TRANSLATING CLIMATE SMART AGRICULTURE POLICIES TO ACTIONS

TRAINER MANUAL

A Guidebook for Operationalizing Climate Smart Agriculture into Local Action

USDA

CIAT
Centro Internacional de Agricultura Tropical
International Center for Tropical Agriculture
Consultative Group on International Agricultural Research

World Agroforestry Centre

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A Guidebook for Operationalizing Climate Smart Agriculture into Local Action Planning

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www.ciat.cgiar.org

World Agroforestry (ICRAF) is a CGIAR Centre of science and development excellence that harnesses the benefits of trees for people and the environment. Its headquarters are in Nairobi, Kenya and operates in 38 countries. We develop knowledge practices from farmers' fields to the global sphere to ensure food security and environmental sustainability. Our vision is an equitable world were all people have viable livelihoods supported by healthy and productive landscapes.

www.worldagroforestry.org/

Ministry of Agriculture, Livestock, Fisheries and Irrigation (MoALFI) Vision is to secure a wealthy Nation anchored by an innovative, commercially oriented and competitive agricultural sector by improving the livelihood of Kenyans and ensuring food security through creation of an enabling

environment and ensuring sustainable natural resource management. To complete the vision and mission and build its own culture, the Ministry has identified the following core values that it operates on professionalism, integrity, efficiency and responsiveness, partnerships and gender equity.

http://www.kilimo.go.ke/

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www.cgiar.org

This study is a product of a collaboration between the Ministry of Agriculture, Livestock and Fisheries of Kenya (MoALF) and the International Center for Tropical Agriculture (CIAT) as part of the FAO-UNDP 'Integrate Agriculture into the National Adaptation Plans-NAPs, and the USDA FAS EC-LEDS Phase II Project on Enhancing Kenyan Capacity for Resilient Agriculture Planning and Programming.

Design and layout:

This guidebook was developed under the coordination of Evan Girvetz (CIAT) and Veronica Ndetu (MoALF) with technical contributions from Caroline Mwongera, Christine Lamanna, Hannah Kamau, Ivy Kinyua, Vincent Ogwang, Robin Mbae, and Benjamin Kibor.

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The trainer's manual benefitted from the expertise and contribution of a large number of experts. The contribution of the County Executive Committee members, Chief Officers and technical staff from Nyeri, Kajiado and Taita Taveta are appreciated for supporting the week-long pilot sensitization, dissemination and capacity building missions.

Finally, special thanks go to (list any person who deserves special mention) development and pilot testing of the guidebook and providing valuable content to review the contents.

Foreword

I suggest that a forward be added to this section. The person to do the forward should be identified.

Acronyms and Abbreviations

CC	Climate Change
CCD	Climate Change Directorate
CEC	County Executive Council
CCF	Climate Change Fund
CGIAR	Consultative Group on International Agricultural Research
CIAT	International Center for Tropical Agriculture
CIDP's	County Integrated Development plans
CSA	Climate Smart Agriculture
EC-LEDS	Enhancing Capacity for Low Emission Development Strategies
FAO	Food and Agriculture Organization
ICRAF	World Agroforestry
KCSAIF	Kenya Climate Smart Agriculture Implementation Framework
KCSAS	Kenya Climate Smart Agriculture Strategy
KICD	Kenya Institute of Curriculum Development
LED	Low emission development
MENR	Ministry of Energy and Natural Resources
MoALF	Ministry of Agriculture, Livestock and Fisheries
NCCC	National Climate Change Council
NEMA	National Environment Management Authority
NGOs	Non-Governmental Organizations
USDA	United States Department of Agriculture

1. Introduction

1.2. About the guidebook?

In many countries, there is evidence of the positive progress in translating climate ambition into actual action at the national level with a growth of laws and policies that address adaptation and mitigation. However, there is still a gap in translating national policies into local actions. Bridging this gap requires building the capacity of the technical officers and policy makers across scales (e.g. sub-national governance levels and communities) to support effective policy implementation.

The challenge: Understanding the importance of Climate change, Agriculture and Policy Frameworks

Much of the nation's agriculture vulnerability to climate change lies in the fact that their agricultural systems largely remain rain-fed and underdeveloped, as most of the farmers are small-scale farmers with few financial resources, limited access to infrastructure, and disparate access to information. At the same time, as these systems are highly reliant on their environment, and farmers are dependent on farming for their livelihoods, their diversity, context specificity, and the existence of generations of traditional knowledge offer elements of resilience in the face of climate change. Overall, however, the combination of climatic, non-climatic drivers and stressors exacerbate the vulnerability of the agricultural systems to climate change. Building resilient agricultural systems whilst minimizing emissions has therefore become an important agenda in Kenya. With **Climate Smart Agriculture (CSA**), concept and approaches identified as key in achieving these wins in a changing climate there is a call to strengthen capacities of all actors and stakeholders and develop policies that effectively guide the implementation of climate smart practices, technologies and innovations. To ensure this the government of Kenya has made considerable efforts such as being part of important international and regional commitments[1], frameworks and plans, developing national policies, plans and strategies and having potential financing sources and mechanisms.

In particular, the **Kenya Climate Smart Agriculture Strategy (KCSAS) and its Implementation Framework (KCSAIF)** enable the transition to agriculture that guarantees food security amid climate variability. Specific objectives of the KCSAS (i) enhance adaptive capacity and resilience of farmers, pastoralists and fisher-folk to the adverse impacts of climate change; (ii) develop mechanisms that minimize greenhouse gas emissions from agricultural production systems; (iii) create an enabling regulatory and institutional framework; and (iv) address cross-cutting issues that adversely impact CSA. The KCSAIF provides broad guidelines from which counties or any other stakeholders are expected to use to implement at the local level. This mission used these

[1] UN Framework Convention on Climate Change (UNFCCC), Nationally Determined Contributions Comprehensive Africa Agriculture Development Program (CAADP), Malabo Declaration On The Transformation Of Agriculture, Agenda 2063

documents to roll out the CSA sensitization and development of action plans and project concepts.

What does this guide aim to do?

This guidebook, therefore, outlines a step-by-step process/approach of sensitizing and capacity building of sub-national agriculture actors on: -

1) Climate-Smart Agriculture (CSA) national documents (policies and strategies) to facilitate the implementation at the farm level
2) Identification and assessment of climate risks
3) Prioritizing CSA practices that best address the context-specific climate risks and development of action plans and concept.

Who can use this guidebook?

This guidebook is intended for national officers, NGOs, civil society organizations, researchers and implementation enthusiasts who are keen on translating national policies, strategies, plans into local action.

The target audience is all local stakeholders that need this knowledge to implement agricultural programs and projects that address climate change risks and enhance the resilience of people and ecosystems.

When to use this guidebook?

This guidebook is useful when there is development of new or review/reform of policy guidelines, commitments and strategies globally or nationally.

1.2. Training Method

Different training methodologies are suggested for use during this training. Detailed instructions on how to carry out each session using the methodologies suggested below are included in the activity description boxes incorporated throughout the training manual. Training methodologies used in this training manual include the following:

- Group work
- Demonstrations
- Brainstorming sessions
- Interactive plenary presentations

Training Materials

The materials needed for each session of the training such as markers, flip charts, masking tape, training manual, etc. are cited. Details about materials are found in each session.

Session 1: Welcome, Introductions and Workshop Objectives

Learning objectives

1. To establish the norms and housekeeping rules
2. To introduce the trainers and participants to each other and
3. To know the participants expectations of the training expectations.

Preparation

- ✓ Read the session carefully
- ✓ Prepare all necessary flip chart papers/ power point slides and write the training objectives

Materials

- Flip chart, markers
- Prepared flip chart/ Power point with the workshop objectives; other flip charts

Duration: 60 minutes

Learning objective 1: To establish the norms and housekeeping rules **Methodology:** Brainstorming
Activity 1: Welcome, establish norms and housekeeping rules Instruction for activity 1. Welcome the participants to the workshop 2. Ask the participants to brainstorm norms for the course. These should include times for breaks and lunch and starting and ending times. Write a list of norms like respecting others' opinions, active participation, etc. 3. Divide participants into small groups of 3 – 5 individuals. 4. Assign each group to be responsible for one day of the training. Explain that on the day they are responsible, they will be expected to get participants back from breaks and lunch on time, collect feedback from participants and meet with trainers at the end of the day to review progress and make suggestions for improvement, prepare energizers for after lunch, conduct the "Where are We" exercise at the beginning of each day, conduct the "Reflections" exercise at the end of the day, and other responsibilities the group suggests.
Learning objective 2: To get to know participants and their expectations. **Methodology:** Brainstorming
Activity 2: Introduction of participants and workshop objectives Instruction for activity 1. Ask participants to group in pairs to introduce one another. One will introduce the other including name, position, where he/she comes from, what is unique about the

weather where he/she comes from and one expectation from the training. Write participants' expectations on one flip chart and what they ate on another flip chart.

2. After all of the participants have been introduced, summarize and comment on the expectations.
3. Present the workshop objectives below to the participants (should be written ahead of time on a flip chart or power point). Ask a volunteer from the participants to read them aloud:

Training objectives

a. Understand the impact of climate change on agriculture
b. Explain Climate-Smart Agriculture (CSA), national documents (policies and strategies) to facilitate the implementation of CSA at the farm level
c. Identify and assess climate risks in respective regions
d. Identify and Prioritizing CSA practices that best address the context-specific climate risks and
e. Development of action plans and concept for different regions.

4. Compare participants' expectations to the workshop objectives and discuss any discrepancies.
5. Review the training goals, objectives, and agenda with participants
6. Through discussion, determine the clarity of objectives, agreement or disagreement on objectives, and areas to consider for revision.
7. Through discussion, determine any gaps between participants' expectations and the goals/objectives of the training.
8. Pass out the training schedule and explain it if necessary. (Print and give hand-out 1 from the annex and give to the participants)

Session 2: Climate Change, Impacts and Agriculture

Learning objectives

1. To introduce basic climate change science (causes and effects)
2. To describe the direct and indirect effects of climate change and agriculture.
3. To identify and explain climate change risks/shocks/hazards

Preparation

- ✓ Read the session carefully
- ✓ Prepare all necessary flip chart papers/ power point slides and write the training objectives
- ✓ Read handout 2

Materials

- Flip chart,
- Markers
- Prepared flip chart/ Power point with the workshop objectives; other flip charts

Plenary Icebreaker (05 minutes)

Duration: 90 Minutes

Learning objective 1: To introduce basic climate change science (causes and effects) **Methodology:** Group work and exercise
Activity 1: Introduction to climate change Instruction for activity 1. Explain to the participants that the next session will be on the basic concepts of climate change science. 2. Ask participants: "What is climate change?" Write responses on a flip chart. Explain to the participants that what climate change is. 3. Ask participants what they think are the major causes of climate change? Write responses on a flip chart. Explain to the trainees the causes of climate change. 4. During a plenary discussion identify some of the human activities that increase the effect of climate change (Refer to hand out 2 for some suggestions)
Learning objective 2: To describe the direct and indirect effect of climate change on agriculture **Methodology:** Group work and exercise
Activity 1: Introducing the link between climate change and agriculture Instruction for activity 1. Ask participants to explain the link between climate change and agriculture 2. Write responses on a flip chart.

3. Explain to the participants the link between agriculture and climate change and their impact on economic development and livelihoods.
4. Explain to the participants that the next activity will be group work.
5. Each group will identify the impact of climate change on agriculture.
6. Divide participants into 3 groups (from 1 to 3) and give them a card. They need to write the impacts in short phrases/words on the small cards.
    - **Group-1**: How does climate change affect crop production?
    - **Group-2**: How does climate change affect livestock production?
    - **Group-3**: How does climate change affect fisheries?

7. Give each group 15 minutes to discuss and write the impacts of climate change on the cards.
8. After 15 minutes, ask representatives of each group to do a plenary presentation on the impact of climate change on various subsectors.
9. When each group finishes the presentation, ask the other participants if they have questions and address them accordingly. Use the key information in Handout 2 below to complement participants' suggestions.
10. When all of the groups finish presentation, explain to the participants the impact of climate change on the agricultural sector in general.
11. Ask participants if they have questions and summarize the session.

Learning objective 3: To identify and explain climate change risks/shocks/hazards

Methodology: Plenary discussion

Activity 1: Explaining climate change risks/shock/ hazards

Instruction for activity

1. Ask participants to list any climate change risk/shock/hazards
2. Write responses on a flip chart.
3. Explain to the participants the risk and their impact on agriculture and livelihoods (A list of risk is found in handout 2). If possible show images on power point on the risks
4. If time allows, have a plenary discussion on way to reduce the impact of climate change in agriculture

Session 3. Introduction to Climate Smart Agriculture

Learning Objectives

1. To define and understand the Climate Smart Agriculture concepts
2. To introduce and identify CSA practices
3. To identify the key characteristics of CSA

Preparation

- ✓ Read the session carefully
- ✓ Prepare all necessary flip chart papers/ power point slides and write the training objectives
- ✓ Read handout 3

Materials

- Flip chart,
- Screen and projector
- Markers
- Prepared flip chart/ Power point with the workshop objectives; other flip charts
- Sticky notes (different colours)

Plenary Icebreaker (05 minutes)

Duration: 120 Minutes

Learning objective 1: To define and understand climate agriculture concepts **Methodology:** Plenary discussion and exercise
Activity 1: Climate Smart Agriculture Concepts Instruction for activity 1. Explain to the participants that the next session will be on the basic concepts of Climate Smart Agriculture. 2. Ask participants: "What is Climate Smart Agriculture?" Write responses on a flip chart. 3. After the discussion explain to the participants what Climate Smart Agriculture is and why it is important. 4. Introduce the 3 pillars/ objectives of Climate Smart Agriculture 5. Give each participant a maker pen and sticky note to describe their understanding of each of the pillars of CSA in their own words 6. Prepare a board with each pillar and request the participants to stick their responses to the board as shown in the picture below

Learning objective 2: To introduce and identify CSA practices

Methodology: Group work and exercise

Activity 1: CSA practices

Instruction for activity

1. Explain to the participants that the next activity will be group work.
2. Each group will identify CSA practices in different sub-sectors.
3. Divide participants into 3 groups (from 1 to 3) and give them a card. They need to write the CSA practices in short phrases/words on the small cards.
   - **Group-1**: Identify CSA practices in crop production
   - **Group-2**: Identify CSA practices in livestock production
   - **Group-3**: Identify CSA practices in fisheries
4. Give each group 15 minutes to discuss and identify the CSA practices in each sub-sector and write the practices on the cards.
5. After 15 minutes, ask representatives of each group to do a plenary presentation on the CSA practices in various subsectors.
6. When each group finishes the presentation, ask the other participants if they have questions and address them accordingly. Use the key information in Handout 3 below to complement participants' suggestions.
7. When all of the groups finish presentation, explain to the participants the CSA practices that were not identified by the groups.
8. Ask participants if they have questions and summarize the session.

Learning objective 3: To identify and explain climate change risks/shocks/hazards

Methodology: Plenary discussion

Activity 1: Characteristics of CSA

Instruction for activity

1. Ask participants to list any characteristics of CSA based on their knowledge and understanding
2. Write responses on a flip chart.
3. Explain to the participants the characteristics of CSA on a flip chart or power point presentation (A list of characteristics is found in handout 3).
4. Have a plenary discussion on each of the characteristic of CSA

Learning objective 4: To identify the entry point for CSA

Methodology: Plenary discussion and presentation

Session 4. National Responses to Climate Change

Learning Objectives

1. To highlight the key guiding policies and legal frameworks on Climate change in Kenya
2. To explain the climate change act and institution established by the act
3. To explain the Kenya Climate Smart Agriculture Strategy and Implementation Framework

Preparation

- ✓ Read the session carefully
- ✓ Prepare all necessary flip chart papers/ power point slides and write the training objectives
- ✓ Read handout 4

Materials

- Flip chart,
- Screen and projector
- Markers
- Prepared flip chart/ Power point with the workshop objectives; other flip charts
- Sticky notes (different colours)

Plenary Icebreaker (10 minutes)

Duration: 150 Minutes

Learning objective 1: To highlight the key guiding policies and legal framework on climate change in Kenya

Methodology: Plenary presentation and discussion

Activity 1: Guiding policies and legal frameworks on climate change

Instruction for activity

1. Explain to the participants that the next session will be on the key guiding policies and legal frameworks on climate change in Kenya.
2. Ask participants: "What is a policy and why are they important for a country?" Write responses on a flip chart.
3. After the discussion explain to the participants what policies are and they importance in implementation of CSA.
4. Introduce the key policies and legal frameworks on climate change in Kenya through a power point presentation or prepare a flip chart with this information (policies related to CSA are listed in handout 4)

5. Ensure that the presentation is participatory for all the participants to understand, allow time for questions and interaction during the presentation e.g. Ask the participant to give reason why a particular policy was formulated or give their opinion on the relevance of the policy or give an opinion on whether the policy is being implemented and the challenges in the implementation (Refer to handout 4)

Learning objective 2: To explain the climate change act and the institutions established by the act

Methodology: Plenary presentation and discussion

Activity 1: Climate change act and institution established in the act

Instruction for activity

1. Explain to the participants that the next activity will be presentation of the climate change act and the institutions established by the act
2. Introduce the climate change act and the institution established in the act to deal with issues of climate change
3. Ensure that the presentation is participatory for all the participants to understand, allow time for questions and interaction during the presentation e.g. Ask the participant to give list the purposes of the climate change act, The objectives of the climate change act (Refer to handout 4)
4. Give a presentation on an overview of the climate change act highlighting the key institutions establish by the act and a summary of their responsibilities.

Learning objective 3: To explain the Kenya Climate Smart Agriculture Strategy and Implementation framework

Methodology: Plenary presentation, discussion and group work

Activity 1: Kenya Climate Smart Agriculture Strategy and Implementation Framework

Instruction for activity

1. Give a presentation on an overview of the Kenya climate smart implementation framework highlighting the following Objectives of the KCSAIF towards increasing Productivity, Resilience and Mitigation in the agriculture sector, the strategic issues and Components for their implementation and guiding actions from which county's priority actions could be identified for implementation
2. Ensure that the presentation is participatory for all the participants to understand, allow time for questions and interaction during the presentation e.g. Ask the participants to give their thought on how relevant are the policies at the county level, What can the county government do to facilitate implementation of the policies and the KCSIF, Does the national government and county government require the KCSIF to implement CSA, Which action in the KCSIF require further guideline to enhance implementation (Refer to handout 4)
3. During the presentation, emphasize the responsibility of the county government in the implementation of the KCSIF

4. Divide participants into 3 groups (from 1 to 3) (the group can be divided by county teams or similar interest groups) and give them a card. Each group will be expected to answer the following questions:
    a) What kind of framework does the county government need to implement CSA at the local level?
    b) What activities/steps are required to develop these frameworks?
    c) Who should be involved in the development of the framework and what is their responsibilities?
    - **Group-1**: All the questions above
    - **Group-2**: All the questions above
    - **Group-3**: All the questions above

9. Give each group 15 minutes to discuss and answer the question.
10. After 15 minutes, ask representatives of each group to do a plenary presentation on their findings.
11. When each group finishes the presentation, ask the other participants if they have questions and address them accordingly.
12. Ask participants if they have any further questions and summarize the session.

Session 5. Prioritizing interventions: the process from long lists to short list

Learning Objectives

1. To evaluate ongoing, past and future projects and programs implementing CSA practices.
2. To develop a long list of CSA interventions using key strategic documents (policies, plans) and County Climate risk Profile
3. Develop a short list of CSA practices that are sub sector and sub-national specific for each sub-sector
4. To identify the gaps and opportunities in implementing the shortlisted CSA intervention

Preparation

- ✓ Read the session carefully
- ✓ Prepare all necessary flip chart papers/ power point slides and write the training objectives
- ✓ Read handout 5

Materials

- Flip chart,
- Screen and projector
- Markers
- Prepared flip chart/ Power point with the workshop objectives; other flip charts
- Sticky notes (different colours)

Plenary Icebreaker (10 minutes)

Duration: 120 Minutes

Learning objective 1: To evaluate ongoing, past and future projects and programs implementing CSA **Methodology:** Group work and exercise
Activity 1: Ongoing, past and future projects implementing CSA practices in each region **Instruction for activity** 1. Explain to the participants that the next session will be on identifying CSA practices in ongoing, past and future projects. 2. Divide participants into 5 groups (from 1 to 3) (The groups can be similar interest/ thematic groups e.g. crops, livestock, fisheries, Environment and water) and give them a flip charts. Each group will be identify projects implementing CSA, the CSA practices implemented and the reasons for implanting these practices in the projects or programs identified in each thematic area. The groups will fill the table below during their discussion

Project name and years of implementation	CSA practices implemented in the project	Opportunities for scaling up CSA practices	Reason for implementing the practice	Implementing organization/ Remarks

- **Group-1**: Crops
- **Group-2**: Livestock
- **Group-3**: Fisheries
- **Group-4**: Water
- **Group-5**: Environment

3. Give each group 20 minutes to identify the project and the CSA practices.
4. After 20 minutes, ask representatives of each group to do a plenary presentation on their findings.
5. When each group finishes the presentation, ask the other participants if they have questions and address them accordingly.
6. Ask participants if they have any further questions and summarize the session.

Learning objective 2: To develop a long list of CSA intervention using key strategic documents and county climate risk profile

Methodology: Group work and discussion

Activity 1: Long list of CSA intervention using strategic documents

Instruction for activity

1. Explain to the participants that the next session will be to identify proposed CSA practices in strategic documents and evaluate their relevance to the sub-sector and region.
2. Divide participants into 5 groups (The groups can be similar interest/ thematic groups e.g. crops, livestock, fisheries, Environment and water) and give them a flip charts. Each group will identify CSA practices listed in the KCSAS, County plans and county risk profiles and evaluate their relevance in the regions for the sub-sector

   Notes:

   - Exerts of the CSA practices identified in the KCSAS are found in Handout 5 (this can be used for reference, the practices should be identified by the participants). Request for the county CSA plans in advance and review the CSA practices. The county climate risk profiles for 31 counties can be found at https://ccafs.cgiar.org/publications/kenya-county-climate-risk-profiles

Group-1: Crops

- **Group-2**: Livestock

- **Group-3**: Fisheries
- **Group-4**: Water
- **Group-5**: Environment

3. Give each group 40 minutes to identify the project and the CSA practices.
4. After 40 minutes, ask representatives of each group to do a plenary presentation on their findings.
5. When each group finishes the presentation, ask the other participants if they have questions and address them accordingly.
6. Ask participants if they have any further questions and summarize the session.

Learning objective 3: To develop a short list of CSA practices that are sub-sector and county level specific

Methodology: Plenary presentation, discussion and group work

Activity 1: Shortlist of CSA practices that are subsector specific

Instruction for activity

1. From list of CSA practices in the previous exercise request the participant to prioritize the most relevant CSA in the different sub-sectors in the region (Note: is some sub-sector the participant need to be specific on the value chain where the practices should be employed)
2. Give each group 10 minutes to identify and agree on a short list of CSA practices for each sub-sector.
3. After 10 minutes, ask representatives of each group to do a plenary presentation on the priorities identified.
4. When each group finishes the presentation, ask the other participants if they have questions and address them accordingly.
5. Ask participants if they have any further questions and summarize the session.
6.

Learning objective 4: To identify the gaps and opportunities in the implementation of shortlisted practices in the sub-sector and in the region

Methodology: Plenary presentation, discussion and group work

Activity 1: Gaps and opportunities in the implantation of identified CSA practices

Instruction for activity

1. Explain to the participants that the next session will be to identify the opportunities and gaps in the implementation of the short listed CSA practices in each of the sub-sector
2. Give each group a marker and 3 colors of post-it notes
3. Explain the exercise and color key e.g.
    i. Rose = Things that are positive (Pink note)
    ii. Thorn = Things that are negative (Yellow note)
    iii. Bud = Things that have potential (Green note)

4. Get each group to generate as many points as possible with regard to the short listed CSA initiatives
5. Let the group take a few minutes to reflect on these themes and have a short discussion about what data has surfaced from the exercise. For example
    i. Where are the gaps?
    ii. What are the opportunities?
    iii. Any opportunities that could be easily accomplished? Low hanging fruit?

Note: You can use any colors available to you if they are different and represent Roses, Buds and Thorns.

Example. Identifying roses, buds and thorns in CSA

Session 6. Linking CSA practices decisions with knowledge, Evidence for Resilient Agriculture: A data atlas for Africa

Learning Objectives

1. Interact with scientific evidence and improve analytical and decision-making skills (Use of data atlas and county risk profile document)

Preparation

- ✓ Read the session carefully
- ✓ Prepare all necessary flip chart papers/ power point slides and write the training objectives
- ✓ Read handout 6

Materials

- Flip chart,
- Screen and projector
- Markers
- Prepared flip chart/ Power point with the workshop objectives; other flip charts
- Sticky notes (different colours)

Plenary Icebreaker (10 minutes)

Duration: 90 Minutes

Learning objective 1: To interact with scientific evidence and improve analytical and decision making skills **Methodology:** Group work and exercise
Activity 1: How to use CSA data booklet Instruction for activity 1. Explain to the participants that the next session will be on how to use scientific evidence for decision making using the CSA compendium/ Data booklet. 2. Provide each group/ participant with a: A data atlas for Africa book copy of Evidence for Agriculture 3. Explain what the Evidence for Resilient Agriculture (ERA) is: A data atlas for Africa is and how to read the graphs 4. Once the participants understand how to read graphs, allow them to read and interrogate the graphs of CSA practices in their AEZs 5. The groups will then choose additional potential CSA practices, which will contribute to the long list.

6. Explain to the participant how to use the **ERA**

How to examine outcomes using ERA

- On your browser type in era.ccafs.cgiar.org
- Head to Analyze tab and then Examine-Outcome
- Select up to 3 practices of your interest
- Followed by the Outcome of choice (Productivity, mitigation or resilience)
- Select up to 3 products of your choice (maize, cassava, oil palm etc.)
- Finally choose the aggregate level you would like (by indicator or pillar or outcome)

How to assess the climate-smartness

- On your browser type in era.ccafs.cgiar.org
- Head to Analyze tab and then assess climate smartness
- Select the practice grouping level (either cluster practice or practice)
- Specify whether you want to include data from papers where the practice was used by itself (solo) or in combination with other practices (combo)
- Select the practices of your choice (e.g. feed addition, agroforestry pruning)
- Select the product and product indicator of your interest (e.g. goats and either milk or meat respectively)
- Set the mean annual temperature (e.g. 15-18) and rainfall (e.g. 700-850) of the areas of your interest
- Select the outcome of interest (productivity, mitigation, resilience)

(the visualization will calculate effect sizes and provide maps where mean is report and the number of studies will be in parentheses)

-

How to identify Interactions

(Practice can be applied by itself or in combination with other practices. For example, reduced till can be applied alone or together with others like mulch or (in) organic fertilizer, etc. The aim is to explore whether it's beneficial or antagonistic using a practice together with others rather than alone.)

- On your browser type in era.ccafs.cgiar.org
- Head to Analyze tab and then identify interactions
- Select your focal practice (e.g. Reduced tillage) [*The tools respond by selecting all the observations that use that practice alone or in combination*]
- Select product category (e.g. Legumes)
- Select the specific product (e.g. Lablab)
- Set mean annual Temperature (e.g. 15-18) and mean annual rainfall (e.g. 750-1100)
- Set the minimum number of studies (e.g. 4)
- Select by what would like to order your bars (e.g. productivity, resilience or mitigation)

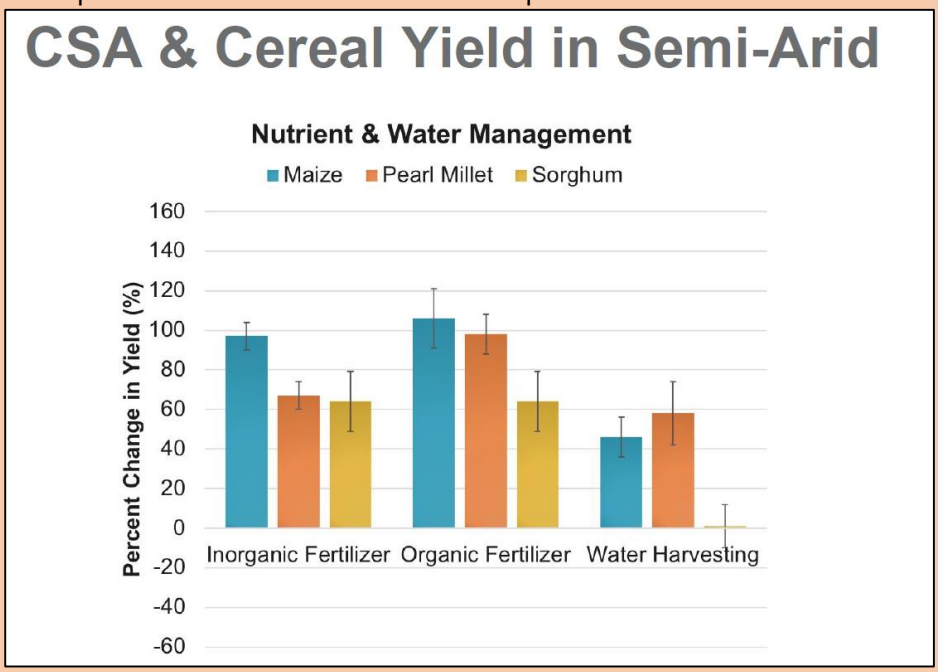
How to discover synergies

(The premise of CSA is that food security and climate change can be addressed simultaneously. Changing management practices affects the outcomes (productivity, mitigation and resilience). Some of these changes can be positive (synergy), some can be

either be positive or negative (tradeoffs) and others can all be negative (bad thing).)

- On your browser type in era.ccafs.cgiar.org
- Head to Analyze tab and then discover synergies
- Select as many management practices of interest
- Select as many products of interest
- Select as many AEZs

Example of the Effects of different CSA practices on Cereal Yield



Change in yield of different crops in response to different CSA practices in Semi-Arid.

Adapted from Data Atlas 2019

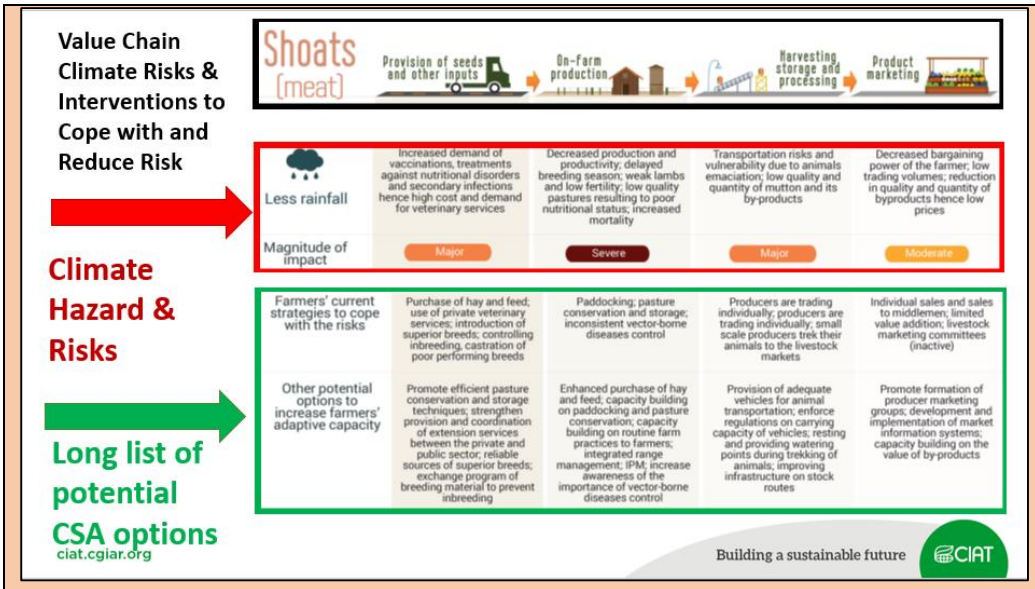
Note: the ERA can be accessed at: https://era.ccafs.cgiar.org/

Activity 2: How to the county climate risk profile

Instruction for activity

1. Explain to the participants that the activity will be on how to use the county climate risk profile and further identify CSA practise based on the county climate risk profile.
2. Provide each group/ participant with a copy of the county climate risk profile
3. Explain what the county climate risk profile is and its importance for CSA planning
4. Once the participants understand what the county climate risk profile is and how to use it
5. Let the groups identify practices under the long list of potential CSA options on to the list of CSA practices

Example of Additional CSA practices from the adaptation options in the County climate risk profile



A section of the Kajiado County profile showing the climate hazards, its magnitude along the value chain as well as interventions that can be taken up along the chain (adapted from Kajiado Climate risk profile)

Note: The county climate risk profiles can be access at: https://ccafs.cgiar.org/publications/kenya-county-climate-risk-profiles

Session 7. Development of CSA investments plans and proposals

Learning Objectives

1. To develop an action plan based on the prioritized action

Preparation

- ✓ Read the session carefully
- ✓ Prepare all necessary flip chart papers/ power point slides and write the training objectives

Materials

- Flip chart,
- Screen and projector
- Markers
- Prepared flip chart/ Power point with the workshop objectives; other flip charts
- Sticky notes (different colours)

Plenary Icebreaker (15 minutes)

Duration: 180 Minutes

Learning objective 1: To develop and action plan based on the prioritized actions

Methodology: Group work and exercise

Activity 1: Developing CSA Action Plan

Instruction for activity

1. Explain to the participants that the next session will be on how to develop an action plan based on one or more of the prioritized actions
2. Divide participants into 5 groups based on the sub-sector e.g. crops, livestock, fisheries, Environment and water) and give them a flip charts.
3. Ask each group to identify a CSA practice based on the shortlist that they believe is a priority. The shortlisted CSA priorities that are related can be classified together especially if the implementations of one affect another or there is complementarity in the implementation of the prioritized activities.

   Project title formulation
4. Based on the CSA practices selected by the participants, ask the participants to suggest a title for their project.
   Notes:
   - The title should fully cover the scope of the objective to be covered
   - The title suggest should be short and communicate a summary of the project

- The groups can suggest different alternatives for a title and finally ask the group to settle on one project title

5. Once a group settles on a title for their project request the group to write the project title on a different flip chart

Development of the project statement

6. Ask each group to brain storm on a problem statement. In defining the problem statement the members of each group should answer the following question; why are we proposing to implement the CSA practices identified? The project beneficiaries can also be describe at this point and how the practices identified will be of benefit to them

Notes:

- A **problem statement** is a concise description of an issue to be addressed or a condition to be improved upon. It identifies the gap between the current (**problem**) state and desired (goal) state of a process
- The group must give a clear reason why they are addressing the issue or why the issue is considered a problem

7. Once a group settles on a brief description of the problem statement request the group to write the project title on a different flip chart

Development of the project objective(s)

8. Ask each group to brain storm on the objective(s) of the project. In defining the objective of the project

Notes:

- A **project objective** describes the desired results of a **project,** which often includes a tangible item. An **objective** is specific and measurable, and must meet time, budget, and quality constraints.
- In case the group only picked one CSA practice they may have only one objective. However, in some cases the implementation of a CSA practice may be several objectives(refer to an example of a project objectives in handout 8)

9. Once a group settles on the project objective(s) request the group to write the project objective(s) on a different flip chart

Project implementation plan

10. Ask each group to brain storm on the project implementation plan by filling the details in the table below;

Objective 1					
Activity	**Target date**	**Resources required**	**Lead person/ organization**	**Anticipated results**	**Remarks**

Notes:

- To be able to come up with a comprehensive implementation plan. Each group must detail the activities that are expected to take place before the objective is met
- This process must be done for each objective.
- For this training the resources required are only estimated. However, during the discussion probe the groups to elaborate how they determine the resources required, why the specific person or organization was selected to lead the activity (ensure relevant persons or organizations are selected).
- The remark column is for notes especially the critical success factors which must be in place for the activity to be carried effectively and to conclusion

Project monitoring, evaluation and reporting

11. Ask each group to brain storm on the monitoring and evaluation of their proposed activities by filling the details in the table below;

Activities	**Indicators**	**Means of Verification**	**Risks and assumptions**
Activity 1……			
Activity 2 ……			
Activity 3……			

Notes

- The list of activities should be taken from the project implementation plan
- Indicators refer to clear and measurable criteria of project progress or variable that can be measured objectively
- The mean of verification tell us where we should obtain the data necessary to prove the objectives **defined** by the indicator has been reached (this should usually be documented evidence)
- The risks and assumptions: a **risk** is an uncertain threat that, in case of occurring, could have a negative impact in the completion of the activity while an **assumption** is the necessary condition that will enable the successful completion of the activity

12. Ask each group to brain storm on the project budget by filling the details in the table below;

Project Budget

Description of activity or Item	**Unit cost**	**Number of units (based on activity)**	**Amount**

Notes

- The budget must be based on the activities proposed to be implemented
- Items included in the budget should be necessary material required to fulfil the set objectives
- The unit description will be based on the item or activity description e.g. KM for distance and Days for day to day activities

13. Ask each tem to brain storm on the best organizational structure that should be put in place to implement the project
14. Give each group 40 minutes to identify the project and the CSA practices.
15. After 40 minutes, ask representatives of each group to do a plenary presentation on their findings.
16. When each group finishes the presentation, ask the other participants if they have questions and address them accordingly.
17. Ask participants if they have any further questions and summarize the session.

Training reference materials

Handout 1. Training Schedule

Day 1

Time	Activity	Responsible
09:00 – 10:00	**Welcome, Introduction and Workshop Objectives** ✓ Welcome remarks ✓ Introductions ✓ Mission Objectives	Facilitating team/ Region Agriculture Leader
10:00 – 10:30	**Tea break**	
10.30-12.00	**Climate Change, impact and Agriculture** ✓ Introduction to climate change ✓ Introducing the link between climate change and agriculture ✓ Climate change risks/ hazards	Facilitating team
12:00 – 13:00	**Introduction to climate smart Agriculture** - CSA concepts	Facilitating team
13:00 – 14:00	**Lunch break**	
14:00 – 16:00	**Introduction to climate smart Agriculture** - Identification of CSA practices - Identification of climate risk and concept	Facilitating team
16.00-16.30	Plenary and review of the day's work	Facilitating team
16:30 – 17:00	**Tea and Departure**	

Day 2

Time	Activity	Responsible
08:30 – 09:00	Recap of previous day lessons and activities	Facilitating team
09.00 – 10.30	**National Responses to climate change** - Policies and legal frameworks on climate change in Kenya (Overview) - Introduction to the climate change act	Facilitating team
10:30 – 11:00	**Tea break**	
11:00 – 12:30	**National Responses to climate change** - Introduction to Kenya Climate Smart Agriculture Strategy and Implementation Framework	Facilitating team

12:30 – 14:00	**Lunch**	
14:00 – 16:30	**Prioritizing interventions: the process from long lists to short list** - evaluate ongoing, past and future projects and programs implementing CSA practices - develop a long list of CSA interventions using key strategic documents - Develop a short list of CSA practices that are sub sector and sub-national specific for each sub-sector	Facilitating team
16:30 – 17:00	Plenary and Review of the Day's Work	Facilitating team
17:00	**Tea & Departure**	

Day 3

Time	Activity	Responsible
8:30 – 09:00	Recap of previous day lessons and activities	Facilitating team
09.00 – 10.30	**Linking CSA practices decisions with knowledge, Evidence for Resilient Agriculture** - Introduction to Data Atlas	
10:30 – 11:00	**Tea**	
11:00 – 13:00	Development of CSA investments plans and proposals - Development of CSA action plan	Facilitating team
13:00 – 14:00	**Lunch**	
14:00 – 16:30	Development of CSA investments plans and proposals - Development of a concept not/ proposal for CSA financing	Facilitating team
16.00-16.30	Plenary and Review of the Day's Work	Facilitating team
16.30-17:00	**Tea and Departure**	

Handout 2: Climate Change, Impacts and Agriculture

1. **What is climate change?**

Climate change is the long-term or permanent shift, either upwards or downwards, of the average climatic condition. These changes are seen in:

i. The onset and cessation dates of rainfall,
ii. The duration and intensity of dry and rainy seasons,
iii. The amounts of seasonal rainfall,
iv. The rainfall intensity,
v. The strength and direction of winds,
vi. Outbreak of diseases and pests; and
vii. The abnormal frequency of floods and droughts.

2. **What causes climate change?**

Climate change is directly or indirectly caused by human activities that alter the composition of the global atmosphere which forms a blanket of gases over the earth. Long-term production of these gases makes the natural climate warmer than usual.

The gases include:

- ✓ Carbon dioxide (CO_2), which is the gas from organic and industrial firewood, industry and vehicle engines and factories;
- ✓ Nitrous oxide (N_2O), a gas from fertilizers that are exposed to the sun's heat;
- ✓ Methane (CH_4), a gas produced primarily under oxygen-deficient (anaerobic) conditions such as those that occur when animal by-products are fermented or rice paddies are put under a complete water cover;
- ✓ Ozone (O_3), a gas from aerosol sprays such as perfumes, cosmetics, and household sprays; and
- ✓ Water vapor from open, natural water bodies such as lakes and oceans.

Some of the activities that amplify effects of climate change are:

- ✓ Clearing land and burning plant biomass for farming exposes the soil and releases the carbon stored in the soil into the atmosphere
- ✓ Burning of wood as firewood or for charcoal releases the carbon stored in the trees into the atmosphere
- ✓ Tillage practices that turn and expose the soil release the carbon stored in the soil into the atmosphere
- ✓ Poorly managed manure leads to more biogas (methane) escaping into the atmosphere
- ✓ Overstocking of livestock leads to land degradation and hence causes soils to emit GHGs
- ✓ Inefficient energy use in the poultry value chain leads to increased carbon emissions to the atmosphere
- ✓ Indiscriminative use of agro-chemicals interferes with maintenance of a sustainable ecosystem

- ✓ Fishing in depleted waters requires more fuel per kilo landed hence increasing GHG emissions.

3. Climate impact of agriculture

Climate change could make it more difficult to grow crops, raise animals, and catch fish in the same ways and same places as we have done in the past. The effects of climate change also need to be considered along with other evolving factors that affect agricultural production, such as changes in farming practices and technology.

3.1. Impacts on Crops

- ✓ Elevated CO_2 has been associated with reduced protein and nitrogen content in alfalfa and soybean plants, resulting in a loss of quality. Reduced grain and forage quality can reduce the ability of pasture and rangeland to support grazing livestock
- ✓ More extreme temperature and precipitation can prevent crops from growing.
- ✓ Dealing with drought could become a challenge in areas where rising temperatures cause soils to become drier.
- ✓ Many weeds, pests, and fungi thrive under warmer temperatures, wetter climates, and increased CO_2 levels.

3.2. Impacts on Livestock

- ✓ Drought may threaten pasture and feed supplies. Drought reduces the amount of quality forage available to grazing livestock.
- ✓ Climate change may increase the prevalence of parasites and diseases that affect livestock.
- ✓ Potential changes in veterinary practices, including an increase in the use of parasiticides and other animal health treatments, are likely to be adopted to maintain livestock health in response to climate-induced changes in pests, parasites, and microbes. This could increase the risk of pesticides entering the food chain or lead to evolution of pesticide resistance, with subsequent implications for the safety, distribution, and consumption of livestock and aquaculture products

3.3. Impacts on Fisheries

- ✓ Some marine disease outbreaks have been linked with changing climate.
- ✓ Changes in temperature and seasons can affect the timing of reproduction and migration.

4. Climate risks

Climate risk refers to risk assessments based on formal analysis of the consequences, likelihoods and responses to the impacts of climate change and how societal constraints shape adaptation options

Impacts from recent climate-related extremes include;

- ✓ heat waves,
- ✓ droughts,

- ✓ floods,
- ✓ cyclones, and
- ✓ wildfires

a) Drought

b) Floods

Handout 3: Introduction to Climate Smart Agriculture

1. What is Climate Smart Agriculture?

The concept integrates economy, society and environment – by jointly addressing food security and climate challenges. It is an approach aimed at developing the technical, policy and investment conditions to achieve sustainable agricultural development for food security under climate change (FAO, 2013a).

CSA is usually defined by its three main objectives:

i. Sustainably increasing agricultural productivity and incomes.
ii. Adapting and building resilience to climate change.
iii. Reducing and/or removing greenhouse gases emissions, where possible.

2. Why CSA?

Good farming practices can maintain biodiversity and reduce the quantity of GHGs released to the atmosphere, and instead trap carbon through improved biomass production

1. CSA increases the soil-carbon content, improves fertiliser- and water-use efficiency as well as water-holding capacity, and makes soils easy to work.
2. CSA increases benefit-cost returns

Note:

- Climate-smart agriculture is site-specific. Practices that can be described as 'climate-smart' in one location may not be smart in other context.
- Climate-smart agriculture is evidence-based with the aim to identify practices that are appropriate to the local context.
- To be effective and sustainable, climate-smart interventions need to consider local social differences, particularly gender and economic inequalities, to ensure equal benefits for men, women, and marginalized groups and to avoid exacerbating existing discriminations.

Comparing current agricultural practices and climate-smart agriculture

	Current agricultural practices	**CSA practices**
Land	Expand agricultural area through deforestation and converting grasslands to cropland.	Intensify use of existing areas rather than expanding to new areas. Expand the area cultivated by restoring degraded land rather than deforesting new areas.
Natural Resources	Make the most use out of natural resources - the land, water, forests, and soils used in	Restore, conserve and use natural resources sustainably.

	production – without paying much attention to their sustainability over the long term.	
Varieties and Breeds	Rely on a few crops and/or few high yielding varieties and breeds.	Use a mix of traditional and modern, locally adapted varieties and breeds to maintain output, increase yields and ensure their stability in the face of climate change.
Inputs	Increase use of fertilizer, pesticides and herbicides.	Improve efficiency of agrochemical use. Control pests and weeds using integrated management approaches. Apply compost, manure and green manure. Rotate crops with legumes to fix nitrogen and reduce use of artificial fertilizers.
Energy use	Use farm machinery that usually relies on fossil fuels – such as tractors and diesel pumps.	Use energy-efficient methods, such as solar power and biofuels.
Production and marketing	Specialize production and marketing to achieve greater efficiency.	Diversify production and marketing to add stability and reduce risk.

Source: **FAO.** 2013. Climate smart agriculture sourcebook. Rome, FAO. (also available at www.fao.org/docrep/018/i3325e/i3325e00.htm).

Some practices that will limit triggers of climate change and thus qualify to be CSA actions include:

1. Selection of appropriate farm enterprises for your area, e.g. growing arrow roots in a flood-prone area, growing drought-tolerant maize varieties in low-rainfall areas, and selecting drought-tolerant livestock species for dry areas
2. Diversification of farm enterprises so that when the season experiences extreme weather, some enterprises will survive
3. Proper timing and application of farm operations such as timely placement of appropriate fertilisers to enable the crop to take them up easily and thus reduce losses through leaching

or conversion to gaseous forms. Equally importantly, such practices will promote crop growth and early maturation.

4. Implementation of soil and water conservation measures such as construction of water-retention structures and minimum or zero tillage, and planting crops that increase ground cover quickly and use little water.
5. Intercropping and crop rotation involving legumes to improve soil fertility as well as increase the chances of some harvest even in poor seasons.
6. Adopting farmyard manure management through biogas production, and farmyard composting to improve soil fertility and reduce release of methane
7. Practising beekeeping which conserves the environment and contributes to natural resource enhancement and biodiversity
8. Promoting climate-efficiency grains in dairy production systems
9. Promoting pasture land rehabilitation and management
10. Preserving hay for use during drier seasons
11. Practising integrated farming so that as much as possible, by-products from one enterprise will be used to promote performance in another enterprise on the farm

3. Key Characteristics of CSA

i. **CSA addresses climate change:** CSA systematically integrates climate change into the planning and development of sustainable agricultural systems

ii. **CSA integrates multiple goals and manages trade-offs:** Ideally, CSA produces triple-win outcomes: increased productivity, enhanced resilience and reduced emissions. But often it is not possible to achieve all three. Frequently, when it comes time to implement CSA, trade-offs must be made. This requires us to identify synergies and weigh the costs and benefits of different options based on stakeholder objectives identified through participatory approaches

iii. **CSA maintains ecosystems services:** Ecosystems provide farmers with essential services, including clean air, water, food and materials. CSA adopts a landscape approach that builds upon the principles of sustainable agriculture but goes beyond the narrow sectoral approaches that result in uncoordinated and competing land uses, to integrated planning and management

iv. **CSA has multiple entry points at different levels:** CSA should not be perceived as a set of practices and technologies. It has multiple entry points, ranging from the development of technologies and practices to the elaboration of climate change models and scenarios, information technologies, insurance schemes, value chains and the strengthening of institutional and political enabling environments. As such, it goes beyond single technologies at the farm level and includes the integration of multiple interventions at the food system, landscape, value chain or policy level.

v. **CSA is context specific:** No interventions are climate-smart everywhere or every time. Interventions must take into account how different elements interact at the landscape

level, within or among ecosystems and as a part of different institutional arrangements and political realities.

vi. **CSA engages women and marginalized groups:** To achieve food security goals and enhance resilience, CSA approaches must involve the poorest and most vulnerable groups. These groups often live on marginal lands which are most vulnerable to climate events like drought and floods. They are, thus, most likely to be affected by climate change. Gender is another central aspect of CSA. Women typically have less access and legal right to the land which they farm, or to other productive and economic resources which could help build their adaptive capacity to cope with events like droughts and floods

vii. CSA strives to involve all local, regional and national stakeholders in decision-making. Only by doing so, is it possible to identify the most appropriate interventions and form the partnerships and alliances needed to enable sustainable development.

Handout 4: National Responses to Climate Change

1. What is Public Policy?

Public policy is a course of government action or inaction in response to public problems. In governance policy refers to a pattern of government decisions and actions intended to address a perceived public problem. Overall, policies do share some common features:

- Policies are authoritative declarations promoted by a person or body given the power to do so.
- Policies shape principles and laws.
- Policies state and influence ways to perform actions and sometimes by whom.

Under the best circumstances, policies are exceptional resources for making the lives of everyone in the community better.

2. Importance of policies

Policies are **important** because they address pertinent issues, some of the importance of policies are listed below;

i. **Guidance:** Policies define the goals of an organization and provide guidance about how to achieve objectives.
ii. **Consistency:** Established policies and procedures ensure the governments processes do not deviate or deteriorate over time, even if leadership changes.
iii. **Accountability:** Ensure government action and processes are accountable.
iv. **Efficiency:** Improve overall organizational performance by keeping everyone "on the same page" when it comes to expectations and issues.
v. **Clarity:** When everyone is 100% clear about what needs to be done, how it needs to be done and who's responsible for doing it, it leads to smooth operations.

3. Policies and legal frameworks on climate change in Kenya

The Government of Kenya is taking climate change and its impact on development seriously. Actions to build climate resilience and transition to a low carbon development pathway are being undertaken at all levels of government. Some of the key policies that are relevant to CSA in Kenya are shown in the table below;

Main policies relevant to CSA in Kenya

Name of Policy/ Legal Document	Key thematic areas relevant to CSA implementation
Constitution of Kenya 2010	The constitution provides for the right to food security, clean and healthy environment, while emphasizing sustainable and productive management of land resources (e.g. maintenance of 10% tree cover of the country's land cover).

Kenya Vision 2030	The country's development blueprint for 2008-2030 identifies agriculture as a key sector to boost economic growth. It aims to transform smallholder agriculture from low-productivity subsistence activities to an innovative, competitive agricultural sector. The vision is operationalized in a series of five-year Medium-Term Plans (MTPs), where MTP-III (2018-2022) outlines climate smart agriculture interventions.
Agriculture, Livestock and Fisheries	
Agricultural Sector Development Strategy 2010-2020	Provides a framework for transforming agriculture into an innovative, commercially and modern viable sector. Kenya's CAADP commits the government to implementing the common vision of the sector, as described in the Agricultural Sector Development Strategy (ASDS) to address the agricultural development agenda in the country.
Kenya Climate Smart Agriculture Strategy 2017-2026	Recognizes climate change as an emerging issue for food and nutrition security and advocates for adaptation interventions that enhance farming communities' resilience to climate change induced effects. It also recognizes the role of mitigation in addressing climate change.
Environmental and climate change	
National Climate Change Response Strategy (2010	The strategy highlights agricultural interventions such as restoration of degraded ecosystems, provision of downscaled weather information, water harvesting for irrigation, protection of natural resource base (soil and water conservation techniques), agricultural waste management, agroforestry, research and dissemination of improved (drought tolerant, salt-tolerant, pest and disease resistant) crops, livestock and fisheries.
National Climate Change Action Plan 2013-2017	The NCCAP identifies climate smart practices that reduce climate vulnerability while reducing emissions and improving agricultural production potential. The practices include; agro-forestry and conservation tillage and management of agricultural wastes, improved management of grazing systems, biogas, livestock diversification, improved breeding of animals, drought

	tolerant crops, water harvesting, integrated soil fertility management, insurance schemes, price stabilization schemes for livestock, strategic food reserves, and mainstreaming climate change into agricultural extension services.
National Climate Change Framework Policy (2017)	The policy includes statements that enhance climate resilience and adaptive capacity, promote low-carbon growth, and mainstream climate change into planning processes. It notes the potential for the agriculture sector to reduce GHG emissions, enhance resilience and recommends investment to create green jobs.
Climate Change Act (2016)	The Act outlines climate resilience and adaptive capacity to promote low carbon growth, and to mainstream climate change into planning processes while developing incentives to promote climate resilient actions.
National Adaptation Plan (NAP)	The Plan summaries short, medium and long-term actions that enhance resilience in the agriculture, livestock and fisheries value chains.
Nationally Determined Contributions (NDCs)	The NDCs provide a framework in which the Kenya Government commits to reduce GHG emissions by 30% by 2030, compared to business as usual scenario (BAU), in addition to building resilience. The agriculture sector will enhance the resilience and contribute to reduction of GHG emissions by promoting climate smart agriculture.
Sessional Paper No. 3 of 2009 on National Land Policy	The policy encourages efficient and sustainable utilization and management of land and land-based resources for provision of food security.
National Agricultural Research System (NARS) policy (2012)	The policy points out that concerted efforts must be made to address the country's vulnerability to climate change and other external shocks. It recommends putting in place Virtual Research Platforms to handle emerging and cross-cutting issues that include natural resource and livelihood systems, bioethics, ecosystems resilience, integrated natural resources management and climate change among others. It also mentions that redefined research agenda should give priority to climate change mitigation and adaptation and continue to cover

	sustainable use and conservation of natural resources (land, forest, flora and fauna) among other priorities.
Livestock Policy 2008/ Sessional Paper No.2	The policy proposes to set up measures to institutionalize and address drought related challenges through adoption of the necessary mitigation interventions. Further, it proposes to create a favorable environment and mechanisms to strengthen capacity of the existing early warning systems and ensure that the operations of such systems are well coordinated to cover all disaster vulnerable areas adequately.
National policy on climate finance (2016)	This Policy establishes the legal, institutional and reporting frameworks to access and manage climate finance, consistent with the institutional structures and framework set out in the Climate Change Act, 2016. The goal of the Policy is to further Kenya's national development goals through enhanced mobilization of climate finance that contributes to low carbon climate resilient development goals

4. The Kenya climate change act

4.1. Purpose of the climate change act;

The CCA aims to reduce vulnerability to climate change and improve our country's ability to take advantage of the opportunities that climate change offers. The Act is to be applied for the development, management, implementation and regulation of mechanisms to enhance climate change resilience and low carbon development for the sustainable development of Kenya.

4.2. Overview of the Climate Change Act

The key features of the Climate Change Act include the following:

- ✓ **National Climate Change Council (NCCC):** The Council provides an overarching national climate change coordination and advisory function. The council coordinate policy direction across the public service, at all levels of government. The Council is an unincorporated body chaired by His Excellency the President, and is designed to utilize existing public service administrative systems to enhance mainstreaming of climate change actions. The Cabinet Secretary for the time being responsible for Climate Change Affairs is the Secretary to the Council. The Council is comprised of nine members, including the Cabinet Secretaries responsible for Climate Change Affairs, the National Treasury, Planning, and Energy; the Chairperson of the Council of Governors; and

representatives from the private sector, civil society, marginalised communities and the academia. The Council will meet at least four times a year.

- ✓ **Climate Change Directorate (CCD):** The lead agency of the government for the technical implementation of climate change functions. Established in the Ministry responsible for Climate Change (currently MENR), the CCD develops national climate change plans, delivers operational coordination, provides analytical support on climate change issues, provides a registry for mitigation actions, serves as a knowledge and information centre, and optimizes the country's efforts to mobilize climate finance. It also serves as the Secretariat for the Council.
- ✓ **National Climate Change Action Plan (NCCAP):** To be formulated by the Cabinet Secretary and approved by the Council, the NCCAP will be the basis for implementing climate change activities. The plans identify priority mitigation and adaptation actions, and actions for mainstreaming climate change in sector functions.
- ✓ **Climate Change Fund:** The CCA establishes a Climate Change Fund for priority actions and interventions to address climate change. These should be approved by the Council, including funding research institutions, private sector, public sector, civil society and other stakeholders; and investment development. The Fund will be vested in National Treasury, administered by the Council and managed by the Principal Secretary responsible for climate change affairs.

4.3. Institutions established to deal with climate change

- ✓ **State departments and national public entities**: integrate the action plan into sectoral strategies and implementation plans; and report on sectoral greenhouse gas emissions for the national inventory
- ✓ **Counties:** will integrate and mainstream climate change actions, interventions and duties; including mainstreaming the National Climate Change Action Plan into CIDPs. County governments will submit an annual report on the implementation of climate change actions to the county assembly, with a copy forwarded to the CCD. In addition, counties may elect to enact their own climate change legislation to further give effect to the CCA. The Governor is required by the CCA to designate a County Executive Committee (CEC) Member that will coordinate climate change affairs within the county
- ✓ **National Environment Management Authority (NEMA):** responsible for monitoring, investigating and reporting on whether public and private entities are in compliance with assigned climate change duties. In addition, NEMA will regulate, enforce and monitor compliance on the level of greenhouse gas emissions; as well as integrate climate risk and vulnerability assessment into all forms of assessment
- ✓ **Kenya Institute of Curriculum Development**: Mainstreaming climate change into the basic education curriculum. KICD integrate climate change into the national basic

education curricula. The Ministry of Education will establish a committee to determine how to connect to the ongoing review of the national basic education curriculum.

- ✓ **Private sectors and other organizations:** The Council may impose climate change obligations on private entities and civil society organizations. The Council may require a private entity to report on the status of its performance of climate change duties.

5. Kenya Climate Smart Strategy and implementation Framework

The KCSAIF is designed to address impacts of climate change challenges to agricultural growth and development. The Framework is aligned to the government's commitments and obligations to guide the transition of the country towards a low-carbon climate resilient development pathway.

The Framework aims at supporting the implementation of the KCSAS 2017-2026 whose objectives are to;

i. Enhance adaptive capacity and resilience of farmers, pastoralists and fisher-folk to the adverse impacts of climate change;
ii. Develop mechanisms that minimize greenhouse gas emissions from agricultural production systems;
iii. Create an enabling regulatory and institutional framework; and
iv. Address crosscutting issues that adversely impact CSA.

5.1. Goal and Objectives of the Framework

Goal

The overall goal of the Framework is to achieve a long-term national low carbon climate resilient development pathway, whilst realizing the development goals of Kenya Vision 2030.

Objectives

The Framework has four objectives:

i. To develop a sustainable system for achieving a coordinated, coherent and cooperative governance of climate resilience and low carbon growth in the agricultural sector.
ii. To mainstream CSA to support the transformation of Kenya's agricultural sector into an innovative, commercially oriented, competitive and modern industry that contributes to poverty reduction and improved food security in Kenya.
iii. To reduce vulnerability of agriculture systems by cushioning them against the impacts of climate change and reduce GHG emissions where possible.
iv. To strengthen communication systems on CSA extension and agro-weather issues

5.2. Framework Implementation Components

The objectives of the Framework are to be realized through implementation of actions designed around the following four components:

1. Institutional coordination.
2. Agricultural productivity and integration of value chain approach.

3. Building resilience and appropriate mitigation actions.
4. Communication systems on CSA extension and agro-weather issues.

The rationale of each component, sub-components and proposed actions are outlined below

5.2.1. Component 1: Institutional coordination

Rationale: This component supports the establishment of an inclusive institutional framework for improved agricultural sector CSA coordination and harmonization, and an enabling policy and institutional environment for the realization of the CSA objectives in general. The component is designed to strengthen inter-ministerial, national and county governments, private sector and CSOs, development partners and other non-state actor's coordination on CSA related issues.

It will enable support towards enhancing capacity for cross-sectoral planning, communication within and between ministries, government institutions with different mandates with regard to CSA issues. Further, the component will enable sector institutions to contribute to and take responsibility for sector-wide coordination and implementation for more effective delivery of their CSA related mandates.

Summary of actions under Component 1:

- ✓ Develop and implement an inter-ministerial communications strategy with respect to interministerial coordination on matters relating to climate smart agriculture.
- ✓ Introduce a biannual joint planning and review session between inter-ministerial team and the county government executive and chief officers responsible for agriculture.
- ✓ Build capacity of national and county government staff in cross-sectoral planning and implementation.
- ✓ Strengthen policy review and analytical capacity at the national and county levels of government.
- ✓ Strengthen the planning, implementation, monitoring and evaluation at the national and county levels of government.
- ✓ Establish a framework for disseminating CSA programmatic planning and implementation as well as annual reports and studies and receiving feedback at national and county levels of government.
- ✓ Annual and biannual Intergovernmental Technical Conference on status of KCSAIF implementation.

5.2.2. Component 2: Agricultural productivity and integration of value chain approach

Rationale: This component is expected to play a major role in ensuring improved agricultural productivity along the value chains. This is aimed at building resilience of agricultural value chain players through use of adaptive technologies and enhanced market linkages. The component will also promote commercialization, food safety and quality control standards along the value chains.

Summary of action under component 2

- ✓ Enhance adoption of improved and adaptive crop, livestock and aquaculture technologies.
- ✓ Increase the area under efficient and renewable energy powered irrigation systems as well as improving water resource-use efficiency in existing and new irrigation systems. Some of the climate change challenges the irrigation sub-sector experiences include; inadequate infrastructure development for irrigation, drainage and water storage, low productivity and poor water management.
- ✓ Support the development of new safe and commercially viable products for priority value chains in each agro-ecological zone. Most agricultural commodities are sold in their raw form and are thus bulky, of low value and have short shelf lives. There is also no traceability mechanism for produce and products from farm to folk. Value addition will ensure longer shelf life, reduced transaction costs and higher incomes.
- ✓ Increase locally and internationally marketed agricultural outputs and to expand the export markets to include non-traditionally exported agricultural commodities. This will also involve developing and improving grading and standards for agricultural commodities. The sector is faced with a number of challenges which include low levels of local market penetration by smallholder producers; low capitalization of bulk traders; inadequate grading and standardization systems; inadequate awareness of the standards by producers and consumers; limited capacity to fully comply with international sanitary and phytosanitary standards (SPS).
- ✓ Reduce post-harvest losses along agricultural value chains, enhance private sector annual storage capacity for agricultural products, enhance communities and household capacity to store agricultural produce; and expand the strategic food reserve to include all appropriate agricultural products and establish strategic feed/grazing reserves.

5.2.3. Component 3: Building resilience and appropriate mitigation actions

Rationale: This component aims at building resilience through adaptation and appropriate mitigation measures. This will be achieved through improved management of natural resource base and development of safety nets along the value chains. The component will also play a major role in identification and deployment of appropriate measures that minimize GHG emissions in agricultural production systems.

Summary of action under component 3

- ✓ Enhancing adoption of climate smart soil management technologies/ practices and rehabilitation of degraded lands. The challenges to be addressed include; nutrient depletion, loss of biodiversity, land degradation, soil erosion, soil acidity and low adoption of CSA technologies and practices.
- ✓ Enhancing integration of CSA practices towards conservation and rehabilitation of water catchment areas, increasing tree cover, and conservation of fisheries resources. The key challenges addressed include degradation of water catchment areas, soil erosion, siltation, pollution of water bodies, eutrophication, low tree cover in agricultural areas,

forest degradation and deforestation, loss of biodiversity, land use change and resource use conflict and encroachment.

- ✓ Increasing crop, livestock and fisheries index-based insurance and establishing a safety net mechanism for residual loss and damage. The sector increasingly experiences vulnerability due to risks related to climate change. There is need to develop mechanisms for risk transfer and management; knowledge dissemination on importance of agricultural insurance and safety nets.
- ✓ Promote adaptation interventions and appropriate mitigation that leads to reduced GHG emissions intensity from the agriculture sector without compromising productivity. It will also promote development of accounting systems on agricultural emissions.

5.2.4. Component 4: Communication systems on CSA extension and agro-weather issues

Rationale: This component aims at strengthening and mainstreaming communication systems on CSA, extension and agro-weather issues among stakeholders in the agriculture sector. In addition, the component will promote generation, access and enhanced application of CSA knowledge among value chain actors. Further, the component will support strengthening of systems for timely provision of climate forecasts to different value chain stakeholders.

Summary of actions under component 4

- ✓ Enhance generation and dissemination of CSA technologies and innovations along the value chains; document, package, and disseminate best CSA practices and technologies; establish functional national and county CSA knowledge and information management systems andStrengthen and maintain CSA knowledge networks and partnerships.
- ✓ Increase agro-climate information services and timely-use of agro-weather products; and enhance and upscale early warning systems and contingency plans for climate change adaptation.

Handout 5: Prioritizing interventions: the process from long lists to short list

There are a number of intervention by different stakeholder at the county level. As such, it is important to review ongoing project in each county to ensure that a comprehensive list of the projects can be identified during the discussion. In case, information of county specific projects are missing the project listed below can be cited as examples and used to identify CSA practices in projects and programs. Government projects implementing CSA interventions in Kenya include;

i. Kenya Climate Smart Agriculture Programme;
ii. Mitigation of Climate Change in Agriculture Programme;
iii. Climate Smart Agriculture program,
iv. STARCK+;
v. Building climate change resilience and food security programme;
vi. Economic Stimulus Programme: Kenya Agricultural Productivity and Agribusiness Project Kenya, Adaptation to Climate Change in Arid Lands.

Note: These government project are implemented in different regions and some project may not be relevant depending on the participants being trained.

The Kenya Climate Smart Agriculture Strategy (Exert)

Thematic Area 1. Adaptation and Building Resilience
Strategic Issue 1: Vulnerabilities due to changes in temperature regimes and precipitation patterns
Strategic goal: Enhanced adaptive capacity and resilience of farmers, pastoralists and fisher-folk to the adverse impacts of climate change.
Strategic objective: Institute measures to reduce the vulnerabilities of farmers, pastoralists and fisher-folk to changing temperature regimes and precipitation patterns

Strategies	Main Activities
(i) Provision of accurate, timely and reliable climate/weather information to inform decisions of actors on crops, livestock and fisheries value chains	(a) Improve network of weather stations countrywide (b) Modernization and maintenance of meteorological infrastructure (c) Integration of scientific and indigenous technical knowledge in weather forecasting (d) Enhance human capacity in weather data collection, analysis and packaging (e) Provide early warning information on seasonal weather patterns

(ii) Promote crop varieties, livestock and fish breeds and tree species that are adapted to varied weather conditions and tolerant to associated emerging pests and diseases.	(a) Breeding of crop varieties, livestock and fish breeds, and tree species, that are adapted to weather variations and tolerant to pests and diseases (b) Facilitate the adoption of crop varieties, livestock breeds and fish and tree, species, that are adapted to weather variations and tolerant to pests and diseases
(iii) Technology development, dissemination and adoption along crops, livestock, fisheries and forestry value chains	(a) Conduct participatory research on Improved technologies and practices informed by needs of users and agro-ecological zones along prioritized value chains (b) Conduct on-farm research into low-cost appropriate technologies and practices and deliver them as packages (c) Build the capacity of extension service providers, producers and other stakeholders in the use of existing/ new/ improved CSA technologies and practices
(iv) Diversification of enterprises and alternative livelihoods	(a) Promote integrated farming systems comprising crops, livestock, aquaculture and farm forestry (b) Promote non-agricultural enterprises as alternative livelihoods
(v) Enhance productivity and profitability of agricultural enterprises	(a) Promote use of improved technologies and practices in crops, livestock, fisheries and forestry (b) Promote post-harvest management, improved storage, distribution and market access

Strategic Issue 2: Vulnerabilities due to extreme weather events

Strategic goal: Reduced vulnerabilities of farmers, pastoralists and fisher-folk to extreme weather events.

Strategic objective: Institute measures to reduce the vulnerabilities of farmers, pastoralists and fisher folk to extreme weather events

Strategies	Main Activities
(i) Develop and implement mechanisms and systems that provide early warnings; ensure Preparedness and response to extreme weather events	(a) Develop effective early warning systems (b) Produce and disseminate downscaled weather information on extreme weather events (c) Preparation of contingency plans
(ii) Develop and use index-based agricultural insurance	(a) Identification and development of suitable agricultural insurance products (b) Build capacity of extension, stockists and other stakeholders on agricultural insurance. (c) Promote the use of agricultural insurance as a means of risk transfer by farmers, pastoralists, and fisher-folk

Strategic Issue 3: Vulnerabilities due to unsustainable natural resource management
Strategic goal: Enhanced resilience of agriculture systems to climate change impacts through sustainable natural resource management
Strategic objective: Mainstream sustainable natural resource management into production systems to enhance resilience of the farmers, pastoralists and fisher-folk

Strategies	Main Activities
(i) Establish baselines and undertake inventory for the natural resources (agricultural land, water, pastures, fisheries and forestry).	(a) Review and collate information on existing natural resources and their distribution (b) Undertake Inventory and mapping of natural resources (c) Develop and maintain database for natural resources at national and county levels
(ii) Promote Sustainable Natural Resource Management	(a) Develop a framework for sustainable natural resource management (b) Integrated soil fertility management (ISFM) (c) Restoration of degraded soils and conservation of soil biodiversity

	(d) Develop and implement programmes and projects on sustainable management and use of natural resources including alternative livelihoods (e.g. protection of riparian reserves, fish landing stations, wildlife corridors, stock routes and off-farm activities)
(iii) Promote water harvesting and storage, Irrigation infrastructure development and efficient water use.	(a) Incorporation of components that enhance resilience (irrigation of crops, aquaculture, livestock watering and agroforestry) in designs and development of water harvesting and storage (b) Development of appropriate irrigation Infrastructure and technologies (including use of clean energy) as per the prevailing farming and pastoral systems (c) Promote effective and efficient agricultural water use, including waste water management.
(iv) Promote and support conservation and propagation of germplasm of species with adaptive capacity.	(a) Establishment of *in-situ* and *ex-situ* genetic resources conservation areas/ centres (b) Identification of species of livestock, crop and fish origin that are adaptive and tolerant to adverse weather conditions (c) Breeding, Multiplication and field trials and demonstrations
(v) Strengthen research, technology development and dissemination for sustainable Land Management and agriculture water management	(a) Undertake participatory and collaborative research on suitable SLM and agricultural water management technologies and innovations (b) Technology development, packaging and transfer

(vi) Establish and implement mechanisms for resolving natural resource use conflicts	(a) Develop mechanisms for identification of potential natural resource conflict hotspots (b) Profile natural resource conflict hotspots (c) Develop mechanism for conflict resolution

Thematic Area 2. Mitigation of Greenhouse Gas Emissions
Strategic Issue 4: Emissions from key sources in agricultural production systems
Strategic Goal 4: Minimize emissions from key sources in agricultural production systems
Strategic Objective 4: Develop mechanisms that minimize greenhouse gas emissions from key sources in agricultural production systems

Strategies	**Main Activities**
(i) Reduce the rate of emissions from livestock (enteric fermentation and manure)	(a) Formulate and support programs that promote development and use of low emissions technologies to manage livestock feed from farm residues and manure (b) Formulate and support programs that promote development and use of low emissions technologies for rangeland, manure and livestock waste management (c) Formulate improved feeds and feed additives to reduce enteric fermentation (d) Develop breeding schemes and improve herd health to enhance efficiency in production (e) Support development and use of innovations in livestock management systems that enhance productivity.
(ii) Reduce the rate of emissions from rice production systems	(a) Promote and develop programmes for improving efficiency in irrigated rice production systems (b) Promote production of rainfed rice (c) Develop and transfer appropriate technologies for efficient rice production

Strategic issue 5: Emissions from other sources in agricultural production systems
Strategic goal: Minimize emissions from other sources in agricultural production systems
Strategic objective: Mainstream efficient agricultural production systems to enhance productivity and minimize emissions as a co-benefit.

Strategies	**Main Activities**
(i) Mainstream Sustainable Natural Resource Management to reduce emissions as a co-benefit	(a) Promotion of agroforestry for reduction of emissions from deforestation and forest degradation plus, forest conservation, sustainable management of forests and enhancement of carbon stocks, including range management. (b) Develop and implement agricultural sector Nationally Appropriate Mitigation Actions (NAMAs) (c) Minimize use of fires in rangelands and croplands management
(ii) Promotion of energy-efficient technologies and innovations	(a) Reduce rate of emissions associated with processing and transportation of agricultural inputs and products (b) Reduce rate of emissions associated with distances covered and residence-time used for capture fisheries (c) Promote alternative techniques/ innovations along agricultural value chains that either use fuel efficiently or green energy.

Handout 6. Linking CSA practices decisions with knowledge, Evidence for Resilient Agriculture: A data atlas for Africa

a) Data Atlas

The atlases profile geospatial indicators of climate variability, bio-physical characteristics and socio-economic variables for each site.

Specific characteristics include annual rainfall and temperature, topography, agricultural resources (soil types, length of growing period, land cover and land use), population and livestock density, market access and livelihood zones. There are also maps showing the length of the growing period in 2000 and the projected length of the growing period in 2030. Combined with the household, village and organisational baseline studies, these site atlases help provide context for each site, and ways in which climate change may affect their food security and agricultural practices

The use of the data atlas has been explained in the module. However it is highly recommended that you visit the CCAFS website and practice before training the session.
The ERA can be accessed at: https://era.ccafs.cgiar.org/

b) County Climate Risk Profiles

The profiles provide an analysis of the underlying causes of vulnerability, ongoing adaptation strategies and existing off-farm services available for combating the risks associated with the hazards, with recommendations for potential adaptation options.

The profiles also give snapshots of the enabling environment for building resilience by giving a synthesis on the policy, institutional and governance context, and possible pathways to be pursued to build institutional capacities for effective redress of potential future climate risks.

The County Climate Risk Profiles can be access at: https://ccafs.cgiar.org/publications/kenya-county-climate-risk-profiles

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Kenya Climate Smart Agriculture Strategy-2017-2026

Kenya Climate Smart Agriculture Implementation Framework-2018-2027