seed Handling	Session Guide
<p>Discussion on participants' experience: 20 minutes</p>	
<p><i>(The facilitator should lead trainees in discussing challenges of seed sourcing and qualities of a good seed).</i></p> <p>Plenary discussion</p> <ul style="list-style-type: none"> • Challenges in Seed Handling • “What are the key activities in Finger Millet seed handling?” • “What challenges are encountered by farmers when handling seeds?” • What does poor-quality finger millet seed look like? <p>Distribute samples of finger millet seed and facilitate discussions on the characteristics of good Finger Millet seed.</p> <p>Plenary Presentation</p> <p>Present power point slides on the good qualities of finger millet seed Good quality Finger Millet seed should be:</p>	<p>List activities and challenges on flip chart and display for referral later in the module</p> <p>Different Finger Millet seed samples showing the differences</p> <p>Present on flip chart</p> <p>Participants' Handouts on qualities of a good Finger Millet seed</p>
4.7.3 Selection and Management of Finger Millet Seed	Session Guide
<p>Presentation and Discussion: 90 minutes</p>	
<p><i>(The facilitator presents the procedure for seed selection from an existing ware Finger Millet farm)</i></p>	<p>List the answers on a flip chart.</p>

<ul style="list-style-type: none"> • Finger Millet Seed Selection • Positive seed selection. • Negative seed selection • Field Excursion Selecting Mother Plants 	<p>Presentation on flip chart or power point</p> <p>Distribute Participants' Handouts on Positive seed selection</p>
4.7.4 Post-harvest Seed Management	Session Guide
Presentation and Discussion: 30 minutes	
<i>(Facilitator guides the trainees in process of harvesting and post-harvest handling of seeds)</i>	
<ul style="list-style-type: none"> • Selecting seed for maximum productivity • Activities farmers carry out in post-harvest seed handling. <p>Presentation</p> <p>Present the chronology of activities required for post-harvest handling using the positive seed selection approach and elicit the reasons why each should be carried out.</p>	<p>List these activities on a flip chart and paste on the wall for future reference</p> <p>Participants 'Handouts</p>
4.7.5 Review of Module	Session Guide
Trainees' Questions, Presentation: 15 minutes	
<p>Facilitator to lead review discussion by asking the questions:</p> <ul style="list-style-type: none"> · What new things did you learn from this module? · What are some of the problems and issues that you have become more aware of in post-harvest management? · What questions do you still have about post-harvest management? · Ask trainees to explain the first point-the message and its application? The second message? The third message? And so on. 	<p>Distribute Participants' Handouts</p> <p>Last Participants' Handout summarizing the main points from the Module.</p>

4.8 Participants' Handouts

1. KALRO/KSCAP Finger Millet Factsheet No. 1. Improved Finger Millet Varieties and Seed Selection.

MODULE 5

FINGER MILLET GOOD AGRONOMIC PRACTICES

5.1 Introduction to the Module

This module is designed for training facilitators of Master Trainers in Finger Millet Good Agronomic Practices. Finger Millet growing requires the good agricultural practices (GAP) for optimal yields and increased incomes. These practices range from site selection, land preparation, planting and fertilizer application, weeding, rouging, crop protection to harvesting.

Poor land preparation, low plant density and weeds reduce yields. Farmers blame the soil, fertilizers, flooding, drought or cold weather for low finger millet yields. At times farmers are unable to visualize the cause and effect relationship between factors of production and yields. On the other hand, poor site selection, poor spacing, exposure to pests and pathogens, and competition with weeds, affect yields and increase costs of production.

When most cultural activities are carried out as recommended, farmers harvest more without necessarily opening up more land or hiring other farms. Using quality seed, rightly spaced furrows, thinly drilling fertilizer, then thinly drilling seed, and thinly covering furrows with smooth soil, thinning, managing pests and diseases as well as making the right management decisions lead to increased finger millet production. Most cultural and field activities when carried out well reduce the need for increased use of agro-chemicals, thus resulting in reduced environmental degradation, increased savings and consequently increased incomes.

There is therefore need to understand the good field operations and management that include site selection, planting, weeding and thinning that will enhance production for a market led finger millet production system. This module provides the learning outcomes necessary for adoption of these field practices

5.2 Module Learning Outcomes

This module targets agricultural extension service providers based at sub county and ward level. It will also be useful for private extension service providers.

By the end of this training module the following out comes must be achieved:

- Important field practices for increased in Finger Millet production identified and explained
- Preparation of Finger Millet farms for planting demonstrated and discussed
- Planting and establishing of Finger Millet plots demonstrated

5.3 Module Target

This module targets Private service and county governments' extension service providers and lead farmers in the targeted finger millet value chain counties.

5.4 Module Users

This module is intended for use by Master Trainers who are members of the Core Trainers Team (CTT) and Lead Farmers in the millet value chain in the target counties. The trainers using this module should thoroughly familiarize themselves with the participant’s handouts (training materials).

5.5 Module Duration

The module is estimated to take a minimum of 3 hours and 45 minutes.

5.6 Module Summary

Sessions	Training Methods	Training Materials	Time
1. Introduction and leveling of expectations	<ul style="list-style-type: none"> Buzz Presentation 	<ul style="list-style-type: none"> Handouts Module Objectives 	<ul style="list-style-type: none"> 10 minutes 5 minutes
2. Introduction to Finger Millet field management practices	<ul style="list-style-type: none"> Plenary presentation Discussions 	<ul style="list-style-type: none"> PowerPoint slides Flip charts Participants’ Handouts 	<ul style="list-style-type: none"> 10 minutes 10 minutes
3. Site preparation and planting	<ul style="list-style-type: none"> Presentation and discussions Group field exercises Summary presentation 	<ul style="list-style-type: none"> PowerPoint slides Participants’ handouts 	<ul style="list-style-type: none"> 20 minutes 40 minutes 20 minutes
4. Field management practices	<ul style="list-style-type: none"> Presentation and group exercises Field demonstration 	<ul style="list-style-type: none"> Flip charts photos Fungicides, insecticides Established Finger Millet plot Sample inputs, farm tools disinfectant, basin of water, measuring tape and lines 	<ul style="list-style-type: none"> 45 minutes 40 minutes
5. Module review	<ul style="list-style-type: none"> Participants’ questions and comments Facilitator’s summary 	<ul style="list-style-type: none"> Participants’ Handouts’ Module review 	<ul style="list-style-type: none"> 20 minutes
TOTAL			3 hours 45 minutes

5.7 Facilitator's Guidelines

5.7.1 Welcome and Levelling of Expectations	Session Guide
Plenary Presentation (15 minutes)	
<i>(The facilitator welcomes trainees to the module to introduce themselves and state their expectations).</i>	
<p>Module Objectives</p> <p>The facilitator introduces the module objectives</p>	Distribute and discuss Participant Handout: Module Objectives.
<p>By the end of the module the trainee should be able to:</p> <ul style="list-style-type: none"> • Identify and explain field practices that are important for increased Finger Millet production • Demonstrate and discuss the preparation of Finger Millet farms ready for planting • Demonstrate planting and establishing of Finger Millet plots 	
5.7.2 Introduction to Finger Millet Field Management Practices	Session Guide
Discussion on Trainees' Experience (20 minutes)	
<i>(The facilitator leads the trainees in discussing Good Agronomic Practices. He/she reminds them that field practices like crop health, soil fertility and seed handling are covered in detail in their stand-alone modules).</i>	
<p>Plenary Discussion</p> <ul style="list-style-type: none"> • “What are the important considerations for establishment of a good finger millet plot?” • Site preparation and crop establishment • Field management practices 	Key considerations against each activity in the seasonal calendar on a flip chart
3. Site Preparation And Plant Establishment	Session Guide
Presentation and Discussion (80 minutes)	
<i>(The facilitator engages the trainees in discussions on site selection, seed bed preparation, and Finger Millet planting).</i>	

<ul style="list-style-type: none"> • Site Selection • Importance of site selection • Factors Considered When Selecting Suitable Sites • Land and Seed Bed Preparation • Opening Up Furrows • Manure, Lime and Planting Fertilizer Application • Placing The Seeds Planting Depth and Covering <p>Group Exercise</p> <ul style="list-style-type: none"> • In pairs calculate how much seed farmer X requires for ¼ acre plot • In plenary and preferably on flip chart, define seed rate, spacing, and plant density • Let the groups’ representatives present their findings. Lead the trainees in discussing seed rate, spacing, and plant density. 	<p>Distribute Participants handouts</p> <p>PowerPoint presentation</p>
5.7.4 Field Management Practices And Exercise	Session Guide
Presentation and Discussion (85 minutes)	
<p><i>(The facilitator guides the trainees in a presentation and field practice session on establishing a Finger Millet plot and carrying out field practices. Ensure that the field is ready including equipment needed before proceeding there)</i></p> <ul style="list-style-type: none"> • Thinning and its importance (10 minutes) • Weed Management (15 minutes) • Top Dressing and Use of Foliar Fertilizers (10 minutes) • Practical Session on Planting and Field Practices (40 minutes) <p>Generate discussion on each of these to enable trainees give their opinions.</p>	<p>Distribute handout on field practices</p> <p>Take trainees through these field practices</p> <p>Distribute flip charts and felt pens</p>
5.7.5 Module Review	Session Guide
Presentation and Discussion (20 minutes)	
<p>Facilitator to lead discussion on review by asking the following</p> <ul style="list-style-type: none"> • What new things did you learn from this module? • What are some of your problems and issues that you have become more aware of in establishment and management of Finger Millet fields? • What questions do you still have about establishment and management of Finger Millet fields? • Who can explain the first point-the message and its application? The second message? The third message? And so on. 	<p>Distribute Participants’ handout and have three trainees read out the messages and their Applications in Finger Millet farming.</p>

Participants' Handouts

1. KALRO/KSCAP Finger Millet Factsheet No. 2. Finger Millet Good Agronomic Practices (GAP).

MODULE 6

INTEGRATED SOIL AND WATER MANAGEMENT PRACTICES FOR FINGER MILLET PRODUCTION

6.1 Introduction to the module

The performance of the agriculture sector in Kenya has continued to decline over the years due to increased soil acidity, mining of nutrients not supplied in the applied fertilizers, lowering of the soil organic matter content caused by non-use organic resources. Macronutrients (nitrogen (N), phosphorus (P), potassium (K)) and Sulphur (S)) and micronutrients (Zinc (Zn), Molybdenum (Mo) and Boron (B)) have been identified as deficient in Kenyan soils. Additionally, climate change has accelerated the decline of the agricultural sector performance through limited and unpredictable water supply to crop production systems. Integrated Soil Fertility Management (ISFM) which includes conservation agriculture offers the best options for improving soil fertility while allowing for climate change adaptation.

Finger Millet is mostly cultivated by smallholder farmers with minimal inputs. Drought management technologies to mitigate drought effects in the finger millet production are available. However, farmers have not realized the full benefits due to limited integration of the developed integrated natural resource management (INRM) and sustainable intensification practices in their finger millet production systems.

This module introduces service providers, lead farmers and facilitators to the importance of integrated soil and water management practices for enhanced finger millet production

6.2 Module learning outcomes

By the end of the module, the following training outcomes should be achieved:

1. Knowledge on soil composition, the various physical, chemical and biological properties and what constitutes a healthy soil including soil classification acquired
2. Soil and plant tissue sampling for laboratory analysis, interpretation and utilization of results and also identification of accredited laboratories in Kenya discussed and understood
3. Soil fertility and plant nutrition for increased crop productivity (R4 Stewardship that includes fertilizer source, rates, application methods and timing) understood by the trainees
4. Knowledge on soil health and Integrated Soil Fertility Management (ISFM) for climate resilient cropping systems (conservation agriculture, cereal legume intercropping, rotation, organic amendments, manure and composting) acquired
5. Knowledge on water harvesting technologies, soil and water management acquired
6. Knowledge and skills for identifying temporary or permanent decline of land productive capacity and provide various solutions to soil degradation imparted and understood by the trainees.

7. Awareness on the occurrence of problematic soils and their management increased and understood by the trainees.

6.3 Module Target Group and Categories

This module targets Private service and county governments' extension service providers and lead farmers in the targeted finger millet value chain counties.

6.4 Module Users

This module is intended for use by Master Trainers who are members of the Core Trainers Team (CTT) and Lead Farmers in the millet value chain in the target counties. The trainers using this module should thoroughly familiarize themselves with the participant's handouts (training materials).

6.5 Module Duration

The Module is estimated to take a minimum of 12 hours

6.6 Module Summary

Integrated soil and water management practices for Finger Millet production			
Sessions	Training methods	Training materials	Duration
6.6.1 Introduction, objectives and expectations	<ul style="list-style-type: none"> • Personal introductions • Presentations • Plenary discussions 	<ul style="list-style-type: none"> • Flips charts • PowerPoint Presentation 	1 hour
6.6.2 Soil composition, properties and health 6.6.2. Conduct Soil sampling and analysis practical's	<ul style="list-style-type: none"> • Presentations • Field demonstrations 	<ul style="list-style-type: none"> • Flips charts • PowerPoint presentation • Participants' Handouts 	1 hours
6.6.3 Soil and plant tissue sampling and analysis 6.6.3. Conduct Soil and plant tissue sampling and analysis practicals	<ul style="list-style-type: none"> • Presentations • Field demonstrations 	<ul style="list-style-type: none"> • Flips charts • PowerPoint presentation • Participants' Handouts 	2 hours
6.6.4. Soil fertility and plant nutrition	<ul style="list-style-type: none"> • Presentations • Field demonstrations 	<ul style="list-style-type: none"> • Flips charts • PowerPoint presentation • Participants' Handouts 	2 hours

6.6.5 Soil health and ISFM for climate resilient cropping systems	<ul style="list-style-type: none"> • Presentations • Field demonstrations 	<ul style="list-style-type: none"> • Flips charts • PowerPoint presentation • Participants' Handouts 	1 hours
6.6.6 Soil and water management and water harvesting technologies	<ul style="list-style-type: none"> • Presentations • Field demonstrations 	<ul style="list-style-type: none"> • Flips charts • PowerPoint presentation • Participants' Handouts 	2 hours
6.6.7 Soil degradation and reclamation	<ul style="list-style-type: none"> • Presentations • Field demonstrations 	<ul style="list-style-type: none"> • Flips charts • PowerPoint presentation • Participants' Handouts 	1 hours
6.6.8 Problematic soils and their management	<ul style="list-style-type: none"> • Presentations • Field demonstrations 	<ul style="list-style-type: none"> • Flips charts • PowerPoint presentation • Participants' Handouts 	1 hours
6.6.9 Module review and discussion	Discussions	<ul style="list-style-type: none"> • Flips charts 	1 hour
Total			12 hours

6.7 Facilitator's Guidelines

Integrated soil and water management practices for Finger Millet production	
6.7.1. Introduction, Objectives and Expectations (1 hour)	Session Guide
<p><i>(The facilitator welcomes trainees to the module and invites them to introduce themselves and state their expectations)</i></p> <p>Module Objectives (1 hour)</p> <p><i>The facilitator presents modules objectives</i></p> <p>By the end of the module the trainee should be able to:</p> <ul style="list-style-type: none"> • Describe soil composition, properties and health • Discuss and explain soil and plant tissue sampling and analysis • Appreciate soil fertility and plant nutrition • Discuss and explain soil health and (ISFM) for climate resilient cropping systems • Identify soil and water management and water harvesting technologies • Explain soil degradation and reclamation • Identify problematic soils and their management 	<ul style="list-style-type: none"> • Summarize trainees' "expectations" and display. • PowerPoint Presentation • Distribute Participants' Handouts on Module Objectives and Training Program

6.7.2. Soil composition, properties and health ((1 hour)	Session Guide
<p><i>(The facilitator presents on soil composition, properties and health)</i></p> <p>Plenary Presentation (45 minutes)</p> <ul style="list-style-type: none"> • Description of soil composition • Description of soil properties • Describe what soil health is all about <p>Discussion (15 Minutes) Let the trainees recall what they learnt and discuss any issues that may arise</p>	<ul style="list-style-type: none"> • PowerPoint Presentation • Distribute Participants' Handouts • Brochures, leaflets and manual
6.7.3. Soil and plant tissue sampling and analysis (2 hours)	Session Guide
<p>Plenary Presentation</p> <ul style="list-style-type: none"> • Overview of the soil sampling methods • Soil analysis results and interpretation • Overview of soil analysis results using available examples • Soil sampling guidelines <p>Practical exercise on soil sampling Demonstration on soil sampling method</p>	<ul style="list-style-type: none"> • PowerPoint Presentation • Distribute Participants' Handouts • Brochures, leaflets and manuals • Practical Demonstration
6.7.4. Soil fertility and plant nutrition (1hour and 30 Minutes)	Session Guide
<p>Plenary Presentation</p> <ul style="list-style-type: none"> • Potential role of different soil managements techniques in addressing soil fertility challenges in Finger Millet smallholder farming systems • Integrated Soil Fertility Management techniques • Soil management guidelines <p>Discussion (30 Minutes) Let the trainees recall what they learnt and discuss any issues that may arise.</p>	<ul style="list-style-type: none"> • PowerPoint Presentation • Distribute Participants Handouts • Brochures, leaflets and manual

6.7.5 Soil health and (ISFM) for climate resilient cropping systems (1 hour)	Session Guide
<p>Plenary Presentation</p> <ul style="list-style-type: none"> • Trainees to have an insight on soil health • Introduce integrated soil fertility management (ISFM) • To relate soil health and ISFM for a climate resilient cropping system • Introduce manure management, mulching, organic amendments and composting for increased use of organic manure for improving agricultural production • Introduce conservation agriculture as a climate smart agriculture practice • To relate cereal legume intercrops and crop rotation as climate resilient cropping systems <p>Discussion (15 Minutes)</p> <p>Let the trainees recall what they learnt and discuss any issues that may arise.</p>	<ul style="list-style-type: none"> • PowerPoint Presentation • Distribute Participants' Handouts • Brochures, leaflets and manual
6.7.6 Soil and water management and water harvesting technologies (2 hours)	Session Guide
<p>Plenary Presentation</p> <ul style="list-style-type: none"> • Principles of soil management for increased crop productivity • Methods of tillage systems that conserve water for crop use. • Introduce the principles of soil fertility management for increased crop productivity • Methods of soil fertility management for increased crop productivity <p>Discussion (30 Minutes)</p> <p>Let the trainees recall what they learnt and discuss any issues that may arise.</p>	<p>Session Guide</p> <ul style="list-style-type: none"> • PowerPoint Presentation • Distribute Participants' Handouts • Brochures, leaflets and manual
1.1.6 Soil degradation and reclamation (1 hour)	Session Guide
<p>Plenary Presentation</p> <ul style="list-style-type: none"> • Overview of soil degradation and reclamation. • Causes of soil degradation • Reclamation measures of degraded soil • Identification of the causes of soil degradation • Identification of Reclamation measures of degraded soil <p>Discussion (15 Minutes)</p> <p>Let the trainees recall what they learnt and discuss any issues that may arise</p>	<ul style="list-style-type: none"> • Session Guide • PowerPoint Presentation • Distribute Participants' Handouts • Brochures, leaflets and manual

6.7.7 Problematic soils and their management (1 hour)	Session Guide
<p>Plenary Presentation</p> <ul style="list-style-type: none"> • Problematic soils and their management • Soils with unsuitable biological properties • Soils with unsuitable chemical properties • Soils with unsuitable physical properties <p>Discussion (15 Minutes) Let the trainees recall what they learnt and discuss any issues that may arise.</p>	<ul style="list-style-type: none"> • PowerPoint Presentation • Distribute Participants' Handouts • Brochures, leaflets and manual
6.7.9. Module review (1 hour)	Session Guide
<p>Plenary Presentation <i>(The facilitator leads the trainees in reviewing the module)</i> Summarize the main points of the training and together with the trainees review the main points:</p> <ul style="list-style-type: none"> • Soil composition, properties and health • Soil and plant tissue sampling and analysis • Finger millet nutrient requirements • Sources of important nutrients • Soil health • Integrated Soil Fertility Management (ISFM) • Relate soil health and ISFM for a climate resilient cropping system • Soil and water management and water harvesting techniques • Problematic soils and their management • Soil degradation and reclamation <p>(Discuss with trainees about new things learnt from this Module. What are some of the problems and issues that they have become more aware of in the module?)</p>	<ul style="list-style-type: none"> • The last Participants' Handout • Summary of the main points from the module on a flip chart and display

6.8 Participants' Handouts

1. Finger Millet Extension Manual [KCEP-CRAL Manual, 2019]
2. Finger Millet Leaflets [KCEP-CRAL Manual, 2019]
3. Soil Management Extension Manual [KCEP-CRAL Manual2019]
4. Soil Management Leaflets [KCEP-CRAL PAMHPLETS2019}
5. OFRA Technical Training Manual.

References

6. E. Teenstra, F. De Buissonjé, A. Ndambi, D. Pelster (2015). *Manure Management in the (Sub-Tropics; Training Manual for Extension Workers)*. Wageningen UR (University & Research centre) Livestock Research, Livestock Research Report 919.
7. Lekasi JK, Tanner JC, Kimani SK, Harris PJC. (2001). Managing manure to sustain smallholder livelihoods in the East African highlands. HDRA publications.
8. KALRO KCEP_Soil Training and Extension manual. <http://www.kcepral.go.ke/wp-content/uploads/2017/04/KCEP-Soil-Training-and-Extension-manual.pdf>
9. Soil Cares Foundation Training Booklets - <https://www.soilcaresfoundation.com/trainings/>
10. D.J. Oyedele and A.A. Amusan, Variabilities of soil properties; part of Simple Soil, Water and Plant Testing Techniques For Soil Resource Management, Proceedings of a training course held in Ibadan, Nigeria, 16-27 September 1996.
11. FAO, CCAFS & International Maize and Wheat Improvement Center (CIMMYT). 2014. Conservation agriculture. Implementation guidance for policymakers and investors. <http://www.fao.org/3/a-i4066e.pdf>.

MODULE 7

FINGER MILLET CROP HEALTH

7.1 Introduction to the Module

This module is designed for use in training facilitators of FFBS on pest and disease management in the dynamic farming environment. This calls for an understanding of Integrated Pests Management (IPM) practices. Finger Millet pests are a constraint to production. Pests like shootfly, Striga weed, cutworms, nematodes reduce productivity. Aphids that transmit viruses, also infest Finger Millet, especially during dry weather. Though farmers blame the soil, fertilizers or bad weather for low yields, the problem could be pests and diseases.

There is therefore need to understand the IPDM and crop protection practices that will lead to reduced costs in pest and disease management and thus enhance productivity for a market led finger millet production system. This module covers field and storage pests.

7.2 Module Learning Outcomes

By the end of the module facilitators should be able to

- Important Finger Millet pests and their symptoms, and economic importance identified.
- Important Finger Millet diseases, their causes, symptoms and economic importance on productivity identified.
- Appropriate pest and disease management practices including IPDM for increased productivity recommended.
- Safe use and handling practices of pesticides recommended

7.3 Module Target

This module targets private service and county governments' extension service providers and lead farmers in the targeted finger millet value chain counties.

7.4 Module Users

This module is intended for use by Master Trainers who are members of the Core Trainers Team (CTT) and Lead Farmers in the millet value chain in the target counties. The trainers using this module should thoroughly familiarize themselves with the participant's handouts (training materials).

7.5 Module Duration

The Module is estimated to take **3 hours and 35 minutes**

7.6 Module Outline

INTERGRATED PEST MANAGEMENT			
Sessions	Training Methods	Training Materials	Time
1. Introduction to the module and leveling of expectations	<ul style="list-style-type: none"> • Discussions • Presentation 	<ul style="list-style-type: none"> • Module objectives • Flip charts, felt pens 	<ul style="list-style-type: none"> • 15 minutes
2. Overview of key Finger Millet pests and diseases	<ul style="list-style-type: none"> • Discussions • Brainstorming • Presentation 	<ul style="list-style-type: none"> • Flip charts and felt pens • PowerPoint images of pests and diseases • Participants' handouts on Finger Millet pests and diseases 	<ul style="list-style-type: none"> • 10 minutes • 10 minutes
3. Finger Millet pests	<ul style="list-style-type: none"> • Group discussions • Buzz exercise • Presentation 	<ul style="list-style-type: none"> • Flip charts, flash cards, felt pens • PowerPoint, participants' handouts 	<ul style="list-style-type: none"> • 15 minutes • 35 minutes
4. Finger Millet diseases	<ul style="list-style-type: none"> • Brainstorming • Presentation 	<ul style="list-style-type: none"> • Flip charts, flash cards, felt pens • PowerPoint, colored pictures, handouts • Materials for testing for bacterial wilt 	<ul style="list-style-type: none"> • 20 minutes • 35 minutes
5 IPM and field sanitation	<ul style="list-style-type: none"> • Group work • Presentation 	<ul style="list-style-type: none"> • Flip charts, felt pens, photos, PowerPoint 	<ul style="list-style-type: none"> • 15 minutes • 15 minutes
6. Safe and effective use of agro chemicals	<ul style="list-style-type: none"> • Presentation • Discussion and feedback 	<ul style="list-style-type: none"> • Sample pesticide and container • Note books, handouts • Flip charts and PowerPoint presentations 	<ul style="list-style-type: none"> • 15 minutes • 15minutes
7. Module review	<ul style="list-style-type: none"> • Participants' questions and comments • Facilitator's summary 	<ul style="list-style-type: none"> • Participants' Handouts • Module review 	<ul style="list-style-type: none"> • 15 minutes
TOTAL			3 hours 35 minutes

7.7 Facilitators' Guidelines

7.7.1 Introduction And Levelling Expectations	Session Guide
(Presentation by the Facilitator:15 minutes)	
<p><i>(The facilitator welcomes trainees to the module crop protection and introduces themselves and state their expectations).</i></p> <p>Module Objectives</p> <p>The facilitator introduces the module objectives.</p> <p>By the end of the module the trainee should be able to:</p> <ul style="list-style-type: none"> • Identify different finger millet pests and their effects on productivity. • Identify various finger millet diseases, their causes, symptoms and effects on productivity. • Recommend appropriate integrated pest and disease management practices for increased finger millet productivity. • Recommend safe use and handling practices of pesticides 	<p>List the trainees' expectations on a flip chart and pin at a strategic place for reference during module review session</p> <p>Distribute and discuss Participants' Handouts on Module Objectives.</p>
7.7.2 Overview Of Key Finger Millet Pests And Diseases	Session Guide
Discussion on Trainees' Experience (20 minutes)	
<p><i>(The facilitators' guide the trainees in identifying Finger Millet pests and diseases and challenges faced by farmers in managing them).</i></p> <p>Presentation</p> <p>Present in power point images of common pests and diseases that are not captioned or labelled.</p> <p>Ask the trainees to name the pests and diseases.</p> <p>Plenary Discussion</p> <p>Challenges encountered by farmers when managing these pests and diseases?</p> <ul style="list-style-type: none"> • Finger Millet pests identification, the stages of their life cycles, economic importance and their management practices • Finger Millet diseases, causes, symptoms, economic importance and management practices • Safe and effective use of agro chemicals considering environmental issues 	<p>List the names of pests and diseases as they are mentioned and the challenges they pose</p> <p>Distribute participants' handouts on images of pests) and images of disease symptoms.</p>

7.7.3 Finger Millet Pests Session Guide

(Presentation and Discussion: 40 minutes)

<p><i>(The facilitator guides the trainees appreciate the economic importance of pests in Finger Millet production, how to identify their destructive stages and the integrated management practices available).</i></p> <ul style="list-style-type: none"> • Economic importance of pests • Key pests description • Signs/symptoms, areas of prevalence and management options: Striga, cutworms, shootfly, stem borers, etc. • PowerPoint schematic illustrations of pest’s life cycle. <p>Buzz Exercise: Identification of Destructive Stages of Pests</p> <p>Ask trainees to identify the destructive stage of the each pest in 5 minutes and present in plenary</p>	<p>Distribute participants’ handouts 1.11.4 Economic importance of pests</p> <p>Ask participants to refer to the handout 1.11.2 and mention and discuss these stages</p>
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<p>Integrated Pest Management Practices</p> <p>The facilitator should present the integrated pest management options. Emphasize on the right stage of targeting for each management strategy and the relationship between the practice and other GAP including crop rotation</p>	<p>Distribute Participants’ handouts 1.11.5 Pests life cycles and 1.11.6 Integrated Pest management options</p>
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7.7.3 Finger Millet Diseases Session Guide

(Presentation, Exercise and Discussion: 60 minutes)

<p><i>(The facilitator should be able to present and lead in discussions on identification of causal organisms, spread of Finger Millet diseases, economic importance and management practices).</i></p> <p>Presentation</p> <ul style="list-style-type: none"> • Disease causing organisms and their symptoms • Transmission of Pathogens • Group Exercise Identification of Diseases and their symptoms <p>(Through brain storming sessions ask the trainees to mention the common Finger Millet diseases in their area).</p> <p>With reference to hand out 1.11.3 distributed earlier, ask trainees in their groups to identify the Finger Millet diseases, their causal agents (pathogens) and symptoms.</p> <p>Allow them to present the answers written on their notebooks and list on flip chart.</p>	<p>Power point or flip charts presentation</p> <p>List the diseases mentioned on flip chart</p> <p>Ask trainees to go back and refer to hand out 1.11.3</p>
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7.7.4 Economic Importance of Finger Millet Diseases List summarized answers on flip chart

<p>Inform trainees that because Finger Millet blast is an important diseases in finger millet, this session shall provide detailed discussions on the disease and mention management issues for the other diseases.</p>	
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<p>Present specific diseases either on flip charts or power point slides</p> <p>1.5 Blast</p> <p>Summarised presentation on power point on Finger Millet blast disease causal agents, signs/symptoms, sources of infection and management options.</p> <p>1.6 Finger Millet Cercospora leaf spot</p> <p>Summarised presentation on power point on other key diseases causal agents, signs/symptoms, sources of infection and management options for Finger Millet late blight</p> <p>Different Finger Millet varieties have different resistance levels to Finger Millet Cercospora leaf spot. These are summarized in trainees' handouts 1.11.10</p> <p>1.7 Other Diseases</p> <p>(Discuss in plenary with the trainees these other Finger Millet diseases highlighting their symptoms, economic importance and IPM practices).</p> <ul style="list-style-type: none"> • Downy mildew • Rust • seedling and leaf blight • Viral diseases <p>1.9 Factors Influencing Occurrence And Spread Of Diseases</p> <p>Buzz group work; ask the trainees to pair and list what they consider are the factors that influence:</p> <ol style="list-style-type: none"> 1. Occurrence of diseases 2. Spread of diseases <p>After plenary discussion present and emphasize about the three key factors in the disease triangle</p> <p>(The facilitator should make a presentation on the factors that influence the occurrence and spread of finger millet diseases)</p> <p>Present the Disease Triangle</p>	<p>Distribute and refer to Participants' Handouts 1.11.8 simple test for bacteria wilt test</p> <p>Distribute Participants' Handouts 1.11.7 bacterial wilt</p> <p>Distribute Participants' Handouts 1.11.9 Late blight</p> <p>Distribute Participants' Handouts 1.11.10 varieties of Finger Millet resistant to late blight</p> <p>Distribute Participants' Handouts 1.11.11 other common Finger Millet diseases</p> <p>List the responses on flip chart</p> <p>Prepare and project the image on figure 1 on disease triangle and facilitate discussions.</p>
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<p>Present Factors that influence Finger Millet disease infections:</p> <p>Present nature of the disease causing organism</p> <ol style="list-style-type: none"> 1. Viral and bacterial diseases 2. Fungal diseases 	<p>Distribute Participants' Handouts 1.11.12 factors that influence disease occurrence and spread</p>
7.7.5 Integrated Pests Management (IPM) and Sanitation	
Session Guide	
(Presentation and Discussion: 35 minutes)	
<p><i>(The facilitator takes the trainees through discussions on the need for IPM emphasizing on the dangers of accumulation and spread of bacterial wilt and other diseases that have no chemical control methods but cause severe crop losses).</i></p> <ul style="list-style-type: none"> • Discuss Integrated Pest Management Practices <ul style="list-style-type: none"> ○ Integrated disease management practices ○ Farm level sanitation. • Techniques of IPM and Sanitation 	<p>List on flip chart</p> <ol style="list-style-type: none"> 1. Challenges 2. Opportunities <p>as they are mentioned</p> <p>Refer to the opportunities when summarising this session</p> <p>List the techniques on flip chart as they are mentioned</p>
<p>Group Exercise</p> <p>In their working groups, ask trainees to list activities that can assist in the following sanitation practices:</p> <ol style="list-style-type: none"> 1. Eliminating amount of pathogen in <ul style="list-style-type: none"> · Finger Millet plant · Finger Millet field · Finger Millet store 2. Reducing the spread of pathogens in <ul style="list-style-type: none"> · Finger Millet field · Finger Millet store <p>Presentation on practices that assist eliminate and prevent spread of pathogens in Finger Millet fields and stores.</p>	<p>Distribute participants' handouts 1.11.13 Integrated Pest Management</p> <p>Trainees to present their work in plenary, after discussion</p> <p>Summarize the issues on IPM and sanitation on flip chart</p>

7.7.6 Safe And Effective Use Of Pesticides Session Guide	
Presentation and Discussion (40 minutes)	
<p>(The facilitator to ask trainees to outline</p> <ul style="list-style-type: none"> • Key issues on agro chemicals use and impacts on the environment). • Introduction – Plenary Discussion • Agro Chemicals • Present overview of Safe and Effective use of pesticides <p>Present flow chart on the key steps in safe and effective use of pesticides</p>	<p>Distribute hand out 1.11.14 Safe and effective use of pesticides</p> <p>Project and present figure two on steps in safe and effective use of pesticides and key issues</p> <p>List key topics to emphasize on safe use training to farmers Session guide</p>
7.7.7 Module Review Session Guide	
Presentation and Discussion (20 minutes)	
<p>Facilitator to lead review the main points on crop protection by asking the questions:</p> <ul style="list-style-type: none"> • What new things did you learn from this Module? • What are some of the problems and issues that you have become more aware of in crop protection? • What questions do you still have about crop protection? 	<p>Distribute hand out number 1.11.15 module review</p>

7.8 Participants' Handouts

1. KALRO/KSCAP Finger Millet Factsheet No. 3, [Finger Millet Crop Health](#).

MODULE 8

FINGER MILLET POST HARVEST MANAGEMENT

8.1 Introduction to the Module

This module is designed for training Master Trainers on the management of post-harvest processes in Finger Millet for food security sustainability and enhanced incomes. Finger Millet easily shatters leading to heavy losses in the field of up to 15% depending on variety. Postharvest losses occur across various stages of the postharvest handling practices namely harvesting, threshing/processing, transportation and storage. Finger Millet can be stored for a long period (up to 10 years) with suitable technologies. Thus, reduction in these losses would increase the amount of Finger Millet available for human consumption and enhance food security, a growing concern caused by increased climate variability. Therefore, there is need for farmers to understand the importance of managing postharvest activities as an adaptive measure for reduced yield and quality losses.

8.2 Module Learning Outcomes

By the end of the module the following training outcomes should be achieved:

1. Types of post-harvest operations for Finger Millet causing losses discussed and explained
2. Practices for managing postharvest yield and quality losses in the various stages identified
3. Importance and potential of Finger Millet production in a changing climate explored and appreciated.

8.3 Module Target

This module targets Private service and county governments' extension service providers and lead farmers in the targeted finger millet value chain counties.

8.4 Module Users

This module is intended for use by Master Trainers who are members of the Core Trainers Team (CTT) and Lead Farmers in the millet value chain in the target counties. The trainers using this module should thoroughly familiarize themselves with the participant's handouts (training materials).

8.5 Module Duration

The Module is estimated to take 3 hours and 30 minutes

8.6 Module Summary

FINGER MILLET POST HARVEST MANAGEMENT			
Sessions	Training Methods	Training Materials	Time
1. Introductions and Training expectations	<ul style="list-style-type: none"> • Buzz • Presentation 	<ul style="list-style-type: none"> • Flip charts, pens, masking tapes, flush cards • Module objectives 	<ul style="list-style-type: none"> • 10 minutes • 10 minutes
2. Introduction to Finger Millet post-harvest management	<ul style="list-style-type: none"> • Presentations • Group exercise • Group presentations 	<ul style="list-style-type: none"> • PowerPoint presentations and discussions • Participants' handouts • Flip charts, pens, flash cards of different colours, cutters • Presentations 	<ul style="list-style-type: none"> • 15 minutes • 30 minutes • 10 minutes
3. Types of post-harvest operations for Finger Millet	<ul style="list-style-type: none"> • Presentation • Plenary discussion • Summary 	<ul style="list-style-type: none"> • PowerPoint • Charts • Participants' handouts 	<ul style="list-style-type: none"> • 30 minutes
4. Practices for managing postharvest yield and quality losses	<ul style="list-style-type: none"> • Presentations and discussions • Plenary discussions 	<ul style="list-style-type: none"> • PowerPoint • Flip charts 	<ul style="list-style-type: none"> • 30 minutes • 15 minutes
5. Importance and potentials of Finger Millet production in a changing climate	<ul style="list-style-type: none"> • Presentation • Plenary discussions 	<ul style="list-style-type: none"> • PowerPoint • Flip charts • Participants' handouts 	<ul style="list-style-type: none"> • 20 minutes • 25 minutes
6. Module review	<ul style="list-style-type: none"> • Participants' questions and comments • Facilitator's summary 	<ul style="list-style-type: none"> • Module review • A small ball for throwing 	15 minutes
TOTAL			3 hours 30 minutes

8.7 Facilitators Guidelines

8.7.1. Trainees Introduction and Expectations (20 Minutes)	Session Guide
<p><i>(Facilitator welcomes trainees to the module section and invites them to introduce themselves and state their expectations)</i>Module Objectives</p> <p><i>The facilitator presents the modules objectives.</i></p> <p>By the end of the module the trainee should be able to:</p> <ol style="list-style-type: none"> 1. Discuss and explain types of post-harvest operations for Finger Millet causing losses 2. Identify practices for managing postharvest yield and quality losses in the various stages 3. Describe and explain importance and potentials of Finger Millet production in a changing climate 	<p>List trainees’ expectations on a flipchart, entitled “Expectations”.</p> <p>Distribute Participants’ Handouts on Module Objectives, discussing each in light of the participants’ expectations.</p>
8.7.2. Introduction to Finger Millet post-harvest management (45 Minutes)	Session Guide
<p><i>(The facilitator guides a discussion on the definition of post-harvest management activities for Finger Millet).</i></p> <p>Plenary Presentation</p> <ul style="list-style-type: none"> • Overview of Finger Millet harvesting and post-harvest handling • Definitions and descriptions • Post-Harvest Management • Postharvest losses 	<p>Question to assess the level of trainees ‘understanding of postharvest management.</p> <p>PowerPoint presentation on definitions of post-harvest, post-harvest management systems</p> <p>Distribute participants’ handouts with definitions of terms</p>
8.7.3. Types of post-harvest operations for Finger Millet (30 minutes)	Session Guide
<p><i>(The facilitator present the various types of postharvest Finger Millet operations that contributes to losses and guide a discussion on these specific operations)</i></p> <p>Plenary Presentation</p> <ul style="list-style-type: none"> • Types of postharvest Finger Millet operations (harvesting, drying, threshing/processing, transportation and storage). 	<p>Explain types of Finger Millet postharvest operations</p> <p>Distribute Participants’ handouts</p>

8.7.4. Practices for managing postharvest yield and quality losses (45 minutes)	Session Guide
<p><i>(The facilitator leads the trainees in identifying various measures for each postharvest operation for managing yield and quality losses).</i></p> <p>Plenary discussion</p> <p>Trainees asks questions and clarifications</p>	<p>PowerPoint presentation measures in each postharvest operation for managing yield and quality losses.</p> <p>Distribute participants' handouts</p>
8.7.5. Importance and potentials of Finger Millet production in a changing climate (45 Minutes)	Session Guide
<p><i>(The facilitator should guide the trainees in discussing the importance and potential of Finger Millet production under a changing climatic conditions).</i></p> <p>Plenary Discussions on Theory of Change</p> <p>Using the theory of change the facilitator guides the trainers on a discussion of how to transform smallholder farmers into multinational companies</p>	<p>PowerPoint presentation Facilitator discusses strategy development based on the theory of change.</p> <p>Distribute participants' handouts; Theory of change as a tool to strategic planning</p>
8.7.6. Module Review (15 Minutes)	Session Guide
<p><i>(Facilitator leads discussion to review the main points covered in the Finger Millet post-harvest management module)</i></p> <p>Ask the trainees key module Questions</p> <ul style="list-style-type: none"> • What are key points you have learned from this Module? • What are some of the problems and issues that you have become more aware of in post-harvest management? • What questions do you still have about post-harvest management? 	<p>Provide Participants' Handout summarizing the main points from the Module</p>

8.8 Participants Handouts

1. KALRO/KSCAP Finger Millet Factsheet No. 7. **Post Harvest Management In Finger Millet**
2. KALRO/KSCAP Finger Millet Factsheet No. 7. **Threshing Finger Millet.**

MODULE 9

FINGER MILLET VALUE ADDED FOOD PRODUCTS

9.1 Introduction to the Module

This module is designed for Master Trainers in skills in Finger Millet value added food products. For a long time, Finger Millet value added products were limited to traditional food products Ugali, “Uji” and local brews. Value-added products can open new markets, create recognition for the crop, expand the market season, and make a positive contribution to the community (Boland and Bosse, 2006). Recently, however, new Finger Millet food products have been developed. These include mandazi, chapati, cake, crackles, onion bites, composite flours, and a highly nutritious paste *Tamuu*. These products are being taken up by communities implying that with a little bit more effort in packaging and marketing, they could easily be commercial drivers for increased Finger Millet production and consumption and thus a Finger Millet industry in Kenya. By virtue of being food products from nutritious Finger Millet, they have superior nutritive properties than food products made from other cereals. These products have to a large extent not been extended and adopted by farmers and other consumers.

9.2 Module Learning Outcomes

By the end of the module training the following training outcomes should be achieved:

- Post-Harvest Value Addition opportunities identified and prioritized
- Understanding of available Finger Millet value added products and their nutritive value enhanced.

9.3 Module Target

This module targets Private service and county governments’ extension service providers and lead farmers in the targeted finger millet value chain counties.

9.4 Module Users

This module is intended for use by Master Trainers who are members of the Core Trainers Team (CTT) and Lead Farmers in the millet value chain in the target counties. The facilitator using this module should thoroughly familiarize themselves with the participant’s handouts (training materials).

9.5 Module Duration

The Module is estimated to take 3 hours and 20 minutes

9.6 Module Summary

FINGER MILLET POST HARVEST MANAGEMNET			
Sessions	Training Methods	Training Materials	Time
1. Introductions and levelling of expectations	Buzz Presentation	Flip charts, pens masking tapes, flush cards Module objectives	5 minutes 5 minutes
2. Introduction to Finger Millet Value Added Food Products	Presentations	PowerPoint presentations and discussions List of products developed Participants' handouts Presentations	10 minutes 20 minutes 10 minutes
3. Awareness and prioritization of opportunities for value added products in Finger Millet.	Presentation Group exercise Group exercise / ranking Group presentations Plenary discussion Summary	Flip charts, pens, flash cards of different colours, cutters Checklist for prioritization Pair wise ranking tool Participants' handouts	20 minutes
4. Nutritive value of Finger Millet value added food and feed products	Presentations and discussions Plenary discussions	Flip charts	10 minutes 20 minutes 10 minutes
5. Module review	Participants' questions and comments Facilitator's summary	Module review A small ball for throwing	10 minutes
TOTAL			3 hour 20 minutes

9.7 Facilitators Guidelines

9.7.1. Introduction and Levelling of Expectation (20 Minutes)	Session Guide
<p><i>(Facilitator welcomes trainees to the module and introduces him/herself by stating his profile and experience of working with farmers).</i></p>	<p>List trainees’ points on a flipchart, entitled “Expectations”. Return to the list at any point during the session but especially at the end of the session.</p>
<p>The facilitator invites the trainees to state their expectations.</p> <p>Module Objectives</p> <p>The facilitator presents modules objectives.</p> <p>By the end of the module the trainee should be able to:</p> <ol style="list-style-type: none"> 1. Identify and prioritize Post-Harvest Value Addition opportunities and demonstrate them 2. Appreciate available Finger Millet value added products and their nutritive value. 	<p>Distribute Participants’ Handouts 1.13.1; Module Objectives, discussing each in light of the participants’ expectations.</p>
9.7.2. Introduction To Finger Millet Value Added Food Products (35 Minutes)	Session Guide
<p><i>(The facilitator guides a discussion on the definition of value addition and benefits of value addition and the range of products).</i></p> <p>Plenary Presentation</p> <ul style="list-style-type: none"> • Overview of Finger Millet Value Added Food Products • Definitions and descriptions • Value addition Agricultural value chain • Benefits of value addition 	<p>Question to assess the level of participants understanding of value addition.</p> <p>PowerPoint presentation on definitions of value additions and then discusses the benefits of value addition.</p> <p>Distribute participants’ handouts 1.13.3; benefits of value added products</p>
9.7.3. Awareness and prioritization of opportunities for value added products in Finger Millet. (30 minutes)	Session Guide
<p><i>(The facilitator will lead the trainees on identifying criteria for priority setting of Finger Millet value added products)</i></p>	<p>PowerPoint presentation identifying criteria for priority setting.</p>

<p>Plenary Presentation</p> <ul style="list-style-type: none"> Identifying Criteria for Prioritizing Finger Millet value added products. <p>Exercise: Developing Criteria for Prioritizing Opportunities</p> <ul style="list-style-type: none"> What will you consider when prioritizing and ranking the products identified in the previous session? Trainees rank the products from the most feasible to the least feasible in their counties. <p>Summary</p> <p>The facilitator summarizes a list of the agreed products a flip chart and the criteria that was used.</p>	<p>Make a list of products Agree on the criteria Analysis the products</p> <p>Distribute participants' handouts 1.13.5; Identifying criteria for priority setting.</p>
<p>9.7.4. Nutritive value of Finger Millet value added food and feed product (60 Minutes)</p>	<p>Session Guide</p>
<p><i>(The facilitator guides the trainees in discussing the importance of nutrients found in Finger Millet food and feed products).</i></p> <p>Plenary Discussions on Finger Millet value added products</p>	<p>Facilitator discusses strategy development based on the theory of change.</p> <p>Distribute participants' handouts 1.13.6; Theory of change as a tool to strategic planning</p>
<p>9.7.5. Module Review</p>	<p>Session Guide</p>
<p>Trainees' Questions, Presentations (10 minutes)</p>	
<p>Facilitator leads discussion to review the main points on Finger Millet Value Added Food and Feed Products</p> <ul style="list-style-type: none"> What new things did you learn from this Module? What are some of the problems and issues that you have become more aware of in Finger Millet Value Added Food Products? What questions do you still have about Finger Millet Value Added Food Products? 	<p>Distribute Participants' Handouts 1.13.9</p> <p>The facilitator review the lesson using a ball game thrown to participants' at random</p>



9.8 Participants' Handouts

1. KALRO/KSCAP Finger Millet Factsheet No. 9. Finger Millet Value Addition.

References

1. Boland, M. and A. Bosse. 2006. What is Value-Added Agriculture?. Kansas State University, Agricultural Economics

MODULE 10

MECHANIZATION OF FINGER MILLET PRODUCTION

10.1 Introduction to the module

Agricultural mechanization supports in enhancing production, productivity and profitability in agriculture by achieving timeliness in farm operations. It comes along with precision in metering and placement of inputs, reducing available input losses, increasing utilization efficiency of costly inputs (seed, chemical, fertilizer, irrigation, water etc.), reducing unit cost of produce, enhancing profitability and competitiveness in the cost of operation. It also helps in the conservation of agricultural produce and byproducts from qualitative and quantitative damages; enables value addition and establishment of agro-processing enterprises for additional income and employment generation from farm produce. Agricultural mechanization is one of the important inputs that has potential to revolutionize all round development in the rural Kenya.

10.2 Module learning outcomes

By the end of the module the following training outcomes should achieved:

- Climate smart tillage options appreciated
- Calibration of fertilizer and seed rates for planters applied
- Use of pest control implements and tools demonstrated
- Harvest timing and yield estimation appreciated
- Estimation of harvesting losses demonstrated
- Machine and procedure for grading demonstrated

10.3 Module Target Group and Categories

This module targets Private service and county governments' extension service providers and lead farmers in the targeted finger millet value chain counties.

10.4 Module Users

This module is intended for use by Master Trainers who are members of the Core Trainers Team (CTT) and Lead Farmers in the millet value chain in the target counties. The facilitator using this module should thoroughly familiarize themselves with the participant's handouts (training materials).

10.5 Module Duration

The Module is estimated to take a minimum of 9 hours

10.6 Module Summary

Mechanization of Finger Millet production activities			
Sessions	Training methods	Training materials	Duration
Introduction, objectives and expectations	<ul style="list-style-type: none"> • Personal introductions/ know your audience • Presentations • Plenary discussions 	<ul style="list-style-type: none"> • Flips charts • Power Point Presentations 	30 hour
Climate smart tillage options	<ul style="list-style-type: none"> • Presentations • Plenary discussions 	<ul style="list-style-type: none"> • Flip chart • Power Point presentation • Participants' Handouts 	30 minutes
Calibration of fertilizer and seed rates for planters	<ul style="list-style-type: none"> • Presentations • Plenary discussions 	<ul style="list-style-type: none"> • Flip chart • Power Point presentation • Participants' Handouts • Practical 	90 hours
Weed control equipment and tools, usage	<ul style="list-style-type: none"> • Presentations • Plenary discussions 	<ul style="list-style-type: none"> • Flip chart • PowerPoint presentation • Participants' Handouts • Practical 	1 hour 10 minutes
Harvest timing, yield estimation machines and tools	<ul style="list-style-type: none"> • Presentations • Plenary discussions 	<ul style="list-style-type: none"> • Flip chart • PowerPoint presentation • Participants' Handouts • Practical 	1 hour 10 minutes
Estimation of harvesting losses	<ul style="list-style-type: none"> • Presentations • Plenary discussions • Demonstrations 	<ul style="list-style-type: none"> • Flip chart • PowerPoint presentation • Participants' Handouts • Practical 	1 hour 10 minutes
Machine and procedure for grading	<ul style="list-style-type: none"> • Presentations • Plenary discussions • Demonstrations 	<ul style="list-style-type: none"> • Flip chart • PowerPoint presentation • Participants' Handouts • Practical 	1 hour
Total			9 hours

10.7 Facilitator's Guidelines

Mechanization of Finger Millet production activities	
10.7.1 Introduction, Objectives and Expectations (30 minutes)	Session Guide
<p><i>(The facilitator welcomes trainees to the module. They are then invited to introduce themselves and state their expectations)</i></p> <p>Module Objectives (30 minutes)</p> <p>(The facilitator presents modules objectives)</p> <p>By the end of the module the trainee should be able to:</p> <ul style="list-style-type: none"> • Appreciate various climate smart tillage operations • Apply various calibration of fertilizer and seed rate for planters • Demonstrated weed control equipment and tools, usage • Appreciate harvest timing, yield estimation, machines and tools • Demonstrate estimation of Pre-harvest and harvesting losses • Demonstrate machine and procedure for green grading 	<ul style="list-style-type: none"> • Summarize Participants' "Expectations" and display. • PowerPoint presentation • Distribute Participants' Handouts on Module Objectives and Training Program
10.7.2. Finger Millet climate smart land preparation tools (2 hours)	Session Guide
<p>Plenary Presentation (1 hour 30 Minutes)</p> <ul style="list-style-type: none"> • Overview of the Finger Millet mechanization activities • Climate smart tillage options <p>Discussion (30 Minutes)</p> <p>Let the trainees recall what they learnt and discuss any issues that may arise</p>	<ul style="list-style-type: none"> • PowerPoint Presentation • Distribute Participants' Handouts • Brochures, leaflets and manual • All trainees
10.7.3. Finger Millet calibration of fertilizer and seed rate for planters (2 hours)	Session Guide
<p>Plenary Presentation(1 hour 30 minutes)</p> <ul style="list-style-type: none"> • Techniques and methods of planter seed and fertilizer rate determination <p>Discussion (30 Minutes)</p> <p>Let the trainees recall what they learnt and discuss any issues that may arise.</p>	<ul style="list-style-type: none"> • PowerPoint Presentation • Distribute Participants' Handouts • Brochures, leaflets and manual

10.7.4. Finger Millet Chemical implements and tools operations (2 hours)	Session Guide
<p>Plenary Presentation(1 hour 30 minutes)</p> <ul style="list-style-type: none"> Techniques and methods of using Finger Millet pest control equipment <p>Discussion (30 Minutes)</p> <p>Let the trainees recall what they learned and discuss any issue that may arise.</p>	<ul style="list-style-type: none"> PowerPoint presentation Distribute Participants' Handouts Brochures, leaflets and manual
10.7.5. Finger Millet harvest timing and yield estimation (1 hours)	Session Guide
<p>Plenary Presentation(1 hour 30 minutes)</p> <ul style="list-style-type: none"> Harvest timing and estimation of yield <p>Discussion (30 Minutes)</p> <p>Let the trainees recall what they learnt and discuss any issues that may arise.</p>	<ul style="list-style-type: none"> PowerPoint presentation Distribute Participants' Handouts Brochures, leaflets and manual
10.7.6. Finger Millet harvesting machine operating principles (1 hours)	Session Guide
<p>Plenary Presentation(1 hour 30 minutes)</p> <ul style="list-style-type: none"> Machine harvest losses <p>Discussion (30 Minutes)</p> <p>Let the trainees recall what they learnt and discuss any issues that may arise.</p>	<ul style="list-style-type: none"> PowerPoint presentation Distribute Participants' Handouts Brochures, leaflets and manual
10.7.7 Machine and procedure for Finger Millet grading (1 hous)	Session Guide
<p>Plenary Presentation</p> <ul style="list-style-type: none"> Overview of Finger Millet grading procedure <p>Practical exercise</p> <p>Demonstrations on management options</p>	<ul style="list-style-type: none"> PowerPoint presentation Distribute Participants' Handouts Brochures, leaflets and manual

10.7.8 Module review (1 hour)	Session Guide
<p>The facilitator leads the trainees in reviewing the module)</p> <p>Summarize the main points of the training and together with the trainees review the main points:</p> <ul style="list-style-type: none"> • Various climate smart tillage operations • Calibration of fertilizer and seed rate for planters • Chemical implements and tools operations • Optimal crop Finger Millet harvesting stage and yield estimation • Estimation of harvesting losses of a machine • Harvesting machine operating principles • Machine and procedure for grain grading <p>Machine and procedure for grain grading (Discuss with trainees about new things learnt from this Module. What are some of the problems and issues that they have become more aware of in the module?)</p>	<ul style="list-style-type: none"> · The last Participants' Handouts · Summary of the main points on from the module on a flip chart and display

10.8 Participants' Handouts

1. KALRO/KSCAP Finger Millet Factsheet No. 4. Land preparation power Tiller in Finger Millet
2. KALRO/KSCAP Finger Millet Factsheet No. 5. Gasoline Tiller Cultivator Weeder-Weeding Machine in Finger Millet.
3. KALRO/KSCAP Finger Millet Factsheet No. 6. Motor blower spraying in Finger Millet.

MODULE 11

FINGER MILLET BUSINESS AND MARKETING

11.1 Introduction to the Module

This module is designed to improve the ToTs knowledge, skills and attitude on Finger Millet farm business management and market assessment. This will enable producers become market oriented, profitable and competitive.

Finger Millet production in Kenya is mostly practiced as a subsistence undertaking by small holder farmers, and often without clear marketing objectives or strategies. This frequently leads to low sales prices for produce and hence low income, leaving the farmer with little for reinvesting in farm production. The low yield can be attributed to poor entrepreneurial attitude, low adoption of improved Finger Millet technology, inadequate access to quality Finger Millet seed and inadequate training in GAPs. High labour requirement for Finger Millet production activities, especially during weeding, harvesting, threshing and winnowing, also contributes to low land acreage hence low economic returns from Finger Millet production. Further, enterprise analysis and planning is rarely done before establishing the enterprise. Therefore, despite the high Finger Millet prices, producers do not benefit from increased incomes, and hence do not commercialize its production. The crop has capacity to meet the triple wins of resilience, mitigation and increased productivity, it is important to refocus farmers to conduct farming as a business.

In most cases, farmers engage middle men to link them to the produce market, and are therefore unaware of the actual market demands, prevailing prices and quality concerns. Middlemen facilitate through engaging in upstream value chains activities like sorting, grading, packaging, storage and bulking that should otherwise have been undertaken by the farmer or farmer groups. In the process, the middle men may earn more than the farmers.

11.2 Module learning outcomes

This module aims at developing entrepreneurial attitudes and promoting commercial farming of Finger Millet value chain. The module also builds the capacity of the Master trainers who will in turn empower farmers to increase productivity and improve marketing for enhanced incomes.

By the end of the module the following outcomes should be achieved:

- Concept of farming business carried through good record keeping described and explained
- Finger Millet production business plan demonstrated and explained
- Market assessment methods and tools identified
- Conducting a market assessment explained
- Developing a marketing plan for farmers or their groups demonstrated and explained.

11.3 Module Target Groups

This module targets Private service and county governments' extension service providers and lead farmers in the targeted finger millet value chain counties.

11.4 Module Users

This module is intended for use by Master Trainers who are members of the Core Trainers Team (CTT) and Lead Farmers in the millet value chain in the target counties. The facilitator using this module should thoroughly familiarize themselves with the participant's handouts (training materials).

11.5 Module Duration

The Module is estimated to take 9 hours

11.6 Module Summary

FARMING BUSINESS			
Sessions	Training Methods	Training Materials	Time
1. Introduction to the module (agribusiness and market assessment) and leveling the expectations	<ul style="list-style-type: none"> Buzz groups (expectations) Sharing Presentation of expectations Power point presentations 	<ul style="list-style-type: none"> Felt pens, masking tape or sticker glue, note books and pens Handout on Module Objectives Projector 	<ul style="list-style-type: none"> 10 minutes 10 minutes 10 minutes
2. Farm business management	<ul style="list-style-type: none"> Power point Plenary presentation Group exercise (shop keeper vs. farming) Summary presentation 	<ul style="list-style-type: none"> Projector Exercise handouts, Flip charts, felt pens, Participants' handouts 	<ul style="list-style-type: none"> 10 minutes 10 minutes 10 minutes
3. Key requirements for Finger Millet agribusiness enterprise management	<ul style="list-style-type: none"> Brain storming Plenary discussions Power point Presentation 	<ul style="list-style-type: none"> Flip charts Projector Handouts, power point 	<ul style="list-style-type: none"> 10 minutes 20 minutes 10 minutes
4. Profitability analysis of Finger Millet enterprise management	<ul style="list-style-type: none"> Plenary exercise Power point presentations 	<ul style="list-style-type: none"> Gross margin analysis chart, Flip charts Projector 	<ul style="list-style-type: none"> 40 minutes

FARMING BUSINESS

Sessions	Training Methods	Training Materials	Time
5 Finger Millet value chain business financing	<ul style="list-style-type: none"> • Brain storming • Power point Presentation 	<ul style="list-style-type: none"> • Projectors • Flip charts 	<ul style="list-style-type: none"> • 20 minutes • 20 minutes

MARKET ASSESSMENT

Sessions	Training Methods	Training Materials	Time
6. Market assessment plan	<ul style="list-style-type: none"> • Buzz activity • Presentation discussion 	<ul style="list-style-type: none"> • Flip charts • Handouts 	<ul style="list-style-type: none"> • 20 minute • 30 minutes
7. Market assessment tools and procedures	<ul style="list-style-type: none"> • Power point Presentation • Plenary discussion • Group exercise • Plenary presentation 	<ul style="list-style-type: none"> • Projector • Flip charts • Handouts • Note books 	<ul style="list-style-type: none"> • 20 Minutes • 20 minutes • 30 minutes • 20 minutes
8. Practical market assessment	<ul style="list-style-type: none"> • Market walk 	<ul style="list-style-type: none"> • Samples for assessment • Handout - Checklist/ tools • Flip charts 	<ul style="list-style-type: none"> • 90 minutes
9. Analysis of market data	<ul style="list-style-type: none"> • Plenary discussion • Plenary presentation 	<ul style="list-style-type: none"> • Flip charts • Analysis template • Participants' handouts 	<ul style="list-style-type: none"> • 20 minutes • 20 minutes
10. Developing a marketing plan	<ul style="list-style-type: none"> • Plenary discussion • Group exercise • Discussions 	<ul style="list-style-type: none"> • Participants' handouts • Power point slides • Flip charts, felt pens 	<ul style="list-style-type: none"> • 20 minutes • 30 minutes • 20 minutes
11. Module review	<ul style="list-style-type: none"> • Participants' Facilitator's summary 	<ul style="list-style-type: none"> • Participants' Handouts module review 	<ul style="list-style-type: none"> • 20 minutes
Total			9 hours

11.7

Facilitators' Guidelines

11.7 Introduction to the Module and levelling the expectations (35 minutes)	Session Guide
<p><i>(The facilitator welcome trainees to the module and introduce him/herself by stating his profile and experience of working with farmers).</i></p> <p>The facilitator invites the trainees to state their expectations for both agribusiness and market assessment.</p> <p>Module Objectives</p> <p><i>(The facilitator presents modules objectives)</i></p> <p>By the end of the module the trainee should be able to;</p> <ul style="list-style-type: none"> • Describe and explain to farmers the concept of farming business carried out through good record keeping • Demonstrate and explain how to develop an enterprise business plan. 	<p>Have trainees mention at least one thing they expect to learn from this course.</p> <p>Handouts</p> <ul style="list-style-type: none"> • Program • Note books • pens <p>Power point presentation</p> <p>Distribute Participants</p> <p>Handouts on: 1.1 Module objectives</p> <ul style="list-style-type: none"> • Gross margin analysis, • Break Even Points (BEP), • Cost structures
11.7.2 Introduction to Finger Millet farm Business Management (45 minutes)	Session Guide
<p><i>(The facilitator defines the term business, facilitate comparison between farming and a common business in the area as well as explain common terms used in business)</i></p> <p>2.1 Agri-Business</p> <p>Ask these questions to initiate discussion about the session</p> <ul style="list-style-type: none"> • What is a business? • What business are we familiar with? • What is agri-business? • What would agribusiness for Finger Millet look like? 	<p>List the answers on flip charts</p>

11.7 Introduction to the Module and levelling the expectations (35 minutes)	Session Guide
<p>1.2 Group Exercise</p> <p>Participants’ Handouts number 1.2 will be used for group exercise. In their groups, let them compare a common retail enterprise (shop) with an agri-business on aspect of inputs, operations, financing marketing cost and record keeping”</p> <p>1.3 Presentation on Common Terms used in Business</p> <p><i>(Facilitator introduces the common terms used in business and relate them to farming. Also, explain the characteristics of a good business)</i></p> <ul style="list-style-type: none"> • Production costs, labour cost, yield/output, producer price, income, person-day, middlemen, saving, credit, value adding, marketing and record keeping • Explain the characteristics of a good business <p>1.4 Characteristics of a Good Business Venture? (most people think a big enterprise started big)</p> <p>Plenary Presentation</p> <ul style="list-style-type: none"> • Something you are passionate about • Has a specific market niche? • With low start-up capital- let the business grow. • Has low initial fixed costs • Scalability-has opportunity to grow or scale out 	<p>Handouts: 1.2: Definition and comparisons between farming and retail shop (business)</p> <p>Distribute the Participants’ Handouts 1.3: Common terms and characteristics of a good business.</p> <p>Power point presentation</p> <p>Hand outs</p> <ul style="list-style-type: none"> • Agribusiness manual • Brochures • Leaflets
<p>3. Concept of Commercial Farming (60 minutes)</p>	<p>Session Guide</p>

11.7 Introduction to the Module and levelling the expectations (35 minutes)	Session Guide
<p><i>(The facilitator compares subsistence and commercial farming and then discusses the principles of management in relation to farming as a business).</i></p> <ul style="list-style-type: none"> • Subsistence and commercial farmers. 	<p>Power point presentation</p> <p>Hand outs</p> <ul style="list-style-type: none"> • Flip charts
<p>3.1 Group Exercise (comparison between commercial and subsistence farming undertakings)</p> <p>In your groups, compare subsistence and commercial farming with respect to input requirements, operational and marketing activities as follows:</p> <ol style="list-style-type: none"> 1. What are the inputs involved in either of the system? (seeds, fertilizers, agro chemicals, land, labour and capital, and machinery) 2. What are the operational activities involved in each of the two? (land preparation, sowing, agronomic practices, and harvesting and storage) 3. What are the marketing activities in each of the two? (transport of the products to the market, processing, packaging, labelling, storage and insurance) 4. Ask one of the groups to present another chip and discuss. Summarize the key points. <p>3.2 Principles of Business Management</p> <p><i>(Referring to Handouts 1.2 on definition and comparison of businesses, discuss the principles of management)</i></p>	<p>Distribute Participants' Handout 1.4: Comparing commercial farming to traditional subsistence farming</p> <p>Flip charts & Felt pens</p> <p>Make a summary of the points raised by the groups on flip chart and display the results</p> <p>List the answers on a flip chart.</p>

11.7 Introduction to the Module and levelling the expectations (35 minutes)	Session Guide
<p>In plenary let trainees mention what these principles stand for.</p> <ul style="list-style-type: none"> • Planning and Forecasting • Organizing • Directing • Coordinating • Controlling 	<p>Distribute Participants' Handouts 1.5:</p> <ul style="list-style-type: none"> • Brochures • Leaflets • Flip charts
<p>4. Key Requirements for an Agri-business Enterprise (60 minutes)</p>	<p>Session Guide</p>
<p><i>(The facilitator facilitates a discussion on the key requirements for production and marketing as well as costs related to production and marketing).</i></p> <p>Ask the trainees to discuss the inputs, operation and marketing requirements for production</p> <p><i>(refer to trainees' Handout on Requirements for an Agri-business Enterprise: Comparing commercial farming to traditional subsistence farming)</i></p> <p>4.1a. Key Requirements for Crop value chain</p> <ul style="list-style-type: none"> • Inputs required • What are the operational activities involved? - Operational Requirements • What are the marketing activities involved? – Marketing Requirements 	<p>Each group to brainstorm on each question.</p> <p>Distribute Handouts on Requirements for an Agri-business Enterprise to trainees:</p> <p>Key requirements for enterprise.</p> <p>Power point presentation</p>
<p>4.2a. Record keeping</p> <p>Ask trainees to mention why farm records are important and types of records to keep</p> <ol style="list-style-type: none"> 1. Definition of a record 2. Why do we need farm records? 3. Types of farm records 4. How to keep records <p><i>(Summarize by facilitating a discussion on "What other strategies can a farmer engage in to enhance return from crop/livestock enterprise?)</i></p>	<p>Types and importance of record keeping</p> <p>Summarize trainees' responses on flip chart and display</p> <p>Participants' Handouts 1.7: Strategies to enhance returns from farming</p>

11.7 Introduction to the Module and levelling the expectations (35 minutes)	Session Guide
5. Analysis of Enterprise management (60 minutes)	Session Guide
<p><i>(The facilitator should guide a discussion on understanding gross margin analysis and net income calculations)</i></p> <p>5.1 Presentation and discussion</p> <ul style="list-style-type: none"> ● Present the Gross Margin Analysis? ● What are the benefits of Gross Margin analysis? <p>Group exercise – in your groups carry out gross margin analysis for your value chains by filling in the chart provided after group exercise one. Group presents and another comments on it.</p>	<p>List answers on flip chart.</p> <p>Distribute Participants’ Handouts on farming gross margin analysis</p> <p>Distribute participants’ handout</p> <p>Group exercise</p> <p>Session guide</p>
6. Enterprise Business Planning (30 minutes)	Session Guide
<p><i>(The facilitator defines the business plan, give its importance as well as explains its keys parts).</i></p> <ul style="list-style-type: none"> ● Business Plan Definition ● The Benefits of a Business Plan? ● Parts of a Business Plan 	<p>Distribute the Participants’ Handouts on Business Planning</p> <p>Distribute Participants’ Handouts on Components of a business plan</p>
7. Enterprise Business Financing (50 minutes)	Session Guide

11.7 Introduction to the Module and levelling the expectations (35 minutes)	Session Guide	
<p><i>(The facilitator defines business financing, explain the types, sources and costs of acquiring the finance)</i></p> <p>Plenary Presentation</p> <ul style="list-style-type: none"> • What is Business Financing? • Types of Finances Available to the Farmers in Our Area • Sources of Finances for Farming <p>Group Exercise On Business Planning</p> <p><i>(The facilitator conducts a group exercise and have the groups identify the internal and external sources of finances and state their advantages and their disadvantages).</i></p> <p>In plenary discuss how to carry out a business plan for an enterprise.</p>	<p>Power point presentation</p> <p>Distribute Participants’ Handouts on Sources of business finances. Cost and advantages</p> <p>Summarize discussion on a flip chart and display on the wall</p> <p>Distribute Handouts on Steps in business planning Session guide</p>	
<p>8. Module Review (30 minutes)</p>	<p>Session Guide</p>	
<p><i>(The facilitator guides the trainees to review the module training by looking at what the message is and its application to farming as a business)</i></p>	<p>Distribute Participants’ Handouts on Message from farming as a business module</p>	
<p>Together review the main points about farming as a business.</p> <ul style="list-style-type: none"> · What new things did you learn from this Module? · What are some of the problems and issues that you have become more aware of in the farming as a business module? · What questions do you still have about seed selection and handling? 	<p>Distribute evaluation forms to trainees, have them filled and returned for analysis</p>	
<p>Session activity</p>	<p>Session Guide</p>	
<p>1. Introduction and levelling expectations (30 minutes)</p> <p>Module Objectives</p> <p><i>(The facilitator presents modules objectives)</i></p>	<p>Summarize Trainees’ “Expectations” from previous day on a flipchart and make displays.</p>	

11.7 Introduction to the Module and levelling the expectations (35 minutes)	Session Guide
<p>By the end of the module training, the trainee should be able to:</p> <ul style="list-style-type: none"> • Identify market assessment methods and tools • Explain how to conduct a market assessment • Demonstrate and explain how to develop a marketing plan for farmers or their groups. 	<p>Distribute Participants' Handouts on Module Objectives.</p>
2. Introduction to Market Assessment (30 minutes)	Session Guide
<p><i>(The facilitator introduces market assessment to the trainees, define market and market assessment, and give dimensions as well as give the benefits)</i></p> <ul style="list-style-type: none"> • Definition (Market and Market Assessment) • Dimensions of a Market Assessment • Benefits of a Market Assessment for agricultural production and specifically Finger Millet production 	<p>Let the trainees brainstorm and define Market assessment and finally relate it to Finger Millet production</p> <p>Discuss with the trainees about their perception of market assessment.</p> <p>Summarize discussion in flip chats</p> <p>Distribute Participants Handouts on Definition, dimension and benefits</p>
3. Market Assessment Plan (40 minutes)	Session Guide

11.7 Introduction to the Module and levelling the expectations (35 minutes)	Session Guide
<p><i>(The facilitator explains the steps to follow when doing market assessment)</i></p> <p>Buzz exercise “<i>What should the market assessment report tell a reader?</i>” Let trainees discuss in pairs for 5 minutes and present to plenary in another 10 minutes</p> <p>Information gathered from a market assessment</p> <p>The information you collect should be useful in:</p> <ol style="list-style-type: none"> 1. Describing the market in general terms that are relevant to your product 2. Describing which area of the local economy your business contributes to. 3. Identifying the type of customers you are targeting and their trends and include the figures and prediction for future growth. 4. Identifying right inputs, and trends in supply 5. Describing the other market assessment undertaken previously, covering past development in your given segment and typical revenues and profits. <p>delivery of produce to market.</p>	<p>List down the need for market assessment on flip chart as they are mentioned</p> <p>Present in plenary</p> <p>Distribute Participants’ Handouts 2.3: Information required from a market assessment exercise.</p>

11.7 Introduction to the Module and levelling the expectations (35 minutes)	Session Guide
<ol style="list-style-type: none"> 6. Describing customer behavior and preferences, as well as areas for improvement in the segment of the economy that includes your business. 7. Indicating how the structure of your business responds to the needs discovered during market research; how will your business grow; competition-wise and uniqueness of agricultural product 8. Identifying competitors and explain their strengths and weaknesses 9. Describing any weaknesses in your business model and how each will be addressed. 10. Providing a brief overview of how your business will address market needs and compare favorably to competitors. <p>Include collective action as strategy for input access and produce marketing through economies of scale;</p> <p>Helps plan timely acquisition of inputs and</p>	
4. Market Assessment Tools And Procedures (150 minutes)	Session Guide
<p><i>(The facilitator helps the trainees to develop the market assessment tools and carry out a simple market assessment)</i></p> <p>1.1 Factors to Consider in Market Assessments</p> <ul style="list-style-type: none"> • Size of the market, • Location, • Channels and • Market players (along the value chain, competitors and other stakeholders) 	<p>Power point plenary presentation and discussion</p>

11.7 Introduction to the Module and levelling the expectations (35 minutes)	Session Guide
<p>4.2 Sources of Market Information</p> <p>Primary sources (direct from the field)</p> <p>Secondary sources (from existing information).</p> <ul style="list-style-type: none"> • Tool • Observation • Surveys • Focus Groups and Product Testing <p>A mix of the tools is good for accurate analysis. http://pestleanalysis.com/market-analysis-tools The contents of a check list</p>	<p>Power point plenary presentation</p> <p>Distribute Participants' Handouts on Tools used in market assessment.</p> <p>Distribute Participants' Handouts on generic questions for a check list or questionnaire</p>
<p>1.3 Procedure for Market Assessment</p> <p>Present in details on flip chart or PowerPoint the key steps needed for the following phases and how they can be achieved (methods)</p> <ul style="list-style-type: none"> • Preparation • Field Data Collection • Analysis, Conclusions, Recommendations and Action Planning 	<p>Plenary presentation</p> <p>Power point/flip charts</p> <p>Distribute Participants' Handouts on Procedures for market assessment and decision making</p>
<p>5. Practical Market Assessment (150 minutes)</p>	<p>Session Guide</p>

11.7 Introduction to the Module and levelling the expectations (35 minutes)	Session Guide
<p><i>(The facilitator organizes for a market tour with the trainees where Finger Millet is marketed to collect data using the tools developed. This should be by:</i></p> <p>Group exercise - Preparation for market assessment</p> <p><i>(The facilitator enables the trainees to develop the check list for each of the tools to be used in market data collection).</i></p> <p>1.1 Preparation for a Market Assessment - Tools (50 minutes)</p> <p>Group exercise: Let each group develop a maximum of five simple questions for the following:</p> <ol style="list-style-type: none"> 1. Questionnaire for aggregators 2. Questionnaire for loaders, and transporters 3. Questionnaire for wholesalers including millers 4. Questionnaire for retailers including millers 5. Questionnaire for Finger Millet processors (value addition) 6. Questionnaire for market manager and other key informants 7. Checklist for Focus Group Discussion (FGD) with group of consumers <p>5.2 Market Visit (100 minutes)</p> <p>Facilitate the groups collect data from a local urban set up using personal interview, FGD or observation tools.</p> <p>After the market visit, let them prepare the information needed ready for analysis.</p>	<p>Handouts on preparation for a market assessment visits</p> <p>Presentation by groups</p> <p>Flip charts and power point</p> <p>Plenary discussion/</p> <p>Distribute Participants Handouts Group exercise</p> <p>Ask each group to present the five questions for the tool they shall use</p> <p>Avail transport to and from the urban set up</p>

11.7 Introduction to the Module and levelling the expectations (35 minutes)	Session Guide
<p><i>(The facilitator to leads the trainees in analyzing the market data collected and preparing for development of a marketing plan).</i></p> <p>Ask the groups to present the information the collected on flip charts and display in the training hall</p> <p>1.1 Need for Analysis</p> <p>12 Analysis Results, Conclusions and Recommendations</p> <ol style="list-style-type: none"> 1. Market segments by name 2. Price trends over a period 3. Supply and demand trends (volumes over time) 4. Market requirements– Quality, varieties, volumes, grade, place, price, packaging, etc. 5. How much value is being added along each market channel? <p>What kind of marketing plan is required?</p>	<p>Session Guide</p> <p>Display flip charts on the wall for ease of reference in next sessions</p> <p>Plenary discussion</p> <p>Flip Charts</p> <p>Excel sheet</p> <p>Power point</p> <p>Distribute Participants’ Handouts on Data analysis, conclusions and recommendations</p>
<p>7. Developing A Marketing Plan (80 minutes)</p>	<p>Session Guide</p>
<p><i>(The facilitator helps to trainees to develop a marketing plan)</i></p> <p>Brainstorm and come up with:</p> <ol style="list-style-type: none"> 1. Description of the target market for the Finger Millet 2. Customer profile 3. Competitor profile. Who are the other competitors to be aware of? <p><i>(The facilitator should let the trainees develop some SMART objectives and write them down for discussion. Use the guide in Handouts 2.11)</i></p> <p>Discussion on elements to be included in a marketing plan:</p>	<p>Distribute Participants’ Handouts 2.10: The Marketing guide</p> <p>Distribute Participants’ Handouts 2.11: Marketing plan template. If time allows they can complete the business plan report</p>

11.7 Introduction to the Module and levelling the expectations (35 minutes)	Session Guide
8. Module Review (30 minutes)	Session Guide
<p><i>(The facilitator leads the trainees in reviewing the module)</i></p> <p>Together review the main points about market assessment and arrangements.</p> <ul style="list-style-type: none"> • What new things did you learn from this Module? • What are some of the problems and issues that you have become more aware of market assessment and arrangements? • What questions do you still have about market assessments and arrangements especially in relation to Finger Millet? 	Distribute Participants' Handouts

MODULE 12

CROSS-CUTTING ISSUES IN FINGER MILLET

SUB MODULE 12.1 AGRICULTURAL INNOVATION PLATFORMS AROUND FINGER MILLET VALUE CHAIN NODES

12.1.1 Introduction to the Module

This module exposes the service providers, lead farmers and facilitators to an innovation systems based configuration of stakeholders called the Agricultural Innovation Platform (AIP). It is an organizational model for stimulating innovation and development and brings actors together in a way that pools together skills and knowledge used to address challenges and utilize opportunities. The actors include individuals, private and public sector organizations, policy makers and other value chain stakeholders and are brought together to seek a solution to a challenge hindering agricultural productivity within a value chain such as Pigeon peas. The Agricultural Innovation Platform facilitates actors to interact, innovate, learn and change with time as they seek a solution to the common challenge or compelling agenda. In an innovation platform, information exchange takes place in an environment where every actor's contribution is valued and various benefits accrue to all in a win-win situation.

12.1.2 Module learning Outcomes

By the end of the module, the following outcomes should be achieved:

- The attributes of an innovation platform appreciated and applied
- Stakeholders mobilized to initiate an Agricultural Innovation Platform
- Agricultural Innovation Platforms established, managed and monitored
- The Agricultural Innovation Platforms and innovation capacity of AIP actors sustained

12.1.3 Module Target Group and Categories

The target users are public county extension officers, private agricultural service providers, and lead farmers

12.1.4 Module Users

This module is intended for use by Master Trainers who are members of the Core Team of Trainers (CTT). The facilitator using this module should thoroughly familiarize themselves with the participants' handouts.

12.1.5 Module Duration

The Module is estimated to take five hours

12.1.6 Sub-Module summary

Agricultural Innovation Platforms (AIP)			
Sessions	Training methods	Training materials	Time
12.6.1 Introduction, objectives and expectations	<ul style="list-style-type: none"> Personal introductions PowerPoint presentation Plenary discussions 	<ul style="list-style-type: none"> Flips charts Projector 	40 minutes
12.6.2 An overview of attributes of an Agricultural Innovation Platform	<ul style="list-style-type: none"> Power point Presentations Plenary discussions 	<ul style="list-style-type: none"> Flip charts Projector Participants' Handouts 	55 minutes
12.6.3. Pre-formation stages –stakeholder mobilization and sensitization.	<ul style="list-style-type: none"> Power point presentations Plenary discussions Role plays 	<ul style="list-style-type: none"> Flips charts Projector Handouts Roles 	55 minutes
12.6.4 AIP Phases (Initiation, Establishment, Management and Sustenance)	<ul style="list-style-type: none"> Power point presentations Plenary discussions Role plays Video clip 	<ul style="list-style-type: none"> Flips charts Projector Handouts Roles 	1 hour 30 minutes
12.6.5 Module review	<ul style="list-style-type: none"> Discussions 	<ul style="list-style-type: none"> Flip Charts 	1 hour
Total			5 hours

12.1.7 Facilitator's Guidelines

Agricultural Innovation Platform (AIP)	
12.7.1.1 Introduction, levelling of expectations and objectives (1 hour)	Session Guide
<p>Introduction (30 minutes) <i>(The facilitator welcomes trainees to the module on Agricultural Innovation Platforms. They are then invited to introduce themselves and state their expectations)</i></p> <p>Module Objectives (30 minutes) (The facilitator presents modules objectives and levels out expectations)</p> <p>By the end of the module trainee should be able to:</p> <ul style="list-style-type: none"> Explain characteristics of an innovation platform Mobilize and sensitize stakeholders into an innovation platform Describe how to initiate and establish Agricultural Innovation Platforms Explain how to manage and sustain innovation capacity of actors in Agricultural Innovation Platforms 	<ul style="list-style-type: none"> Summarize Participants' "Expectations" and display. PowerPoint Presentation Module Objectives and Training Program

12.7.2 The characteristics of an innovation platform (1hour)	Session Guide
<p>The facilitator presents an overview of innovation platforms and their main characteristics</p> <p>Plenary Presentation (30 minutes)</p> <ul style="list-style-type: none"> • Past progression of research and extension models and their shortcomings • Agricultural Innovation Systems perspective and Agricultural Innovation Platforms model • Comparison of Agricultural Innovation Platforms with social and technical events working through committees with different roles but common goals • Value chain actor linkage facilitation and other benefits <p>Discussion (30 minutes) Let the trainees recall what they learnt and discuss any issues that may arise.</p>	<ul style="list-style-type: none"> • PowerPoint Presentation • Notes Handouts, • Brochures, information leaflets and manuals
12.7.3 Preformation and formation phases of the Finger Millet AIP (3 hours)	Session Guide
<p>Plenary Presentation (1 hour 30 minutes)</p> <ul style="list-style-type: none"> • Initiation or preformation phase • Establishment • Management • Sustainability <p>Discussion (30 minutes) Let the trainees recall what they learnt and discuss any issues that may arise.</p>	<ul style="list-style-type: none"> • PowerPoint Presentation • Distribute Participants Handouts • Brochures, Leaflets, Manuals • Short video clips
12.7.4 Module review (30 minutes)	Session Guide
<p><i>(The facilitator leads the trainees in reviewing the module)</i></p> <p>Summarize the main points of the training and together with the trainees review the main points on:</p> <ul style="list-style-type: none"> • AIP characteristics and initiation • AIP establishment and management • Sustenance of Finger Millet AIPs <p><i>(Discuss with trainees new things learnt from this Module. What are some of the problems and issues that they have become more aware of in the module?)</i></p>	<ul style="list-style-type: none"> • The last Participants' Handouts • Summarize the main points from the module on a flip chart and display

12.8 Participants' Handouts

1. Kamau, G.M. and Makini F.W. (2019) Agricultural Innovation Platforms for knowledge exchange and learning for technical, economic, social and institutional change

References

1. Felister Makini, Wellington Mulinge, Lawrence Mose, Beatrice Salasya, Geoffrey Kamau, Margaret Makelo, and On'gala, J. (2018) Impact of Agricultural Innovation Platforms on Smallholder livelihoods in Eastern and Western Kenya. FARA Research Results Vol2(6)
2. F. Makini, G. Kamau, M. Makello, A. Adekunle, G.Mburathi. (2013) Operational field guide for developing and managing local agricultural innovation platforms KARI ISSN 978-9966-30-004-1
3. Gabriel Teno and Jean-Joseph Cadilhon (2016) Innovation platforms as a tool for improving agricultural production: the case of Yatenga province, northern Burkina Faso (Journal of field actions, vol 9, 2016)

SUB-MODULE 12.2: GENDER, VULNERABLE AND MARGINALIZED GROUPS (VMGs), SOCIO, ENVIRONMENTAL CONCERNS AND COHESION IN FINGER MILLET PRODUCTION

12.2.1 Introduction to the Module

Finger millet is an important agro-enterprise and therefore all the gender categories (men, women, youth vulnerable marginalized groups (VMGs) are involved in its value chain from production, marketing and consumption. However, women perform most of the crop's production activities such as planting, weeding, harvesting and threshing, most of which are labour intensive. Despite this huge women's contribution, gender inequalities exist in all areas of the value chain. Some of these gender inequalities include: division of labour, access to and control of resources and decision making within and beyond the household. These inequalities limit women, youth and VMGs access to and benefit from the various Technologies Innovations and Management Practices (TIMPs) at different nodes of the value chain. At the macro-level, effective participation of women and youth in groups and market activities is constrained by their low decision making power, lack of voice and lack of access to financial resources. Gender analysis examines the productive and reproductive roles of men and women; access, control and ownership of resources; levels of power relations; differential needs, constraints and opportunities; and impact of these differences (positive/ negative) on lives of men, women, youth and the VMGs.

The Finger Millet value chain TIMPs interventions, when designed and implemented with gender equitable principles, can foster adoption leading to increased productivity as well as enhanced social and environmental impacts.

The overall objective of this module is to ensure that gender mainstreaming and social inclusion in Finger Millet TIMPs is enhanced by field agricultural practitioners and extension officers as an effort geared towards achieving Climate Smart Agriculture "triple win" in target counties

12.2.2 Module learning outcomes

By the end of the module the following should be achieved:

- Understanding of the concept of gender mainstreaming and social inclusion in Finger Millet value chain enhanced
- Understanding of youth empowerment in Finger Millet value chain increased
- Understanding of women empowerment in Finger Millet value chain enhanced
- Understanding of the strategies for inclusion of vulnerable and marginalized groups in Finger Millet value chain increased
- Understanding of socio-cultural barriers in Finger Millet value chain increased
- Environmental and social management framework (ESMF) tool understood appreciated

12.2.3 Module Target Group

This module targets Private service and county governments' extension service providers and lead farmers in the targeted finger millet value chain counties.

12.2.4 Module Users

This module is intended for use by Master Trainers who are members of the Core Trainers Team (CTT) and Lead Farmers in the millet value chain in the target counties. The facilitator using this module should thoroughly familiarize themselves with the participant's handouts (training materials).

12.2.5 Module Duration

The Module is estimated to take 5 hours.

12.2.6 Module Summary

Gender mainstreaming and social inclusions in the Finger Millet value chain			
Sessions	Training methods	Training materials	Duration
12.2.6.1 Introduction, expectations and objectives	<ul style="list-style-type: none"> • Personal introductions • PowerPoint Presentations • Plenary discussions 	<ul style="list-style-type: none"> • Flips charts • Felt pens • Projector • Laptop • Participants handouts 	40 minutes
12.2.6.2 Gender mainstreaming in green value chain	<ul style="list-style-type: none"> • PowerPoint Presentations • Group discussions • Plenary discussions 	<ul style="list-style-type: none"> • Flips charts • Felt pens • Projector • Participants handouts 	40 minutes
12.2.6.3 Youth empowerment in Finger Millet value chain	<ul style="list-style-type: none"> • PowerPoint Presentations • Group discussions • Plenary discussions 	<ul style="list-style-type: none"> • Flips charts • Felt pens • Projector • Participants handouts 	35 minutes
12.2.6.4 Women empowerment in Finger Millet value chain	<ul style="list-style-type: none"> • PowerPoint Presentations • Group discussions • Plenary discussions 	<ul style="list-style-type: none"> • Flips charts • Felt pens • Projector • Participants handouts 	35 minutes
12.2.6.5 Strategies for inclusion of vulnerable and marginalized groups	<ul style="list-style-type: none"> • PowerPoint Presentations • Group discussions • Plenary discussions 	<ul style="list-style-type: none"> • Flips charts • Felt pens • Projector • Participants handouts 	35 minutes
12.2.6.6 Environmental and Social Management Framework	<ul style="list-style-type: none"> • PowerPoint Presentations • Group discussions • Plenary discussions 	<ul style="list-style-type: none"> • Flips charts • Felt pens • Projector • Participants handouts 	45 minutes

12.2.6.7 Socio economic and environmental impact of Finger Millet activities	<ul style="list-style-type: none"> • PowerPoint presentations • Group discussions • Plenary discussions 	<ul style="list-style-type: none"> • Flips charts • Felt pens • PowerPoint Presentation • Participants handouts 	35 minutes
12.6.8 Module Review	<ul style="list-style-type: none"> • Plenary discussions 	<ul style="list-style-type: none"> • Flips charts • Felt pens 	35 minutes
Total			5 hours

12.2.7 Facilitator’s Guidelines

Gender mainstreaming and social inclusion in Finger Millet value	
12.2.7.1 Introduction, Objectives and Expectations (1 hour)	Session Guide
<p><i>(The facilitator welcomes trainees to the module on gender mainstreaming and social inclusion in Finger Millet value chain. They are then invited to introduce themselves and state their expectations)</i></p> <p>Module Objectives (30 minutes)</p> <p>(The facilitator presents modules objectives)</p> <p>By the end of the module training trainee should be able to:-</p> <ul style="list-style-type: none"> • Appreciate gender mainstreaming and social inclusion , in Finger Millet value chain • Recognize need for youth empowerment in Finger Millet value chain • Appreciate women empowerment in Finger Millet value chain • Identify strategies for inclusion of vulnerable and marginalized groups in Finger Millet value chain • Appreciate socio-cultural barriers in Finger Millet value chain • Identify the environmental and social management framework (ESMF) tool 	<ul style="list-style-type: none"> • Summarize Trainees’ “Expectations” and display. • PowerPoint Presentation • Flipcharts • Group exercise • Objectives and Training Program

12.2.7.3 Gender mainstreaming and social inclusion in Finger Millet value chain (1.5 hours)	Session Guide
<p><i>(The facilitator explains what is gender mainstreaming, who does what activity, who has access to what resources and why gender mainstreaming is important in Finger Millet value chain)</i></p> <p>Plenary Presentation (30 minutes)</p> <ul style="list-style-type: none"> • Definition of gender • What is gender mainstreaming and why it is important. • Who does what? (gender division of roles in Finger Millets value chain) • Who owns what? (access and control of resources & benefits) • Who makes which decisions? • Socio-cultural limitations related to Finger Millet value chain • Existing policies in support of gender mainstreaming <p>Group exercise (30 minutes)</p> <p>General discussion (30 minutes) Let the trainees recall what they learned and discuss any issue that may arise</p>	<ul style="list-style-type: none"> • PowerPoint Presentation, Group exercise • Plenary discussions • Distribute Participants' Handouts • Group exercise • Plenary discussions
12.2.7.3 Youth empowerment in Finger Millet value chain (1:15 minutes)	Session Guide
<p>Plenary Presentation (30 minutes)</p> <ul style="list-style-type: none"> • Why agriculture is not attractive to youth • Youth's role in the value chain • Strategies to empower youth in Finger Millet value chain <p>Group work (30 minutes)</p> <p>Group discussion (15 minutes) Let the trainees recall what they learned and discuss any issue that may arise.</p>	<ul style="list-style-type: none"> • PowerPoint Presentation • Group exercise • Plenary discussion

12.2.7.4 Women empowerment in Finger Millet value chain (1 : 15 minutes)	Session Guide
<p>Plenary Presentation (30 minutes)</p> <ul style="list-style-type: none"> • Women’s role in the value chain • Challenges facing women in the value chain • Strategies for empowering women in the value chain <p>Group exercise (30 minutes)</p> <p>Plenary discussion (15 minutes)</p>	<ul style="list-style-type: none"> • PowerPoint Presentation • Distribute participants’ handouts • Group exercise • Plenary discussion
12.2.7.5. Strategies for inclusion of vulnerable and marginalized groups in Finger Millet value chain (1:15 minutes)	Session Guide
<p>Plenary Presentation (30 hour)</p> <ul style="list-style-type: none"> • Who are vulnerable and marginalized groups (VMGs) • Why gender inequality exist • Social inclusion and why • Strategies of inclusion of VMGs <p>Group exercise (30 minutes)</p> <p>Plenary discussions (15 minutes)</p>	<ul style="list-style-type: none"> • PowerPoint Presentation • Group exercise • Plenary discussion
12.7.6. Environmental and social management framework (ESMF) (1:15 minutes)	Session Guide
<p>Plenary Presentation (30 minutes)</p> <ul style="list-style-type: none"> • Objective of ESMF in value chain • Environmental and social risks of the value chain activities • Environmental and social safeguards • Environmental and socioeconomic impacts of Finger Millet value chain activities <p>Group exercise (30 minutes)</p> <p>Plenary discussion (15 minutes)</p>	<ul style="list-style-type: none"> • PowerPoint Presentation • Group exercise • Plenary discussion

12.7.5. Module review (1 hour)	Session Guide
<p><i>(The facilitator leads the trainees in reviewing the module)</i></p> <p>Summarize the main points of the training and together with the trainees review the main points:</p> <ul style="list-style-type: none"> • What is gender mainstreaming and why it is important. • Youth empowerment in Finger Millet value chain • Women empowerment in Finger Millet value chain • Strategies for inclusion of vulnerable and marginalized groups in Finger Millet value chain • Socio-cultural barriers in the value chain • Environmental and socioeconomic impacts of Finger Millet activities <p>Let the trainees recall what they learnt and discuss any issues that may arise.</p>	<ul style="list-style-type: none"> · Summary of the main points on from the module on a flip chart and display

SUB-MODULE 12.3: CLIMATE-SMART AGRICULTURAL POLICY OPTIONS

12.3.1 Introduction to the Module

Kenya adopted Vision 2030 in 2007 as a new blue print and roadmap for political, social and economic development of the country in the next two decades. The Vision also identifies Agriculture as the engine of growth through transformation of smallholder and subsistence agriculture to innovatively and commercially oriented agriculture. Kenya promulgated the new constitution in 2010 which proposes two levels of governments (national & county) with defined functions. Agriculture is one of the devolved governance functions. However, agriculture in Kenya is facing many challenges and threats such as climate change, declining agricultural performance, limited high potential agricultural land and over-reliance on rain fed agriculture, limited diversification of Agricultural production, poor and inadequate rural infrastructure, inadequate and declining research in agriculture, agricultural sector financing and related activities and low technical capacity among the actors. Therefore, agricultural policy in Kenya revolves around the main goals of increasing productivity and income growth, especially for smallholders; enhanced food security and equity, emphasis on irrigation to introduce stability in agricultural output, commercialization and intensification of production especially among small scale farmers; appropriate and participatory policy formulation and environmental sustainability. This module introduces the national and county governments, service providers, lead farmers, facilitators and relevant stakeholders in the design and implementation of effective climate-smart-sensitive agricultural policy options to promote the transition to climate-smart agriculture at the smallholder level. The policy context of this module is structured around six topics.

12.3.2 Module Learning Outcomes

By the end of this module training, the following outcomes should be achieved:

- The role of agricultural policy frameworks in Kenya appreciated
- Climate-smart agriculture practices, policy options and approaches appreciated
- Climate-smart-sensitive policy cycle understood
- Implementation of the climate-smart-sensitive policy at the county level understood
- Financing and Investments for Climate-smart Agriculture appreciated
- The need for a Technology Policy appreciated

12.3.3 Module Target Group

This module is intended for service providers, policy makers, public extension agents, lead farmers and relevant stakeholders in the design and implementation of effective, climate-smart-sensitive agricultural policies.

12.3.4 Module Users

This module is intended for use by Master Trainers who are members of the Core Team of Trainers (CTT). The facilitators using this module should thoroughly familiarize themselves with the required participant's hand-outs.

12.3.5 Module Duration

The Module is estimated to take a 5 hours.

12.3.6 Module Summary

Climate-Smart Agricultural Policy Options			
Sessions	Training methods	Training materials	Time
12.6.1 Introduction, learning expectations and outcomes	<ul style="list-style-type: none"> • Personal introductions • Group discussions • Plenary discussions • PowerPoint Presentations 	<ul style="list-style-type: none"> • Flips charts • Felt pens • Projector 	40 minutes
12.6.2 Agricultural Policy Frameworks in Kenya	<ul style="list-style-type: none"> • PowerPoint Presentations • Practical exercises • Plenary discussions 	<ul style="list-style-type: none"> • Flips charts • Felt pens • Projector 	50 minutes
12.6.3 Climate-smart agriculture practices, policy options and approaches	<ul style="list-style-type: none"> • PowerPoint Presentations • Practical exercises • Plenary discussions 	<ul style="list-style-type: none"> • Flips charts • Felt pens • Projector • Participants' Handouts 	50 minutes
12.6.4 Climate-smart-sensitive policy cycle	<ul style="list-style-type: none"> • PowerPoint Presentations • Plenary discussions 	<ul style="list-style-type: none"> • Flips charts • Felt pens • Projector • Participants' Handouts 	20 minutes
12.6.5 Implementation of the climate-smart-sensitive policy at the county level	<ul style="list-style-type: none"> • PowerPoint Presentations • Practical exercise • Plenary discussions 	<ul style="list-style-type: none"> • Flips charts • Felt pens • Projector • Participants' Handouts 	50 minutes
12.6.6 Financing and Investments for Climate-smart Agriculture	<ul style="list-style-type: none"> • PowerPoint Presentations • Practical exercise • Plenary discussions 	<ul style="list-style-type: none"> • Flips charts • Felt pens • Projector • Participants' Handouts 	50 minutes
12.6.7 Technology Policy	<ul style="list-style-type: none"> • PowerPoint Presentations • Plenary discussions 	<ul style="list-style-type: none"> • Flips charts • Felt pens • Projector • Participants' Handouts 	20 minutes
12.6.8 Module Review	Plenary discussion	<ul style="list-style-type: none"> • Flip charts • Felt pens 	20 minutes
Total			5 hours

12.7 Facilitator’s Guidelines

Module 12.3: Climate-Smart Agricultural Policy Options	
13.3.1 Introduction, Expectations and Outcomes (1 hour)	Session Guide
<p><i>(The facilitator welcomes trainees to the module. They are then invited to introduce themselves and state their expectations)</i></p> <p>Trainees Expectations (50 minutes) (The facilitator requests the trainees to form groups and list their expectations)</p> <p>Module Outcomes (10 minutes) <i>(The facilitator presents module learning Outcomes)</i> By the end of this module, the trainee should be able to:</p> <ul style="list-style-type: none"> • Appreciate the role of agricultural policy frameworks in Kenya • Appreciate climate-smart agriculture practices, options and approaches • Recognise the stages in climate-smart-sensitive policy cycle • Realize the phases in the implementation of the climate-smart-sensitive policy at the county level • Evaluate and select financing and investments options for Climate-smart Agriculture • Appreciate the need of a technology policy 	<ul style="list-style-type: none"> • Summarize Trainees’ “Expectations” and display. • PowerPoint Presentation • Distribute Participants Handouts on Module Objectives and Training Program
12.3.2 Agricultural Policy Frameworks in Kenya (1 hour 20 minutes)	
<p>Plenary Presentation (20 minutes)</p> <ul style="list-style-type: none"> • The role of agricultural policy frameworks in Kenya <p>Practical Exercise (30 minutes) <i>(The facilitator requests the trainees to form groups and identify the gaps between agricultural policy frameworks and the existing agricultural policies)</i></p> <p>Plenary Discussions (30 minutes)</p>	<ul style="list-style-type: none"> • PowerPoint presentation • Distribute participants’ handouts • Group Exercise

12.3.3 Climate-smart agriculture practices, policy options and approaches (1 hour 20 minutes)	Session guide
<p>Plenary Presentation (20 minutes)</p> <ul style="list-style-type: none"> • Considerations for climate-smart production systems • Existing systems, practices and methods suitable for climate-smart agriculture • Institutional and policy options • Ensuring farmer organizations for market access • Gendered approach <p>Practical Exercise (30 minutes)</p> <p><i>(The facilitator requests the trainees to form groups and identify the existing climate-smart agriculture practices and the relevant policy options for implementation)</i></p> <p>Plenary Discussions (30 minutes)</p>	<ul style="list-style-type: none"> • PowerPoint presentation • Distribute participants' handouts • Group Exercise
12.3.4 Climate-smart-sensitive policy cycle (20 minutes)	Session Guide
<p>Plenary Presentation (10 minutes)</p> <ul style="list-style-type: none"> • Stages in the climate-smart-sensitive policy cycle <p>Plenary Discussions (10 minutes)</p>	<ul style="list-style-type: none"> • PowerPoint presentation • Distribute participants' handouts
12.3.5 Implementation of the climate-smart-sensitive policy at the county level (1 hour 20 minutes)	Session Guide
<p>Plenary Presentation (20 minutes)</p> <ul style="list-style-type: none"> • Phases in the implementation of the climate-smart-sensitive policy at the county level <p>Practical exercise (30 minutes)</p> <p><i>(The facilitator requests the trainees to form groups and develop a program showing steps, activities and stakeholders for the implementation of climate-smart policies)</i></p> <p>Plenary Discussions (30 minutes)</p>	<ul style="list-style-type: none"> • PowerPoint presentation • Distribute participants' handouts • Practical Exercise

12.3.6 Policy financing and investments for Climate-smart Agriculture (1 hour 20 minutes)	Session Guide
<p>Plenary Presentation (20 minutes)</p> <ul style="list-style-type: none"> • Why financing is needed • Financing gaps • Sources of financing • Financing mechanisms • Connecting action to financing • Types of subsidies to farmers <p>Practical exercises (30 minutes)</p> <p><i>(The facilitator requests the trainees to form groups and identify potential sources of financing, financing mechanisms and connecting action to financing)</i></p> <p>Plenary Discussions (30 minutes)</p>	<ul style="list-style-type: none"> • PowerPoint presentation • Distribute participants' handouts • Practical Exercise
12.3.7 Need of Technology Policy (20 minutes)	Session guide
<p>Plenary Presentation (10 minutes)</p> <ul style="list-style-type: none"> • What is a technology policy? • Why do we need technology policy? • Is technology policy inconsistent with a market oriented economy? • Technology policy in Kenya <p>Plenary Discussions (10 minutes)</p>	<ul style="list-style-type: none"> • PowerPoint presentation • Distribute participants' handouts
12.3.8 Module review (20 minutes)	Session guide
<p><i>(The facilitator leads the trainees in reviewing the module)</i></p> <p>Summarize the main points of the training and together with the trainees review the main points:</p> <p>(Each participant lists the main points learnt during the training. Discuss with trainees new things learnt from this Module. What are some of the problems and issues that they have become more aware of in the module?)</p>	<ul style="list-style-type: none"> • Q& A session • Recap the main points • Test understanding • Participatory evaluation of the session

12.8 Participants' Handouts

12.3.9 References

Alila, P.O. & Atieno, R. (2006). A paper for the Future Agricultures Consortium workshop, Institute of Development Studies, 20-22 March 2006. Future Agricultures.

Chronic Poverty Advisory Network (2012). Agriculture Policy Guide 2. Meeting the challenge of a new Pro-poor agricultural paradigm: The role of agricultural policies and programs. www.chronicpovertynetwork.org

Chirwa, E.; Dorward, A.; Kathule, R.; Kumwenda, I.; Kydd, J., Poole, N.; Poulton, C. & Stockbridge, M. (undated). Farmer Organization for market access: Principles for policy and practice. Imperial College London. University of Malawi. Agricultural Policy Research Unit. <http://www.imperial.ac.uk/agriculturalsciences/research/sections/aebm/projects/farmerorg.htm>

Food and Agriculture Organization of the United Nations (2016). The Gender in Agricultural Policies Analysis Tool (GAPo). FAO 2016.16274EN/2/01.18

Food and Agriculture Organization of the United Nations (FAO) (2010). “Climate-Smart” Agriculture. Policies, Practices and Financing for Food Security, Adaptation and Mitigation.

Ha-Joon Chang (2002). African Technology Policy Studies Network (ATPS). Who needs Technology Policy? Published by The African Technology Policy Studies Network, Nairobi, Kenya. ISBN: 9966-916-18-0

RoK (2007). Kenya adopted Vision 2030.

RoK (2010). Kenya Constitution

ANNEXES

ANNEX 1: PROGRAM OF TRAINING

Time	Day 0 (Sunday)	Duration	Remarks / Facilitator
Late Evening	<ul style="list-style-type: none"> · Arrival of participants and registration – Host · Setting up and prepare training venue and materials – CTT 	2 Hours	The training venue and materials are ready for use
Close of Day 0			
Time	Day 1 (Monday)	Duration	Remarks / Facilitator
	Climate Setting		The trainees relax and climate set for the ten-day training
8.30-10.30am	<ul style="list-style-type: none"> Welcome by host and Prayers Self-introductions –(CTT) · Introduction to Finger Millet component of the Kenya Climate Smart Agricultural Project (KCSAP) · Official opening Ceremony (CDA Bomet/Kericho) · Introduction to the training program (CTT) · Formation of groups and setting norms (CTT) 	10 minutes 30 minutes 15 minutes 15 minutes 20 minutes 30 minutes	
10.30 -11.00am	Tea Break (Group Photo)	30 minutes	Health Break
11.00am - 1.00pm	Module 1.0 Climate Change and climate smart agriculture <ul style="list-style-type: none"> - Introduction to climate change and variability, leveling of expectations, and module objectives -Impacts of climate change and variability on agriculture and food security 	1 hr 1 hr	
1.00 -2.00pm	Lunch Break	1 hour	

2.00 - 4.00pm	Module 1.0 Climate Change and climate smart agriculture cont. Concept of Climate smart agriculture (CSA) Projected future climate scenarios and how to manage	1 hr 1 hr	
4.00 - 4.30pm	Tea Break	30 minutes	Health Break
4.30 - 5.00pm	Module 1.0 Climate Change and climate smart agriculture cont. Module review	20 minutes	
End of Day 1			
Day 2	Tuesday		
8.30 - 10.30am	Module 2.1 FFBS Methodology <ul style="list-style-type: none"> Leveling expectations and Module objectives, Discussions on existing extension approaches and facilitation skills 	15 minutes 1 hr 40 minutes	
10.30-11.00am	Coffee Break	30 minutes	
	· Module 2.1 Introduction to FFBS Methodology · Experiences with FFS, Group exercise · Key steps in FFBS establishment and capacity building model	1 hr 10 minutes	
11.00am-1.00pm		50 minutes	
1.00pm-2.00pm	Lunch Break	1 hour	

2.00 - 4.00pm	<ul style="list-style-type: none"> · Key steps in FFBS establishment and capacity building model · Conclusion and Review of Module 1 <p>Module 2.2 Facilitation and Communication skills</p> <ul style="list-style-type: none"> · Levelling expectations, module objectives · Introduction to Facilitation and teaching · Group exercise · Role play and discussions · Concept of adult learning 	<p>10 minutes</p> <p>15 minutes</p> <p>15 minutes</p> <p>25 minutes</p> <p>45 minutes</p> <p>10 minutes</p>	
4.00 - 4.30pm-	Tea Break	30 minutes	Health Break
4.30 - 5.30pm	<ul style="list-style-type: none"> · Concept of adult learning cont'd. · Facilitation tools for FFBS 	<p>20 minutes</p> <p>40 minutes</p>	
Close of Day 2			
Time	Day 3 (Wednesday)	Duration	Remarks / Facilitator
8.30am-10.30am	<p>Recap of day 2</p> <ul style="list-style-type: none"> · Communication skills and public speaking · Module review 	<p>15 minutes</p> <p>30 minutes</p> <p>15 minutes</p>	
	<p>Module 2.3 Curriculum Development for FFBS</p> <ul style="list-style-type: none"> · Introduction and levelling expectations, module objectives · Recap on key steps in FFBS program · Introduction of curriculum development in general 	<p>10 minutes</p> <p>15 minutes</p> <p>5 minutes</p>	

10.30am-11.00am	Tea Break	30 minutes	Health Break
	Introduction of curriculum development in general continued	25 minutes	
11.00am-1.00pm	<ul style="list-style-type: none"> · Guidelines for developing FFBS curriculum · Developing an FFBS curriculum 	40 minutes 55 minutes	
1.00pm-2.00pm	Lunch Break	1 hour	
2.00pm-4.00pm	<ul style="list-style-type: none"> · Developing an FFBS curriculum cont'd · Module Review · Module 2.4 Participatory Monitoring and Evaluation · Introduction, levelling expectations, module objectives · Introduction to M&E 	25 minutes 40 minutes 10 minutes 45 minutes	
4.00pm-4.30pm	Coffee Break	1 hour	
4.30pm-5.15pm	Introduction to M&E cont'd <ul style="list-style-type: none"> · -Principles and characteristics of PM&E 	15 minutes 30 minutes	
Close of Day 3			
Time	Day 4 (Thursday)	Duration	Remarks / Facilitator
8.30am-10.30am	<ul style="list-style-type: none"> -Tools and relevance to FFBS PM&E -Developing FFBS PM&E plans 	40 minutes 1 hr 20 minutes	
10.30am-11.00am	Tea Break	30 minutes	Health Break

11.00am-1.00pm	-Developing FFBS PM&E plans cont. Module review Module 2.5 Up scaling and sustainability -Introduction and levelling of expectations, module objectives and recap on FFBS model -Farmer led FFBS field day	10 minutes 40 minutes 30 minutes 40 minutes	
1.00pm-2.00pm	Lunch Break	1 hour	
2.00pm-4.00pm	-Farmer led FFBS field day cont'd -Planning for up scaling farmer led FFBS -Up scaling farmer led FFBS	30 minutes 50 minutes 40	
4.00pm-4.30pm	Coffee Break	30 minutes	
4.30pm - 5.10pm	-Up scaling farmer led FFBS cont'd · Module review	20 minutes 20 minutes	
Close of Day 4			
Time	Day 5 (Friday)	Duration	Remarks / Facilitator
8.30am-10.30am	Module 3.0. Finger Millet production in Kenya and its production niches cont. - Introduction, leveling of expectations, and module objectives - . Status of Finger Millet in Kenya - Areas of production, crop needs, and suitability maps	1 hour 50 minutes 10 minutes	

10.30am-11.00am	Tea Break	30 minutes	Health Break
11.00am-1.00pm	- Areas of production, crop needs, and suitability maps cont'd -Challenges and opportunities in Finger Millet production in the light of the triple wins (productivity, resilience, and mitigation) -Module review	40 minutes 50 minutes 30 minutes	
1.00pm-2.00pm	Lunch Break	1 hour	
2.00pm-4.00pm	Module 4: Finger Millet Variety Selection and Seed System - Introduction, leveling of expectations, and module objectives. -Introduction to Finger Millet varieties · Sources of quality Finger Millet variety seed	40 minutes 60 minutes 30 minutes	
4.00pm-4.30pm	Coffee Break	30 minutes	
4.30pm - 5.10pm	Sources of quality Finger Millet variety seed cont'd.	- 40 minutes	
Close of Day 5			
Time	Day 6 (Monday)	Duration	Remarks / Facilitator
8.30am-10.30am	On-farm seed selection and Post-harvest seed management · Module review	1 hr 40 minutes 20 minutes	
10.30am-11.00am	Tea Break	30 minutes	Health Break

11.00am-1.00pm	Recap on Finger Millet Variety Selection and Seed System. Module 5. Finger Millet Good Agronomic Practices -Introduction, leveling of expectations and module objectives - Introduction to Finger Millet field management practices. · - Site preparation and planting	10 minutes 15 minutes 20 minutes 1 hr 20 minutes	
1.00pm-2.00pm	Lunch Break	1 hour	
2.00pm-4.00pm	Field management practices Module review Module 6. Integrated Soil and Water Management Practices for Finger Millet production · -Introduction, leveling of expectations and module objectives	1 hr 25 minutes 20 minutes 15 minutes	
4.00pm-4.30pm	Coffee Break	30 minutes	
4.30pm - 5.55pm	Module 6. Integrated Soil and Water Management Practices for Finger Millet Production cont'd · -Introduction, leveling of expectations and module objectives	45 minutes	
Close of Day 6			
Time	Day 7 (Tuesday)	Duration	Remarks / Facilitator
8.30am-10.30am	Soil composition, properties, health, Conduct of Soil sampling and analysis practical's Soil and plant tissue sampling, analysis and practicals	1 hr 1 hr	

10.30am-11.00am	Tea Break		30 minutes	Health Break
11.00am-1.00pm	Soil and plant tissue sampling, analysis and practicals Cont'd - Soil fertility and plant nutrition		1 hr 1 hr	
1.00pm-2.00pm	Lunch Break		1 hour	
2.00pm-4.00pm	- Soil fertility and plant nutrition cont'd · Soil health and ISFM for climate resilient cropping systems		1 hr 1 hr	
4.00pm-4.30pm	Coffee Break		30 minutes	
4.30pm-5.30pm	· Soil health and ISFM for climate resilient cropping systems		1 hr	
Close of Day 7				
Time	Day 8 (Wednesday)	Duration	Remarks / Facilitator	
8.30am-10.30am	· Soil and water management and water harvesting technologies	2 hrs		
10.30am-11.00am	Tea Break	30 minutes		Health Break
11.00am-1.00pm	Soil degradation and reclamation · Problematic soils and their management	1 hr 1 hr		
1.00pm-2.00pm	Lunch Break	1 hour		

2.00pm-4.00pm	Module review and discussion Module 7: Crop Health Introduction to the module, leveling of expectations, and module objective Overview of key Finger Millet pests and diseases	1 hr	
4.00pm-4.30pm	Finger Millet pests Coffee Break	15 minutes 20 minutes 35 minutes 30 minutes	
4.30 - 5.30pm	Finger Millet pests Finger Millet diseases	15 minutes 45 minutes	
Close of Day 8			
Time	Day 9 (Thursday)	Duration	Remarks / Facilitator
8.30am-10.30am	- Finger Millet diseases - IPM and field sanitation - Safe and effective use of agro chemicals - Module review	10 minutes 30 minutes 30 minutes 15 minutes	
10.30am-11.00am	Module 8 Finger Millet Post Harvest Management -Introduction to the module, leveling of expectations, and module objective Tea Break	35 minutes 30 minutes	Health Break

11.00am-1.00pm	-Introduction to Finger Millet Post-Harvest Management Types of post-harvest operations for Finger Millet Practices for managing postharvest yield and quality losses	55 minutes 30 minutes 35 minutes	
1.00pm-2.00pm	Lunch Break	1 hour	
2.00pm-4.00pm	Practices for managing postharvest yield and quality losses Importance and potentials of Finger Millet production in a changing climate Module review Module 9. Finger Millet Value Added Food Products -Introduction to the module, leveling of expectations, and module objective -Introduction to Finger Millet Value Added Food Products	10 minutes 45 minutes 15 minutes 10 minutes 40 minutes	
4.00pm-4.30pm	Coffee Break	30 minutes	

4.30 - 5.45	- Awareness and prioritization of opportunities for value added products in Finger Millet. - Nutritive value of Finger Millet value added food and feed products. -Module review	20 minutes 40 minutes 15 minutes	
Close of Day 9			
Time	Day 10 (Friday)	Duration	Remarks / Facilitator
8.30am-10.30am	Module 10. Mechanization of Finger Millet Production. -Introduction to the module, leveling of expectations, and module objective - Climate smart tillage options -Calibration of fertilizer and seed rates for planters	30 minutes 30 minutes 1 hr	
10.30pm-11.00pm	Tea Break	30 minutes	
11.00am-1.00pm	-Calibration of fertilizer and seed rates for planters cont'd Weed control equipment and tools, usage · Harvest timing, yield estimation machines and tools	30 minutes 1 hr 10 minutes 20 minutes	
1.00pm-2.00pm	Lunch Break	1 hour	

2.00pm-4.00pm	<ul style="list-style-type: none"> Harvest timing, yield estimation machines and tools Estimation of harvesting losses 	50 minutes 1 hr 10 minutes	
4.00pm-4.30pm	Coffee Break	30 minutes	
4.30 - 5.30	<ul style="list-style-type: none"> Machine and procedure for grading 	1 hr	
Close of Day 10			
Time	Day 11 (Monday)	Duration	Remarks / Facilitator
8.30am-10.30am	Module 11: Finger Millet Business and Marketing <ul style="list-style-type: none"> Introduction to the module, module objectives, and leveling expectations Farm business management Key requirements for Finger Millet agribusiness enterprise management Profitability analysis of Finger Millet enterprise management 	30 minutes 30 minutes 40 minutes 20 minutes	
10.30pm-11.00pm	Tea Break	30 minutes	
11.00am-1.00pm	<ul style="list-style-type: none"> Profitability analysis of Finger Millet enterprise management Finger Millet value chain business financing Market assessment plan Market assessment tools and procedures 	20 minutes 40 minutes 50 minutes 10 minutes	

1.00pm-2.00pm	Lunch Break	1 hour	
2.00pm-4.00pm	· Market assessment tools and procedures · Practical market assessment	1 hr 20 minutes 40 minutes	
4.00pm-4.30pm	Coffee Break	30 minutes	
4.30 - 5.20 pm	· Practical market assessment	50 minutes	
Close of Day 11			
Time	Day 12 (Tuesday)	Duration	Remarks / Facilitator
8.30am-10.30am	- Analysis of market data - Developing a marketing plan - Module review	40 minutes 1 hr 10 minutes 10 minutes	
10.30pm-11.00pm	Tea Break	30 minutes	
11.00am-1.00pm	Module 12: Cross-Cutting Issues in Finger Millet Sub Module 12.1 Agricultural Innovation Platforms around Finger Millet Value Chain Nodes -Introduction, module objectives, and leveling expectations -An overview of attributes of an Agricultural Innovation Platform -Pre-formation stages –stakeholder mobilization and sensitization.	40 minutes 55 minutes 25 minutes	

1.00pm-2.00pm	Lunch Break	1 hour	
2.00pm-4.00pm	· Pre-formation stages –stakeholder mobilization and sensitization. · AIP Phases (Initiation, Establishment, Management and Sustainance)	30 minutes 1 hr 30 minutes	
4.00pm-4.30pm	Coffee Break	30 minutes	
4.30 - 5.30 pm	· Sub-Module review	1 hr	
Close of Day12			
Time	Day 13 (Wednesday)	Duration	Remarks / Facilitator
8.30am-10.30am	Sub-Module 12.2: Gender, Vulnerable and Marginalized Groups (VMGs), Socio-Environmental Concerns and Cohesion in Finger Millet Production -Introduction, sub-module objectives, and leveling expectations -Gender mainstreaming in finger millet value chain -Youth empowerment in Finger Millet value chain -Women empowerment in Finger Millet value chain	40 minutes 40 minutes 35 minutes 5 minutes	
10.30pm-11.00pm	Tea Break	30 minutes	

11.00am-1.00pm	<ul style="list-style-type: none"> -Women empowerment in Finger Millet value chain -Strategies for inclusion of vulnerable and marginalized groups -Environmental and Social Management Framework -Socio economic and environmental impact of Finger Millet activities 	<p>30 minutes</p> <p>35 minutes</p> <p>45 minutes</p> <p>10 minutes</p>	
1.00pm-2.00pm	Lunch Break	1 hour	
2.00pm-4.00pm	<ul style="list-style-type: none"> -Socio economic and environmental impact of Finger Millet activities · Sub-module Review <p>Sub-Module 12.3: Climate-Smart Agricultural Policy Options</p> <ul style="list-style-type: none"> · Introduction, module objectives, and leveling expectations. 	<p>25 minutes</p> <p>35 minutes</p> <p>40 minutes</p> <p>20 minutes</p> <p>30 minutes</p>	
4.00pm-4.30pm	Coffee Break		
4.30 - 5.30 pm	<ul style="list-style-type: none"> - Agricultural Policy Frameworks in Kenya - Climate-smart agriculture practices, policy options and approaches 	<p>30 minutes</p> <p>30 minutes</p>	

Close of Day13			
Time	Day 14 (Thursday)	Duration	Remarks / Facilitator
8.30am-10.30am	<ul style="list-style-type: none"> -Climate-smart agriculture practices, policy options and approaches -Climate-smart-sensitive policy cycle - Implementation of the climate-smart-sensitive policy at the county level - Financing and Investments for Climate-smart Agriculture 	20 minutes 20 minutes 50 minutes 30 minutes	
10.30pm-11.00pm	Tea Break	30 minutes	
11.00am-1.00pm	<ul style="list-style-type: none"> - Financing and Investments for Climate-smart Agriculture. -Technology Policy -Module Review 	20 minutes 20 minutes 20 minutes	
1.00pm-2.00pm	Lunch Break	1 hour	
Close of Day14 and Departure			





Kenya Climate Smart
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