UNITED REPUBLIC OF TANZANIA
MINISTRY OF AGRICULTURE LIVESTOCK AND FISHERIES

TRAINING GUIDE

FOR CLIMATE SMART AGRICULTURE PRACTICES AND TECHNOLOGY PRACTITIONERS

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ACRONYMS

CSA	Climate Smart Agriculture
SUA	Sokoine University of Agriculture
FAO	Food and Agriculture Organization of the United Nations
MIN	Minutes
UNFCCC	United Nations Framework Convention for Climate Change
M&E	Monitoring and Evaluation
SACCOs	Savings and Credit Cooperatives

AKNOWLEDGEMENT

This Training Guide has been prepared by a technical team from various Departments, Units and Agencies within the Ministry of Agriculture Livestock and Fisheries with a wealth of valuable information sourced from different stakeholders around the country including Sokoine University of Agriculture and World Vision. The Ministry is highly indebted to The Food and Agriculture Organization of the United Nations and DFID funded Vuna Climate Smart Agriculture Programme for the technical and financial support that enabled the preparation of this training Guide.

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INTRODUCTION

Climate-Smart Agriculture is "agriculture that sustainably increases productivity, resilience (adaptation), reduces or removes Greenhouse Gases (GHGs) (mitigation) where possible, and enhances achievement of national food security and development goals" (FAO, 2010). However, in Tanzanian context, the adapted definition of Climate-Smart Agriculture is "agriculture that sustainably increases productivity and income, increases the ability to adapt and build resilience to climate change and enhances food and nutrition security while achieving mitigation co-benefits in line with national development priorities" (National Task Force Planning Workshop Report, 2016). CSA aims to achieve food security and broader development goals under a changing climate and increasing food availability using different practices and technologies. CSA practices and technologies on crop, livestock and fisheries aim at addressing tradeoffs and synergies between the three pillars; productivity, adaptation, and mitigation. By addressing challenges in environmental, social, and economic dimensions across productive landscapes, CSA practices and technologies also embrace priorities of multiple countries and stakeholders in order to achieve more efficient, effective, and equitable food systems.

In understanding the importance of CSA in crops, livestock and fisheries production practices and technologies were identified and mapped according to Agro-Climatic Zones of Tanzania. These Practices and technologies serve as tools for deciding options within which the three CSA pillars can be achieved.

It is because of the importance of CSA in the Tanzanian context that this Training Guide has been developed, in order to guide trainers on how to equip relevant stakeholders on the uptake of CSA practices and technologies within the agricultural sector. This guide is divided into five chapters whereby chapter 1 aims at helping users to understand some of the impacts of climate change and possible solutions for addressing climate related risks with regard to agriculture. It also provides an understanding of how changes in climate can affect agriculture and subsequently identifies best practices that will help farmers to adapt in their respective agro-climatic zones. Chapter 2 introduces in detail the concept of CSA practices and technologies in crop, livestock and fisheries production. Chapter 3 provides guidance on identification, roles and engagement mechanisms of different stakeholders on implementation of CSA related activities. Chapter 4 helps elaborate on issues related to mainstreaming of CSA into agricultural plans, programmes and budgets. Lastly, chapter 5 give guidance on how to carry out monitoring and evaluation of CSA related activities and interventions.

It is important to note that, the effective use of this guide requires to go hand in hand with the use of CSA manual, Guideline document and other relevant materials as may be recommended in this training guide. The supplementary documents have detailed explanations and elaborations to help the trainer on preparation and development of the lessons. In this way, it is expected for the trainer to achieve intended learning objectives to the trainees.

CHAPTER ONE

1. TOPIC 1: CLIMATE CHANGE AND ITS IMPACT ON AGRICULTURE

VENUE: Classroom **DURATION:** 60 Min

SUB-TOPICS

- Definition of terms
- The Concept of Climate change
- The impacts of climate change on agriculture
- The impacts of agriculture on climate change
- Climate change risks and vulnerabilities in agriculture
- Adaptation and mitigation of climate change

MAIN OBJECTIVE

The main objective of the lesson is to enable participants to understand what climate change is, as well as its impact in agriculture so that they can be able to facilitate targeted group on appropriate measures for effective adaptation and mitigation of climate change in their respective agro-ecological zones.

SPECIFIC OBJECTIVES

It is expected that at the end of the lesson participants will be able to:-

- Define key terms commonly used in explaining the impact of Climate Change in agriculture (Climate change, Risks, Vulnerability, Adaptation, and Mitigation)
- Understand the concept of Climate Change
- List at least five impacts of Climate Change on agriculture and three impacts of agriculture on climate change
- Explain potential Climate Change risks and vulnerabilities in agriculture
- Explain at least three potential adaptation actions and two mitigation actions

LESSON DEVELOPMENT

Start the lesson by giving a general introduction followed by explaining the main objective as well as specific objectives of the lesson. Ask participants few questions related to the subject matter in order to know their level of understanding of the subject, while listing all their answers on the writing board. Write proper answers on the writing board so that participants can compare.

Continue with the lesson by defining five key terms commonly used when explaining the impact of Climate Change in agriculture. Explain clearly the concept of Climate Change by giving examples. Divide participants into groups depending on their number and ask each group to list five impacts of Climate

Change on agriculture and three impacts of agriculture on Climate Change for 15 minutes. Ask each group to present their work while listing the results on the writing board. Thereafter, explain the impacts of climate change on agriculture and the impacts of agriculture on Climate Change and then conclude the lesson by summarizing and ask participant if they have any questions.

TEACHING METHODS

Lecturing, Plenary discussions, Question & Answers and group work/discussion

TEACHING AIDS

Video for Climate Smart Agriculture, internet access to play the video in real time or embed it in a PowerPoint ahead of time, writing board, marker pen/chalks, Posters, Flip Chart

CHAPTER TWO

2. TOPIC 2: CLIMATE SMART AGRICULTURE

2.1 PERIOD 1: Concept of Climate Smart Agriculture

SUB TOPICS

- Introduction to Climate Smart Agriculture
- CSA Pillars
- Characteristics of CSA Practice and Technologies

VENUE: Classroom **DURATION:** 60 Min

MAIN OBJECTIVE:

At the end of the training session participants will be able to understand the concept of Climate Smart Agriculture.

SPECIFIC OBJECTIVES

At the end of the subject, participants will be able to:

- Explain Climate Smart Agriculture
- Identify Pillars of Climate Smart Agriculture
- Characterize CSA Practices and Technologies

LESSON DEVELOPMENT

Start by probing the understanding of Climate Smart Agriculture (CSA) by asking participants the question "who can tell the meaning of CSA?" Write down answers from participants on a flip chart. Thereafter, give participants the definition of CSA as defined by FAO and make them aware of keywords (pillars of CSA) which are Productivity, Adaptation and Mitigation. Start with global definition followed by Tanzania definition which has emphasis on increased income, food and nutrition security, achievement of mitigation co-benefits through adaptation, but all should be in line with national development priorities. Explain in details, the need to practice CSA in light of climate change adaptation while achieving mitigation co-benefits because in Tanzania, adaptation is the key priority followed by mitigation. Examples should be given such as Tanzania and other developing countries are more vulnerable to the impact of Climate Change as compared to developed countries with ability to adapt and at the same time to mitigate the impact of climate change can be given to make the lesson more understood.

Explain the three pillars of CSA (Productivity, Adaptation and Mitigation). Elaborate each pillar to the participants by explaining their actual meaning and what they intend to achieve through CSA. Give examples on how each pillar can be achieved through CSA to enhance understanding. Use illustrations or short relevant videos where possible. Then ask participants to form groups and allow them to discuss

for 10 minutes if the aforementioned practices in their local area adhere to the three pillars of CSA and how. Allow groups to present their findings in plenary and let the groups ask two or three questions after each presentation. After all groups have presented, give overall feedback by emphasizing that, sometimes it's hard to have all three pillars attained in one practice.

Ask participants to give examples of CSA practices and technologies based on the definitions of CSA and the three CSA pillars. Note down the examples on the flip chart or writing board, and then give definition of CSA practices and technologies. Expand the definitions given by sharing examples of CSA practices and technologies readily available in the local areas, or by emphasizing on the ones already mentioned and move on to mention others which are not practiced in the geographical area but relevant. Lastly, discuss with the participants on the key characteristics of CSA.

End the training session by asking questions to the participants about their understanding of CSA, CSA pillars, CSA practices and technologies. Give them training manuals/notes for further reading and referencing.

TEACHING METHODS

Plenary/group/group discussion questions and answers and lecture

TEACHING AIDS

Projector, Posters, Video on CSA, stationary (Flip chart, Exercise books, pens, marker pen), loud speaker

2.2 PERIOD 2: Soil and Water Conservation Practices and Technologies

SUB TOPICS:

- Meaning of soil and water conservation practices and technologies
- Types of soil and water conservation practices and technologies
- Suitable Soil and water conservation Practices and technologies in different agro-climatic zones

VENUE: Classroom **DURATION:** 75 Min

MAIN OBJECTIVE:

At the end of the training session, participants will be able to describe soil and water conservation practices and technologies that are used in the country, and in the different agro-climatic zones.

SPECIFIC OBJECTIVES

At the end of the subject participants will be able to:

- Comprehensively define the meaning of soil and water conservation practices and technologies
- Mention different types of soil and water conservation practices and technologies
- Describe the types of soil and water conservation practices and technologies and its suitability in different agro-climatic zones and for their localities.

LESSON DEVELOPMENT

Start by asking the participants what they know about the meaning and importance of soil and water conservation. Write on flip chart the answers and allow five minutes for plenary discussion. Thereafter write down on flip chart or project the meaning and importance of soil and water conservation.

Ask participants to write on the card different types of soil and water conservation practices they know (each participant should write only one), place the card on board by grouping cards with the same answers together. Thereafter finish by projecting different types of soil and water conservation practices. Provide group work to the participants to write down on flip charts, the types of soil and water conservation practices and their suitability in different agro-climatic zones. Afterwards, groups should present their work and discuss. Thereafter project the types of soil and water conservation practices in different agro-climatic zones. Finish the lesson, by asking participants (sampling at two) questions on soil and water conservation practices and technologies.

TEACHING METHODS

Groups and Plenary discussion, Questions & Answers, group work, Lecture.

TEACHING AIDS

Flip Chart, Maker Pen, Manila cards, Projector and Computer/laptop.

2.3 PERIOD 3: Conservation agriculture (CA) Practices and Technologies

SUB TOPICS:

- Meaning of Conservation agriculture
- Types of conservation agriculture practices and technologies
- Suitable conservation agriculture practices in different agro-climatic zones

VENUE: Classroom **DURATION:** 75 Min

MAIN OBJECTIVE:

At the end of the training participants will be able to understand conservation agriculture practices and technologies, their uses and suitability in different agro-climatic zones.

SPECIFIC OBJECTIVES

At the end of the subject, participants will be able to:

- Explain the meaning of conservation agriculture
- Mention different types of conservation agriculture practiced in the country
- Identify different types of conservation agriculture practices suitable for their localities.

LESSON DEVELOPMENT

Introduce the subject by projecting a picture of CA practice/technology and allow five minutes for discussion. Thereafter, project on the board the meaning of conservation agriculture and explain the projected picture. Afterward, allow participants to discuss in groups and write on flip chart different types of conservation practices and their advantage to the environment. Then group representatives present their answers, and allow other group members to contribute and ask questions. Thereafter, write down on a flip chart or project different types of conservation agriculture and explain their importance.

Then, provide manila cards to the participants to write conservation agriculture practices from their localities. Place the card on the board by grouping them based on similarities, this will help to know commonly used CA practices to allow the trainer to emphasize on the potential practices to be introduced or perfected in the area. At the end of the session, ask questions to the participants on conservation practices and technologies.

TEACHING METHODS

Brainstorming, Group discussion, questions & answers, Lecture.

TEACHING AIDS

Picture/Photo, Flip Chart, Maker Pen, Manila cards, Projector, Blackboard and Compute

2.4 PERIOD 4: Rain Water Harvesting and Irrigation Practices

SUB TOPICS:

- Meaning and Importance of rain water harvesting
- Rain water harvesting technologies
- Irrigation practices and technologies

VENUE: Classroom **DURATION:** 75 Min

MAIN OBJECTIVE:

At the end of the training session, participants will be able to describe the concept of rainwater harvesting and irrigation practices.

SPECIFIC OBJECTIVES

At the end of the subject participants will be able to:

- Explain the rain water harvesting concept
- Identify types of rain water harvesting techniques suitable in their localities
- Explain CSA irrigation practices
- Describe rain water harvesting and irrigation practices

LESSON DEVELOPMENT

Start by asking the participants what they know about rainwater harvesting and irrigation practices. Write on flip chart the answers and allow 10 minutes for plenary discussion. Thereafter, write down on flip chart or project the answers from the participants.

Ask participants to write on the card different types of rain water harvesting techniques and irrigation practices suitable in their localities then place the card on board by grouping cards with the same answers together. Thereafter, finish by projecting on the board different types of rain water harvesting techniques and irrigation practices suitable in their localities.

At the end of the lesson, finish by asking participants (sampling at four) questions on rain water harvesting and irrigation practices.

TEACHING METHODS

Group and Plenary discussion, Questions & Answers, group work, Lecture.

TEACHING AIDS

Flip Chart, Maker Pen, Manila cards, Projector and Computer/laptop, chart/drawings showing recommended CSA practices in different Agro-climatic zones of Tanzania

2.5 PERIOD 5: Soil Fertility Management Practices

SUB TOPICS:

- Meaning and importance of soil fertility management practices
- Manure application
- Efficient use of fertilizer (micro dozing)
- Integrated soil fertility management

VENUE: Classroom **DURATION:** Classroom 75 Min

MAIN OBJECTIVE

At the end of the training session, participants will be able to describe soil management practices which are relevant on addressing impact of climate change in agriculture.

SPECIFIC OBJECTIVES

At the end of the subject participants will be able to:

- Explain the meaning and importance of soil fertility management practices
- Define the efficient use of fertilizers
- Identify soil management practices in line with CSA pillars
- Explain soil fertility in line with CSA pillars

LESSON DEVELOPMENT

Start by asking the participants what they know about the meaning and importance of soil fertility management practices. Write on flip chart the answers and allow five minutes for plenary discussion. Thereafter, write down on flip chart or project on the board the meaning and importance of soil fertility management practices.

Provide group work to the participants to write down on flip chart types of soil fertility management practices. Afterward, the groups should present their work and discuss in plenary. Later on, finish by projecting the types of soil fertility management practices and its importance on CSA. Ask question and discuss in plenary the soil fertility and its contribution on CSA pillars. Write the answers on flip chart and finish by providing the notes.

TEACHING METHODS

Group and Plenary discussion, Questions and Answers, group work, Lecture.

TEACHING AIDS

Flip Chart, Maker Pen, Projector and Computer/laptop, manila sheets

2.6 PERIOD 6: Crop Management Practices and Technologies

SUB TOPICS:

- Meaning of crop management
- Management practices and technologies in crops
- Adaptable crops and crop varieties
- Integrated Pest and Diseases Management (IPM)
- Timely/early planting/sowing

VENUE: Classroom **DURATION:** 45 Min

MAIN OBJECTIVE:

At the end of the training session, participants will be able to understand crop management practices and technologies in relation to CSA pillars

SPECIFIC OBJECTIVES

At the end of the subject participants will be able to:

- Explain the meaning and importance of crop management
- Explain different crop management practices and technologies
- Identify desirable adapted crop and crop varieties
- Explain the benefit of using Integrated Pest Management (IPM)
- Explain the importance of timely/early planting/sowing practices

LESSON DEVELOPMENT

Start the lesson by asking the participants what they know about crop management and their importance. Write answers on flip chart and allow five minutes for plenary discussion. Thereafter, write down on flip chart or project the meaning and importance of crop management. Continue the session by asking the participants to mention different crop management practices and technologies available in their locality and continue plenary discussion.

Then, let participants mention characteristics of adaptable crop and crop varieties. Write their answers on the board and allow plenary discuss, then continue by displaying different types of adaptable crops and crop varieties. Afterward, stress the link between different crop management practices and technologies, improved seeds and crop productivity in relation to Climate Change adaptation strategies.

Ask participants the methods used to manage pest in their areas. Note down their answers on the board. Emphasize on the ones which are related to Integrated Pest Management and concur with CSA pillars. Continue by defining the term Integrated Pest Management as a broad-based approach that integrates practices for economic control of pests with minimal impact to human health and environment. Stress the point by saying that IPM aims to suppress pest populations below the Economic Injury Level and promotes a safer and more sustainable management and control of pests in agriculture. Tell participants that IPM lies at the centre of insect, disease, and weed control. Later, explain the combination of farming strategies and biological control agents as necessary methods to pesticide and herbicide use that can help farmers to address pest problems.

Explain to participants that IPM can provide a healthy and balanced ecosystem in which the vulnerability of plants to pests and diseases is decreased; hence it contributes to climate change adaptation. Give emphasis by telling the participants that it is important to diversify farming system by using IPM as it builds farmers' resilience to potential risks posed by climate change such as proliferation of pests. Make it clear that it is important to understand pest behavior indifferent agro ecological zones because it helps on adopting and developing new IPM technologies to respond to threats resulting from Climate Change.

Ask participants about the importance of timely land preparation and early planting/sowing advantages and disadvantages? Write down their answers on the board and later on give them the right answer, tell them that early land preparation and planting is the practice that ensures optimal use of the short rains and increases efficient use of organic nutrient accumulated in the soil dry season (nitrogen flush). Make it clear to the participants that the use of this practice can be more effective when supplemented with timely of weather information provided by relevant authorities.

Conclude the lesson by questions and answers session and by distributing to the participants handouts for further reading.

TEACHING METHODS

Lecturing, question and answers, brain storming

TEACHING AIDS

Flip chart, marker pens, pictures

2.7 PERIOD 7: Agroforestry Practices and Technologies

SUB TOPICS:

- Meaning and importance of agroforestry
- Common agroforestry practices and technologies

VENUE: Classroom **DURATION:** 60 Min

MAIN OBJECTIVE:

At the end of the training session, participants will be able to describe agroforestry practices and technologies in their respective agro-climatic zone.

SPECIFIC OBJECTIVES

At the end of the subject, participants will be able to:

- Explain the meaning and importance of agroforestry
- Describe the common agroforestry practices and technologies in their respective agro-climatic zone.

LESSON DEVELOPMENT

Start by asking participants what they know about the meaning and importance of agroforestry. Write on flip chart answers and allow 10 minutes for plenary discussion. Thereafter write down on flip chart or project the meaning and importance of agroforestry. Provide group work to the participants to write down on flip chart common agroforestry practices and Technologies in their respective agro-climatic zone. Afterward, the groups should present their work and discuss. Conclude the training session by projecting common agroforestry practices and technologies.

TEACHING METHODS

Group and plenary discussion, Questions and Answers, group work, Lecture.

TEACHING AIDS

Flip Chart, Maker Pen, Projector, Computer/laptop, note book, real plant materials.

2.8 PERIOD 8: Adaptation Practices and Technologies in Livestock Keeping

SUB TOPICS:

- Climate change and livestock keeping
- Improved Livestock Breeds
- Improved feeds and feeding
- Pasture and grazing land management
- Alternative source of water for livestock

VENUE: Classroom **DURATION:** 120 Min

MAIN OBJECTIVE:

At the end of the training session participants will be able to understand adaptation practices and technologies in livestock keeping in relation to climate change.

SPECIFIC OBJECTIVES

At the end of the subject participants will be able to:

- Understand the relationship between climate change and livestock keeping
- Identify desirable livestock breeds adaptable to a agro-ecological zone
- Outline methods used to improve livestock breeds
- Identify available feeds and methods of improving them for different livestock breeds available in a given area
- Identify different methods of conserve and manage forage/pasture
- Identify alternative water sources for livestock

LESSON DEVELOPMENT

Start the lesson by asking participants to mention the impacts of climate change in livestock production. Write answers on the board so that are clearly seen and make the necessary corrections on plenary discussion. Afterward ask participants if they think livestock keeping has any contribution to the impacts of Climate Change. Based on their responses, explain the relationship between Climate Change and livestock keeping. Emphasize on the effect of the release of methane from enteric fermentation of livestock keeping, manure management and land degradation. Ask few questions on the relationship between livestock keeping and Climate Change. Divide participants in small groups and ask them to differentiate between Local and exotic breeds, let them present their answers later on summaries the answers. Prepare slideshow of different breeds, select few and explain their adaptation capacity to climate change. A local based example of the breed would be better if present.

Ask participants the way they do conserve forage in their areas. Note down the answers on the board. Emphasize the desirable forage conservation methods as described in the CSA guideline or CSA Manual. Continue the lesson by showing pictures and explaining few pastures and grazing land management practices which are regarded as climate smart as elaborated in the CSA Guideline and summarized in the CSA manual. Ask participants if there are any alternative sources of water for livestock production in their area. Write the answers on the board. Show them the common alternative sources of water for livestock production. Emphasis should be given on how to make them available for use during the periods of prolonged dry spell as projected by climate change models.

TEACHING METHODS

Group discussion, Lecturing, Presentation, demonstration

TEACHING AIDS

Flip chart, laptop, projector, pictures, illustration and demonstration area, real materials

2.9 PERIOD 9: Manure Management Practices

SUB TOPICS:

- Meaning and importance of manure
- Source of manure
- Manure management

VENUE: Classroom **DURATION:** 45 Min

MAIN OBJECTIVE:

At the end of the training session participants will be able to understand different forms of utilizing manure in relation to climate change.

SPECIFIC OBJECTIVES

At the end of the subject participants will be able to:

- Explain the meaning and importance of manure
- Outline different ways of proper manure utilization

LESSON DEVELOPMENT

Ask participants what they understand about manure and different sources of manure in their area. Write the answers on the board and make the necessary corrections on plenary discussion. Afterward ask participants how do they handle and dispose manure from their locality. Note down the answers on the board and stress the desirable ways of disposing and handling manure especially those environmentally/Climate Change friendly technologies or practices. Ask participants if there is any person with environmentally/climate change friendly technologies. Emphasis on the mentioned technologies in relation to the three pillars of CSA. Finalize by associating environmentally/Climate Change friendly technologies and soil management practices (nutrient losses). Stress that all these are essential for building resilience and mitigating to Climate Change impacts.

TEACHING METHODS

Group discussion, Lecturing, Presentation

TEACHING AIDS

Flip chart, laptop, projector, pictures, illustration and demonstration area, real materials

2.10 Period 10: Climate Smart Agriculture in Fishing and Aquaculture

SUB TOPICS:

- Impact of Climate Change on Fishing and Aquaculture enterprises
- Climate Smart Fishing and Aquaculture practices
- Sustainable Fishing
- Seaweed Farming

VENUE: Classroom **DURATION:** 60 Min

MAIN OBJECTIVE:

At the end of the training session, participants will be able to understand the Climate-Smart agriculture practices in Fishing and Aquaculture enterprises.

SPECIFIC OBJECTIVES

At the end of the subject participants will be able to:

- Explain impacts of climate change on fishing and aquaculture enterprise
- Identify Climate-Smart Fishing and Aquaculture practices
- Explain sustainable fishing in the context of climate smart fishing
- Describe seaweed farming in the context of mitigating Climate Change impact

LESSON DEVELOPMENT

The trainer start by probing participants' understanding on the meaning of aquaculture by asking a question such as "what comes into minds when someone says Aquaculture?" After a little discussion on its meaning, then the trainer summarizes the discussion by giving the actual meaning of Aquaculture. Thereafter, the trainer ask participants to think of any ways by which weather variability or climate change can impact fishing enterprises and aquaculture. Thereafter, the trainer writes answers obtained on the flip chart or writing board. After that the trainer explains each of the mentioned response with emphasize on the impact of temperature on oxygen availability, biophysical characteristics of the aquatic organisms, water pollution through formation of algae bloom and increase of solute concentration triggered by evaporation. On giving explanation the trainer may use video or demonstrate by drawings on the writing boards.

Afterward, the trainer introduces the concept of sustainable fishing by giving few examples of sustainable fishing practices aided by pictures. In the end the trainer give an explanation on how sustainable fishing is related to Climate-Smart agriculture by associating with CSA pillar of increase of agricultural productivity.

The concept of seaweed farming is then introduced as another CSA practice mostly practiced along the sea coast. The trainer explain seaweed farming as a practice which has bigger contribution on sequestrating atmospheric carbon compared to similar area under terrestrial agricultural activity. This explanation should be related to the third pillar of CSA which is target on mitigation of GHG by reducing GHG in the atmosphere.

Then the trainer concludes the lesson by encouraging participants to visit any nearby place where aquaculture or seaweed farming is practiced. The trainer should also provide manual for further reading at the end of the session.

TEACHING METHODS

Plenary discussion, questions and answers and lecture

TEACHING AIDS

Flip Chart, Maker Pen, Projector and Computer and pictures

2.11 PERIOD 11: Upscaling of Climate Smart Agriculture

SUB TOPICS:

- CSA practices and technologies
- Challenges on upscaling practices and technologies
- Ways for upscaling CSA practices and technologies

VENUE: Classroom **DURATION:** 45 Min

MAIN OBJECTIVE:

At the end of the training session, participants will be able to understand on how to upscale Climate-Smart Agriculture practices and technologies in their localities.

SPECIFIC OBJECTIVES

At the end of the subject, participants will be able to:

- Define CSA practices and technologies
- Understand challenges on upscaling CSA practices and technologies
- Explain ways for upscaling CSA practices and technologies

LESSON DEVELOPMENT

At the beginning present to participants the main concept of CSA practices and technologies in relation to three CSA pillars. Then ask the participants a question such as" is there a need to upscale CSA in their localities?" Write down answers obtained from the participants on the flip chart. Afterward, arrange participants in groups of livestock keepers, crop farmers, fisheries and let them discuss common CSA practices applicable to them. While still in their groups ask them to pick one practice and describe how they can be able to upscale in other areas and within their communities. Let this discussion last for about 20 minutes. Then, allow groups to present their findings in plenary and take two or three question after each presentation. After all the group have presented give overall feedback and elaborate more on methods they could further consider for upscaling of the CSA practices. Then discuss with the participants on common challenges associated with the upscaling of CSA. Let participants share their experience and on the same time the trainer will have to be presenting possible solution on overcoming the challenges. Based on the discussion and solutions presented, list down various ways which can be considered for upscaling of CSA practices.

In the end, ask general questions about CSA upscaling and their relevance in the respective area and emphasize on the possible solutions to overcome CSA upscaling challenges in the respective area. Then give them the training manual/notes for further reading and referencing.

TEACHING METHODS

Plenary discussion questions and lecture

TEACHING AIDS

Projector, standby generator, stationaries (Flip chart, Exercise books, pens, marker pen)

CHAPTER THREE

3. TOPIC 3: CSA STAKEHOLDERS INVOLVEMENT

SUB TOPICS:

- Identification of stakeholders
- Roles of different stakeholders on implementation and upscaling of CSA
- Stakeholders engagement mechanisms
- Approaches for CSA integration

VENUE: Classroom **DURATION**: 60 Min

MAIN OBJECTIVE:

At the end of training session participants will be able to identify CSA stakeholders and their roles in the implementation and scaling up of CSA practices and technologies

SPECIFIC OBJECTIVES

At the end of the session, Participant will be able to;

- Identify CSA Stakeholders
- Explain roles of different CSA stakeholders
- Describe different mechanisms for stakeholder engagement
- Identify different approaches for CSA implementation

LESSON DEVELOPMENT

Start session by asking participants if they can mention stakeholders that they think are important in implementation of CSA. After that, mention other stakeholders that were not mentioned and describe why they are important. Thereafter, group participants in groups which represent major categories of stakeholders such as policy makers, planners, farmers, private sectors, NGOs, youth, women and men and let them discuss their roles on any CSA intervention of their choice. Afterward, ask the groups to present their discussed roles, allow plenary discussion for twenty minutes after presentation from each group.

Then ask participants if there is necessity for the different stakeholder to work together. If the answer is yes, ask them to mention mechanisms which can allow them to work together. Ask them to discuss those mechanisms briefly on how they are effective on engaging different stakeholders on implementing CSA intervention. Afterward, present and describe other mechanisms which were not mentioned and how they can be used adopted to help bring and engage CSA stakeholders on implanting CSA intervention. Then introduce different approaches which should be considered on implementing different mechanisms for engaging stakeholder such as gender inclusive and participatory approach. Emphasis should be given on issues such as gender, inclusion of the three CSA pillars and evolvement of multi-

stakeholders. In the end, present summary on key stakeholder to be considered on implementing CSA intervention and their roles, give summary of different mechanisms of stakeholder engagement; briefly give emphasis on approaches to be considered and their application in the respective area.

TEACHING METHODS;

Lecturing, group discussion, questions and answers,

TEACHING AIDS;

Projecting board, projector, laptop, notebooks, pens, flip chat, marker pens

CHAPTER FOUR

4. TOPIC 4: MAINSTREAMING OF CSA INTO AGRICULTURAL PLANS

SUB TOPICS:

- Awareness creation and sensitization of CSA
- CSA related activities and their relevant justifications
- Planning of CSA activities with gender consideration
- Budgeting for CSA related activities

VENUE: Classroom **DURATION:** 120 Min

MAIN OBJECTIVE

To teach participants on mainstreaming of CSA in agricultural related plans in order to increase agriculture resilience to the impact of climate change, increase agricultural productivity, sustainability and farmers' income.

SPECIFIC OBJECTIVES

At the end of the training session participants will be able to:

- Define CSA awareness creations
- Create awareness to stakeholders
- Identify at least three target groups for CSA awareness creation
- Mainstream CSA activities into agricultural plans Explain CSA related activities in a given area
- Plan CSA activities with gender considerations
- Budget for CSA activities

LESSON DEVELOPMENT

Start the lesson by asking participants to define the word awareness by associating it to CSA. Take a note of the answers and write them on the board. Later ask participants what they understand about awareness creation and sensitization. Assist participants to give the right definitions of the words awareness and awareness creation in relation to Climate Smart Agriculture (CSA). Give clarifications on the meaning of Climate Change and how it affects agriculture and livelihood. Show participants the impacts of Climate Change using power point slides or pictures/photos.

Then ask participants to explain at least five methods of creating awareness. Take note of the answers. Afterward, give more elaboration on the method of awareness creation and give examples on their failure or success.

Ask participants to give example of few target groups which can be considered for awareness creation purpose. Note down their responses and then tell the participants that the target groups for CSA awareness creation include government authorities, central and local administrative authorities, religious, traditional leaders, opinion leaders, NGOs, civil society, donors and media. On mentioning the target group, give more elaboration and examples in relation to awareness creation methods. Emphasize the points by saying that a successful awareness raising strategy takes into account the type of target group, type of message to be reached out for each particular target group and selection of appropriate awareness creation method for communicating the messages.

Now divide participants into four groups and let them discuss how they may create CSA awareness activities to the target group of their choice. Go around the groups to see whether they have understood the assignment and assist them accordingly. Then, allow a representative member from each group to a make brief presentation and allow others to contribute to the presentation after its done.

Ask participants to mention main sources of finance to agricultural investments in Tanzania. Write down their responses and later give them the more sources those from the farmers, herders, fishers and foresters, development partners, central and local government as well as NGOs. Emphasize by saying that for successive public investment, it is better to consider potential stakeholders in a given locality and identify the most suitable activities when developing CSA strategies, investments and financing plans.

Explain to participants' things that have to be considered when budgeting for CSA related activities. Give elaborations by saying that large fixed capital investments with significant lifetimes are particularly vulnerable to being maladaptive if climate risks are not considered. Continue by telling participants that for successful investment they must screen agricultural investment plans for their degree of "climate smartness". The screening methodology considers potential contribution of planned activities to the three pillars of CSA and other aspects of adaptation as well as mitigation. This suggests that Climate-Smart agricultural investments with mitigation co-benefits should be identified within the context of existing agricultural investment strategies developed for the purposes of agricultural growth.

Start by pointing out that financing options specifically targeting CSA are still limited, necessitating for a strategic use and combination of funding sources in existence. Ask participants to mention sources of funds they thought could be used for CSA activities in their respective areas. Moderate and remind them to include internal and external sources. The internal sources are: Local Government Authorities (LGAs), budgets, National budgets and Agricultural Sector Development Programme (ASDP), while the external sources include United Nations Framework Convention for Climate Change (UNFCC), United Nations (UN) organizations, Multilateral Development Banks (MDBs); bilateral public financing channels; Compliance and voluntary carbon markets; and Private sector actors and philanthropy. Tell participants the roles played by each financing agencies on CSA activities and how they may get access to such funds.

Conclude the session by asking different questions to participants and tell them what is expected to be done in the next training session.

TEACHING METHODS

Question and answers, brainstorming, group discussion, questions at the end of the period,

TEACHING AIDS

Flip charts, black/white board, marker pens, projector

CHAPTER FIVE

5.TOPIC 5: MONITORING AND EVALUATION OF CSA INTERVENTIONS

SUB TOPICS:

- The meaning of Monitoring and evaluation (M&E)
- Identification of baseline indicators for CSA
- Performance Indicators for CSA interventions
- Monitoring tools and Record keeping
- Creation of evidence for CSA practices performance

VENUE: Classroom **DURATION:** 60 Min

MAIN OBJECTIVE:

In the end of the lesson, participants will be able to know how to monitor and evaluate CSA interventions or related projects in their respective areas.

SPECIFIC OBJECTIVES:

At the end of the subject Participants will be able to:

- Explain the meaning and importance of M&E
- Describe and identify the baseline indicators
- Describe and identify key performance indicators and their uses
- Distinguish between baseline and key performance indicators
- Identify different M&E tools
- Explain importance of records keeping for evidence based creation
- Describe how CSA evidence can be created

LESSON DEVELOPMENT

Start lesson by asking the participants if they know anything about Monitoring and evaluation. Thereafter, provide the proper definition of M&E so that there is common understanding among participants. Then, explain the importance of Monitoring and Evaluation for CSA interventions or related projects. Then, introduce the concept of baseline indicator, describe its characteristics and lead them to identify sources of the indicators. After that introduce the concept of key performance indicators, describe their characteristic and explain how they can be obtained.

Then, ask the participants to briefly reflect on the main differences between the two types of indicators. After that, divide participants into groups and give them simple CSA intervention for them to develop baseline indicators and key performance indicator. Then let them discuss their outputs in the plenary.

Then continue by introducing participants on different tools for monitoring and evaluation. Explain the importance of these different tools including their usefulness in record keeping for monitoring and evaluation. Then give emphasis of record keeping for evidences creating with the purpose of sharing lessons learnt with others during project or activity implementation.

Describe various ways by which participants can be able to document their M&E data and create evidence for sharing with other in an easy and customizable way. Finally, end the training session by providing the summary of the topics and emphasis on the importance of M&E, the two types of indicators, tools for M&E and their importance.

TEACHING METHODS

Group work, lecture, plenary discussions, questions and answers

TEACHING AIDS

Flip charts, writing board, marker pens, notebooks, laptop and projector

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