



Climate Smart Agriculture Technologies, Innovations and Management Practices for Kale Value Chain

TRAINING OF TRAINERS' MANUAL



Nyaga A., Gatambia E., Kamau E., Gathambiri C., Wanyama J.M., Amata R., Wandera F.M., Kamau G., Ndubi J., Mwangi H., Ochieng V., Nasirembe W., Ndung'u J., Kirigua V.O. and Wasilwa L.A.

JULY 2021

Disclaimer

The information presented in this draft manual is for advisory use only. Users of this manual should verify site specific details that relate to their agro-climatic zones from their area agricultural extension officers.

© Kenya Agricultural and Livestock Research Organization 2021

All rights reserved. No part of this book may be reproduced, stored in database systems, transcribed in any form or by any means, electronic, mechanical photocopying, recording or otherwise without prior written permission of the publisher.

Published by

Kenya Agricultural and Livestock Research Organization

KALRO Secretariat

P O Box 57811-00200

Nairobi, KENYA

Email: directorgeneral@kalro.org

Tel. No(s): +254-722206986/733333223

Compiled by: Nyaga A., Gatambia E., Kamau E., Gathambiri C., Wanyama J.M., Amata R., Wandera F.M., Maina S., Kamau G., Ndubi J., Mwangi H., Ochieng V., Nasirembe W., Ndung'u J., Kirigua V.O. and Wasilwa L.A.

Editors: Ouda J.O., Mukundi K.T., Nyabundi K.W., Mwirigi M., Maina P. and Nyaga A.

Editing and Publication coordination: Kirigua V and Lung'aho C.

Design and layout: Nyaola E. and Mnene N.

Typesetting: Kibwage P.N.

ISBN: 978-9966-30-071-3

Climate Smart Agriculture Technologies, Innovations and Management Practices for Kales Value Chain

TRAINING OF TRAINERS' MANUAL

JULY 2021



FOREWORD

Kenya Climate-Smart Agriculture Project (KCSAP) tasked the Kenya Agricultural and Livestock Research Organization (KALRO) with the implementation of the project's 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 is development of sustainable seed production and distribution systems for priority value chains to enhance availability and access to improved seeds, animal breeds and fingerlings by target beneficiaries. This will be supported under Component 1 namely 'Upscaling Climate-Smart Agricultural Practices'. Against this background, KALRO and her National Agricultural Research Systems (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 24 value chains being addressed. The training content is drawn from the CSA TIMPs that support respective value chains.

The contents are arranged in progressive modules supported by extensive information from research and background data drawn from the TIMPs. Their relevance is 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 of replicating 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 enable achievement of the envisaged 'Triple Wins' of increased productivity, enhanced resilience and reduction of greenhouse gases emissions.

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. The project runs for five years and implemented in 24 counties, mainly in the arid and semi-arid lands (ASALs), at an approximate cost of KES 25 billion. 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) Upscaling 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 tasked 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 the prioritized value chains. The crop-based value chains are 19 and include roots and tubers (cassava, potato), pulses (dry beans, green gram and pigeon peas), vegetables (tomato, onion, indigenous vegetables, kale), cereals (sorghum, millet, maize, teff) nuts (cashew nut), fruits (banana, mango, water melon) and fibre (cotton). Those that are animal production based are five (5) and include apiculture, indigenous chicken (meat and eggs), dairy (cattle and camel), red meat (cattle, sheep and goats) and aquaculture. Also, there are three (3) cross cutting themes on pastures and fodder, natural resource management, and animal health. The TIMPs were categorized into those ready for upscaling and those requiring validation. Furthermore, gaps that required further research and development of TIMPs were identified. Training of Trainers’ (ToT) manuals focusing on TIMPs that are ready for up scaling for each of the value chains were subsequently developed to form the basis of training county extension staff, service providers and lead farmers. Those trained are in turn expected to cascade the 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 the 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 Climate Smart Training of Trainers’ Manual for Kale (Sukuma wiki)

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

TABLE OF CONTENTS

Foreword.....	v
Preface.....	vii
List of Abbreviation.....	xi
Introduction.....	1
PART 1.....	1
SECTION 1: Background.....	3
SECTION 2: Training Content.....	5
SECTION 3: Training Design.....	8
SECTION 4: Facilitator Guidelines.....	10
PART II: TRAINING MODULES.....	15
MODULE 1: Climate Change and Climate Smart Agriculture.....	16
MODULE 2: Farmer Field and Business School (FFBS) Approach in Kale Production..	20
MODULE 3: Good Agricultural Practices (GAPs) and Food Safety Management Systems (FSMS).....	25
MODULE 4: Kale Production Niches And Climatic Requirements	33
MODULE 5: Kale Variety Selection.....	37
MODULE 6: Kale Seed Systems.....	41
MODULE 7: Climate Smart Agronomic Practices for Kale.....	44
MODULE 8: Integrated Soil and Water Management Practices for Kale Production.....	48
MODULE 9: Kale Crop Health.....	54
MODULE 10: Kale Harvesting and Postharvest Management.....	59
MODULE 11: Kale Value Addition.....	63
MODULE 12: Mechanization of Kale Production.....	67
MODULE 13: Kale Business and Marketing.....	73

MODULE 14. Kale Cross-Cutting Issues (Agricultural Innovation Platforms, Policy, Gender Mainstreaming And Social Inclusion)	78
SUB-MODULE 14.1: Agricultural Innovation Platforms	78
SUB-MODULE 14.2: Kale Gender, Vulnerable And Marginalized Groups (Vmgs), Social, Environmental Concerns And Cohesion	83
SUB-MODULE 14.3: Climate-Smart Agricultural Policy Options	88

ANNEXES

ANNEX 1: Training Program	93
ANNEX 2: FFBS Learning Materials	97
ANNEX 3: FFBS Traing Guide For TOT	100

LIST OF TABLES

Table 1: Summary of 14 module outlines for the kale value chain.....	5
Table 2: Description of Training Methods.....	11
Table 3: Individual Sample Evaluation Form.....	13

LIST OF ABBREVIATIONS AND ACRONYMS

AEZs	Agro-ecological zones
AIP	Agricultural Innovation Platform
APVC	Agriculture Product Value Chain
ASAL	Arid and Semi-Arid Land
B	Boron
CA	Conservation Agriculture
CCP	Critical Control Point
CIG	Common Interest Group
CL	Critical Limit
CTT	Core Team of Trainers
CC	Climate Change
CSA	Climate Smart Agriculture
ESMF	Environmental and Social Management Framework
FFBS	Farmer Field and Business School
FSMS	Food Safety Management System
GAP	Good Agricultural Practice
ha	Hectare
HACCP	Hazard Analysis and Critical Control Point
HCD	Horticulture Crop Directorate
IDM	Integrated Disease Management
INRM	Integrated Natural Resource Management
IPM	Integrated Pest Management
ISFM	Integrated Soil Fertility Management
IWM	Integrated Weed Management
K	Potassium
KALRO	Kenya Agricultural and Livestock Research Organization
KCSAP	Kenya Climate Smart Agriculture Project
kg	Kilogram
LF	Lead Farmer
Mo	Molybdenum
N	Nitrogen
P	Phosphorus
S	Sulphur
TIMPs	Technologies, Innovations and Management Practices
ToT	Training of Trainer
VMG	Vulnerable and Marginalized Group
Zn	Zinc





INTRODUCTION

About this manual

This training of trainers' manual consist of two parts. Part I comprises notes for the facilitators while part II is made up of training module in the value chain.

PART I

This part consists of four sections including the Background of the Kale value chain, Content of the Training, Training Design and Facilitators Guidelines.





SECTION 1: BACKGROUND

1.1 The Role of Kale in the Kenyan Economy

Kale or “Sukuma wiki” as commonly referred to is produced for the domestic market. The name Sukuma wiki literally means the ‘week pusher’, which connotes the importance of this vegetable in enabling the weeks to pass by before the next wage or salary payment, particularly among low income urban dwellers. It is the most highly consumed leafy vegetable in the country, grown in all the 47 counties. According to the Kenya Horticultural Crops Directorate (HCD), between 2017 and 2018, the area under Kale production and volume produced increased from 30,687 to 35,034 ha and from 491,815 to 600,766 t, representing 14 and 22% increase, respectively. The value increased from KES 7.976 to 9.583 billion, representing 20% increase. In the same year, Kale accounted for 18.1% of all the exotic vegetables by value in the country.

Kale is mainly grown by small-scale farmers and serves as a source of food and cash income in most parts of the country. It plays a crucial role in terms of contribution to food security, poverty eradication, and economic development. The sub sector employs about a majority of the smallholder farmers mostly women and youth. They also provide a positive spillover effect upon a range of other industries like transport and trade.

1.2 Role of Kale as Food and Nutrition Security

Kale is the most affordable and popular leafy vegetable and most diversely eaten vegetable by most Kenyans. It is present in most Kenyan house hold dishes as is the most popular vegetable consumed with Ugali (a popular maize flour based meal) and other starches such as rice, chapatti, bananas and others. Most households probably consume it at least twice a week. It is grown mainly for the domestic market. Kale is a nutrition superstar due to the amounts of vitamins A, K, B6 and C, calcium, potassium, copper, Iron and manganese it contains. One cup of raw kale has just 33 calories and only 7 grams of carbohydrate. So, it’s a very diabetes-friendly/weight-friendly vegetable.

1.3 Climate Smart Kale Technologies, Innovation and Management Practices

The National average for Kale production in Kenya is about 17.1 t/ha which falls below the full potential about 30 t/ha. This is attributed to several constraints that include unavailability/inaccessibility of clean high yielding Kale planting materials, lack of knowledge by farmers on the correct varieties for their specific areas, erratic rainfall due to climate change, low soil fertility, high incidence of pests and diseases among others.

The project seeks to assist farmers to address these challenges in production, yield and utilization by exploiting the crop’s potential in partnership with relevant private and public actors on Good Agricultural Practices (GAPs). The aim is to improve farm productivity through the adoption of GAPs.

1.4 Objectives of the Training

The purpose of this training is to provide Kale farmer trainers with knowledge and skills on how to facilitate and support farmers for increased productivity through adoption of GAP’s.

Specifically, the objectives of this training are:

1. Providing farmers' trainers with relevant altitude, knowledge and skill in farming as a business and market assessment techniques for market led production.
2. Refreshing farmer trainers' knowledge and skills in Kale GAPs including on-farm variety selection, establishment and management of Kale fields.
3. Providing farmers trainers with knowledge and skills on the potential in value addition at individual or group level as post-harvest Kale management.
4. Providing farmer trainers with knowledge and skills in participatory techniques for effective facilitation of adult learning processes through FFBS and developing inclusive stakeholder partnership development for sustainable upscaling of Kale production.

After the 8 day training, ToTs participants will train farmers for a season long FFS session on Kale. The FFS training will involve providing the trainers with techniques in participatory preparation, mobilization, planning, implementation, monitoring and evaluation of FFS sessions. They will also train farmer groups to scale up the adoption of GAPs through farmer lead FFS in their villages and those neighboring them

SECTION 2: TRAINING CONTENT

2.1 Orientation of the Module

This section outlines the orientation and content of the 14 modules, which are intended to ensure adoption and up scaling of Kale TIMPs, to improve productivity, resilience and mitigation of harmful greenhouse gases. The purpose of these modules is to enhance the knowledge and capacities of trainers in understanding and disseminating the climate-smart Kale practices to the intended beneficiaries, who are primarily farmers.

2.2 Module Outline

Each of the 14 modules consist of 8 parts. These parts are:

- a) **Introduction** – context and background of training needs, 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
- e) **Module duration** –number of hours of exposure to materials
- f) **Module summary** –sequence of sessions, training methods, materials and duration
- g) **Facilitators guideline** –detailed sessions, training methods, materials and session guides
- h) **Participant’s handouts** – detailed notes and reference materials for trainees

The outline of the 14 modules is presented in **Table 1**.

Table 1: Summary of 14 module outlines for the Kale value chain

No.	Module Name	Need Addressed	Expected Training Outcomes	Duration
1	Climate change and climate smart agriculture	<ul style="list-style-type: none">• The impact of climate crisis to Kale production• The climate smart technologies for Kale value chain	<ul style="list-style-type: none">• Master trainers made aware of the potential impact of climate change on Kale production• Master trainers updated on climate smart techniques for Kale	2 hours
2	Farmer Field Business School (FFBS) approach	<ul style="list-style-type: none">• Skills/ technologies for production, processing and marketing	<ul style="list-style-type: none">• Improved technologies/ innovations and agronomic practices for Kale availed	3 hours 30minutes

3	Good Agricultural Practices (GAP) and Food Safety Management System (FSMS) - Hazard Analysis Critical Control Points (HACCP) Plan	<ul style="list-style-type: none"> Enhance food safety through lowering presence of hazardous solids/ organisms/ and pollutants pathogens 	<ul style="list-style-type: none"> Techniques for determining pollutants in food material explored for adoption in Kale value chain 	4 hours 30 minutes
4	Kale production niche and climate requirements	<ul style="list-style-type: none"> Identify areas suitable for Kale production 	<ul style="list-style-type: none"> Master trainers learn of Kale niche in the respective counties 	2 hours
5	Kale variety selection	<ul style="list-style-type: none"> Awareness on improved Kale varieties 	<ul style="list-style-type: none"> Master trainers made aware of the new improved varieties 	2 hours
6	Kale seed systems	<ul style="list-style-type: none"> Both formal and informal seed kale systems 	<ul style="list-style-type: none"> The formal and informal seed supply systems analyzed. 	1 hour 30 minutes
7	Climate smart agronomics practices for kale	<ul style="list-style-type: none"> Options for innovating increased Kale production 	<ul style="list-style-type: none"> Both water and input manipulations analyzed along benefits 	4 hours
8	Integrated soil and water management practices for kale production	<ul style="list-style-type: none"> Soil water and fertility enhancing techniques availed. 	<ul style="list-style-type: none"> All techniques analyzed for possible benefits 	3 hours 30 minutes
9	Kale Crop Health	<ul style="list-style-type: none"> All major pests (invertebrate and vertebrate) and diseases organisms control mechanisms availed to the master trainers. 	<ul style="list-style-type: none"> Reduction of kale yield loss caused by the major pests and diseases 	8 hours
10	Kale harvesting and Post-harvest management	<ul style="list-style-type: none"> Postharvest handling technologies to reduce losses in quantity and quality 	<ul style="list-style-type: none"> Trainees sensitized on proper harvesting techniques and storage facilities, hygiene and monitoring 	2 hours

11	Kale value addition	<ul style="list-style-type: none"> • Various Kale value added products 	<ul style="list-style-type: none"> • Value addition and Kale products identified for the farming communities and business entities • Opportunities identified and prioritized 	2 hours 30 minutes
12	Mechanization of Kale production	<ul style="list-style-type: none"> • Adaptation of mechanized operations of Kale from crop establishment, crop management to post-harvest operations 	<ul style="list-style-type: none"> • Options of mechanization for increased yield availed to farmer groups. 	2 hours
13	Kale business and Marketing	<ul style="list-style-type: none"> • Review business options and develop agribusiness plan in Kale production value chain • Review marketing skills and strategies in Kale production 	<ul style="list-style-type: none"> • Agribusiness skills in Kale production Value Chain identified and shared • Marketing skills and strategies (Collective/Aggregation, contract and E-marketing) in Kale production reviewed 	6 hours
14	Kale Cross cutting issues Innovation Platforms Gender mainstreaming and social inclusion Policy	<ul style="list-style-type: none"> • Articulate how Voluntary Marketing Groups can draw benefits from Kale value chain • Options of employment opportunities in Kale production • Sites for information profiled at the county levels • Review policy strategies and regulation in kale production value chain 	<ul style="list-style-type: none"> • Opportunities for marginalized groups identified and gains made • Farmers get access to more information on Kale production • Policies, strategies and regulations influencing Kale production including climate smart challenges reviewed and shared 	6 hours 30 minutes
Total Duration				50 Hours

SECTION 3: TRAINING DESIGN

3.1 Delivery System

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

a) Establishment of a team of facilitators

- A Core Team of Trainers (CTT) to train farmer trainers (service providers) as facilitators of a ToT course will be established. This is done using this manual and modules contained herein.
- Each of the Master Trainers will facilitate trainers of farmers and other stakeholders to acquire knowledge and skills for facilitating Farmer-led Field and Business Schools through practical demonstrations.

b) Upscaling –This will be done by selecting lead farmers (LF) to be trained in 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 offering crop sciences and State Department of Agriculture, MoALF will facilitate initial training of trainers of farmers and other stakeholders. They will also provide mentorship to farmers’ trainers during the first year of LF trainings and 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 FFBSs to form partnership with stakeholders for sustainability and support LFs to conduct their training and form Kale TIMPs up scaling networks.

c) Lead Farmer Networks- Association of LFs in the counties is to take up farmer trainings and upscaling 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 Kale farmer or their groups.

3.3 Training Duration

The ToT course for Master Trainers of the 14 modules in the Kale value chain shall take a total of 50 hours of training period. This does not include break hours of mid-morning, afternoon and lunch.

3.4 Logic of Design and Flow of Session

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

participant's expectations; (iii) Relate participants' 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 e.g. having a participant to summarize the key points learnt and their application or implication; and, (vi) Distribute the participants' handouts.

SECTION 4: FACILITATOR GUIDELINES

4.1 Preparation of Training Materials

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

1. The facilitators should familiarize themselves and internalize the guidelines provided by this manual prior to the training.
2. 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.
3. Flip charts and good quality felt pens could be used interchangeably with LCD projections. Each participant will require one felt pen while the trainers will require two sets of felt pens.
4. Visual aids like field equipment and tools should also be arranged in time before the sessions start.
5. There should be adequate copies of participants' handouts (one per participant) to be distributed at the end of each session or as may be suitable.
6. 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 site and market place.

- a) **Training Room** – Should have adequate space for 25 participants 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, projector, a flip charts holder and white wall to act as a projector screen.
- b) **Demonstration Site** – Should be located within a walking distance with at least five distinct plots for demonstrations.
- c) **Market Sites** – these include cereal 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, service providers and researchers with elaborate training back ground 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 trainer 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, they should not be lectured. Rather, they should be facilitated and listened to so that they may 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 and the corresponding days and time allocation (**Annex 1**).

4.4 Training Methods

The training methods proposed for each session are suitable for adult learners and appropriate for addressing knowledge, skills and attitudes of the participants. 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 i.e. presentations should be separated by other participatory training methods. Table 2 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

4.5 Planning Schedule and Guideline for ToT Preparation

While planning for this training, the CTT leader should ensure the following before the training:

1. **Six weeks** – recruit Master Trainers, compose CTT, have at least 5 Kale demonstration plots planted with Kale.
2. **Four weeks** – send out invitation letters to participants and special guests detailing purpose, venue and program. Follow up on demonstration sites. Brief CTT members.

3. **Two weeks** – confirm names of participants; reproduce training materials for facilitators and package, preparedness of the field sites to be visited and special guests, if any. Hold briefing of CTT members to finalize training plan.
4. **Four days** –Confirm training sites preparedness, prepare sitting arrangements, and brief assistants
5. **One day** - arrange training room furniture, place materials, equipment and stationery on the tables. Arrange for reception of the trainees at residence proposed.
6. **On first day** – arrange for reception of trainees at the training venue. Ensure climate setting is done before the course is officially opened. This includes:
 - Registration
 - Welcoming to venue by host
 - Elaborate introduction of CTT and participants
 - Introduction to the project and training course
 - Ground rules
 - Groups formation

4.6 Evaluation of the Training

Half day is to be 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 section 4.4. The evaluation to be conducted using two strategies as follows: First, the evaluation forms are to be distributed for filling by individual trainees without conferring or refereeing to each other. The evaluation forms are then collected and analyzed by the CTT members.

The second strategy of evaluation is trainees' group evaluation. Here the trainees are to be asked to 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 clarifications 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.

Table 3: Sample Evaluation Form

Aspect / Module	Rating		
	Very Useful (3 marks)	Useful (2 marks)	Of Limited Use (1 marks)
1. Climate change and Climate smart Agriculture			
2. Farmer Field and Business School Approach in Kale Production			
3. Good Agricultural Practices (GAPs) and Food Safety Management Systems (FSMS)			
4. Kale production Niches and Climatic Requirements			
5. Kale variety selection and access to quality seeds.			
6. Kale Seed Systems			
7. Climate Smart Agronomic Practices			
8. Integrated Soil and Water Management Practices for Kale			
9. Kale Crop Health			
10. Kale Harvesting and Post-harvest Management			
11. Kale Value Addition			
12. Mechanization of Kale production Activities			
13. Kale Business and Marketing			
14. Cross-Cutting Issues (Agricultural Innovation Platforms, Policy, Gender Mainstreaming and Social Inclusion)			

4.7 Facilitator's Training Notes and Reference Materials

4.8 Key references

Key references should be provided for each module plus a list of other relevant publications.

4.8.1 Guide on the use of the information

The trainers will be advised to issue farmers with at most two publications for each of the training sessions. This is because if they go away with more than 10 publications 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, CD or portable hard drive to enable farmers easily access and if necessary, print any of them.

Trainers will be advised to issue one general Kale farming manual to be accompanied by other relevant publications e.g. information sheets, brochures, factsheets and posters. With subsequent training modules, they can develop their collection of publications.



Kale in a typical Kenyan farm



PART II: TRAINING MODULES

This part presents the content of 14 modules of training namely: Climate change and climate smart agriculture, Farmer Field Business school (FFBS) approach, Kale production niche and climate requirements, Good Agricultural Practices (GAP) and Food Safety Management System (FSMS), Kale variety selection, Kale seed systems, Kale climate smart agronomics practices, Integrated soil and water management practices for Kale, Kale Crop Health, Kale harvesting and Post-harvest management, Kale value addition, Mechanization of Kale production activities, Kale business and Marketing, and Kale Cross cutting issues Innovation Platforms, Policy, gender mainstreaming and social inclusion).

All the modules will be divided into the following:

1. Introduction
2. Module learning outcomes
3. Module target group
4. Module users
5. Module duration
6. Module summary
7. Facilitator's guidelines
8. Reference Materials



MODULE 1

CLIMATE CHANGE AND CLIMATE SMART AGRICULTURE

1.1 Introduction

The impacts of climate change and variability in agriculture, food systems and food security is a serious concern. Kenya's agricultural production systems is highly impacted upon, due to the low adaptive capacity and the high exposure to climate related risks. 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 use of appropriate tools and technologies coupled with effective communications of weather information is expected to reduce the negative impacts of climate change. Thus, there is need to mainstream suitable climate resilient technologies, innovations and management practices (TIMPs) to increase agricultural productivity and resilience to climatic shocks. The desired net effect would be improved food security, agri-business and livelihoods.

1.2. Module Learning Outcomes

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

- Concept of the climatic change and availability discussed and explained.
- Impacts of the climate change and variability on agricultural and food security shared.
- Concept of climate smart agriculture (CSA) shared and explained.
- Future climate scenarios and how to manage projected and appreciated.

1.3 Module Target Group

This module targets public and public agricultural extension agents, service providers and lead farmers based at sub-county and ward level.

1.4 Module Users

This module is intended for use by Master trainers who are members of the core team of trainers (CTT) and Lead Farmers in the target counties. The trainers using this module should thoroughly familiarize themselves with the participants' handouts (training materials).

1.5 Module Duration

The module is estimated to take 2 hours

1.6. Module Summary

Module 1: Climate Change and Climate Smart Agriculture in Kale Value Chain			
Sessions	Training Methods	Training Materials	Duration
1.6.1 Introduction and Levelling Expectations	<ul style="list-style-type: none"> • Personal • Introduction • PowerPoint Presentation • Plenary discussion 	<ul style="list-style-type: none"> • Projector • Laptop • Flip charts 	10 minutes
1.6.2 Introduction to climate change and variability	<ul style="list-style-type: none"> • PowerPoint Presentation • Case study videos • Plenary discussion 	<ul style="list-style-type: none"> • Projector • Laptop • Videos • Flip charts • Participants' handouts 	20 minutes
1.6.3. Concept of Climate smart agriculture (CSA) in Kale	<ul style="list-style-type: none"> • PowerPoint Presentation • Plenary discussion 	<ul style="list-style-type: none"> • Projector • Laptop • Videos • Flip charts • Participants' handouts 	1 hour
1.6.4 Projected future climate scenarios affecting Kale and how to manage	<ul style="list-style-type: none"> • PowerPoint Presentation • Case study videos • Plenary discussion 	<ul style="list-style-type: none"> • Projector • Laptop • Flip charts • Participants handouts 	20 minutes
1.6.5. Module review	<ul style="list-style-type: none"> • Participants' questions and comments • Facilitator' summary 	<ul style="list-style-type: none"> • Module review 	10 minutes
TOTAL			2 hours

1.7 Facilitator's Guidelines

1.7.1. Introduction and Levelling Expectations (10 minutes)	Session Guide
<p><i>(The trainer introduces the trainees to this module on climate change and climate smart agriculture).</i></p> <p>Trainees' expectation (5 minutes) <i>The facilitator organizes the trainees into groups to state and list their expectations.</i></p> <p>Module Objectives (5 minutes) <i>(The trainer presents module's objectives on power point).</i> By the end of the module training, the trainee should be able to:</p> <ul style="list-style-type: none"> • Explain climate change and adaptations. • Describe Climate Smart Agriculture (CSA) . • Describe and explain available climate smart crop management practices in Kale production. • Explain the benefits of selected climate smart crop management practices in Kale production. 	<ul style="list-style-type: none"> • PowerPoint presentation • Distribute Participants' handouts

1.7.2 Introduction to Climate Change and Climate Variability (20 minutes)	Session guide
<p><i>(The trainer proceeds to introduce the module basics).</i></p> <p>Plenary presentation (10 minutes)</p> <ul style="list-style-type: none"> • Basic terminologies used in the module (weather, climate, variability, adaptation, coping). • Explain climate change and climate variability. • The causes of climate change. • Climate risks impacting agriculture. • Proposed adaptation and mitigation measures <p>Case study videos and discussion (10 minutes)</p> <ul style="list-style-type: none"> • The impact of climate change 	<ul style="list-style-type: none"> • PowerPoint presentation • Plenary Discussion • Video Presentation
1.7.3 Concept of Climate Smart Agriculture (CSA) (1 hour)	Session Guide
<p><i>(The trainer presents to the trainees the principles underpinning CSA and the link to deliverable of project objectives).</i></p> <p>Plenary Presentation (45 minutes)</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>Plenary discussion (15 minutes) Discussions on the CSA concept</p>	<ul style="list-style-type: none"> • PowerPoint presentation • Participants' handouts • Plenary discussion.
1.7.4 Projected Future Scenarios that will Impact Productivity (20 minutes)	Session Guide
<p><i>(The trainer leads the trainees in discussing future climatic projections focusing on rainfall and temperature, which directly impacts on crop yields) are the long-term rainfall and temperature projections as impacted by climate change?</i></p> <p>PowerPoint presentation (10 minutes)</p> <ul style="list-style-type: none"> • Projected impacts on food production and needed adaptation measures especially for Kale. <p>Video presentation and discussion (10 minutes)</p> <ul style="list-style-type: none"> • Short Video on showing projections of rainfall and temperature. 	<ul style="list-style-type: none"> • PowerPoint presentation • Video presentation • Plenary discussion
1.7.5 Module Review (10 minutes)	Session Guide
<p><i>(The trainer leads the trainees in summarizing the key points discussed in the module)</i></p>	<ul style="list-style-type: none"> • Plenary discussion

1.8 Reference materials

Participants handouts

- Climate Change and CSA Factsheets
- Climate Change and CSA Leaf-lets

Reference

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

MODULE 2

FARMER FIELD AND BUSINESS SCHOOL (FFBS) APPROACH IN KALE PRODUCTION

1.1 Introduction

This module is designed for training and exposing trainees to the Farmer Field and Business Schools (FFBS) approach and concepts. In addition, practitioners of FFBS need to have knowledge of this methodology in order to transfer various Technologies, Innovations and Management Practices (TIMPs) in Kale production to farmers. The trainees will thereafter facilitate farmers in the Common Interest Groups (CIGs) to learn by doing the available TIMPs from a common plot of FFBS and then implement what they have learnt to their individual farms in order to meet the KCSAP project objective of increased productivity and building resilience to climate change. The FFBS also empowers the learners with various skills in leadership, communication and agri-business. Since the methodology is participatory, it improves the learners' observation skills and creates linkages with other value-chain players, thereby making Kale production profitable and sustainable.

Training of trainers is a cost-effective way to introduce new approaches that require new skills to trainers, facilitators and institution, and leads to a common vision and common methodology for moving into new areas of extension and education. The vision inherent in farmer field schools is that trainers work alongside farmers as advisors and facilitators, encouraging independence, analysis and organization. The farmer field school methods promote exploration, discovery and adaptation under local conditions in the right way. The “right way” means not only building on good science and technological methods, but also fitting into local ecological, social, economic and historical contexts. Finding the “right way” means that all stakeholders need to participate and gain ownership of the process.

2.2. Module Learning Outcomes

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

- Concept of FFBS approach, teaching and facilitating described and explained.
- Approaches to effective facilitation and participatory learning for FFBS demonstrated and explained.
- Knowledge and analytical skills to design simple experiments for testing options identified and demonstrated.
- Shift from the traditional focus to improving productivity to farming business proposition explained and facilitated.

2.3. Module Target Group

This module targets public and private agricultural extension agents, service providers and lead farmers based at sub-county and ward level

2.4. Module Users

This module is intended for use by Master Trainers who are members of the Core Team of Trainers (CTT) and Lead Farmers in the Kale value chain target Counties. The facilitators using this module should thoroughly familiarize themselves with the participants' Handouts (training materials).

2.5. Module Duration

The Module is expected to last for a time duration of 3 hours 30 Minutes.

2.6 Module Summary

Module 2: Farmer Field and Business School Approach			
Sessions	Training Methods	Training Materials	Time
2.6.1 Introduction, Climate setting, leveling of expectations and objectives.	<ul style="list-style-type: none"> • Participatory introduction • Participants grouping • Facilitation principles and methods • Setting of learning norms • Levelling of expectations • Plenary Presentation • Host team and functions of host team 	<ul style="list-style-type: none"> • Laptop • Projector • Flip charts • Mark pens 	20 minutes
2.6.2 FFBS Methodology Historical Background <ul style="list-style-type: none"> • Approach and concept • Definition • Objectives • Principles of FFBS • Steps in conducting FFBS • Ecosystem • Agro-Ecosystem Analysis (AESAs) • Participatory Technology Development (PTD) 	<ul style="list-style-type: none"> • Plenary presentation • Plenary discussions 	<ul style="list-style-type: none"> • Pictorials • Laptop • Projector 	1 hour
2.6.3 Introduction to Communication and communication skills	<ul style="list-style-type: none"> • Plenary presentation • Group exercise 	<ul style="list-style-type: none"> • Projector • Laptop • Flip charts • Felt pens 	30 minutes
2.6.4 Facilitation and leadership skills	<ul style="list-style-type: none"> • Presentation • Plenary discussion 	Power point and Projector.	30 minutes

2.6.5 Organization and management in FFBS	<ul style="list-style-type: none"> • Plenary presentation • Plenary discussion 	Power point and Projector.	30 minutes
2.6.6 Developing FFBS Curriculum for the Kale value chain	<ul style="list-style-type: none"> • Plenary presentation • Group discussion 	Power point, Projector, Flip charts and felt pens	30 minutes
2.6.7 Module review	<ul style="list-style-type: none"> • Presentation • Plenary discussion 	Flip charts, Power point presentations and projectors	10 Minutes
TOTAL			3 hours 30 Mins

2.7 Facilitator's guidelines

2.7.1 Introduction, climate setting Leveling Expectations and Objectives (20 minutes)	Session Guide
<p><i>(The trainer welcomes trainees to the module and thereafter invites them to state their expectations).</i></p> <p>Trainee introduction and climate setting (10 minutes) Introduction of participants, setting training norms, formation of FFBS sub groups (Working groups) and trainees to share their expectations</p> <p>Module Objectives (10 minutes) <i>The facilitator presents modules objective in PowerPoint</i> By the end of the module, the trainee should be able to:</p> <ul style="list-style-type: none"> • Describe and explain concept of Farmer Field and Business School approach, teaching and facilitation. • Demonstrate and explain approaches to effective facilitation and participatory learning for FFBS. • Identify and demonstrate knowledge and analytical skills to design simple experiments for testing options. • Explain and facilitate shift from the traditional focus to improving productivity to farming business proposition. 	<ul style="list-style-type: none"> • Provide checklist for introduction of trainees to help them build confidence in participation • Summarize and display trainees expectations • Assign roles to the Sub groups • Set norms and nominate leaders • Power point presentation on the objectives of the FFBS training module
2.7.2 FFBS Methodology (1 hour)	Session guide
<p>Plenary presentation (45 minutes) The facilitator takes the trainees through the main concepts and pillars of FFBS which includes:</p> <ul style="list-style-type: none"> • The definition of FFBS • Participatory Technology Development (PTD) for the Kale value chain TIMPs 	<ul style="list-style-type: none"> • PowerPoint presentation • Plenary discussion

<ul style="list-style-type: none"> • Agro ecosystems Analysis (AESAs) of the Kale value chain • Concept of what is this what is that • FFBS principle of Integrated production and pest management (IPPM) • FFBS Business concept and opportunities in the Kale value chain stages <p>Plenary discussion (15 minutes)</p> <ul style="list-style-type: none"> • Pillars of FFBS 	
2.7.3 Introduction to Communication and Communication skills (30 minutes)	
<p>Group exercise to gauge the understanding of trainees (20 minutes)</p> <ul style="list-style-type: none"> • What is communication? • Communication channels, • Barriers to effective communication and • How to effectively communicate <p>Plenary presentation (10 minutes) Communication and communication skills</p>	<p>Session guide</p> <ul style="list-style-type: none"> • Group exercise • PowerPoint presentation • Participants' handouts
2.7.4 Facilitation and leadership skills (30 min)	
<p>Plenary presentation (20 hours)</p> <ul style="list-style-type: none"> • Definition of Facilitation, facilitator and effective facilitation • Qualities of a good facilitator • Golden rules of facilitation • Roles and responsibilities of FFBS Facilitators • Difference between facilitation and teaching • Definition of leadership • Elements of leadership • Types of leadership • Characteristics of a good leader <p>Plenary discussion (10 minutes)</p> <ul style="list-style-type: none"> • Discussion on facilitation 	<p>Session guide</p> <ul style="list-style-type: none"> • PowerPoint presentation • Participants' handouts • Plenary discussion
2.7.5 Organization and management in FFBS (30 minutes)	
<p>Plenary presentation</p> <p>Steps of FFBS implementation framework :</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 	<p>Session guide</p> <ul style="list-style-type: none"> • PowerPoint presentation • Participants' handouts • Plenary discussion

<ul style="list-style-type: none"> • Graduation • Establishment of Lead FFBS • Follow ups <p>Plenary discussion</p> <ul style="list-style-type: none"> • FFBS implementation Framework 	
2.7.6 Developing FFBS Curriculum for the Kale value chain (30 minutes)	Session guide
<p>Plenary presentation (20 minutes) Steps of Participatory technology development on the Kale value chain production</p> <ul style="list-style-type: none"> • Identify the major constraints to increased yields of Kale value chain production • Ranking of constraints in order from highest. • Identify list of TIMPs to address the constraints • Rank the TIMPs in order from the most preferred • Develop PTD on the most preferred TIMP objective • Decide on the parameters for AESA • Develop FFBS curriculum using crop growth stage calendar for the Kale value chain <p>Group exercises (10 minutes)</p> <ul style="list-style-type: none"> • Constraint identification and ranking • TIMPs options identification and ranking • Identification of the growth stages of the value chain crop and development of FFBS training curriculum 	<p>Group exercises on</p> <ul style="list-style-type: none"> • pair wise matrix ranking of constraints and TIMPs in Kale value chain • curriculum development based on the value chain growth stages • Presentations of the group exercises on flip charts • power point presentations on PTD and curriculum development
2.7.7 Module review (30 minutes)	Session guide
<ul style="list-style-type: none"> • Participants questions and answers • Facilitators summary • Guideline on FFBS Kale action plans 	<ul style="list-style-type: none"> • PowerPoint presentation • Plenary discussion • Module summary

2.8 Participants' Handouts

- FFBS Factsheets
- FFBS Guides

References

1. FAO (2006). Farmer Field School FFS Manual.
2. Khisa Godrick (2004). Farmer Field School Methodology: Training of Trainers Manual.
3. Sustainet East Africa (2010). Farmer Field School: A Technical Manual.

MODULE 3

GOOD AGRICULTURAL PRACTICES (GAPs) AND FOOD SAFETY MANAGEMENT SYSTEMS (FSMS)

3.1. Introduction

This module is designed for training and exposing trainees to good agricultural practices and food safety management system along the Kale value chain.

Declining food safety, reduced food quality, unsustainable farming practices and negative environmental impact from agricultural activities plague the food sector and impose risks in the agricultural sector. These can be mitigated by adoption of Good Agricultural Practices (GAPs). The GAPs mitigate risks through risk prevention, risk analysis and promotion of sustainable agriculture by means of Integrated Pest and Disease Management (IPDM) and Integrated Crop Management (ICM). On the other hand, worker safety and health along with traceability requirements are a major concern to modern consumers. The GAPs are vital in protecting consumer health by ensuring safety within the food chain. It is imperative to operate from the table upstream to include suppliers of agricultural inputs and providers of logistics and farm equipment. Therefore, GAPs constitute a certification system for agriculture, specifying procedures that must be implemented to produce and supply food that is safe for consumers and wholesome use of sustainable methods.

Food safety assures food quality based on the absence or occurrence of hazards that are risky to human and animal health, within acceptable limits. Hazards are common along food value chains that lack effective control measures and may be due to ‘bad’ agronomic practices or are introduced along the supply chain from the farm to fork continuum. Today, there is an increasing public concern on the negative environmental and health impacts of agrochemicals as well as microbial pathogens and their toxins. Control of the hazards occurrence can be done by implementation of an effective Food Safety Management Systems (FSMS) through Hazard Analysis Critical Control Points (HACCP) management system. It involves a seven step management system that provides the framework for monitoring the entire food chain. This makes it more of a preventive, rather than a reactive tool designed to identify and control potential problems before they occur.

3.2. Module Learning Outcomes

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

1. GAPs on food safety and enhanced quality along the Kale value chains discussed and appreciated.
2. Knowledge on optimization and utilization of resources (water, soil, manure, fertilizers and other inputs), environmental protection and conservation acquired and described.
3. Worker safety and health within the crop production system explained.
4. Traceability in food safety and quality along the Kale value chain mapped and implemented.

3.3. Module Target Group

This module targets public and public agricultural extension agents, service providers and lead farmers based at sub-county and ward level.

3.4. Module Users

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

3.5. Module Duration

The Module is estimated to take 4 hours and 30 minutes

3.6 Module Summary

Module 3. Good Agricultural Practices (GAPs) and Food Safety Management Systems (FSMS)			
Sessions	Training Methods	Training Materials	Time
3.6.1 Introduction, objectives and levelling of expectations	<ul style="list-style-type: none"> • Groups to bring out expectations • Plenary presentation 	<ul style="list-style-type: none"> • Module objectives • Marker pens • Flip charts • Projector • Laptop 	10 minutes
3.6.2 Understanding what is GAP and its application in the Kale value chain	<ul style="list-style-type: none"> • Plenary presentations • Plenary discussion 	<ul style="list-style-type: none"> • Flip charts • Marker pens • Projector • Laptop • Pictorials/video clips 	10 minutes
3.6.3 Discussion of what factors to consider when selecting a site for agricultural activities through Risk Assessment	<ul style="list-style-type: none"> • Plenary presentation • Plenary discussion 	<ul style="list-style-type: none"> • Flip charts • Marker pens • Projector • Laptop • Pictorials/video clips • Data sheets 	10 minutes
3.6.4 Review of GAP requirements for audit and types of protocols possible	<ul style="list-style-type: none"> • Plenary presentations • Plenary discussion 	<ul style="list-style-type: none"> • Data forms • Flip charts • Marker pens • Projector • Laptop • Pictorials/video clips • Data sheets 	10 minutes
3.6.5 Introduction to Site Selection	<ul style="list-style-type: none"> • Plenary Presentation • Plenary discussion 	<ul style="list-style-type: none"> • Projector • Laptop 	10 minutes
3.6.6 GAP checklists and Audit	<ul style="list-style-type: none"> • Plenary Presentation • Group exercise 	<ul style="list-style-type: none"> • Flip charts • Marker pens • Projector • Laptop 	10 minutes

3.6.7 Safe use of Pesticides and calibration of sprayers and nozzles	<ul style="list-style-type: none"> • Group work on nozzles • Rate of discharge • Safety guidelines 	<ul style="list-style-type: none"> • Pictorials/video clips • Knapsacks • Measuring cylinders • Tape measure • Nozzles • Empty clean pesticide containers 	1 hour
3.6.8 Understanding of food safety management system in crop value chains	<ul style="list-style-type: none"> • Plenary presentation • Plenary discussion 	<ul style="list-style-type: none"> • Flip charts • Marker pens • Projector • Laptop, • Pictorials/video clips 	30 minutes
3.6.9 Determination of food safety risk/hazards in crop value chains (hazard analysis)	<ul style="list-style-type: none"> • Plenary presentation • Group exercise 	<ul style="list-style-type: none"> • Projector • Laptop • Flip charts • Marker pens • Participants' hand outs 	30 minutes
3.6.10 Determination of critical control points (CCPs) and Critical limits (CLs) in Kale value chain	<ul style="list-style-type: none"> • Plenary Presentation • Group Exercise 	<ul style="list-style-type: none"> • Projector • Laptop • Flip charts • Marker pens 	30 minutes
3.6.11 Prevention and corrective measures for CCPs in Kale value chain	<ul style="list-style-type: none"> • Plenary Presentation • Group exercise 	<ul style="list-style-type: none"> • Flip charts • Marker pens • Power point projector • Laptop • Pictorials/video clips 	30 minutes
3.6.12 Module review	<ul style="list-style-type: none"> • Participants' questions and comments • Facilitator's summary 	<ul style="list-style-type: none"> • Participants' hand outs • Module review 	30 minutes
TOTAL			4 hours 30 minutes

3.7 Facilitator's Guidelines

3.7.1 Introduction and Levelling Expectations (10 Minutes)	Session Guide
<p><i>The facilitator welcomes trainees to the sub-module on GAPs and introduces him/herself stating profile and experience of working with farmers.</i></p> <p>Trainees' introductions and expectations (5 minutes)</p> <p>The facilitator invites the trainees to state their expectations after brain storming in their respective county groups</p>	<ul style="list-style-type: none"> • Summarize trainees' Expectations on a flipchart • PowerPoint presentation

<p>Module Objectives (5 minutes) <i>The facilitator presents module's objectives in power point.</i></p> <p>By the end of the module, the trainee should be able to:</p> <ul style="list-style-type: none"> • Appreciate GAP's matters of food safety and quality along the crop value chain. • Describe optimization and utilization of resources (water, soil, manure, fertilizers, and other inputs), environmental protection and conservation. • Explain worker safety and health within the crop production system. • Map and implement traceability in food safety and quality along the crop value chain 	
<p>3.7.2 Understanding what is GAP and its application in the Kale value chain (10 minutes)</p> <p><i>Facilitator leads discussions on understanding of GAPs and its relevance to actors in the Kale value chain</i></p> <p>Plenary Presentation (10 minutes)</p> <ul style="list-style-type: none"> • Understanding GAP in the context of crop production • Explain the role of GAPs in safe and sustainable food production system for growers and consumers. • Understanding GAPs as the key to high commodity market destinations <p>Plenary discussion GAP application in the Kale value chain</p>	<p>Session Guide</p> <ul style="list-style-type: none"> • PowerPoint presentation • Participants handouts • Plenary discussion
<p>3.7.3 Discussion of what factors to consider when selecting a site for agricultural activities through Risk Assessment (10 minutes)</p> <p><i>Facilitator guides discussions on the key determinants of site suitability for agricultural activities.</i></p> <p>Plenary presentation and discussion (10 minutes)</p> <ul style="list-style-type: none"> • Factors to be considered in an agricultural site selection (Site history, slope of land, type of soil versus crop, water sources and physical quality, soil and water analysis) • The need for documentation in a farm assurance system • Types of mandatory farm records • General guidelines to conservation agriculture (CA) 	<p>Session Guide</p> <ul style="list-style-type: none"> • PowerPoint presentation • Participants' handouts • Plenary discussion

3.7.4 Review of GAP requirements for audit and types of protocols possible (10 minutes)	Session Guide
<p><i>(The facilitator leads the trainees in summarizing the key points discussed in the module)</i></p> <p>Plenary presentation and discussion (10 minutes)</p> <ul style="list-style-type: none"> • Methods and procedures required at on-farm level to obtain GAP certification in crops production. • Good soil management practices (appropriate crop rotations, manure application) • Careful management of water resources and efficient use of water for rain-fed crop production via irrigation. • Selection of crop types and varieties to meet local consumer needs. • Adoption of IPM practices to minimize the potential impact of pest control actions on workers, food, and environmental and health safety. • Minimizing contamination at harvest, on-farm processing and storage. 	<ul style="list-style-type: none"> • Power point presentation • Participants' handouts • Plenary session
3.7.5 Introduction to Site Selection (10 minutes)	Session Guide
<p><i>The facilitator introduces the various factors involved in site selection through Pictorials/video clips PPT's and farm walk</i></p> <p>Plenary Presentation and discussions (10 minutes)</p> <ul style="list-style-type: none"> • Factors to be considered in an agricultural site selection • (Site history, slope of land, type of soil versus crop, water sources and physical quality, soil and water analysis) • The need for documentation in a farm assurance system • Types of mandatory farm records • General guidelines to conservation agriculture (CA) 	<ul style="list-style-type: none"> • Power point presentation • Participants' handouts
3.7.6 GAP checklists and Audit (10 minutes)	Session Guide
<p><i>Facilitator guides the trainees on self-assessment (Internal audit and corrective measures for non-compliance)</i></p> <p>Plenary presentation (5 minutes)</p> <ul style="list-style-type: none"> • Need for mandatory records in GAPs • Internal Audit procedures • Practical on Mock Audits • Interpretation of audit reports • Compliance and corrective actions <p>Group exercise (5 minutes)</p> <ul style="list-style-type: none"> • Groups audit a farm or a process within the training site • Present audit results and verdict and corrective actions 	<ul style="list-style-type: none"> • PowerPoint presentation • Global GAP checklists • Participants' handouts • Group exercise

3.7.7 Safe use of Pesticides and calibration of sprayers and nozzles (1 hour)	Session Guide
<p><i>The facilitator organizes the groups to identify level of knowledge on pesticide use and safety; Determination of less hazardous pesticides, fungicides and herbicides, quantities to apply and respective PHIs</i></p> <p>Group exercise (30 minutes) Practical session on how to handle different types of pesticides, fungicides and herbicides together with their calibrations</p> <p>Plenary presentation (30 minutes)</p> <ul style="list-style-type: none"> • Guided knapsack calibration • Different types of nozzles and their uses • Pesticide safety 	<ul style="list-style-type: none"> • Power point presentation • Pesticide containers • Knapsack sprayers • Nozzles • Participants hand outs • Group exercise •
3.7.8 Understanding Food Safety (30 minutes)	
<p><i>The facilitator should be able to introduce food safety system by defining it and sharing its benefits with the trainees). Power points</i></p> <p>Plenary presentation and discussion</p> <ul style="list-style-type: none"> • Overview of Food Safety Management Systems (FSMS). • Why food safety is important in crops production systems. • Risks to human/animal health due to chemical, biological and physical hazards exposure. • Legal and market requirements for food safety practice. • Food safety practices that reduce risks/hazards. • Use of HACCP tool/system for monitoring crop production 	<ul style="list-style-type: none"> • PowerPoint presentation • Participants' handouts • Plenary discussion
3.7.9 Determination of food safety risks/hazards (30 minutes)	
<p><i>Facilitator should guide discussions on the steps of identification of food safety hazards FSMS</i></p> <p>Plenary Presentation (15 minutes)</p> <ul style="list-style-type: none"> • Explain the concept of risk identification (Hazard analysis) in crop production chain. • Listing the types of hazards that cause illness or death. • Determine and identify factors influencing likely occurrence/severity of hazards. • List hazards alongside the possible control measures 	<ul style="list-style-type: none"> • Power point presentation • Participants hand outs • Group exercise

<ul style="list-style-type: none"> • Explain the concept in a flow diagram <p>Group Exercise (15 minutes)</p> <ul style="list-style-type: none"> • Groups to identify major risk/hazards at points of crop production • Produce flow diagrams for the crop 	
<p>3.7.10 Determination of critical control points (CCP) in crop value chains (30 minutes)</p>	
<p><i>The facilitator introduces the topic on determination of critical control points (CCP)</i></p> <p>Plenary presentation (15 minutes)</p> <ul style="list-style-type: none"> • Why is important to determine CCP in production chain (preventing, eliminating or reducing risks). • How to monitor and measure the CCP (point, step or procedure). • How to document the CCP. • How to establish critical limits (from standards or guidelines) for each CCP. <p>Group Exercise (15 minutes)</p> <ul style="list-style-type: none"> • Groups to identify and establish critical control points and critical limits. 	<ul style="list-style-type: none"> • Power point presentation • Participants hand outs • Group exercise
<p>3.7.11 Prevention and corrective measures for CCP in crop value chains (30 minutes)</p>	
<p><i>The facilitator introduces the topic on prevention and control of possible hazards</i></p> <p>Plenary presentation (15 minutes)</p> <ul style="list-style-type: none"> • Establishment of corrective actions against CCP • Establish verification procedures for CCP • Establish record-keeping and documentation procedures • How to develop HACCP plan and Food safety tool kit for the crop value chain <p>Group exercise (15 minutes)</p> <p>Groups to identify and establish corrective actions and verification procedures for crop value chain.</p>	<ul style="list-style-type: none"> • Power point presentation • Participants hand outs • Group exercises
<p>3.7.12 Module Review (30 minutes)</p>	
<p><i>(The facilitator leads the trainees in summarizing the key points discussed in the module)</i></p>	<p>Plenary discussion</p>

3.8.Participants' Handouts

- Good Agricultural Practices (GAP) hand book
- HACCP hand book for crop production
- Farm management and production hand book

References

- Hazard Analysis Critical Control Point Principles and Application Guidelines (2018). National Advisory Committee on Hazards Criteria for Foods.
- Food Safety Manual for Farmer Field Schools (2010). A training reference guide on food safety in global FFS Programmes, FAO.
- Global GAP Version V(2017). GLOBALG.A.P./FoodPLUS GmbH (www.globalgap.org).

MODULE 4

KALE PRODUCTION NICHEs AND CLIMATIC REQUIREMENTS

4.1 Introduction

This module exposes farmer trainers' to the different types of ecological conditions comprising of altitudes, soils, climate and agro-ecological zones (AEZs) for Kale production. These abiotic factors greatly influence the yields of Kale due to their relationship with biotic factors (pests, diseases, weeds, beneficial soil-borne microbial activities). It is therefore important to understand the agro-ecological zone suitability for Kale so as to ensure high productivity. Kale are mainly grown by smallholder farmers under rain-fed or irrigation. The crop is mostly grown as a monoculture. The production systems are guided by the size of the farm, demand or purpose (e.g., for subsistence/kitchen gardens, commercialization where farmers strictly produce for markets or a mixture of the two). There is need for the knowledge on the production niches and climatic conditions for increased productivity of Kale.

4.2 Module Learning outcomes

- Importance of Kale in Kenya's economy understood and appreciated.
- Knowledge on altitudes and soil types/characteristics for Kale production enhanced.
- Climatic conditions (temperatures, rainfall and humidity) required for Kale production understood and applied.
- Specific County agro-ecological zones for Kale production explained and understood.

4.3 Module Target Group

This module is intended for public agricultural extension providers in the Kale value chain target Counties and service providers.

4.4 Module users

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

4.5 Module Duration

The Module session is expected to last for a time duration of 2 hours

4.6 Module Summary

Module 4: Kale production niches and climatic requirements			
Sessions	Training methods	Training materials	Time
4.6.1 Introductions and climate setting	<ul style="list-style-type: none"> • Self-introduction • Plenary discussion • Group exercise 	<ul style="list-style-type: none"> • Flips charts • Felt pens • Laptop for power point Presentation • Projector 	10 minutes
4.6.2 Importance of Kale in Kenya's economy	<ul style="list-style-type: none"> • Presentations • Plenary discussion 	<ul style="list-style-type: none"> • Flips charts • Felt pens • Laptop for power point presentation • Projector • Participants' handouts 	20 minutes
4.6.3 Kale production ecological/climatic requirements for optimal yields	<ul style="list-style-type: none"> • Presentations • Plenary discussion 	<ul style="list-style-type: none"> • Flips charts • Felt pens • Laptop for power point presentations • Participants' handouts • Projector 	20 minutes
4.6.4 Kale production Agro-ecological zones (AEZs)- average yields, and constraints in the target Counties	<ul style="list-style-type: none"> • Group exercise • Presentations • Plenary discussion 	<ul style="list-style-type: none"> • Flips charts • Felt pens • Laptop for power point presentations • Projector 	1 hour
4.6.5 Module review	<ul style="list-style-type: none"> • Discussions/ conclusion and way forward 	<ul style="list-style-type: none"> • Flip charts • Felt pens • Laptop for power point presentations 	10 minutes
Total			2 hours

4.7 Facilitator's Guidelines

Module 4: Kale production and appropriate climatic requirements	
4.7.1. Introductions and climate setting (10 minutes)	Session Guide
<p><i>(The facilitator welcomes trainees to the module on Kale production and appropriate climatic requirements. They are then invited to introduce themselves and state their expectations)</i></p> <p>Expectations (5 minutes)</p> <p>The trainees to form groups (e.g. county based) and list their expectations.</p> <p><i>The facilitator presents module objectives</i></p>	<ul style="list-style-type: none"> • Summarize the facilitator/trainees involvement in Kale value chains

<p>Objectives (5 minutes)</p> <p>By the end of the module, the trainee should be able to:</p> <ul style="list-style-type: none"> • To define the importance of Kale in Kenya’s economy. • Indicate and describe altitudes and soil types/ characteristics for Kale production. • Describe climatic conditions (temperatures, rainfall and humidity) required for Kale production. • Explain specific county agro-ecological zones for Kale production. 	
<p>4.7.2 Importance of Kale in Kenya’s economy (20 minutes)</p>	
<p>Plenary Presentation (15 minutes)</p> <ul style="list-style-type: none"> • Origin of Kale • Kale in Kenyan households • Key counties producing Kale in Kenya • General Kale production in Kenya <p>Facilitator’s guided discussions (5 minutes) Questions/answers/comments</p>	<ul style="list-style-type: none"> • PowerPoint presentation • Participants’ handouts
<p>4.7.3 Kale production ecological/climatic requirements (20minutes)</p>	
<p>Plenary Presentation (10 minutes)</p> <ul style="list-style-type: none"> • Altitude and Agro-ecological zones for Kale production • Climatic conditions (Rainfall, Temperatures and humidity) • Soils (soil types, pH, general fertility for Kale) <p>Facilitator’s guided discussion (10 minutes) Questions/answers/comments</p>	<ul style="list-style-type: none"> • Power point presentation • Participants’ handouts • Plenary discussion
<p>4.7.4. Kale production AEZs (villages), average yields, and constraints in the target Counties (1 hour)</p>	
<p>Plenary Presentation (30 Minutes) Facilitator guides in reviewing and discussing suitability map (County by County)</p> <p>Group exercise (15 minutes) Trainees to bring out specific county or sub-county AEZs, land size, yields and constraints to Kale production and present in the plenary:</p> <ul style="list-style-type: none"> • Agro-ecological zones (AEZs) and % area suitable for Kale • Average land/farm size under Kale production in Kenya 	<ul style="list-style-type: none"> • Power point presentations • Group work • Open discussions with the guidance of the facilitator • Plenary discussion

<ul style="list-style-type: none"> • Average yield of Kale per farm • Constraints to Kale production <p>Discussions/presentations from the groups (15 minutes) Let the trainees/groups share the group exercise outcomes</p>	
<p>4.7.5. Module review (10 minutes)</p>	<p>Session Guide</p>
<p><i>(The facilitator leads the trainees in reviewing the module)</i> Summary of the main points from the training (5 minute)</p> <ul style="list-style-type: none"> • Objectives and expectations (review done on basis of the expectations listed earlier) • Trainees to recall the Kale production ecological/ climatic requirements, Kale production AEZs (villages) average yields, and constraints in the target Counties • Trainees to indicate new sets of skills and knowledge acquired from the module. The results are recorded per county presented • Trainees to randomly pin-point the way forward issues. <p>Facilitator’s guided discussion (5 minutes)</p>	<ul style="list-style-type: none"> • The participants’ handouts/training materials • Summarize the main points of the module on a flip chart and display • Plenary discussion

4.8 Participants’ Handouts

- Kale production Guides
- Kale leaflets
- Kale factsheets

MODULE 5

KALE VARIETY SELECTION

5.1. Introduction

This module exposes service providers, lead farmers and facilitators to the improved Kale varieties, their uses and target area of production. The various Kale varieties are released for different ecological areas. There are varieties for cold high altitude and low altitude warm areas. Inadequate supply of adaptable planting materials of superior Kale varieties of the right variety is one of the key constraints to Kale production. Farmers should be able to identify the varieties suited to their regions and their needs. There is therefore need to train farmer trainers in the target counties on the different Kale varieties, their suitable areas of production and their end uses. This module is intended for use in training of facilitators of Farmer Business Schools (FFBS) on on-farm Kale variety characterization and selection.

5.2 Learning Outcomes

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

1. The Kale crop described.
2. The various improved kale varieties, their ecological areas of cultivation and their attributes and uses identified.
3. Appropriate variety for specific regions identified.

5.3 Module Target Group

This module targets agricultural extension, service providers and lead farmers based at Kale target counties.

5.4. Module users

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

5.5 Module Duration

The Module is estimated to take 2 hours

5.6 Module Summary

Module 5. Kale Variety Selection			
Sessions	Training Methods	Training Materials	Time
5.6.1. Introduction and Objectives Expectations	<ul style="list-style-type: none">• Plenary presentation• Group discussion and presentation of expectations	<ul style="list-style-type: none">• Flips charts• Felt pens• Laptop for power point presentations• Projector	10 minutes

5.6.2. Introduction to various improved Kale varieties, their ecological areas of cultivation and their attributes and uses.	<ul style="list-style-type: none"> • Group Exercises to identify local Kale varieties • Plenary Presentations • Plenary discussion 	<ul style="list-style-type: none"> • Flips charts • Felt pens • Laptop for power point presentations • Projector • Manila papers 	30 minutes
5.6.3 Recommended Kale varieties for specific regions	<ul style="list-style-type: none"> • Plenary Presentation • Group exercise • Field demonstration 	<ul style="list-style-type: none"> • Flips charts • Felt pens • Laptop for power point presentations • Projector • Manila papers 	1 hour
5.6.4. Module review	<ul style="list-style-type: none"> • Group Exercise • Facilitator's summary 	<ul style="list-style-type: none"> • Participants' handouts • Module review • Kale manual 	2 0 minutes
TOTAL			2 hours

5.7. Facilitator's Guidelines

Module 5: Kale Variety Selection	
5.7.1 Introduction and levelling of expectations and objectives (10 minutes)	Session Guide
<p>Introduction (5 minutes) <i>(The facilitator welcomes trainees to the module on Kale varieties and introduces himself/herself by stating his/her profile and experience.)</i> The facilitator invites the trainees to introduce themselves and state their expectations.</p> <p>Module Objectives (5 minutes) (The facilitator presents modules objectives) By the end of the module the trainee should be able to:</p> <ol style="list-style-type: none"> 1. Describe the Kale crop and its climatic and ecological requirements. 2. Identify the various improved Kale varieties their ecological areas of cultivation and their uses. 3. Identify the Kale varieties suited to the counties of interest. 	<ul style="list-style-type: none"> • Summarize trainees' "expectations" and display. • Distribute participants' handouts • Module Objectives,

5.7.2 Introduction to Kale and the various improved Kale varieties and their uses (30 minutes)	Session Guide
<p><i>(The facilitator describes the Kale crop and guides the trainees in identifying the various Kale improved varieties and their uses).</i></p> <p>Group exercise and discussion (10 minutes) Ask trainees highlight and describe some of the Kale varieties they know.</p> <p>Plenary Presentation (20 minutes)</p> <ul style="list-style-type: none"> • What are Kale? • Improved Kale varieties. • Categories of Kale varieties <p><i>Show trainees the photographs of each variety and the full description and its uses.</i></p>	<ul style="list-style-type: none"> • Distribute Participants' handouts • Group exercise • Plenary discussion
5.7.3 Recommended Kale varieties for the target counties (1 hour)	Session Guide
<p>Plenary Presentation</p> <p>Varieties for the target counties (10 minutes)</p> <ul style="list-style-type: none"> • Kale growing regions and the new regions which are being targeted for Kale cultivation in Kenya. • Kale varieties suited for each county • County climate conditions for target county (semi-arid, hot dry low land, cold dry highlands and high potential) <p>Group exercises (10 minutes) Trainees discuss and come up with Kale varieties in their county</p> <p>Field demonstration (40 minutes) <i>(Ensure there is an established plot/samples of all the varieties or Kale plant samples).</i></p> <ul style="list-style-type: none"> • Visit the Kale plots/leaf samples with the trainees and assist them identify and study the various varieties. • After the field visit facilitate them to recall what they learned and discuss on any issue that may arise. (can also use Kale plant samples for the various varieties) 	<ul style="list-style-type: none"> • Distribute participants' handouts. • Group exercise • Field demonstration

5.7.4 .Module review (20 minutes)	Session Guide
<p><i>(The facilitator should be able to lead the trainees in reviewing the module)</i></p> <p>Group Exercise</p> <p>Summarize the main points of the training</p> <p>Together with the trainees review the main points about improved Kale varieties</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 Kale varieties? • What questions do you still have about identification of Kale varieties? 	<ul style="list-style-type: none"> • The last Participants' Handouts • Summary of the main points from the module.

5.8. Participants' Handouts

- Kale leaflets
- Kale Factsheets

MODULE 6

KALE SEED SYSTEMS

6.1 Introduction

Kale farmers either recycle their own seeds or source seeds from their neighbours, local markets or seed stockists. Prolonged use of farmer-saved seeds significantly reduces yields and undermines the investment in commercial production and marketing of improved certified seeds. This has negatively impacted on the dissemination of improved high-quality Kale seed. As agricultural production increasingly becomes commercialized and global food markets become more competitive, farmers need to invest in improved Kale varieties seeds for high sustainable yields. This module exposes county extension officers, private service providers, lead farmers and facilitators to the various seed systems and the importance of quality seed in Kale production. It also covers community seed production and gives direction on how to interface formal and informal seed production to enable farmers venture into commercial production of Kale.

6.2 Module learning outcomes

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

1. The main Kale seed systems in Kenya explained and appreciated.
2. Seed production in formal and informal seed system described.
3. The importance of informal seed system, community seed bulking and its interface with formal seed production for enhanced production of quality Kale seeds explained.

6.3 Module Target Group and Categories

This module is intended for public and private extension agents, service providers and lead farmers

6.4 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 be well conversant with the participants' handouts.

6.5 Module Duration

The Module is estimated to take a minimum of 1 hour 30 minutes

6.6 Module Summary

Module 6: Kale Seed System			
Sessions	Training methods	Training materials	Time
6.6.1 Introduction, objectives and expectations	<ul style="list-style-type: none"> • Self-introduction • Presentations • Plenary discussion 	<ul style="list-style-type: none"> • Flips charts • Marker pens • PowerPoint presentation 	10 minutes

6.6.2 Definition of seed and seed system in Kenya	<ul style="list-style-type: none"> ▪ Group exercise ▪ Plenary presentations 	<ul style="list-style-type: none"> ▪ Flips charts ▪ Marker pens ▪ PowerPoint Presentation 	15 minutes
6.6.3 Formal seed system in Kenya	<ul style="list-style-type: none"> ▪ Plenary Presentation ▪ Plenary discussion 	<ul style="list-style-type: none"> ▪ PowerPoint Presentation ▪ Flips charts ▪ Marker pens 	30 minutes
6.6.4 Informal seed system in Kenya	<ul style="list-style-type: none"> ▪ Plenary Presentation ▪ Plenary discussion ▪ Group exercise 	<ul style="list-style-type: none"> ▪ PowerPoint Presentation ▪ Flips charts ▪ Marker pens 	25 minutes
6.6.5 Module review	<ul style="list-style-type: none"> ▪ Group exercise ▪ Plenary discussion ▪ Presentation 	<ul style="list-style-type: none"> ▪ Flips charts 	10 minutes
Total			1 hour 30 Minutes

6.7 Facilitator's Guidelines

Module 6: Kale Seed System	
6.7.1. Introduction and levelling of expectations and objectives (10 minutes)	Session Guide
<p>Introduction <i>(The facilitator welcomes trainees to the module on the main Kale seed systems and thereafter invites trainees to introduce themselves and state their expectations.</i></p> <p>6.7.1. Module Objectives (10 minutes) <i>(The facilitator presents modules objectives)</i> By the end of the module, the trainee should be able to:</p> <ul style="list-style-type: none"> • Appreciate Kale seed systems and its importance in production • Describe seed production in formal and informal seed system • Explain informal seed system, community seed bulking and its interface with formal seed production for enhanced production of quality 	<ul style="list-style-type: none"> • Summarize Trainees' "expectations" and display. • PowerPoint presentation • Plenary discussion • Distribute participants' handouts
6.7.2. Definition of seed and seed system in Kenya (15 minutes)	Session Guide
<p>Group exercise and presentations: (10 Minutes)</p> <ul style="list-style-type: none"> • What is quality seed? 	<ul style="list-style-type: none"> • Group exercise • PowerPoint presentation • Distribute participants' handouts

<p>Plenary Presentation (5 Minutes)</p> <ul style="list-style-type: none"> • Definition of a seed system and characteristics of main seed systems (formal and informal seed system) • Commodity corridors 	
<p>6.7.3 Formal seed systems in Kenya (30 minutes) Session Guide</p>	
<p>Plenary presentation and discussion (15 Minutes)</p> <ul style="list-style-type: none"> • Legal requirements for seed certification • Seed certification process • Post certification activities for enforcing the Seed Act Cap 326 • Post certification activities for seed quality assurance • Seed importation and exportation requirements <p>Plenary Discussion (15 minutes)</p> <ul style="list-style-type: none"> • Formal seed systems 	<ul style="list-style-type: none"> • PowerPoint presentation • Distribute participants' handouts
<p>6.7.4 Informal seed system in Kenya (25 minutes) Session Guide</p>	
<p>Plenary presentations: (15 minutes)</p> <ul style="list-style-type: none"> • Seed multiplication • Kale seed standards and commercial production • Informal seed system • Community seed bulking and how it is implemented • Synergies for formal and informal seed systems <p>Group exercise and discussion (10 Minutes) Calculate seed requirements for the county/ward/farmer group and present</p>	<ul style="list-style-type: none"> • PowerPoint Presentation • Distribute participants' handouts • Group exercise • Plenary discussion
<p>6.7.5 Module review (10 minutes) Session Guide</p>	
<p><i>(The facilitator leads the trainees in reviewing the module)</i></p> <p>Summarize the module together with the trainees and have a recap of the main components in:</p> <ul style="list-style-type: none"> • Kale seed systems and their characteristics • Importance of using certified seed • Informal seed <p><i>(Discuss the knowledge acquired and skills learnt from this module with the trainees. What are the observations made by trainees from this module?)</i></p>	<ul style="list-style-type: none"> • Participants' handouts • Summarize the main points from the module on a flip chart and display

6.8 Participants' Handouts

- Kale leaflets
- Kale factsheets

MODULE 7

CLIMATE SMART AGRONOMIC PRACTICES FOR KALE PRODUCTION

7.1 Introduction

In order to optimize productivity of Kale, farmers need to adopt specific agronomic packages, without which the yield potential of improved varieties cannot be achieved. In addition, the weather vagaries occasioned by climate change effects make it necessary to incorporate adaptation or mitigation measures which can enable Kale farmers increase its productivity. In this respect, climate smart agronomic practices come to the fore. There is therefore need for farmer facilitators from the Kale target counties to be furnished with skills and knowledge that will enable them to guide farmers on the climate smart Kale agronomic practices, seed selection, seed raising nurseries, quality seedling, and disease and pest management strategies.

7.2 Module Learning outcomes

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

1. Agronomic practices for Kale production described and explained.
2. Region specific agronomic practices for Kale production optimization outlined.
3. Appropriate inputs and their correct application rates for Kale production described.
4. Timing of operations and inputs application in Kale production described and explained.

7.3 Module Target Group and Categories

This module targets service providers, public and private extension agents and lead farmers from Kale value chain target counties.

7.4 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 familiarize themselves with the participants' handouts or training materials.

7.5. Module Duration

The module is estimated to take a duration of 4 hours.

7.6 Module Summary

Module 7: Kale climate smart agronomic practices			
Sessions	Training methods	Training materials	Time
7.6.1 Introductions and climate setting, objectives and expectations	<ul style="list-style-type: none">• Self-introduction• Plenary discussion• Presentations• Group exercise	<ul style="list-style-type: none">• Flips charts• Felt pens• Laptop• Projector	10 minutes

7.6.2 Agronomic practices for Kale production	<ul style="list-style-type: none"> • Plenary presentation • Practical exercise (groups tour nearby farm for layout demonstration) • Plenary discussion resulting from the farm visit 	<ul style="list-style-type: none"> • Flips charts • Felt pens • Laptop • Projector 	1 hour 20 minutes
7.6.3. Site selection, Types of nurseries, Land Preparation and crop rotation	<ul style="list-style-type: none"> • Practical exercise (groups tour nearby farm for layout demonstration) • Presentations 	<ul style="list-style-type: none"> • Flips charts • Felt pens • Laptop 	1 hour 20 minutes
7.6.4 Appropriate inputs and their recommended application rates for optimum production of Kale	<ul style="list-style-type: none"> • Presentations • Group exercise (trainees enlist inputs and dosage in different counties) • Plenary discussion to share group work results 	<ul style="list-style-type: none"> • Flips charts • Felt pens • Laptop • Projector • Participants' handouts 	1 hour
7.6.5 Module review and discussion	<ul style="list-style-type: none"> • Discussion/ conclusion and way forward 	<ul style="list-style-type: none"> • Flip charts • Felt pens • Laptop • Projector 	10 minutes
Total			4 hours

7.7 Facilitator's Guidelines

Module 7: Climate Smart Agronomic Practices for Kale	
7.7.1. Introductions, climate setting (10 minutes)	Session Guide
<p><i>The facilitator welcomes trainees to the module. The trainees are then invited to introduce themselves and state their expectations</i></p> <p>Expectations (5 minutes) The trainees form groups (e.g., county based) and list expectations from the module</p> <p><i>The facilitator presents the module objectives.</i></p>	<ul style="list-style-type: none"> • Summarize the trainees expectations • PowerPoint presentations • Group exercise (listing and presenting expectations).

<p>Objectives (5 minutes)</p> <p>By the end of the training module, the trainee should be able to:</p> <ul style="list-style-type: none"> • Explain and describe agronomic practices for Kale production. • Types of nurseries for different ecological zones • Describe appropriate inputs and their correct rates of application for Kale production. • Outline region specific Kale production agronomic practices. • Specify the right timing for operations or inputs application in Kale production. 	<ul style="list-style-type: none"> • Expectations lists kept for later reviewing compliancy
<p>7.7.2. Agronomic practices for Kale production (1 hour 20 minutes)</p>	
<p>Plenary Presentation (30 minutes) The facilitator presents critical factors on:</p> <ul style="list-style-type: none"> • Factors for selecting Kale production as an enterprise • Climate smart land preparation • Climate smart planting (nurseries, seed rates, plant density) • Spacing (inter-and intra-row spacing) • Weed control – Types of weeding • Mulching • Pests and disease control • Crop rotation • Conservation agriculture principles/benefits <p>Practical exercise (30 minutes) Groups tour nearby for farm layout demonstration</p> <p>Plenary discussion (20 minutes) Questions/answers and comments</p>	<ul style="list-style-type: none"> • PowerPoint Presentation • Plenary discussion • Distribute participants' handouts/training materials • Practical exercise
<p>7.7.3. Site selection, Types of nurseries, Land Preparation and crop rotation (1 hour 20 minutes)</p>	<p>Session Guide</p>
<p>The facilitator guides trainees in a practical session in the demonstration fields on</p> <ul style="list-style-type: none"> • Site selection and farm layout • Types of nurseries and seed beds • Land preparation and crop rotation 	

7.7.4. Appropriate inputs for the optimal production of Kale and their correct/recommended application rates (1 hour)	Session Guide
<p>Group exercise (30 minutes)</p> <ul style="list-style-type: none"> • The facilitator guides trainees to list or/and present the required inputs for use in Kale production • The trainees get into county groups to provide lists of Kale inputs and their application rates as practiced by farmers. • The groups present their results in the plenary - opening up for questions, answers and discussion. <p>Plenary presentation and plenary discussion (30minutes)</p> <ul style="list-style-type: none"> • The recommended Kale inputs (seeds, fertilizers, manures, among others.), their rates and their time of application for optimal yields 	<ul style="list-style-type: none"> • PowerPoint Presentation • Distribute participants' handouts • Groups exercise • Plenary discussion
7.7.4. Module review (10 minutes)	Session Guide
<p><i>(The facilitator leads the trainees in reviewing the module)</i></p> <p>Summary of the main points from the training</p> <ul style="list-style-type: none"> • Objectives and expectations (review done on basis of the objectives and expectations listed earlier) • <i>Trainees to randomly indicate new sets of skills and knowledge learnt from the module. The results are recorded per county presented</i> • Trainees randomly (average of 10 cases) pin-point the way forward issues. 	<ul style="list-style-type: none"> • Participants' handouts • Summarize the main points of the module on a flip chart and display

7.8. Participants' Handouts

1. Kale production Guides.
2. Kale leaflets
3. Kale Factsheets
4. Brochures

MODULE 8

INTEGRATED SOIL AND WATER MANAGEMENT PRACTICES FOR KALE PRODUCTION

8.1 Introduction

Poor soil conditions and unreliable availability of moisture in most smallholder farming systems have been the main causes of low yields. Generally, crop yields have continued to decline over the years due to increased soil acidity, mining of nutrients not supplied in the applied fertilizers and poor soil structure caused by failure to use the available sources of organic matter. 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 availability for the Kale production systems. Integrated Soil Fertility Management (ISFM), through conservation agriculture offers the best options for improving soil fertility in the advent of climate change adaptation.

Kale is mostly cultivated by smallholder farmers with minimal inputs. Drought management technologies to mitigate drought effects in Kale 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 production systems. This module exposes public and private extension agents, service providers, lead farmers and facilitators to the integrated soil and water management practices for enhanced Kale production.

8.2 Module learning outcomes

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

1. Soil composition, the various physical, chemical and biological properties and what constitutes a healthy soil, including soil classification explained and appreciated.
2. Soil and plant tissue sampling for laboratory analysis, interpretation and utilization of results from accredited laboratories in Kenya discussed and described.
3. Soil health and ISFM for climate resilient cropping explained.
4. Water harvesting technologies, soil and water management discussed and explained
5. Temporary or permanent decline of land productive capacity and various solutions to soil degradation identified.
6. Problematic soils and their management identified and described.

8.3 Module Target Group and Categories

This module is intended for public and private extension agents, lead farmers and service providers in the Kale producing regions.

8.4 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 be well conversant with the participants' handouts.

8.5 Module Duration

The Module is estimated to last for a duration of 3 hours 30 minutes

8.6 Module Summary

Module 8: Integrated soil and water management practices for Kale production			
Sessions	Training methods	Training materials	Duration
8.6.1 Introduction, objectives and expectations	<ul style="list-style-type: none">• Self-introduction• Plenary Presentation• Plenary discussion	<ul style="list-style-type: none">• Flip charts• Marker pens• Projector for PowerPoint presentation• Laptop	10 minutes
8.6.2 Soil composition, properties and health,	<ul style="list-style-type: none">• Plenary Presentations• Plenary discussion	<ul style="list-style-type: none">• Flip charts• Marker pens• Projector for PowerPoint presentation• Laptop• Participants' handouts	20 minutes
8.6.3 Soil and plant tissue sampling and analysis	<ul style="list-style-type: none">• Plenary Presentations• Field demonstrations (Conduct soil and plant tissue sampling and analysis)	<ul style="list-style-type: none">• Projector for PowerPoint presentation• Participants' handouts• Soil and plant tissue sampling tools	1 hour
8.6.4. Soil fertility and plant nutrition	<ul style="list-style-type: none">• Plenary Presentation• Plenary discussion	<ul style="list-style-type: none">• Flip charts• Marker pens• Projector for PowerPoint presentation• Laptop• Participants' handouts	20 minutes

8.6.5 Soil health and (ISFM) for climate resilient cropping systems	<ul style="list-style-type: none"> • Plenary Presentation • Plenary discussion 	<ul style="list-style-type: none"> • Flip charts • Marker pens • PowerPoint presentation • Participants' handouts 	20 minutes
8.6.6 Soil and water management and water harvesting technologies	<ul style="list-style-type: none"> • Plenary Presentation • Plenary discussion 	<ul style="list-style-type: none"> • Flip charts • Marker pens • PowerPoint presentation • Participants' handouts 	20 minutes
8.6.7 Soil degradation and reclamation	<ul style="list-style-type: none"> • Presentations • Plenary discussion 	<ul style="list-style-type: none"> • Flip charts • Marker pens • PowerPoint presentation • Participants' handouts 	20 minutes
8.6.8 Problematic soils and their management	<ul style="list-style-type: none"> • Presentations • Plenary discussion 	<ul style="list-style-type: none"> • Flip charts • Marker pens • PowerPoint presentation • Participants' handouts 	20 minutes
8.6.9 Module review and discussion	<ul style="list-style-type: none"> • Discussion 	<ul style="list-style-type: none"> • Flip charts 	20 minutes
Total			3 hours 30 minutes

8.7 Facilitator's Guidelines

Module 8: Integrated soil and water management practices for Kale production	
8.7.1. Introduction, Objectives and Expectations (10 minutes)	Session Guide
<i>(The facilitator welcomes trainees to the module on sustainable water and soil fertility management practices for optimal production of Kale in moisture stressed conditions. The trainees are then invited to introduce themselves and state their expectations)</i>	<ul style="list-style-type: none"> • Summarize trainees' "Expectations" and display. • PowerPoint presentation

<p>Module Objectives (10 minutes) <i>(The facilitator presents modules objectives)</i> By the end of the module, the trainee should be able to:</p> <ul style="list-style-type: none"> • Appreciate soil composition and what constitutes a healthy soil, including soil classification • Describe soil and plant tissue sampling for laboratory analysis, interpretation and utilization of results from accredited laboratories in Kenya • Explain soil health and Integrated Soil Fertility Management (ISFM) for climate resilient cropping systems. • Explain water harvesting technologies, soil and water management • Identify temporary or permanent decline of land productive capacity and provide various solutions to soil degradation. • Identify and describe problematic soils and their management 	<ul style="list-style-type: none"> • Distribute participants' handouts on Module Objectives and Training Program
<p>8.7.2. Soil composition, properties and health (20 minutes)</p>	<p>Session Guide</p>
<p><i>(The facilitator presents on soil composition, properties and health)</i></p> <p>Plenary presentation (10 minutes) Soil composition, properties and health</p> <ul style="list-style-type: none"> • Description of soil composition • Description of soil properties • Describe what soil health is all about <p>Plenary discussion (10Minutes) Let the trainees recall what they learnt and discuss any issues that may arise</p>	<ul style="list-style-type: none"> • PowerPoint presentation • Participants' handouts • Plenary discussion
<p>8.7.3. Soil and plant tissue sampling and analysis (1 hour)</p>	<p>Session Guide</p>
<p>Plenary Presentation (30 minutes)</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 and demonstration on soil sampling (30 minutes)</p> <ul style="list-style-type: none"> • soil sampling methods 	<ul style="list-style-type: none"> • PowerPoint presentation • Distribute participants' handouts • Practical exercise and demonstration

8.7.4. Soil fertility and plant nutrition (20 minutes)	Session Guide
<p>Plenary Presentation (10 minutes)</p> <ul style="list-style-type: none"> • Potential role of different soil management techniques in addressing soil fertility challenges in Kale smallholder farming systems • Integrated Soil Fertility Management techniques • Soil management guidelines <p>Plenary discussion (10 Minutes) Let the trainees recall what they learnt and discuss any issues that may arise.</p>	<ul style="list-style-type: none"> • PowerPoint presentation • Plenary discussion • Distribute participants' handouts
8.7.5 Soil health and (ISFM) for climate resilient cropping systems (20 minutes)	Session Guide
<p>Plenary Presentation (10 Minutes)</p> <ul style="list-style-type: none"> • Soil health • Introduce integrated soil fertility management (ISFM) • Soil health and ISFM for a climate resilient cropping system • Manure management, mulching, organic amendments and composting for increased use of organic manure for improving agricultural production • Conservation agriculture as a climate smart agriculture practice • Kale intercrops and crop rotation as climate resilient cropping systems <p>Plenary discussion (10 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
8.7.6 Soil and water management and water harvesting technologies (20 minutes)	Session Guide
<p>Plenary Presentation (10 Minutes)</p> <ul style="list-style-type: none"> • Principles of soil management for increased Kale productivity • Methods of tillage systems that conserve water for Kale use. • Principles of soil fertility management for increased Kale productivity • Methods of soil fertility management for increased Kale productivity <p>Plenary discussion (10 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 • Plenary discussion

8.7.7 Soil degradation and reclamation (20 minutes)	Session Guide
<p>Plenary Presentation (10 minutes)</p> <ul style="list-style-type: none"> • Overview of soil degradation and reclamation. • Reclamation measures of degraded soil • Identification of the causes of soil degradation • Identification of reclamation measures of degraded soil <p>Plenary discussion (10 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 • Plenary discussion
8.7.8 Problematic soils and their management (20 minutes)	Session Guide
<p>Plenary presentation (10 minutes)</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>Plenary discussion (10 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
8.7.9. Module review (20 minutes)	Session Guide
<p><i>The facilitator leads the trainees in reviewing the module)</i> Summarize the main points of the training review the main points together with the trainees. Discuss with trainees about new things learnt from this Module. Let them identify some of the problems and any other issues arising from the module.</p>	<ul style="list-style-type: none"> • The last participants' handouts • Summary of the main points from the module on a flip chart and display

8.8. Participants' Handouts

- Soil Management Extension Manual [KCEP-CRAL Manual 2019]
- Soil Management Leaflets [KCEP-CRAL Pamphlets 2019]
- OFRA Technical Training Manual.

MODULE 9

KALE CROP HEALTH

9.1 Introduction to the module

Pests and diseases are important biotic constraints which cause significant yield losses in kale production. Kale farmers depend heavily on pesticides for pest management. Cases of overuse of pesticides have been reported in production of vegetables including Kale. Occasionally farmers using pesticides do not apply the recommended dose, which leads to resistance, thus ineffectiveness. A proper pest, disease and weed management program is very crucial in minimizing losses and ensuring that both environmental and food safety concerns are adequately addressed. Available options for the control of these biotic impediments to high yields of kale can greatly prevent losses experienced by farmers. There is need to employ human and environmentally safe approaches to pest, disease and weed management so as to increase productivity and enhance food safety and security. This module exposes service providers, lead farmers and facilitators to the importance of maintaining crop health and human as well as environmental safety in Kale production. The module introduces the major kale pests and diseases, their distribution and management. It also unveils the economic losses caused by the mentioned pests and diseases. Finally, the module gives details of the recommended sustainable integrated pests, disease and weed management practices that if applied can help reduce the yield losses and improve the quality of produce.

9.2 Module Learning outcomes

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

1. Major Kale pests of economic importance including Sustainable Integrated Kale pest management (IPM) practices and scouting for threshold determination explained and understood
2. Knowledge on pre-disposing factors of major Kale diseases enhanced
3. Knowledge on identification of symptoms of specific diseases common in Kale enhanced and applied and shared
4. Knowledge and skills in Integrated Disease Management (IDM) of Kale enhanced
5. Knowledge on safe use of pesticides and sources of information on up to date registered pesticides enhanced and applied

9.3 Module Target Group and Categories

This module is intended for service providers, public and private extension agents.

9.4 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 participant's handouts.

9.5 Module Duration

The Module is estimated to take a minimum of 8 hours

9.6 Module Summary

Module 8: Crop Health			
Sessions	Training methods	Training materials	Time
9.6.1 Introduction, objectives and expectations	<ul style="list-style-type: none"> • Self-introductions • Group exercise • Plenary presentation • Plenary discussion 	<ul style="list-style-type: none"> • Flips charts • Marker pens • PowerPoint presentation 	30 minutes
9.6.2 Major Kale pests that cause economic losses and their control methods;	<ul style="list-style-type: none"> • Group work • Plenary presentation • Plenary discussion • Practical exercise 	<ul style="list-style-type: none"> • Flips charts • Marker pens • Projector • Laptop • Participants' handouts 	1 hour
9.6.3 Sustainable Integrated Pests Management practices and scouting for threshold determination in Kale	<ul style="list-style-type: none"> • Plenary presentations • Plenary discussion 	<ul style="list-style-type: none"> • Flip charts • Marker pens • Projector • Laptop • Participants/handouts 	1 hour
9.6.4 Major Kale diseases that cause economic losses and conditions that favor their development including their control methods	<ul style="list-style-type: none"> • Group work • Plenary Presentation • Plenary discussion • Practical exercise 	<ul style="list-style-type: none"> • Flip charts • Marker pens • Projector • Laptop • Participants' handouts 	1 hour 30 minutes
9.6.5 Sustainable Integrated Management of Kale diseases and scouting for threshold determination	<ul style="list-style-type: none"> • Presentations • Plenary discussion • Field demonstration 	<ul style="list-style-type: none"> • Flip charts • Marker pens • Projector • Laptop • Participants' handouts 	1 hour 30 min
9.6.6 Integrated weed management (Major weeds of Kale)	<ul style="list-style-type: none"> • Plenary Presentation • Plenary discussion • Field demonstration 	<ul style="list-style-type: none"> • Flip charts • Marker pens • Projector • Laptop • Participants' handouts 	1 hour
9.6.7 Safe use of agro-chemicals and update source for registered agro-chemicals (PCPB registered products)	<ul style="list-style-type: none"> • Presentations • Practical • Plenary discussion 	<ul style="list-style-type: none"> • Projector • Laptop • Flip charts • Marker pens • Participants' handouts 	1 hour

9.6.8 Module Review	<ul style="list-style-type: none"> • Discussion/Recap of the module • Take away messages 	<ul style="list-style-type: none"> • Flip charts • Marker pens • Participants' handouts 	30 minutes
Total			8 hours

9.7 Facilitator's Guidelines

Module 9: Kale Crop Health	
9.7.1. Introduction and levelling of expectations and objectives (30 minutes)	Session Guide
<p>Introduction (15 minutes) <i>(The facilitator welcomes trainees to the module on kale crop health. They are then invited to introduce themselves and state their expectations through group work)</i></p> <p>Module Objectives (15 minutes) <i>(The facilitator presents modules objectives)</i> By the end of the module, the trainee should be able to:</p> <ul style="list-style-type: none"> • Identify major pests, diseases and weeds • Describe and explain integrated pest, disease and weed management in Kale • Explain safe use of agro-chemicals (pesticides, fungicides and herbicides) 	<ul style="list-style-type: none"> • Summarize trainees' "expectations" • PowerPoint presentation • Participants' handouts
9.7.2. Major Kale pests that cause economic losses and their control methods; emerging/migratory pests (1 hour)	Session Guide
<p><i>(The facilitator makes a presentation on the common kale pests that are of economic importance)</i></p> <p>Group work (15 minutes)</p> <ul style="list-style-type: none"> • Trainees to share Kale pest information from their respective Counties <p>Plenary Presentation (20 minutes)</p> <ul style="list-style-type: none"> • Names of pests and their descriptions • Symptoms of their infestation/type of damage • Data on economic significance of the common pests <p>Practical exercise (15 minutes)</p> <ul style="list-style-type: none"> • Identification of kale pests from provided specimens <p>Discussion (10 minutes)</p> <ul style="list-style-type: none"> • Let the trainees recall what they learned and discuss any issue that may arise 	<ul style="list-style-type: none"> • PowerPoint presentation • Group exercise • Practical exercise • Participants' handouts

9.7.3. Sustainable Integrated Pest Management (IPM) practices in Kale production; scouting and threshold determination (1 hour)	Session Guide
<p>Plenary Presentation (40 minutes)</p> <ul style="list-style-type: none"> • IPM principles; how to implement them with a focus on cultural, physical, biological and chemical pest management options. • Critical considerations for proper scouting • Threshold determination and when to implement control measures • An overview on the safe use of agro-chemicals (demonstration on how to select most suitable pesticides, for the management of pests in Kale) <p>Discussion (20 minutes) Let the trainees recall what they learned and seek clarification on the principles of sustainable IPM options</p>	<ul style="list-style-type: none"> • PowerPoint presentation on scouting for pests • Participants' handouts (brochures, leaflets and manuals on pest specimens on Kale)
9.7.4. Major Kale diseases that cause economic losses, conditions that favour their development and their control methods (1 hour 30 minutes)	Session Guide
<p>Group work (30 minutes)</p> <ul style="list-style-type: none"> • Determination of Kale diseases in specific Counties <p>Plenary Presentation (30 Minutes)</p> <ul style="list-style-type: none"> • Presentations on Kale diseases and conditions that favor their development <p>Practical Exercise (30 Minutes)</p> <ul style="list-style-type: none"> • Identification of major diseases causing economic losses <ul style="list-style-type: none"> ○ damage based on samples presented 	<ul style="list-style-type: none"> • PowerPoint presentation • Participants' handouts • Disease identification guidelines • Practical Exercise
9.7.5. Sustainable Integrated Diseases Management (IDM); scouting and threshold determination (1 hour 30 minutes)	Session Guide
<p>Plenary presentation (30 minutes)</p> <ul style="list-style-type: none"> • Critical considerations for scouting and when to implement Kale disease control measures • Presentation on Integrated Disease Management (IDM) in Kale • An overview on the safe use of recommended agro-chemicals (demonstration on how to select most suitable fungicides for the management of major Kale diseases). <p>Field visit (1 hour)</p> <ul style="list-style-type: none"> • Visit to a nearby Kale field for collection and identification of diseased Kale samples 	<ul style="list-style-type: none"> • PowerPoint presentation • Participants' handouts • Disease management guidelines • Field demonstration

9.7.6 Integrated weed management (Major weeds of Kale (1 hour	Session Guide
<p>Plenary presentation (45 minutes)</p> <ul style="list-style-type: none"> • Identification of weeds • Major weeds affecting Kale • Integrated Weed control <p>Plenary discussion (15 minutes) Integrated weed management</p>	<ul style="list-style-type: none"> • PowerPoint presentation • Participants' Handouts • Plenary discussion
9.7.7 Safe Use of pesticides - PCPB recommended (1 hour)	Session Guide
<ul style="list-style-type: none"> • Safe use of agro-chemicals and update source for registered agro-chemicals (PCPB registered products) • Label indicators and safety marks 	<ul style="list-style-type: none"> • Practicals • Power point presentation • Participants handouts
9.7.7. Module review (30 minutes)	
<p><i>(The facilitator leads the trainees in reviewing the module)</i> Summarize the main points of the training: The facilitator should review the following main points about climatic conditions suitable for Kale production:</p> <ul style="list-style-type: none"> • Major pests of Kale and their economic impacts • Integrated Pest Management (IPM) options in Kale production • Major diseases of Kale and their economic impact • Integrated Disease Management (IDM) options for Kale • Major weeds of Kale and their economic impacts • Integrated Weed Management (IWM) options for Kale <p><i>(Discuss with trainees about new things learnt from this Module. What are some of the issues that need clarification)?</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

9.8. Participants' handouts

1. Fact sheets on Kale pests and their management
2. Factsheets on Kale diseases and their management
3. Factsheets on weeds affecting Kale production and their management
4. Weed Management Manual by Mwangi, H.W., KALRO-Kabete.

MODULE 10

KALE HARVESTING AND POSTHARVEST MANAGEMENT

10.1. Introduction

Careful handling of Kale from harvesting up to market ensures maintenance of good quality. Farmers and other actors at each chain level do not always follow recommended practices and this leads to high postharvest losses. There is need to sensitize farmers and other Kale value chain actors on importance of proper harvesting and postharvest handling of Kale and capacity build them on best practices that include determination of maturity indices, harvesting technique, appropriate harvesting and holding containers, sorting and grading, precooling at farm level, packaging and transportation. This module is designed for training facilitators of FFBS in knowledge and skills that are useful in postharvest handling of Kale. Kale destined for markets should be harvested using appropriate harvesting techniques and at the right time. This ensures good quality of produce with long shelf-life.

10.2 Module Learning Outcomes

By the end of the module the participants should be able to:

- Identify the maturity indices for Kale destined for various markets
- Identify quality attributes of Kale that need to be preserved during postharvest handling
- Understand/demonstrate the appropriate harvesting technique and harvesting containers for Kale
- Understand the whole range of postharvest practices for Kale from harvesting to marketing
- Know and appreciate use of low cost cooling units at farm level namely charcoal cooler and Zero energy cooler

10.3 Module Target Group

This module targets public and private agricultural extension agents, lead farmers and service providers, based at sub county and ward level. It can also be useful for private extension service providers.

10.4 Module Users

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

10.5 Module Duration

The Module is estimated to take 2 hours

10.6 Module summary

Module 10. Kale Harvesting and Postharvest management			
Sessions	Training Methods	Training Materials	Time
10.6. 1. Introduction, Expectations Objectives	<ul style="list-style-type: none"> • Personal introduction • Group exercise • Plenary presentation 	<ul style="list-style-type: none"> • Flip charts • Felt pens • Projector • Laptop 	10 minutes
10.6.2. Constraints and opportunities in postharvest handling of Kale	<ul style="list-style-type: none"> • Group exercise • Plenary presentations 	<ul style="list-style-type: none"> • Flip charts • Felt pens • Participants' handouts • Videos 	20 minutes
10.6.3. Kale Postharvest chain TIMPs	<ul style="list-style-type: none"> • Group exercise • Plenary presentation • Practical demonstration • Video presentation 	<ul style="list-style-type: none"> • PowerPoint • Participants' handouts • Materials for demos 	1 hour
10.6.4. Module review	<ul style="list-style-type: none"> • Facilitator's summary • Group exercise 	<ul style="list-style-type: none"> • Flip charts • Projector • Module evaluation forms 	30 minutes
TOTAL			2 hours

10.7 Facilitator's guidelines

Module 10: Kale Harvesting and Postharvest management	
10.7.1 Introduction and levelling of expectations and objectives (10 minutes)	Session Guide
<p>Introduction and Expectations</p> <p><i>(The facilitator welcomes trainees to the module and thereafter trainees are invited to introduce themselves and state their expectations)</i></p> <p>Module objectives (10 minutes)</p> <p>(The facilitator presents module's objectives)</p> <p>By the end of the module trainees should be able to:</p> <ul style="list-style-type: none"> • Describe the whole range of postharvest handling practices for Kale 	<ul style="list-style-type: none"> • Participants handouts • PowerPoint presentation • Summarize trainees' expectations and display on flip chart/board.

<ul style="list-style-type: none"> • Explain the constraints and opportunities in Kale postharvest value chain • Appreciate climate smart and gender-friendly postharvest TIMPs for minimizing the losses and enhancing quality of Kale 	
10.7.2 Constraints and opportunities in postharvest handling of Kale (20 minutes)	Session Guide
<p><i>(Highlight the Kale postharvest value chain – harvesting, and postharvest handling among others)</i></p> <p>Group exercise (10 minutes)</p> <ul style="list-style-type: none"> • Trainees discuss constraints in the postharvest handling of Kale, and suggest solutions <p>Plenary presentation (10 minutes) Trainees present results of group work in plenary</p>	<ul style="list-style-type: none"> • PowerPoint presentation • Participants’ handouts
10.7.3 Kale postharvest handling practices TIMPs (1 hour)	Session Guide
<p><i>(Facilitator uses slides to train)</i></p> <p>PowerPoint Presentation (40 minutes)</p> <p>PowerPoint presentation on the operations in Kale harvesting and postharvest handling practices</p> <ul style="list-style-type: none"> • Maturity indices and harvesting of Kale (importance of harvesting at the right maturity index, advantages and disadvantages of harvesting too early or too late) • Preparations farmers need to make prior to harvesting • Kale harvesting methods • Harvesting containers <p>Practical demonstrations (20 minutes)</p> <ul style="list-style-type: none"> • Sorting and grading (a sample of Kale purchased from the market and grading into various grades with reference to any existing standards) 	<ul style="list-style-type: none"> • PowerPoint presentation • Participants’ handouts
10.7.4 Training review (30 minutes)	Session Guide
<p><i>(The facilitator should be able to lead the trainees in reviewing the module)</i></p> <p>Plenary presentation (15 min)</p> <p>Together with the trainees, summarize the main points of the training.</p>	<ul style="list-style-type: none"> • PowerPoint presentation • Participants’ handouts • Summary of the main points from the Module

Group Exercise (15 min)

Together with the trainees review the main points about Kale post-harvest handling practices

- 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 harvesting and postharvest handling practices of Kale?
- What questions do you still have about post-harvest handling in Kale?

10.8. Participant's Handouts

- Kale postharvest handling Factsheets

MODULE 11

KALE VALUE ADDITION

11.1. Introduction

Being a leafy vegetable, Kale is highly perishable resulting to high postharvest losses and short shelf-life. Processing of Kale into various products enhances shelf life thus ensuring availability during off season. Agro-processing add value to Kale hence increases economic returns to various value chain actors. This can be through diversification of markets and utilization of Kale. Knowledge and skills in Kale value addition is limited or lacking at grass-root levels. There is need for capacity building to address these challenges and promote Kale value addition at cottage industry level as viable commercial enterprises. This module is therefore designed for training facilitators to acquire skills that are useful in adding value to Kale.

11.2 Module Learning Outcomes

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

- The role of Kale as a food and nutrition security crop explained and appreciated.
- Nutritional composition of Kale and its health benefits, food security and income described.
- Constraints in value addition and consumption of Kale, and suggested solutions identified
- Kale-based value added products identified and explained.

11.3 Module Target Group

This module targets public and private extension agents, service providers and lead farmers.

11.4 Module Users

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

11.5. Module Duration

The Module is estimated to take 2 hours 30 minutes.

11.6. Module Summary

Module 11. Kale value addition			
Sessions	Training Methods	Training Materials	Time
11.6.1. Introduction, objectives and expectations	<ul style="list-style-type: none"> • Personal introduction • Group work • Plenary Presentation 	<ul style="list-style-type: none"> • Flip charts • Projector • Laptop 	10 minutes
11.6.2 Role of Kale as a food and nutrition security crop	<ul style="list-style-type: none"> • PowerPoint Presentation • Group exercise • Plenary Presentation 	<ul style="list-style-type: none"> • Flip charts • Felt pens • Projector • laptop • Participants' handouts 	20 minutes
11.6.3. Nutritional composition of Kale and its role in human health	<ul style="list-style-type: none"> • PowerPoint • Plenary presentation • Group exercise 	<ul style="list-style-type: none"> • PowerPoint presentation • Flip charts • Felt pens • Participant handouts 	30 minutes
11.6.4. Constraints in value addition and consumption of Kale	<ul style="list-style-type: none"> • Group exercise • Plenary Presentation 	<ul style="list-style-type: none"> • List of value added products • Checklist for prioritization • Pair wise ranking tool • Flip charts • Felt pens • Participants' handouts • Projector • Laptop 	20 min
11.6.5 Kale based value added products	<ul style="list-style-type: none"> • Plenary Presentations • Plenary discussion • Sensory evaluation of value added Kale products 	<ul style="list-style-type: none"> • Projector • Laptop • Participant handouts • Assorted value addition equipment and ingredients (Kale, Kale flours, among others.) 	1 hour

11.6.6. Module review	<ul style="list-style-type: none"> • Plenary discussion • Presentations 	<ul style="list-style-type: none"> • Flip charts • PowerPoint presentations • Module evaluation forms 	10 minutes
TOTAL			2 hours 30 minutes

11.7. Facilitator's Guidelines

Module 11. Kale value addition	
11.7.1 Introduction, expectations and objectives (10 minutes)	Session Guide
<p>Introduction and expectations <i>(The facilitator welcomes trainees to the module on value addition of Kale. They are then invited to introduce themselves and state their expectations)</i></p> <p>Module Objectives (10 minutes) <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"> • Appreciate the role of Kale as a food and nutrition security crop. • Describe nutritional composition of Kale, health benefits, food security and income. • Identify constraints in value addition and consumption of Kale, and suggest solutions. • Explain how to make Kale-based value added products. 	<ul style="list-style-type: none"> • Participants' handouts • PowerPoint Presentation • Summarize trainees' expectations and display on flip chart/board.
11.7.2 Role of Kale as a food and nutrition security crop (20 minutes)	SSession Guide
<p><i>(The facilitator presents on malnutrition cases in Kenya and the importance of Kale in addressing food security and malnutrition challenges)</i></p> <p>Plenary Presentation (10 minutes) PowerPoint presentation highlighting the critical elements:</p> <ul style="list-style-type: none"> • Micronutrient malnutrition cases in Kenya • Dietary nutrient requirements [focusing on Vulnerable and Marginalized Groups (VMGs)] <p>Group Exercises (10 minutes) Trainees discuss in groups, the main malnutrition challenges in their respective counties / regions</p>	<ul style="list-style-type: none"> • PowerPoint presentation • Participants' handouts • Recipe books • Sample Kale and other processing ingredients • Group exercise

11.7.3 Kale nutritional composition and impact of consumption on human health (30 minutes)	
<p>Plenary presentation (30 minutes)</p> <ul style="list-style-type: none"> • Overview of the documented Kale nutritional composition and their role in human health and nutrition 	<ul style="list-style-type: none"> • PowerPoint • Participant handouts • Brochures, leaflets, manual, factsheets, posters
11.7.4. Constraints in value addition and consumption of Kale, and suggested solutions (20minutes)	Session Guide
<p>Group exercise (5min)</p> <p>Groups discuss the constraints in Kale value addition and consumption</p> <p>Plenary presentation (15 min)</p> <p>Overview of constraints in value addition and consumption of Kale</p>	<ul style="list-style-type: none"> • PowerPoint presentation • Group Exercise
11.7.5 Kale based value added products (1 hour)	Session Guide
<p>Plenary presentation (50 min)</p> <ul style="list-style-type: none"> • Overview of Kale based value added products • Meaning of value addition • Requirements for value addition of Kale • Kale based value added products <p>Practical exercise (10 minutes)</p> <ul style="list-style-type: none"> • Demonstration on formulation of Kale based products 	<ul style="list-style-type: none"> • Leaflets • Sensory evaluation forms • Assorted value addition equipment and ingredients
11.7.6 Training review (10 minutes)	Session Guide
<p><i>(The facilitator leads the trainees in reviewing the module)</i></p> <p>Review the main points about Kale value addition together with the trainees.</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 Kale value addition? • What questions do you still have about Kale value addition? 	<p>Summary of the main points from the Module.</p>

11.8. Participants' Handouts

- Kale value addition leaflets, handouts

MODULE 12

MECHANIZATION OF KALE PRODUCTION

1.1 Introduction

Agricultural mechanization enhances production, productivity and profitability in agriculture by achieving timeliness, quality, quantity, entrepreneurship and reduced drudgery in farm operations. It comes along with precision in metering and placement of inputs, thus reducing input losses, increasing utilization efficiency of costly inputs (seed, chemical, fertilizer, irrigation among others), reducing unit cost of produce and enhancing profitability plus competitiveness in the cost of operation. It also helps in the conservation of agricultural produce and by-products 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 Kale farming in Kenya especially when applied to seedbed preparation, planting, weeding, pest control, harvesting and post-harvest activities. This module is designed for training facilitators to acquire skills that are useful in mechanization of Kale farming value chain.

1.2 Module learning outcomes

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

- Climate smart tillage options identified and explained.
- Seedbed preparation for raised nursery bed explained.
- Seedbed preparation for direct sowing.
- Calibration of fertilizer, seed rates for planters and rollers demonstrated.
- Transplanting of seedlings demonstrated.
- Laying out of irrigation structures demonstrated.
- Use of pest control implements and tools demonstrated.
- Harvest timing and yield estimation demonstrated.
- Estimation of harvesting losses demonstrated.
- Harvesting and transportation demonstrated.

1.3 Module Target Group and Categories

This module is intended for private service providers and county public extension agents.

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.

1.5 Module Duration

The Module is estimated to take a duration of 2 hours.

1.6 Module Summary

Module 12. Mechanization of Kale production activities			
Sessions	Training methods	Training materials	Duration
1.6.1 Introduction, objectives and expectations	<ul style="list-style-type: none"> • Personal introduction • Plenary Presentation • Plenary discussion 	<ul style="list-style-type: none"> • Flip charts • Felt pens • Projector • Laptop 	10 minutes
1.6.2 Climate smart tillage options explained	<ul style="list-style-type: none"> • Plenary Presentation • Plenary discussion 	<ul style="list-style-type: none"> • Projector • Laptop • Flip chart • Felt pens • Participants' handouts 	10 minutes
1.6.3 Seedbed preparation for raised nursery bed explained	<ul style="list-style-type: none"> • Plenary Presentation • Plenary discussion 	<ul style="list-style-type: none"> • Projector • Laptop • Flip chart • Felt pens • Participants' handouts 	10 minutes
1.6.4 Seedbed preparation for direct sowing demonstrated	<ul style="list-style-type: none"> • Plenary Presentation • Plenary discussion 	<ul style="list-style-type: none"> • Projector • Laptop • Flip chart • Felt pens • Participants' handouts 	10 minutes
1.6.5 Calibration of fertilizer, seed rates for planters and rollers demonstrated	<ul style="list-style-type: none"> • Plenary Presentation • Plenary discussion 	<ul style="list-style-type: none"> • Projector • Laptop • Flip chart • Felt pens • Participants' handouts 	10 minutes
1.6.6 Transplanting of seedlings demonstrated	<ul style="list-style-type: none"> • Plenary Presentation • Plenary discussion 	<ul style="list-style-type: none"> • Projector • Laptop • Flip chart • Felt pens • Participants' handouts 	10 minutes
1.6.7 Laying out of irrigation structures demonstrated	<ul style="list-style-type: none"> • Plenary Presentation • Plenary discussion 	<ul style="list-style-type: none"> • Projector • Laptop • Flip chart • Felt pens • Participants' handouts 	10 minutes
1.6.8 Use of pest control implements and tools demonstrated	<ul style="list-style-type: none"> • Plenary Presentations • Plenary discussion 	<ul style="list-style-type: none"> • Flip chart • Power Point presentation • Participants' handouts • Practical 	10 minutes

1.6.9 Harvest timing and yield estimation demonstrated	<ul style="list-style-type: none"> • Plenary Presentations • Plenary discussion 	<ul style="list-style-type: none"> • Flip chart • Power Point presentation • Participants' handouts • Practical 	10 minutes
1.6.10 Estimation of harvesting losses demonstrated	<ul style="list-style-type: none"> • Presentations • Plenary discussion 	<ul style="list-style-type: none"> • Flip chart • PowerPoint presentation • Participants' handouts • Practical 	10 minutes
1.6.11 Harvesting and transportation demonstrated	<ul style="list-style-type: none"> • Presentations • Plenary discussion 	<ul style="list-style-type: none"> • Flip chart • PowerPoint presentation • Participants' handouts • Practical 	10 minutes
1.6.12 Module review	<ul style="list-style-type: none"> • Presentations 	<ul style="list-style-type: none"> • PowerPoint presentation 	10 minutes
Total			2 hours

12.7 Facilitator's Guidelines

12.7.1 Introduction, Objectives and Expectations (10 minutes)	Session Guide
<p><i>(The facilitator welcomes trainees to the module and thereafter invites them to introduce themselves and state their expectations)</i> <i>The facilitator presents module objectives</i></p> <p>Module Objectives By the end of the module, the trainee should be able to:</p> <ol style="list-style-type: none"> Identify and explain climate smart tillage options prepare a raised nursery bed prepare a direct sowing field Calibrate fertilizer, seed rates for planters and rollers Transplant seedlings Lay out of irrigation structures Use pest control implements and tools Time harvesting stage and estimate yield Estimate harvesting losses Harvest and transport 	<ul style="list-style-type: none"> • Summarize trainees' "expectations" and display. • PowerPoint presentation • Participants' handouts

12.7.2. Climate smart tillage options (10 minutes)	Session Guide
<p><i>(The facilitator presents on the commonly known Kale pests that are of economic importance)</i></p> <p>Plenary Presentation (5 minutes)</p> <ul style="list-style-type: none"> • Overview of the Kale mechanization activities • Climate smart tillage options <p>Plenary discussion (5 minutes) Let the trainees recall what they learned and discuss any issue that may arise</p>	<ul style="list-style-type: none"> • PowerPoint presentation • Participants' handouts • Plenary discussion
12.7.3. Seedbed preparation for raised nursery bed	Session Guide
<p>Plenary Presentation (10 minutes)</p> <ul style="list-style-type: none"> • Techniques and methods of raised bed design and construction • Techniques and methods of ridging <p>Discussion</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 • Participants' handouts • Plenary discussion
12.7.4. Seedbed preparation for direct sowing (10 minutes)	Session Guide
<p>Plenary Presentation (10 minutes)</p> <ul style="list-style-type: none"> • Techniques and methods of direct sowing seed bed preparation • Techniques and methods of ridging for direct sowing <p>Discussion</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 • Participants' handouts • Plenary discussion
12.7.5. Calibration of fertilizer and seed rate for planters and soil firming (10 minutes)	Session Guide
<p>Plenary Presentation (10 minutes)</p> <ul style="list-style-type: none"> • Techniques and methods of planter seed and fertilizer rate determination and soil firming <p>Discussion</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 • Participants' handouts • Plenary discussion

12.7.6. Transplanting of seedlings (10 minutes)	Session Guide
<p>Plenary Presentation (10 minutes)</p> <ul style="list-style-type: none"> Techniques and methods of planter seed and fertilizer rate determination and soil firming <p>Discussion Let the trainees recall what they learned and discuss any issue that may arise.</p>	<ul style="list-style-type: none"> PowerPoint presentation Participants' handouts Plenary discussion
12.7.7. Laying out of irrigation structures (10 minutes)	Session Guide
<p>Plenary Presentation (10 minutes)</p> <ul style="list-style-type: none"> Techniques and methods of irrigation design and construction <p>Discussion Let the trainees recall what they learned and discuss any issue that may arise.</p>	<ul style="list-style-type: none"> PowerPoint presentation Participants' handouts Plenary discussion
12.7.8. Pest control equipment and tools usage (10 minutes)	Session Guide
<p>Plenary Presentation (10 minutes)</p> <ul style="list-style-type: none"> Techniques and methods of using pest control equipment; knap sack and boom sprayer <p>Plenary discussion Let the trainees recall what they learnt and discuss any issues that may arise</p>	<ul style="list-style-type: none"> PowerPoint presentation Participants' handouts Plenary discussion
12.7.9. Time harvesting and estimation of yield (10 minutes)	Session Guide
<p>Plenary Presentation 10 Minutes</p> <ul style="list-style-type: none"> Techniques and methods of using knife to harvest water melon <p>Plenary discussion Let the trainees recall what they learnt and discuss any issues that may arise</p>	<ul style="list-style-type: none"> PowerPoint presentation Participants' handouts Plenary discussion
12.7.10 Estimate harvesting losses (5 minutes)	Session Guide
<p>Plenary Presentation (10 minutes)</p> <ul style="list-style-type: none"> Techniques and methods of using knife to harvest water melon <p>Plenary discussion Let the trainees recall what they learnt and discuss any issues that may arise</p>	<ul style="list-style-type: none"> PowerPoint presentation Participants' handouts Plenary discussion

12.7.11 Harvesting and transportation (5minutes)	Session Guide
<p>Plenary Presentation (10 minutes)</p> <ul style="list-style-type: none"> Techniques and methods of using knife to harvest water melon <p>Plenary discussion Let the trainees recall what they learnt and discuss any issues that may arise</p>	<ul style="list-style-type: none"> PowerPoint presentation Participants' handouts Plenary discussion
12.7.12 Module review (10 minutes)	Session Guide
<p><i>(The facilitator leads the trainees in reviewing the module)</i> Summarize the main points of the training and together with the participants review the main points:</p> <ul style="list-style-type: none"> Various climate smart tillage operations Seedbed preparation for raised nursery bed Seedbed preparation for direct sowing Calibration of fertilizer, seed rates for planters and rollers Transplanting of seedlings Laying out of irrigation structures Use of pest control implements and tools Optimal crop Kale harvesting stage and yield estimation Estimation of harvesting losses Harvesting and transportation Harvest and transport with minimum injury <p><i>(Discuss with trainees about new things learnt from the module and any issues that may arise)</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

- Kale Mechanization Factsheet
- Mechanization leaflets.

MODULE 13

KALE BUSINESS AND MARKETING

13.1 Introduction

Kale is considered as one of the most important vegetable crops and a source of income for many people in all counties in Kenya. It generally has a lower cost of production compared to other horticultural crops. Under the Kenya Government's policy for addressing poverty, Kale has been identified as a key crop with the potential to benefit over 30 million people in the country. Kale production in Kenya is being hindered by declining soil fertility among other factors. However, Kale is mainly grown under small-scale. Farmers grow most of the Kale on holdings of less than one hectare. Currently the production of Kale is low compared to the projected potential in some counties. Markets and marketing of Kale is a major issue of concern to small scale farmers and other actors in the Kale value chain in Kenya, particularly inconsistency in supplying sufficient volumes required for trade, seasonal supply and price fluctuations. To strengthen the Kale value chain, it is important to equip farmer facilitators with the skills and knowledge on Kale farming business and marketing strategies. Therefore, this module is designed to expose Master Trainers in Kale farming business and marketing.

13.2 Module Learning Outcomes

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

- The business concept, transitioning from subsistence to commercialization, risk management, and emerging farming business models explained and appreciated.
- Planning a farm business using SWOT Analysis, farm budgeting and business plan described and explained,
- Tools for managing and implementing a farm business, record keeping, performance (break-even, gross-margin, benefit-cost ratios) and entrepreneurship skills described and explained.
- Details of a Small Farm Business Plan and financing developed and shared.
- .Marketing approaches and strategies of Kale identified and mapped.

13.3 Module Target Group

This module targets agricultural extension officers, service providers and lead farmers.

13.4 Module Users

This module is intended to be used by a Master Trainer who is among the members of the core team trainers. The facilitator using this module should thoroughly familiarize and avail the participants' handouts.

13.5 Module Duration

The Module is estimated to take a duration of 6 hours

13.6 Module Summary

Module 13. Kale Business and Marketing			
Sessions	Training Methods	Training Materials	Time
13.6.1. Levelling of participants' expectations about the module and objectives	<ul style="list-style-type: none"> • Introduction • Plenary discussion 	<ul style="list-style-type: none"> • Projector • Laptop • Flip charts • Marker pens • Masking tapes/flip chart holders 	10 minutes
13.6.2. Explain the business concept, transitioning from subsistence to commercialization, risk management, and emerging farming business models	<ul style="list-style-type: none"> • Plenary presentation • Plenary discussion • Group exercise 	<ul style="list-style-type: none"> • Projector • Laptop • Flip charts • Marker pens • Masking tapes/flip chart holders 	20 minutes
13.6.3. Kale business Planning: SWOT Analysis, farm budgeting and business plan	<ul style="list-style-type: none"> • Plenary presentation • Plenary Discussion • Group exercise 	<ul style="list-style-type: none"> • Projector • Laptop • Flip charts • Marker pens • Masking tapes/flip chart holders 	20 minutes
13.6.4 Enterprise business planning: Record keeping; Enterprise performance (Break-even, Gross margin, Benefit-cost ratios)	<ul style="list-style-type: none"> • Plenary presentation • Plenary Discussion 	<ul style="list-style-type: none"> • Projector • Laptop • Flip charts • Marker pens • Masking tapes/flip chart holders 	1 hour 30 minutes
13.6.5 Kale enterprise planning, Financing & analysis	<ul style="list-style-type: none"> • Plenary presentation • Plenary Discussion 	<ul style="list-style-type: none"> • Projector • Laptop • Flip charts • Marker pens • Masking tapes/flip chart holders 	30 minutes
13.6.6 Marketing Analysis: Marketing channels/linkages (Emerging and inclusive farmer-market linking models); Marketing Approaches/Strategies and Marketing Plan	<ul style="list-style-type: none"> • Plenary presentation • Plenary Discussion 	<ul style="list-style-type: none"> • Projector • Laptop • Flip charts • Marker pens • Masking tapes/flip chart holders 	1 hour

2.11.7 Participatory market research	<ul style="list-style-type: none"> • Plenary presentation • Plenary Discussion 	<ul style="list-style-type: none"> • Projector • Laptop • Flip charts • Marker pens • Masking tapes/ flip chart holders 	2 hours
13.6.7. Training review	<ul style="list-style-type: none"> • Facilitator’s summary • Plenary presentation • Plenary Discussion 	<ul style="list-style-type: none"> • Module review • Participants handouts 	10 minutes
TOTAL			6 hours

13.7 Facilitators Guidelines

Module 13. Kale Business and Marketing	
13.7.1 Levelling participants’ expectations about the module (10 minutes)	Session Guide
<p><i>(The facilitator welcomes trainees to the module and thereafter invites them to state their expectations)</i></p> <p><i>(The facilitator presents module objectives)</i></p> <p>By the end of this module, the trainee is expected to:</p> <ul style="list-style-type: none"> • Appreciate business concept, transitioning from subsistence to commercialization, risk management, and emerging inclusive farmer-market linking models • Describe how to plan a farm business using SWOT Analysis, farm budgeting and business plan. • Describe and explain the tools for implementing a farm business: Record keeping, enterprise performance (Break-even, Gross margin,), entrepreneurship, business financing & analysis. • Develop and share details of a Small Farm Business Plan • Identify and evaluate the marketing approaches/ strategies, market linkage/channels and research for Kale enterprise. 	<ul style="list-style-type: none"> • Summarize trainees’ “expectations” and display on flip chart/board. • Participants Hand-outs • Program • PowerPoint presentation

13.7.2 Appreciate business concept, and emerging inclusive farmer-market linking models (20 minutes)	Session Guide
<p><i>(The facilitator to highlight elements of business concept and emerging farming business models)</i></p> <p>Plenary Presentation (10 minutes) Make presentation on business concept, transitioning from subsistence to commercialization, risk management, and emerging inclusive farmer-market linking models</p> <p>Group Exercise (10 minutes) Discuss areas of adjustments in the models</p>	<ul style="list-style-type: none"> • PowerPoint presentation • Participants handouts • Group Exercise
13.7.3 Planning a farm business using SWOT Analysis, Kale enterprise budgeting and business plan (20 minutes)	Session Guide
<p><i>(The facilitator highlights the components of SWOT matrix and their interactions to generate opportunities based on the other components)</i></p> <p>Plenary Presentation (10 minutes)</p> <ul style="list-style-type: none"> • SWOT analysis • Budgeting • Business planning <p>Group Exercise (10 minutes)</p> <p>List the strengths, weaknesses, opportunities and threats in Kale farming as a business and marketing</p>	<ul style="list-style-type: none"> • Participants 'handouts • Group exercise
13.7.4 Describe and explain the tools for implementing a farm business: Record keeping, Business Financing & analysis) and entrepreneurship (1 hr 30 minutes)	Session Guide
<p>Plenary Presentation (1hr) <i>(The facilitator highlights the importance of the tools in managing Kale production as a farm business)</i></p> <ul style="list-style-type: none"> • The farmer as an entrepreneur • Record keeping • Enterprise performance (Break-even, Gross margin,), entrepreneurship, • Profitability assessment (break-even, gross margin& benefit cost ratios) • Financing & analysis <p>Plenary Discussion (30 minutes)</p>	<ul style="list-style-type: none"> • PowerPoint presentation • Participants handouts • Plenary discussion

13.7.5 Kale enterprise planning, Financing & analysis (30 minutes)	Session Guide
<ul style="list-style-type: none"> • Plenary Sessions and group work 	<ul style="list-style-type: none"> • Flip Charts
13.7.6 Marketing Analysis: Marketing channels/linkages (Emerging and inclusive farmer-market linking models); Marketing	Session Guide
<ul style="list-style-type: none"> • Plenary Sessions and group work 	Flip charts
13.7.8 Marketing approaches/strategies, market linkage/channels and research for Kale enterprise (2 hrs)	Session Guide
<p>Plenary Presentation (2 hours) <i>(The facilitator highlights the marketing strategies for the Kale farm business)</i></p> <ul style="list-style-type: none"> • Market research • Producer organizations/Group marketing • Niche marketing • Contract farming • Online/internet marketing <p>Plenary Discussion</p>	<ul style="list-style-type: none"> • PowerPoint presentation • Participants' handouts
13.7.9 Training review (10 minutes)	Session Guide
<p><i>(The facilitator leads the trainees in reviewing the module. Conclude by thanking the trainees)</i></p> <p>Plenary Presentation (10 minutes)</p> <p><i>Summarize the main points of the training</i></p>	<ul style="list-style-type: none"> • Plenary presentation • Summary of the main points from the Module.

13.8. Participants' Handouts

- Kale Business and Marketing factsheets
- Kale production manual

References

1. Tawedzegwa M. (2012). Farming as a family business. Training manual. Zimbabwe agricultural competitiveness program.
2. Wanjala S. P.O.; Karanja D; Wambua S; Otiep G; Odhiambo C. and Birachi E. (2018). Marketing Arrangements Used by Small Scale Bean Farmers in Kenya: What Needs to Change for Sustainable Trade Volumes?
3. USAID (2012). Farming as a Family Business Training Manual Zimbabwe Agricultural Competitiveness Program.

MODULE 14

KALE CROSS-CUTTING ISSUES (AGRICULTURAL INNOVATION PLATFORMS, POLICY, GENDER MAINSTREAMING AND SOCIAL INCLUSION)

SUB-MODULE 14.1

AGRICULTURAL INNOVATION PLATFORMS

14.1.1 Introduction

This module exposes the service providers, lead farmers and facilitators to an innovation system-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, which in this case is Kale. The AIP facilitates actors to interact, innovate, learn and change with time as they seek solutions to the common challenges 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 manner. The AIP has been proved to be a useful methodology for catalyzing uptake, up scaling and sustaining use of various technologies.

14.1.2. Sub-Module learning Outcomes

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

1. The definition of agricultural innovation systems and innovations clearly described and understood.
2. The characteristics of an innovation platform described and understood.
3. Mobilization of stakeholders for initiation, establishment, management and sustainability of an Agricultural Innovation Platform explained and demonstrated.
4. The benefits and challenges of Innovation Platforms explained and understood

14.1.3 Sub-Module Target Group and Categories

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

14.1.4 Sub-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.

14.1.5 Sub-Module Duration

The Module is estimated to take a duration of 2 hours

14.1.6 Module Summary

Sub-Module 14.1 Agricultural Innovation Platforms (AIP)			
Sessions	Training methods	Training materials	Time
14.1.6.1 Introduction, objectives and expectations	<ul style="list-style-type: none"> • Personal introduction • Plenary Presentations • Plenary discussion 	<ul style="list-style-type: none"> • Flips charts • Felt pens • Projector • PPT presentation 	10 minutes
14.1.6.2 Definition of Agricultural Innovation Systems and different types of innovations (technical, institutional and organizational)	<ul style="list-style-type: none"> • PowerPoint Presentations • Plenary discussion • Group exercise 	<ul style="list-style-type: none"> • Flips charts • Felt pens • Projector • PPT presentation 	30 minutes
14.1.6.3 Characteristics of an Agricultural Innovation Platform	<ul style="list-style-type: none"> • PowerPoint Presentation • Plenary discussion 	<ul style="list-style-type: none"> • Flip charts • Felt pens • Projector • PPT Presentation • Participants Handouts 	30 minutes
14.1.6.4 Phases of an innovation platform (Initiation, Establishment, Management and Sustainability)	<ul style="list-style-type: none"> • PowerPoint presentations • Plenary discussion • Group Exercise 	<ul style="list-style-type: none"> • Flips charts • Felt pens • Projector • Handouts • PPT Presentation 	20 minutes
14.1.6. 5 Case studies of successful Agricultural Innovation Platforms	<ul style="list-style-type: none"> • PowerPoint presentations • Plenary discussion • Role plays 	<ul style="list-style-type: none"> • Flips charts • Felt pens • Projector • PPT Presentation • Participants' handouts 	10 minutes
14.1.6. 6 Benefits and challenges of Agricultural Innovation Platforms	<ul style="list-style-type: none"> • PowerPoint presentations • Plenary discussion • Role plays • 	<ul style="list-style-type: none"> • Flips charts • Felt pens • Projector • PPT presentation • Participants' handouts 	10 minutes
14.1.6.7 Module review	<ul style="list-style-type: none"> • Discussion 	<ul style="list-style-type: none"> • Flip Charts • Felt pens • Fact Sheets 	10 minutes
Total			2 hours

14.1.7 Facilitator’s Guidelines

Sub Module 14.1 Agricultural Innovation Platform (AIP)	
14.1.7.1. Introduction, levelling of expectations and objectives (10 Minutes)	Session Guide
<p>Introduction <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 <i>(The facilitator presents modules objectives and levels out expectations)</i></p> <p>By the end of the module, the trainee should be able to:</p> <ul style="list-style-type: none"> • Define agricultural innovation systems, innovation process and innovations • Describe characteristics of an innovation platform • Describe how to initiate, establish, manage and sustain an Agricultural Innovation Platform • Describe the benefits and challenges of Agricultural innovation platforms 	<ul style="list-style-type: none"> • Summarize Trainees’ “Expectations” and display. • PowerPoint Presentation
14.1.7.2 A definition of Agricultural Innovation Systems and different types of innovations (technical, institutional and organizational) (30 minutes)	Session Guide
<ul style="list-style-type: none"> • Past progression of research and extension models and their shortcomings • Agricultural Innovation Systems model and actualization through Agricultural Innovation Platforms • Definition of innovation process • Types of innovations (products of innovation process) 	<ul style="list-style-type: none"> • PowerPoint Presentation • Plenary discussion
14.1.7.3. Characteristics of an Agricultural Innovation Platform (30 minutes)	Session Guide
<p><i>The facilitator should present an overview of innovation platforms and their main characteristics</i></p> <p>Plenary Presentation (15 minutes)</p> <ul style="list-style-type: none"> • Characteristics of Agricultural Innovation Platforms • Why Agricultural innovation platforms are used • Where to form Agricultural Innovation Platforms • Establishment of linkages between value chain actors in agricultural innovation platforms <p>Plenary 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 • Participants’ handouts • Plenary discussion

14.1.7.4 Phases of an innovation platform (Initiation, Establishment, Management and Sustenance (20 minutes))	Session Guide
<p>Plenary Presentation (20 minutes)</p> <p>Initiation phase</p> <ul style="list-style-type: none"> • Mobilization of stakeholders in the Kale value chain for challenge identification • General description of the value chain within a specific area <p>Establishment Phase</p> <ul style="list-style-type: none"> • Clear prioritization of the key value Chain challenge or compelling agenda in the (weakness in the chain) • Vision of the AIP formulated with clear goals • Development of a business plan with clear milestones to guide operations of the AIP • Formation of a main committee to coordinate platform activities. • Formation of diverse sub-committees with clear roles <p>Management Phase</p> <ul style="list-style-type: none"> • Keeping stakeholders focused on the business plan to ensure an inclusive and transparent process • Neutral facilitation to ensure joint strategy building and action and the coordination of support activities • Managing emerging experts taking up leading roles and issues as champions <p>Sustainability and scaling Phase</p> <ul style="list-style-type: none"> • Changing roles of initiator, local stakeholders and Private sector • Local stakeholders lead and own AIP while Initiator backstops and private sector supports and seize opportunity • Embarking on fresh issues or challenges • Maintaining capacity acquired to address new issues or challenges in subsequent cycles <p>Plenary discussion</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 • Participants Handouts • Plenary discussion
14.1.7.5 Case studies of successful AIPS (10 minutes)	Session Guide
<p>Plenary Presentation and discussion</p> <ul style="list-style-type: none"> • successful innovation platforms and their achievements 	<ul style="list-style-type: none"> • PowerPoint Presentation • Plenary discussion

14.1.7.6 Benefits and challenges of AIPS (10 minutes)	Session Guide
<p>Plenary Presentation</p> <ul style="list-style-type: none"> • Benefits of Agricultural innovation platforms • Challenges of Agricultural Innovation platforms 	<ul style="list-style-type: none"> • PowerPoint Presentation • Plenary discussion
14.1.6.5. Module review (10 minutes)	Session Guide
<p><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 on:</p> <ul style="list-style-type: none"> • Agricultural Innovation Systems, Innovation process and different Innovations • AIP characteristics, why and where to form them • The four Phases of Innovation Platforms • The benefits and challenges of innovation Platforms <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"> • Participants' Handouts • Summarize the main points from the module on a flip chart and display

14.1.7. Participants' Handouts

- Kamau G. (2020) Agricultural Innovation Platform Factsheet
- Kamau G. (2020) Agricultural Innovation Platform Phases Fact sheets

References

1. Kamau, G.M. and Makini F.W. (2019). Agricultural Innovation Platforms for knowledge exchange and learning for technical, economic, social and institutional change.
2. Makini F., Mulinge W., Mose L., Salasya B., Kamau G., Makello M., and On'gala, J. (2018). Impact of Agricultural Innovation Platforms on Smallholder livelihoods in Eastern and Western Kenya. FARA Research Results Vol2(6).
3. Makini F., Kamau G., Makello M., Adekunle A., Mburathi G., (2013). Operational field guide for developing and managing local agricultural innovation platforms KARI ISSN 978-9966-30-004-1

SUB-MODULE 14.2

KALE GENDER, VULNERABLE AND MARGINALIZED GROUPS (VMGs), SOCIAL, ENVIRONMENTAL CONCERNS AND COHESION

14.2.1 Introduction

Kale is a major 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 weeding while men mostly perform the task of marketing. Despite this huge women's contribution, gender inequalities exist in all areas of the value chains. 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 benefits 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, community 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.

Kale 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 Kale TIMPs is enhanced by field agricultural practitioners and extension officers as an effort geared towards achieving Climate Smart Agriculture "triple win" in target counties.

14.2.2 Sub-Module learning outcomes

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

1. The concept of gender mainstreaming and social inclusion in Kale value chain understood and appreciated.
2. Youth empowerment in Kale value chain explained and understood.
3. Women empowerment in Kale value chain explained and understood.
4. Strategies for inclusion of vulnerable and marginalized groups in Kale value chain understood and applied.
5. Knowledge on environmental and social management framework (ESMF) tool enhanced.

14.2.3 Sub-Module Target Group

This module is intended for lead farmers, service providers and county public and private extension agents.

14.2.4 Sub-Module Users

This module is intended for use by Master Trainers who are members of the Core Team of Trainers (CTT). This module outlines the learning outcomes, the category of trainees targeted, module summary, and participants' handouts. The facilitator using this module should thoroughly familiarize themselves with the participant's handouts.

14.2.5 Sub-Module Duration

The Module is estimated to take a minimum of 2 hours.

14.2.6 Sub-Module Summary

Sub-Module 14.2 Gender mainstreaming and social inclusion in the Kale value chain			
Sessions	Training methods	Training materials	Duration
14.2.6.1 Introduction, expectations and objectives	<ul style="list-style-type: none"> • Personal introductions • Presentations • Plenary discussion 	<ul style="list-style-type: none"> • Flips charts • Felt pens • PowerPoint Presentation • Laptop • Participants' handouts 	10 Minutes
14.2.6.2 Gender mainstreaming in Kale value chain	<ul style="list-style-type: none"> • PowerPoint Presentations • Group Exercise • Plenary discussion 	<ul style="list-style-type: none"> • Flips charts • Felt pens • PowerPoint Presentation • Participants handouts 	30 minutes
14.2.6.3 Youth empowerment in Kale value chain	<ul style="list-style-type: none"> • PowerPoint Presentations • Group exercise • Plenary discussion 	<ul style="list-style-type: none"> • Flips charts • Felt pens • PowerPoint Presentation • Participants handouts 	20 minutes
14.2.6.4 Women empowerment in Kale value chain	<ul style="list-style-type: none"> • PowerPoint Presentations • Plenary discussion 	<ul style="list-style-type: none"> • Flips charts • Felt pens • PowerPoint Presentation • Participants handouts 	20 minutes
14.2.6.5 Strategies for inclusion of vulnerable and marginalized groups	<ul style="list-style-type: none"> • PowerPoint Presentations • Plenary discussion 	<ul style="list-style-type: none"> • Flips charts • Felt pens • PowerPoint Presentation • Participants handouts 	20 minutes

14.2.6.6 Environmental and Social Management Framework	<ul style="list-style-type: none"> • PowerPoint Presentations • Plenary discussion 	<ul style="list-style-type: none"> • Flips charts • Felt pens • PowerPoint Presentation • Participants handouts 	10 minutes
14.2.6.7 Module Review	<ul style="list-style-type: none"> • Plenary discussion 	<ul style="list-style-type: none"> • Flips charts • Felt pens 	10 Minutes
Total			2 hours

14.2.7 Facilitator’s Guidelines

Sub Module 14.2: Gender mainstreaming and social inclusion in Kale value	
14.2.7.1 Introduction, Objectives and Expectations (10 Minutes)	Session Guide
<p><i>(The facilitator welcomes trainees to the module and thereafter invites them to introduce themselves and to state their expectations)</i></p> <p>Module Objectives (10 Minutes) <i>The facilitator presents modules objectives</i></p> <p>By the end of the module training, the trainee must be to: -</p> <ul style="list-style-type: none"> • Understand gender mainstreaming and social inclusion, in Kale value chain • Understand youth empowerment in Kale value chain • Appreciate women empowerment in Kale value chain • Recognize strategies for inclusion of vulnerable and marginalized groups in Kale value chain • Understand 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
14.2.7.2 Gender mainstreaming and social inclusion in Kale value chain (30 Minutes)	Session Guide
<p><i>(The facilitator should present and explain what is gender mainstreaming, who does what activity, who has access to what resources among others. and why gender mainstreaming is important in Kale value chain).</i></p> <p>Plenary Presentation (20 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 Kale value chain) • Who owns what? (access and control of resources & benefits) • Who makes which decisions? 	<ul style="list-style-type: none"> • PowerPoint presentation, Group exercise • Plenary discussion • Participants’ handouts • Group exercise • Plenary discussion

<ul style="list-style-type: none"> Existing policies in support of gender mainstreaming <p>Group exercise and discussion (10 minutes) Let the trainees recall what they learned and discuss any issue that may arise</p>	
<p>14.2.7.3 Youth empowerment in Kale value chain s (20 minutes)</p>	<p>Session Guide</p>
<p>Plenary Presentation (20 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 Kale value chain <p>Group exercise and discussion 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 Participants’ handouts
<p>14.2.7.4 Women empowerment in Kale value chain (20 minutes)</p>	<p>Session Guide</p>
<p>Plenary Presentation (20 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>Plenary discussion 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 Plenary discussion Participants’ handouts
<p>14.2.7.5. Strategies for inclusion of vulnerable and marginalized groups in Kale value chain (20 minutes)</p>	<p>Session Guide</p>
<p>Plenary presentation (20 min)</p> <ul style="list-style-type: none"> Who are vulnerable and marginalized groups (VMGs) Why gender inequality exists Social inclusion and why Strategies of inclusion of VMG <p>Plenary discussion Let the trainees recall what they learned and discuss any issue that may arise</p>	<ul style="list-style-type: none"> PowerPoint Presentation Plenary discussion Participants’ handouts

14.2.7.6. Environmental and social management framework (ESMF) (10 minutes)	Session Guide
<p>Plenary presentation (10 minutes)</p> <ul style="list-style-type: none"> • Objective of ESMF in Kale value chain • Environmental and social safeguards of Kale • Safeguard policies triggered by the project <p>Plenary discussion Let the trainees recall what they learned and discuss any issue that may arise</p>	<ul style="list-style-type: none"> • PowerPoint Presentation • Plenary discussion
14.2.7.7. Module review (10 Minutes)	Session Guide
<p><i>The facilitator leads the participants 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"> • What is gender mainstreaming and why it is important? • Youth empowerment in Kale value chain • Women empowerment in Kale value chain • Strategies for inclusion of vulnerable and marginalized groups in Kale value chain • Environmental and Social Management Framework of Kale activities <p>Let the trainees recall what they learned and discuss any issue 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

14.2.8 Participants' Handouts

- Gender mainstreaming and social inclusion factsheets
- Gender mainstreaming and social inclusion guides

Reference

Commonwealth secretariat, (2001). Gender Mainstreaming in Agriculture and Rural Development: A Reference Manual for Governments and Other Stakeholders. Marlborough house, London.

SUB-MODULE 14.3

CLIMATE-SMART AGRICULTURAL POLICY OPTIONS

14.3.1 Introduction

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 and county) with defined functions. Agriculture is one of the devolved governance functions. In Kenya, agriculture faces 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, low financing of agricultural sector 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.

14.3.2 Sub-Module Learning Outcomes0

Climate-smart agriculture practices, policy options and approaches identified and understood.

1. Climate-smart-sensitive policy cycle explained and understood
2. Implementation of the climate-smart-sensitive policy at the county level discussed and shared.
3. Financing and Investments for Climate-smart Agriculture discussed and appreciated.
4. The need for a Technology Policy explained and understood

14.3.3 Sub-Module Target Group

This module is intended for public and private service providers, public extension agents and lead farmers.

14.3.4 Sub-Module Users

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

14.3.5 Sub-Module Duration

The Module is estimated to take a duration of 2 hours 30 minutes.

14.3.6 Sub-Module Summary

Module 13.3: Climate-Smart Agricultural Policy Options			
Sessions	Training methods	Training materials	Time
14.3.6.1 Introduction, learning expectations and outcomes	<ul style="list-style-type: none"> ▪ Personal introductions ▪ Group discussion ▪ Plenary discussions ▪ Presentations 	<ul style="list-style-type: none"> ▪ Flips charts ▪ Felt pens ▪ PowerPoint Presentations 	10 minutes
14.3.6.2 Agricultural Policy Frameworks in Kenya	<ul style="list-style-type: none"> ▪ Presentations ▪ Practical exercises ▪ Plenary discussion 	<ul style="list-style-type: none"> ▪ Flips charts ▪ Felt pens ▪ PowerPoint Presentations 	30 minutes
14.3.6.3 Climate-smart agriculture practices, policy options and approaches	<ul style="list-style-type: none"> ▪ Presentations ▪ Practical exercises ▪ Plenary discussion 	<ul style="list-style-type: none"> ▪ Flips charts ▪ Felt pens ▪ PowerPoint Presentations ▪ Participants Handouts 	40 minutes
14.3.6.4 Climate-smart-sensitive policy cycle	<ul style="list-style-type: none"> ▪ Presentations ▪ Plenary discussion 	<ul style="list-style-type: none"> ▪ Flips charts ▪ Felt pens ▪ PowerPoint Presentations - Participants Handouts 	20 minutes
14.3.6.5 Implementation of the climate-smart-sensitive policy at the county level	<ul style="list-style-type: none"> ▪ Presentations ▪ Practical exercise ▪ Plenary discussion 	<ul style="list-style-type: none"> ▪ Flips charts ▪ Felt pens ▪ PowerPoint Presentations ▪ Participants' Handouts 	40 minutes
14.3.6.6 Financing and Investments for Climate-smart Agriculture	<ul style="list-style-type: none"> ▪ Presentations ▪ Practical exercise ▪ Plenary discussion 	<ul style="list-style-type: none"> ▪ Flips charts ▪ Felt pens ▪ PowerPoint Presentations ▪ Participants Handouts 	1 hour
14.3.6.7 Technology Policy	<ul style="list-style-type: none"> ▪ Presentations ▪ Plenary discussion 	<ul style="list-style-type: none"> ▪ Flips charts ▪ Felt pens ▪ PowerPoint Presentations ▪ Participants Handouts 	20 minutes

14.3.6.8 Module Review	Plenary discussion	Flip charts Felt pens	30 minutes
Total			2 hours 30 minutes

14.3.7 Facilitator's Guidelines

Sub-Module 14.3: Climate-Smart Agricultural Policy Options	
14.3.7.1 Introduction, Expectations and Outcomes (10 Minutes)	Session Guide
<p><i>(The facilitator welcomes trainees to the module and invites them to introduce themselves and state their expectations).</i></p> <p>Trainees Expectations <i>(The facilitator requests the participants to form groups and list their expectations)</i></p> <p>Module Objectives <i>(The facilitator presents module learning Objectives)</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. • Recognize the stages in climate-smart-sensitive policy cycle. • Understand the phases in the implementation of the climate-smart-sensitive policy at the county level. • Be able to evaluate and select financing and investments options for Climate-smart Agriculture. • Appreciate the need for a technology policy 	<ul style="list-style-type: none"> • Summarize Participants' "Expectations" and display. • PowerPoint presentation • Participants handouts
14.3.7.2 Agricultural Policy Frameworks in Kenya (30 minutes)	
<p>Plenary presentation (20 minutes)</p> <ul style="list-style-type: none"> • The role of agricultural policy frameworks in Kenya <p>Practical exercise (10 minutes) Facilitator requests the trainees to form groups and identify the gaps between agricultural policy frameworks and the existing agricultural policies</p>	<ul style="list-style-type: none"> • PowerPoint presentation • Participants' Handouts • Practical Exercise

14.3.7.3 Climate-smart agriculture practices, policy options and approaches (40 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 and plenary discussion (20 minutes) Facilitator requests the trainees to form groups and identify the existing climate-smart agriculture practices and the relevant policy options for implementation.</p>	<ul style="list-style-type: none"> • PowerPoint presentation • Distribute participants' handouts • Practical exercise • Plenary discussion
14.3.7.4 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 discussion (10 minutes)</p>	<ul style="list-style-type: none"> • PowerPoint presentation • Participants' handouts • Plenary discussion
14.3.7.5 Implementation of the climate-smart-sensitive policy at the county level (40 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 (20 minutes) <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>	<ul style="list-style-type: none"> • PowerPoint presentation • Participants' Handouts • Practical exercise
14.3.7.6 Policy financing and investments for Climate-smart Agriculture (1 hour)	Session Guide
<p>Plenary presentation (30 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) <i>(The facilitator requests the trainees to form groups and identify potential sources of financing, financing mechanisms and connecting action to financing)</i></p>	<ul style="list-style-type: none"> • PowerPoint presentation • Distribute participants' handouts • Practical exercise

14.3.7.7 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 discussion (10 minutes)</p>	<ul style="list-style-type: none"> • PowerPoint presentation • Distribute participants' handouts • Plenary discussion
14.3.7.8 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"> • Summarize the main points of the training and together with the trainees review the main points. • Trainees lists the main points learnt during the training • Discuss with trainees new things learnt from this Module <p>Ask the trainees 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 • Participatory evaluation of the session

14.3.8 Participants' Handouts

- Handout on Agricultural Policies in Kenya
- Kale policy guides

ANNEXES

ANNEX 1: TRAINING PROGRAM

The training program presented here assumes that the trainees report on Sunday evening and Monday is the first day.



KENYA CLIMATE SMART AGRICULTURE PROJECT TRAINING OF TRAINERS FOR KALE VALUE CHAIN

COUNTY _____

VENUE: _____

Time	Day 0 (Sunday)	Duration	
Time	Day 1 (Monday) Morning Session Chair:	Duration	Facilitator/ Remarks
08.30 - 09.00 am	Arrival and welcome of participants, prayer, introduction, climate setting, Formation of working groups and norms	30 minutes.	
09.00 am –10:30 am	<ul style="list-style-type: none"> • Introduction to climate smart project • Official opening • Official opening • Brief on the training program 	1 hour 30 minutes	
10:30 – 11:00 am	Tea Break & group photograph	30 minutes	
11.00 - 11.30 pm	Climate setting and class organization	30 minutes	
11.30 – 1.00 pm	Climate Smart Agriculture Practices Introduction, objectives and expectations Understanding climate change and its impacts on agriculture, food security and its mitigation measures	2hourrs 30 minutes	

1.00 - 2.00 pm	Lunch break	1 hour	
	Day 1 (Monday) Afternoon Session Chair:		
2.00 – 5.30 pm	Farmer field and business school (FFBS) Introduction and levelling of expectations	3hours	
5.00 – 5.30 pm	Tea break	30 minutes	
Time	Day 2 (Tuesday) Morning Session Chair:	Duration	
8.00 – 8.10 am	Recap	10 minutes	
8.10 - 10.10 am	Gender integration in kale production	2 hours	
10.00 – 10.30 am	Tea break	30 minutes	
10.30 – 1.00 am	Soil & Fertility Management Introduction to integrated soil fertility and water management	2hours 30minutes	
1.00 – 2.00 pm	Lunch break	1 hour	
	Day 2 (Tuesday) Afternoon Session Chair:		
2.00 - 3.00 pm	Water management in kale production	1 hour	
3:00 – 5.00 pm	Kale production environment and climatic requirements	2hours	
5.00– 5.30 pm	Tea break	30 minutes	
Time	Day 3 (Wednesday) Morning Session Chair:	Duration	
8.00 – 8.10 am	Recap	10 minutes	
8.10 – 10.10 am	Improved kale varieties	2 hours	
10.10 – 11.30 am	Tea break	20 minutes	
11.30am – 1.00 pm		1hour 30 minutes	
1.00 – 2.00	Lunch break	1 hour	
	Day 3 (Wednesday) Afternoon Session Chair:		
2.00 – 2.30 pm	Kale seed systems	30 minutes	
2.30– 4.30 pm	Good Agronomic Practices in Kale	2 hours	
4.30– 5.00 pm	Tea break	30 minutes	
Time	Day 4 (Thursday) Morning Session Chair:	Duration	
8.00 – 8.10 am	Recap	10 minutes	
08.10 am –10.10 pm	Agricultural Innovation Platform	2 hours	
10.10 – 10.30 am	Tea break	20 minutes	
10.30 – 12.30 am	Mechanization in kale value chain	2 hours	

12.30 – 1.00 pm	Module review	30 minutes	
1.00 – 2.00 pm	Lunch Break	1 hour	
	Day 4 (Thursday) Afternoon Session Chair:		
2.10 - 4.30 pm	Integrated pest disease management (Diseases,)	2 hours 20 minutes	
4.30 – 5.00Pm	Tea break		
Time	Day 5 (Friday) Morning Session Chair:	Duration	
8.00 – 8.10 am	Recap	10 minutes	
8.10- 10.10 am	Integrated pest disease management- Pests (disease)	2 hours	
10.10 – 10.30 am	Tea break	20 minutes	
10.30 am – 1.00 pm	Integrated pest disease management- Pests (Insects)	2 hours 30 minutes	
1.00 – 2.00 pm	Lunch Break	1 hour	
	Day 5 (Friday) Afternoon Session Chair:		
1.00 – 4.30 pm	Integrated pest disease management- (Weed management)	2 hours 30 minutes	
4.30 – 5.00 pm	Tea break	30 minutes	
Time	Day 6 (Saturday) Morning Session Chair:	Duration	
8.00 – 8.10 am	Recap	10 minutes	
8.10 – 10.10 pm	Postharvest Management in Kale	2 hours	
10.10 – 10.30 am	Tea break	20 minutes	
10.30 – 1.00 pm	Kale value addition	2 hours 30 minutes	
1.00 – 2.00 pm	Lunch Break	1 hour	
	Day 6 (Saturday) Afternoon Session:		
2.00 – 5.00 pm	Kale business and Marketing	3 hours	
5.00 – 5.30 pm	Tea break	30 minutes	
Time	Day 7 (Sunday) Morning Session Chair:	Duration	
8.00 – 8.10 am	Recap	10 minutes	
8.10 – 10.10 am	Good agricultural Practices in kale Production	2 hours	
10.10 – 10.30 am	Tea Break	10 minutes	
10.30 – 1.00 pm	Food safety issues in kale Production	1 hour	
1.00 – 2.00pm	Lunch Break	1 hour	

	Day 7 (Sunday) Afternoon Session:		
2.00 – 4.00 pm	Policy issues in kale value chain	2 hours	
4.00 – 4.30 pm	Tea break	30 minutes	
Time	Day 8 (Monday) Morning Session Chair:	Duration	
08.00 – 8.10 am	Recap	10 minutes	
08.10 – 10.00 am	Field visit for agronomy, pests and disease management practical	1 hour 50 minutes	
10.00 – 10.30 am	Tea break	30 minutes	
10.30 – 12.30	Field reports	2 hours	
12.30 – 1.00 pm	Module Review	1 hour	
1.00 – 2.00 pm	Lunch Break	1 hour	
	Day 8 (Monday) Afternoon Session:		
2.00 – 3.00	Course Assessment	1 hour	
3.00 – 4.00	Way Forward	1 hours 30 minutes	
4.00 – 4.30	Workshop Closure and issuance of certificates	30 minutes	
4.30 - 5.00 pm	Tea Break	30 minutes	

ANNEX 2: FFBS LEARNING MATERIALS

PARTICIPATORY TECHNOLOGY DEVELOPMENT (PTD) AND CURRICULUM ON KALE SPACING MANAGEMENT

Value Chain	Kale
Learning Enterprise	Kale
Funded Enterprise	Kale VC at production level
Background Problem	Low Kale production due to Soil fertility
Objective	To increase production through Proper soil fertility management

Factors to consider:

- Land topography
- Runs (blocks should face East to West)
- Certified seeds of preferred Kale variety

Setting the P.T.D blocks:

- Plots to be laid (10x10) M, arranged three in a row with a footpath of 1M apart.
- The blocks must be right angled.
- The number and length of planting drills must be equal in each plot.
- The recommended spacing 60 cm x 60 cm
- During data collections: collect the data using 3-4 plants in the midst of each block.
- Other TIMPs should be applied equally in each block.
- Planting should be done on the same day in all blocks.
- Weeding and spraying should also be done the same time

PTD EXERCISE

Example

Problem: Soil Fertility

2: Possible solutions

- Deep tillage
- Double digging
- Manure application
- Crop rotation
- Inorganic Fertilizer

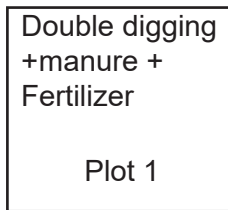
3. Objective of PTD

- Comparison of double digging, deep tillage and normal digging (>10cm)

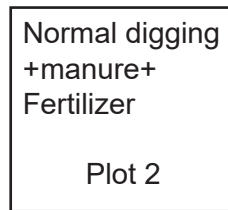
4. Treatments

- i. Double digging
- ii. Normal digging (>10 cm)
- iii. Deep tillage (<20 cm)

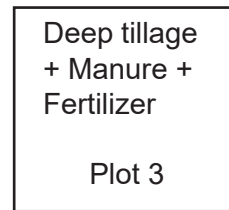
5. PTD layout
Combination 1



Combination 2




Combination 3



- ❑ Test Crop: Kale
- ❑ Manure and fertilizer will be applied to all treatments at the same recommended rate

All other factors will be held constant

A typical Format of Crop AESA Sheet

NAME OF FFS: Naivasha FFBS		
AESA NO : 5 GROUP NO: 3 PLOT NO : 1 PROBLEM ADDRESSED: Trainees to identify the best Soil management options	DATE: 22/07/2021 WEEK NO: 6	
GENERAL INFORMATION	PARAMETERS	
Variety: Kale 1,000 Headed Date planted: 31/07/2021 Age of crop: 6WKS Spacing: 60cm x60cm Manure Poultry 10kg Fertilizer: DAP (18:46:0) Weather: Mostly cloudy Time of observation: 10:45am Plant population: 80 Plants Germination %: 80%	Length of leaves; 35cm Width of leaves: 20cm No of leaves: 12 No of diseased leaves: 0 No of dead leaves: 0 Length of plant: 50cm	
INSECT PEST	PLANT DRAWING	NATURAL ENEMIES
Pest observed: None	 Figure 1	Natural enemies observed:1 None
OBSERVATIONS	RECOMMENDATIONS	
Soil moisture: Diseases: Insect pests: Plant health: Deficiency: Weeds: Predators:	What management practices should be applied Continue monitoring	

ANNEX 3: FFBS TRAINING GUIDE FOR TOT

Time	Activity	Objectives	Materials	Responsible persons
8.00 – 8.05am	Prayer	To commit the days activity to the Lord	Bible	Host team
8.05 –8.10am	Roll call, brief & Recap	Know who is present. To remind ourselves of previous activities	Register Previous AESA	Host team
8.10 – 9.00am	Field monitoring AESA	To check the progress of our enterprise by collecting data	Books, pens, ruler pencils and weighing balance.	All
9.00 – 10.00am	Processing of AESA and presentation	To synthesize, analyse the data and present it to the larger groups for collective decisions on what management action to take	Flip charts, books, feltpens, board crayons ruler and masking tape	Facilitator host team.
10.00 – 10.30am	Group dynamics	<ul style="list-style-type: none"> - to energise (revitalise) the group - to enhance participation - to educate on group activities 		Host team/ facilitator
10.30 –11.30am	Special topic	To input on a special topic which will widen their scope of knowledge/skills.	Books, pens, pencils.	Facilitator
11.30 – 11.40am	Review of the days activities	To evaluate our achievements	AESA materials	Facilitator
11.40 –11.50am	Planning for next session	To prepare adequately	Flip charts, felt pens	Host team
11.50 –11.55am	Roll call Announcements	To note the late comers, absentees	Register	Host team
11.55 – 12.00noon	Prayer	Thank God for the day	Bible	Host team



Kenya Climate Smart
Agriculture Project

Kenya Climate Smart Agriculture Project (KCSAP)
P.O. Box 57811-00200, City Square, Nairobi, Kenya

www.kalro.org