Training on Climate-Smart Agriculture to Strengthen the Capacity of ASARECA-Member National Agricultural Research Institutes

Joab Osumba | John Recha | Blaise Amony | Joshua Okonya | Julian Barungi | Enock Warinda

Workshop Report

CGIAR

AICCRA
Accelerating Impacts of CGIAR Climate Research for Africa

Training on Climate-Smart Agriculture to Strengthen the Capacity of ASARECA-Member National Agricultural Research Institutes

Workshop Report

Accelerating Impacts of CGIAR Climate Research for Africa (AICCRA)

July 2022

Joab L. Osumba
John W. Recha
Blaise Amony
Joshua S. Okonya
Julian Barungi
Enock Warinda

ASARECA
Transforming Agriculture for Improved Livelihoods

CAADP XP4 PROGRAMME

IFAD
Investing in rural people

To cite this workshop report

Osumba JL, Recha JW, Amony B, Okonya JS, Barungi J, Warinda E. 2022. Training on Climate-Smart Agriculture to Strengthen the Capacity of ASARECA Member National Agricultural Research Institutes. AICCRA Workshop Report. Accelerating Impacts of CGIAR Climate Research in Africa (AICCRA).

About AICCRA reports

Titles in this series aim to disseminate interim climate change, agriculture, and food security research and practices and stimulate feedback from the scientific community.

About AICCRA

The Accelerating Impacts of CGIAR Climate Research for Africa (AICCRA) project is supported by a grant from the International Development Association (IDA) of the World Bank.

Contact us

Accelerating Impacts of CGIAR Climate Research for Africa (AICCRA). Email: aiccra@cgiar.org

Acknowledgments

The Accelerating Impacts of CGIAR Climate Research for Africa (AICCRA) project is supported by a grant from the International Development Association (IDA) of the World Bank. IDA helps the world's poorest countries by providing grants and low to zero-interest loans for projects and programs that boost economic growth, reduce poverty, and improve poor people's lives. IDA is one of the largest sources of assistance for the world's 76 poorest countries, 39 of which are in Africa. Annual IDA commitments have averaged about $21 billion over circa 2017-2020, with approximately 61 percent going to Africa.

About the authors

Joab Osumba (J.Osumba@cgiar.org) is a Climate Smart Agriculture Policy Specialist. AICCRA Eastern and Southern Africa at the International Livestock Research Institute (ILRI).

John Recha (J.Recha@cgiar.org) is a Climate Smart Agriculture Policy Scientist. AICCRA Eastern and Southern Africa at the International Livestock Research Institute (ILRI).

Blaise Amony (b.amony@asareca.org) is a Program Officer - Capacity Development. Association for Strengthening Agricultural Research in Eastern and Central Africa (ASARECA).

Joshua Okonya (j.okonya@asareca.org) is a Program Officer - Technology & Innovation. Association for Strengthening Agricultural Research in Eastern and Central Africa (ASARECA).

Julian Barungi (j.barungi@asareca.org) is a Program Officer - Policy. Association for Strengthening Agricultural Research in Eastern and Central Africa (ASARECA).

Enock Warinda (e.warinda@asareca.org) is the Executive Director - Technology & Innovation. Association for Strengthening Agricultural Research in Eastern and Central Africa (ASARECA).

Table of contents

Background information

1.1 Introduction

ASARECA is implementing the AICCRA project that has synergy with a project titled "Comprehensive Africa Agriculture Development Programme ex-pillar IV (CAADP-XP4)". Implementation of this 5-year CAADP-XP4 project started in 2019 and is part of the European Union's (EU) Development Smart Innovation through Research in Agriculture (DeSIRA) initiative. The project is expected to deliver five (5) key outputs namely: (i) Strengthened capacities of ASARECA and partner organizations in competencies required for successful implementation of the CAADP-XP4 project; (ii) Multi-stakeholder partnerships for innovation established and in operation; (iii) Policies in support of climate-relevant agriculture and food systems transformation formulated, investments increased, advocacy and market linkages strengthened; (iv) Knowledge management and communication systems for decision-making and sharing of innovation and for advocacy related to climate-relevant agriculture transformation established; and (v) Enhanced planning, coordination, monitoring, evaluation, learning, and reporting.

The training in CSA were organized under the auspices of ASARECA's AICCRA and CAADP-XP4 projects. The training contributed to AICCRA activity 2.3.3 on Building capacity of public and private sector next users to support implementation of CSA technology packages in focus countries. The CSA training also contributed to CAADP-XP4 project activity area 1.1 that focuses on Strengthening the internal capacities of ASARECA and its regional and country level partners.

The Accelerating the Impact of CGIAR Climate Research for Africa (AICCRA) and International Livestock Research Institute (ILRI) Climate Smart Agriculture (CSA) experts trained young scientists from the 14-member Association for Strengthening Agricultural Research in Eastern and Central Africa (ASARECA) countries on CSA at the SG Premium Resort Hotel in Arusha Tanzania on July 4th and 5th July 2022. The ASARECA member countries are Burundi, Cameroun, Central African Republic, Democratic Republic of Congo, Eritrea, Ethiopia, Madagascar, Kenya, Republic of Congo, Rwanda, Sudan, South Sudan, Tanzania and Uganda.

The workshop was convened by ASARECA and hosted by Tanzania Agricultural Research Institute (TARI) and to empower young ASARECA scientists to effectively contribute to the transformation of agriculture in Africa. The training targeted over 45 participants including agricultural researchers, farmer group leaders, young scientists, and CSA experts from the National Agriculture Research Institutes (NARIs) of Burundi, Cameroon, Central African Republic, Democratic Republic of Congo, Eritrea, Ethiopia, Kenya, Madagascar, Republic of Congo, Rwanda, South Sudan, Sudan, Tanzania, and Uganda.

The workshop was graced by Dr. Geoffrey Mkamilo, the Chairperson ASARECA Board of Directors, who is also the Director General Tanzania Agricultural Research Institute (TARI), and Dr. Enock Warinda, the Executive Director of ASARECA.

1.2 Overview and background information

The capacity gap assessment study and the 2021 benchmarking exercise facilitated by ASARECA participants from the 14 member NARIs identified and reported the priority capacity gap needs for their junior staff which included training in sustainable and CSA. Secondly, there was need to

convene periodic CSA capitalization meetings for members of the recently formed ASARECA-CSA Alliance (ACSAA) to review progress made in managing CSA platforms, assess challenges faced in the platforms, and provide mechanisms for improvement in managing CSA platforms. Based on this, ASARECA organized the training on CSA to strengthen the capacity of young scientists involved in implementation of CSA related agricultural projects at NARIs and the second meeting of the ACSAA to review progress made in managing CSA platforms.

From 2014 when the Global Alliance for CSA (GACSA) was established, the CSA Movement has been forming CSA Alliances and CSA Platforms in various regions and countries in Africa to promote, coordinate and share information and lessons on the introduction, promotion and scaling of CSA among stakeholders at both national and sub-regional level. ASARECA-CSA Alliance (ACSAA) was formed in August 2021 as a multistakeholder platform to champion the concept of CSA within ASARECA member states and to coordinate and convene joint action by 14 member states on CSA best practices. The ACSAA brings together agricultural scientists, agro-meteorologists, climate change experts, private sector players, farmers, extension workers and policy makers. The Alliance (or Platform) intends to work closely with a network of National CSA/CA/CAWT Task Forces (NCATFs) in Eastern and Central Africa which coordinate CSA stakeholders in their respective countries. The Platform also works on this with diverse CSA stakeholder groups including national governments, regional economic communities, research, NGOs/CBOs and private sector among others. To effectively promote the concept and practice of CSA in the ASARECA mandate region, ASARECA Secretariat has embarked on equipping young ASARECA scientists with knowledge, skills, and attitude for this purpose. It is against this background that ASARECA Secretariat sought the services of CSA experts from ILRI-AICCRA to train the young scientists.

1.3 Objectives of the training workshop

The overall objective of this training was to strengthen the capacity of ASARECA member NARIs to perform their individual mandates and to better work together.

The specific objectives include:

- To increase visibility of AICCRA and CAADP-XP4 projects among regional and country-level partners.
- To strengthen the capacity of stakeholders in ASARECA member countries in implementation of climate relevant AR4D initiatives.
- To review progress in implementation of the agreed action points of the CSA alliance and planning for the next steps of action.
- To document success stories among the participants of the previous benchmarking exercise.
- To facilitate CSA knowledge and information sharing among scientists in the ASARECA member countries.

1.4 Expected outputs of the training workshop

- Visibility of the CAADP-XP4 project increased among regional and country-level partners through implementation of key actions from the CAADP-XP4 communications and visibility plan.
- Stakeholders in ASARECA member countries trained on CSA topical areas.
- Progress in implementation of the agreed action points of the CSA alliance reviewed and next steps of actions agreed upon.
- Success stories on previous benchmarking exercise documented.

- Knowledge and information on new CSA-Technologies, Innovations and Management Practices (TIMPs) shared among agricultural scientists.

1.5 The CSA Training

The training in CSA was face to face and was facilitated by CSA-experts from ILRI, and staff of the ASARECA Secretariat and Tanzania Agricultural Research Institute (TARI). It was conducted through classroom sessions based on the CSA Course 101 developed by the CGIAR Research Program on Climate Change, Agriculture and Food Security (CCAFS) and available at https://csa.guide/. It involved presentations, discussions, group work and field visits to CSA demonstration sites. Simultaneous interpretation was available for the French and English languages.

Climate-smart interventions in agriculture, or climate-resilient agriculture, is increasingly becoming a global climate policy priority. Agriculture is increasingly gaining recognition from climate policy actors for its exposure to climate change impacts and its contribution to climate change. Investment into CSA innovations are also receiving increasing attention from investors. The official climate change policy position for all countries of East Africa is to prioritize adaptation, with mitigation expected to be a co-benefit *if, when and where possible*. The training covered the following topical areas:

Climate-Smart Agriculture as an approach to dealing with the impacts of climate change and variability.

- What is climate-smart agriculture?
- Why climate-smart agriculture?
- What is New? What is Different? How is it different?

Climate-Smart Agricultural (technologies& practices) for: Land, Soil, Nutrients, Water, Energy, Biodiversity, Ecosystems, Landscapes, and Value Chains

- Technologies and practices: Crop production; Soil, Water, Livestock & Energy management; Forestry and agroforestry; Fisheries and aquaculture
- Systems approach: Landscape management; Value chains; Access to finance
- Enabling environment: Index-based insurance; Climate information services; Policy engagement; Institutional arrangements; Gender and social inclusion
- Developing a CSA plan: CSA Knowledge & Information, Situation analysis; Targeting and prioritization
- Management, Scenario Planning, Climate and Agro weather Advisories, and Post-Season Review
- CSA Monitoring, evaluation, and learning
- Climate Finance (for adaptation and mitigation)

There was also a groupwork and a takeaway assignment as follows:

- Groupwork: The Climate-Smart Farm – attributes & intervention strategies assessment (this groupwork was divided into two, to cover a research aspect and an extension aspect)
- Takeaway Assignment: Field Operations – Climate-Smart Aspects of the CSA Concept/ Approach (this assignment was meant to give a glimpse of what to expect and questions to pose during the field tour the following day) – the takeaway assignment is annexed.

Session 1: Opening Session and setting stage

On 4th and 5th June 2022, the workshop was held at the SG Premium Resort Hotel in Arusha, Tanzania. The approach to workshop facilitation included brief PowerPoint presentations followed by groupwork exercises and plenary discussion. The workshop started with a self-introduction session facilitated by Ms. Blaise Amony of ASARECA, followed by a presentation on the Program, Objectives, and Background of the ASARECA CSA Alliance by Mr. Joshua Okonya of ASARECA. The background presentation included details about ASARECA's ACSAA and the CAADP-XP4 project. This background presentation was crowned by keynote statements by the Executive Director of ASARECA (Dr. Enock Warinda) and the Director-General of TARI (Dr. Geoffrey Mkamilo). The inaugural session culminated in a group photo before the morning tea break.

.

Figure 1. CSA training workshop participants in Arusha, Tanzania.

From tea break the workshop went straight to the CSA sensitization training sessions facilitated by Joab Osumba and John Recha, summaries of which are provided in the subsequent sections. The presentations were crowned with one groupwork exercised comprising of two sets of questions, one set for a research-oriented exercise and the other set for an extension-oriented exercise.

Session 2: The CSA Training – Plenary Facilitation

The broad objective of the first presentation session (Introduction to CSA) was to equip participants (learners) with knowledge, skills and attitude to promote research on Climate-Smart Agriculture (CSA) in a sustainable manner

The specific Objectives/Learning Outcomes: By the end of the course, the learners were to be able to:

- Describe the concept of, and justify the need for, Climate-Smart Agriculture
- Explain the need for transition to CSA approaches
- Design innovative Climate-Smart considerations in their agricultural research

The presentation outline for the first session included the following aspects

- Introduction
    - some evidence of climate change
    - Some impacts of climate change in agriculture sector
- Background to "Climate-Smart" Agriculture
- Definition of "Climate-Smart" Agriculture
- Making Agriculture "Climate-Smart"
    - What is New?
    - What is Different?
    - How is it different?

The presentation outline for the second session (on climate-smart technologies & practices in Agriculture) included the following aspects: -

- Land, soil and nutrient management options that sequester carbon in the soil, reduce greenhouse gas emissions and help intensify production while boosting the natural resource base
- Water "demand-supply" management options in the context of increased temperature, both in rainfed and irrigated agriculture
- Energy management options that reduce and/ or remove greenhouse gas emissions across the agri-food system: – i.e., energy use efficiency within the system or along the chain
- Climate-smart crop, livestock, fisheries and aquaculture technologies and practices

Note: The technologies & practices covered productivity, adaptation and mitigation aspects in crops, livestock, fisheries, value chains and landscapes, among others.

The presentation outline for the third session (on climate-smart technologies & practices in Agriculture) included the components of the CCAFS CSA Plan (see Figure 3) as follows: -

- CSA Plan consists of four components: (1) Situation Analysis; (2) Targeting and Prioritizing; (3) Program Support; and (4) Monitoring, Evaluation and Learning (see Figure 1 next slide).
- Within each component of the CSA Plan are information, tools, and techniques to enable action
- The CSA Plan components can be and are being applied both independently and as a package across levels of decision making from subnational to continental scales globally
- In this presentation we describe the concepts underpinning the four-step approach

Figure 2. The CCAFS CSA Plan Outline

Session outline: Climate-Smart technologies & practices in Agriculture

Session 3: Groupwork and Takeaway Assignment

Questions of the two sets of groupwork exercises are presented below:

Groupwork 1 - Relevance of research to CSA

- 1. List the research you have done in the last 3 years
    - Identify attributes of the research which qualify as climate-smart, under: -
        - Attributes responding to temperature/heat stress issues
        - Attributes responding to rainfall/water stress issues
        - Attributes responding to other climatic stress issues
- 2. Identify researchable attributes that could contribute to addressing climate risks under the following thematic areas: -
    - Altering the exposure of target livelihoods to climate risks
    - Reducing the sensitivity of target systems to climate risks
    - Strengthening the adaptive capacity of target communities to climate risks

Groupwork 2 – The Climate-Smart Farm - The concept of CSA farm resilience

- 1. Based on experiences from your area of work
    a) State the characteristic features of a well maintained (less vulnerable, more resilient) farm – Category 1
    b) State the characteristic features of a poorly maintained (more vulnerable, less resilient) farm – Category 2
    c) From the lists generated, identify the characteristic features that qualify to be strategies for climate smart agriculture in each farm
- 2. Based on your group discussion on the two typical farms, further analyze category 1 farm and category 2 farm as follows:
    a) State the extreme weather events which can affect the typical farms

b) From the lists generated, identify the farm features (practices and structures) that are vulnerable to such extreme weather events
c) State what can happens in each of these typical farms when a specified extreme weather event (from the list) occurs
d) Suggest methods that can be applied to help a farmer in category 2 to progressively move to category 1

- 3 Adaptation strategies for
    a) Suggest interventions a farmer can apply to move his/her farm from a climate vulnerable system to a climate resilient system
    b) Suggest interventions for any support the farmer may require from a service provider to help him/her move his/her farm from a climate vulnerable system to a climate resilient system

Takeaway assignment – This assignment comprises a list of Field Operations & Agricultural Resources - for Climate-Smart Aspects of the CSA Approach. The participants are to study each operation and determine what aspect or what component of that operation is climate-smart and how.

Session 4: Fieldwork in Babati District, Manyara region

Day 2 was spent on fieldwork in Babati District, Manyara Region (see Figure 2).
The list of fieldwork sites is provided below:

1 Halla Village Crop-livestock CSA integration, biogas production, and Soil and water management techniques in Nangara Ward.
2 Nangara ward peri-urban framing.
3 Solar powered drip irrigation for tomato production by the Bright Youth Group at Nangara Ward Agriculture Resource Centre
4 Ms. Eva farm in an urban area setting with beekeeping and fish farming, and horticulture.

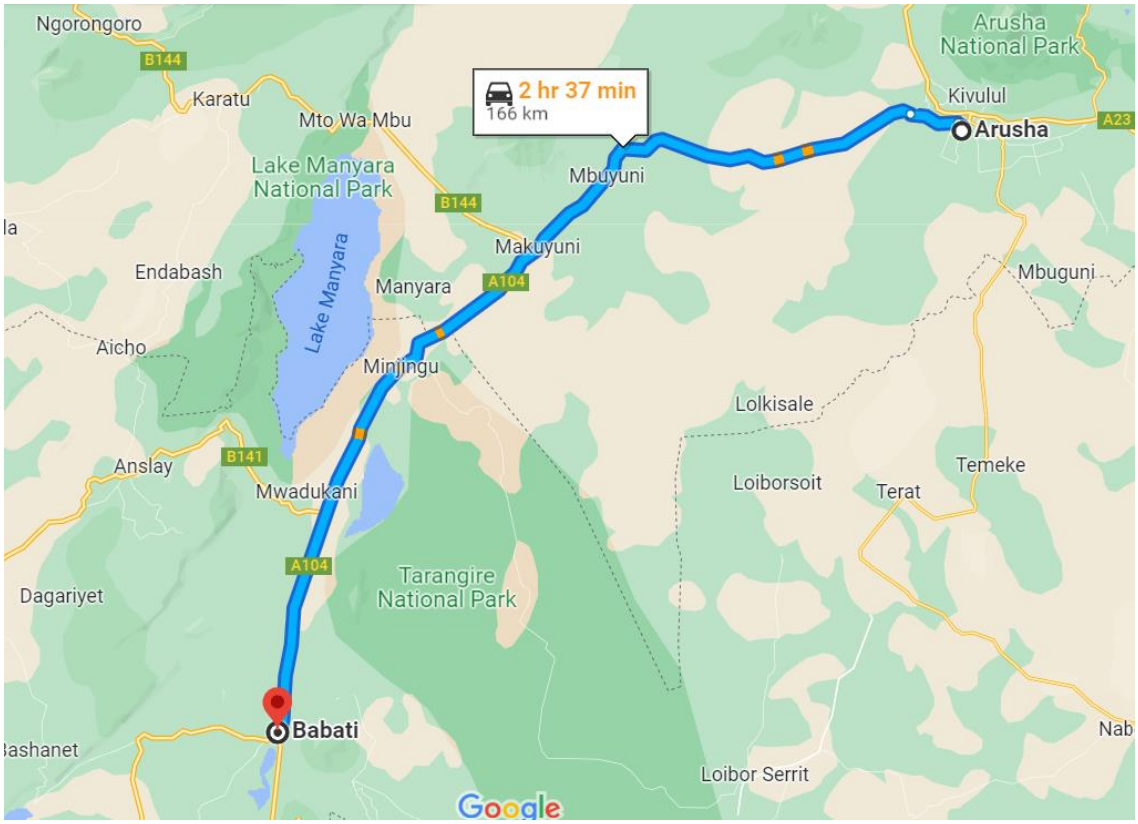

Figure 3. Trip to Babati District, Manyara Region

Key CSA messages at the various field sites were as follows:

Halla village

What to observe	What to look for: Relationship to CSA/ Points to focus on
• Visit famer group at Halla village • Receive information on crop-livestock farming activities performed • Biogas production • Question: What is the extent of crop-livestock integration in the system?	• There is a strong case for crop-livestock system integration in CSA approaches, but crop-oriented initiatives have a weaker crop-livestock integration focus thanlivestock-oriented initiatives: it is possible for a land/crop system to operate through the value chain without a livestock system, but not vice versa. The utilization of animal wastes for bioenergy lessens the dependence on fossil fuels, which can help mitigateclimate change • By-products of household biogas act as organic fertilizers, benefiting agricultural production and lessening the need for external fertilizer input • Biogas helps rural communities improve their access to energy for cooking and electricity, reduces negative health impacts, and enhances livelihoods at the same time

Agriculture Ward Resource Centre

Fieldwork site/ topic/ what to observe	What to look for: Relationship to CSA / Points to focus on
• Visit Youth Bright Group at Agriculture Ward Resource Centre • Receive information related to drip irrigation in tomato production • Tomato production under greenhouse at Peri-urban in Babati Town Council	• Drip irrigation is considered precision farming for efficient water use. Questions to ask could include the state of water availability at the site or in the area, to ascertain the rationale for choosing drip irrigation • Tomato: Tomato is usually produced under irrigation in open field or under greenhouse farming to improve microclimate management . • Greenhouse farming: Greenhouse farming allows for horticultural production across a wide range of AEZs due to improved microclimate management • Peri-urban agriculture (PUA): Very little information is available on climate-smart peri-urban agriculture. Available information shows that PUA preserves unsealed surfaces for the infiltration of surface-runoff and retains water as a flood prevention measure. Local food production resulting in short transport distances potentially lowers emissions and energy demand for cooling perishable products. PUA also creates possibilities to reuse urban organic waste and/or urban wastewater

Ms. Eva farm in the urban

What to observe	What to look for: Relationship to CSA / Points to focus on
• Receive information on Beekeeping and fish farming • activities and other farming activities • Bean field at Eva farm integrated with banana crop and fruit trees • Goats and pigs • Organic farming • Compost manure	• Beekeeping: The priority climate-smart strategy for apiculture is ecosystem-based but can also be landscape-oriented depending on the nature of vegetation across the landscape. However, there is very little information on local impacts and vulnerabilities, which hampers adaptation planning for the system and subsector • Fish farming: see slide on Stage of Intervention (culture fisheries and aquaculture – what to consider) • Common bean: Common bean is more sensitive to heat stress than most other pulses but fixes nitrogen and can contribute reduction in external fertilizer application • Mixed farming: There is a strong case for crop-livestock system integration in CSA approaches, but crop-oriented initiatives have a weaker crop-livestock integration focus than livestock-oriented initiatives: it is possible for a land/crop system to operate through the value chain without a livestock system, but not vice versa. The utilization of animal wastes for bioenergy lessens the dependence on fossil fuels, which can help mitigate climate change • Agroforestry (see next slide): Trees on farms and on the wider landscape increase farm resilience to natural hazards through reduced land degradation, reduced soil temperature, reduced runoff, better humidity retention, reduced evapotranspiration, reduced soil erosion, improved soil quality, increased soil absorptive capacity, and increased carbon sequestration through increased biomass accumulation. • Farm diversity – ask questions on the extent of farm diversity and how it supports farm resilience

Contribution of agroforestry to CSA

- Actions in agroforestry can contribute to all three CSA pillars
  - **Productivity:** Sustainable yields; supplementing diets from tree products; additional income streams
  - **Adaptation:** Shelterbelts, windbreaks, and protection against landslides and floods; Prevent land degradation; increases the absorptive capacity of soil and reduce evapotranspiration; Canopy cover reduces soil temperature, runoff and soil erosion.
  - **Mitigation:** Reduced deforestation and degradation, increased carbon sequestration through increased biomass

Lake Babati

What to observe	What to look for: Relationship to CSA / Points to focus on

• Learning visit on environmental degradation around lake Babati (Visit to the District environmental officer)
• CSA practices at Babati
  • Soil and water management (terraces)
  • Water utilisation techniques (solar powered irrigation)
	• When climate change interacts with a fragile or degraded environment, the impact is more severe than when the environment is resilient or conserved
	• Based on the lessons from the technologies and practices session, observe and ask questions on the triple wins of CSA for soil and water management as agricultural resources

Stage of Intervention to check for climate -smartness of technologies, practices and innovations – crops

1. Climate information sourcing and scenario planning
2. Variety selection and planting material (Objective for production, varieties, quality, etc.)
3. Site selection (soil type, slope, water source etc.)
4. Land preparation (manual, mechanized, types and standards)
5. Soil management (rotation, side and intercrops, erosion control etc.)
6. Nursery practices (optional)
7. Field Planting/ Planting out (time, spacing, etc.) – depends on AEZ
8. Fertilizer application and NUTRIENT REPLENISHMENT (mineral and/ or organic, splitting etc.)
9. Water management (vital) and Irrigation (optional)
10. Weed management and crop maintenance (major weeds with control options; crop maintenance practices)
11. Pest management (major pests with control options)
12. Disease management (major diseases with control options)
13. Harvest management and harvesting procedures (time, quality, standards etc.)
14. Post-harvest handling and management (transport, storage, etc.)
15. Yield potential

Stage of Intervention to check for climate -smartness of technologies, practices and innovations – livestock

1. Seasonal weather timing in the locality (especially for plant-based feed sources, and for disease surveillance)
2. Dairy input supplies
3. Animal husbandry activities (specify them)
4. Growing fodder (refer to fodder crop stages)
5. Making of silage/concentrates
6. Feeding animals
7. Veterinary services/disease control
8. Calf rearing
9. Milking
10. Transportation to collection/aggregation centre
11. Transportation to processing centre
12. Bulking milk
13. Chilling/cooling/freezing milk
14. Processing and Packaging
15. Transportation to processing centre
16. Storage
17. Transportation to wholesaling/ distribution points
18. Delivery to retail market
19. Trading/Sale to consumers
20. Insurance (type and nature of insurance)

Stage of Intervention to check for climate -smartness of technologies, practices and innovations – culture fisheries and aquaculture – what to consider

1. Seasonal weather monitoring and timing in the locality
2. What are the major farm level aquaculture practices on the site?
3. How productive is the fish farm compared to the nearest fish farms?
4. ecosystem-based adaptation/ landscape-oriented adaptation
5. improving efficiency in the use of natural resources under aquaculture
6. improved feeding by reducing waste and improving "Fish In -Fish Out" ratios
7. Reducing losses from disease in aquaculture, especially where rising temperatures adversely affect farmed species
8. reduction of pre-harvest and post-harvest losses
9. What challenges are the farmer facing?
10. How do factors such as rainfall, river flows, lake levels or thermal structure affect aquaculture in the region?
11. water resource management: How is water and other NRs managed and utilised in the fish farm to produce the fish?
12. What is the balance of demand for land, water, energy and feed resources between the aquaculture component of the farm and the other components?
13. For aquaculture, feed is considered the primary determining factor for emission levels, with fertilizers being a secondary factor. How are these resources managed in the system visited?
14. Fuel and energy used to exchange and treat the water, and to power vehicles and equipment also generate carbon dioxide emissions. How is this emissions source dealt with in the site visited?
15. The effects of methane and nitrous oxide in sediments and the water column, which are relatively undetermined, are also potentially important and require further study. What is the possible state these parameters in the site visited?
16. In the processing stages, energy use is the primary determining factor for greenhouse gas emissions. How does this link up for site visited?
17. There are wide variations in emissions depending on local practices and inputs (e.g., species, sourcing, quantity and quality) and operating efficiency. Is it possible to get data on what needs to be known on this for site visited?
18. Water used in food processing may also be an important factor in determining greenhouse gas emissions. Is it possible to get data on what needs to be known on this for site visited?
19. Aquatic foods may travel considerable distances in a range of forms and in various states of perishability. Is it possible to get data on what needs to be known on this for site visited?
20. During transport, greenhouse gas outputs are usually directly related to fuel and energy use in handling. Is it possible to get data on what needs to be known on this for site visited?

Session 4: Next Steps

ASARECA has plans to engage every country team on CSA training within the 14-country mandate area.

Annexes

Annex 1. Workshop agenda

DAY 1: MONDAY 4/07/2022: CLIMATE-SMART AGRICULTURE COURSE 101		
Time (EAT)	**Session**	**Responsible**
08:00 – 08:30	Arrival & registration	Racheal Namuzibwa ASARECA
08:30 – 09:00	Self-introductions	Blaise Amony ASARECA
09:00 – 09:45	Presentation of the Program, Objectives and Expected Outputs	Joshua Okonya ASARECA
09:45 – 10:15	Presentation on the role of CAADPXP4 project in strengthening capacity of its key stakeholders to improve management of CSA platforms	Blaise Amony ASARECA
10:15 – 10:35	Statement by ASARECA Executive Director	Dr. Enock Warinda ASARECA
10:35 – 11:55	Welcome remarks and Official Opening by DG of TARI	Dr. Geoffrey Mkamilo TARI
11:55 – 12:10	Group photo/ Media Interviews	Genevieve Apio ASARECA
12:10 – 11:40	**Tea/Coffee Break**	**Hotel**
11:40 – 12:40	Climate-Smart Agriculture as an approach to dealing with the impacts of climate change and variability. ◎ What is climate-smart agriculture? ◎ Why climate-smart agriculture? ◎ What is New? What is Different? How is it different?	Dr. John Recha& Joab Osumba ILRI
12:40 – 13:30	Q&A/ Discussion session	Dr. Luka Atwok MAFGOSS
13:30 – 14:30	**Lunch Break**	**Hotel**
14:30 -15:30	Climate-Smart Agricultural (technologies & practices) for: Land, Soil, Nutrients, Water, Energy, Biodiversity, Ecosystems, Landscapes, and Value Chains ◎ Technologies and practices: Crop production; Soil, Water, Livestock & Energy management; Forestry and agroforestry; Fisheries and aquaculture ◎ Systems approach: Landscape management; Value chains; Access to finance ◎ Enabling environment: Index-based insurance; Climate information services; Policy engagement; Institutional arrangements; Gender and social inclusion	Dr. John Recha& Joab Osumba
15:30 – 16:30	Discussion	Dr. Bashir M. Ahmed ARC
16:30 – 17:30	◎ Developing a CSA plan: CSA Knowledge & Information, Situation analysis; Targeting and prioritization ◎ Management, Scenario Planning, Climate and Agro weather Advisories, and Post-Season Review	Dr. John Recha& Joab Osumba

	◎ CSA Monitoring, evaluation, and learning ◎ Climate Finance (for adaptation and mitigation)	
17:30 – 18:00	**Coffee Break**	**Hotel**
18:00	**End of Day 1 & Logistics**	**Racheal Namuzibwa**
DAY 2: TUESDAY 5/07/2022: CLIMATE SMART AGRICULTURE PRACTICES &TECHNOLOGIES		
08:00 – 09:00	**Groupwork and Takeaway Assignment:** ◎ Groupwork: The Climate-Smart Farm – attributes & intervention strategies assessment ◎ Takeaway Assignment: Field Operations – Climate-Smart Aspects of the CSA Concept/ Approach	Dr. John Recha& Joab Osumba Dr. Lucy Ssendi TARI
09:00-11:00	◎ Travel from Arusha to Babati District (Introduction/ background on Babati)	Dr. Elirehema Y. Swai
11:00 – 11:20	Courtesy visit to Babati town council (Brief description of Babati- by Dr. Swai)	District Executive Director /District Agricultural Irrigation and Cooperatives Officer Dr. Elirehema Y. Swai
11:20- 11:40	Travel to Halla Village	All Dr. Elirehema Y. Swai
11:40- 12:10	◎ Visit famer group at Halla village ◎ Receive information on crop – livestock farming activities performed. ◎ Biogas production.	Dr. Elirehema Y. Swai
12:10- 12:25	◎ Travel to Nangara ward	All
12:25- 13:00	◎ Visit Youth Bright Group at Agriculture Ward Resource Centre ◎ Receive information related to drip irrigation in tomato production.	Dr. Elirehema Y. Swai
13:00- 13:15	◎ Travel to Ms. Eva farm ◎	Dr. Elirehema Y. Swai
13:15- 14:00	◎ Receive information on Beekeeping and fish farming activities.	Dr. Elirehema Y. Swai
14:00 – 15:00	**Lunch in Babati**	**Hotel**/ Dr. Elirehema Y. Swai
15:00 – 15:30	Learning visit on environmental degradation around lake Babati (Visit to the District environmental officer) CSA practices at Babati ◎ Soil and water management (terraces) ◎ Water utilisation techniques (solar-powered irrigation)	Dr. Lucy Ssendi
15:30- 18:30	Travel back to Arusha	Dr. Elirehema Y. Swai All

18:30	**Tea/Coffee Break and End of Day 2**	**Hotel**
DAY 3: WEDNESDAY 6/07/2022: CLIMATE SMART AGRICULTURE PRACTICES &TECHNOLOGIES		
08:00 – 09:00	Recap of lesson leant from Babati. Discussion on key take home messages on Climate Smart Technologies, adaptation, and Challenges.	Dr. Rose Ubwe and Dr. Meliyo
09:00 – 09:30	Travel to TARI Selian	Dr. Rose Ubwe and Dr. Meliyo
09:30- 10:30	◎ Brief overview of TARI Selian center activities and various Research activities on Climate Smart Technologies	Dr. Rose Ubwe and Dr. Meliyo
10:30- 11:15	◎ Travel to Monduli Juu	Dr. Rose Ubwe and Dr. Meliyo
11:15- 11:35	◎ Courtesy call to Monduli District Council	DED/DAICO
11:35- 13:40	Travel to Olarashi village at Farmer 1, Ms. Glory Emanuel ◎ Visit her two farms and get information on Climate Smart Technology practiced ◎ General discussion and departure.	Dr. Rose Ubwe and Dr. Meliyo
13:40- 14:10	◎ Visit farmer 2, Mr. Abdi Semvua ◎ Get information on copping strategies and nature conservation.	Dr. Rose Ubwe and Dr. Meliyo
14:10- 14:50	◎ Travel to farmer 3 at Mbuyuni Village- Nanja	Dr. Rose Ubwe and Dr. Meliyo
14:50- 15:50	◎ Visit a farmer, Mr. Sanare Losimaye and get information on Climate Smart Technologies practiced, lesson leant and challenges.	Dr. Rose Ubwe and Dr. Meliyo
15:50- 16:30	◎ Travel back to Arusha	Dr. Rose Ubwe and Dr. Meliyo
16:30 – 17:00	**Tea/Coffee Break and End of Day 3**	**Hotel**
DAY 4: THURSDAY 7/07/2022: BENCMARKING EXERCISE TO COCREATE KNOWLEDGE THROUGH MULTI STAKEHOLDER PARTNERSHIPS TO IMPLEMENT CSA INITIATIVES		
08:00 – 09:00	◎ Recap of lesson leant from Monduli. ◎ Discussion on key take home messages on Climate Smart Technologies, adaptation, and Challenges.	Dr. Elirehema Y. Swai Dr. Lucy Ssendi
09:00- 09:45	◎ Travel to Arumeru District	Dr. Elirehema Y. Swai Dr. Lucy Ssendi
09:45- 10:05	◎ Courtesy call to Arumeru District council	All
10:05- 10:30	◎ Travel to TARI Tengeru in Arumeru	All
10:30- 11:45	◎ Visit TARI Tengeru Centre ◎ Tour of demonstration plots (horticultural crops) ◎ Visit training institute for livestock (pasture)	Dr. Elirehema Y. Swai Dr. Lucy Ssendi

	◎ Visit biotechnology lab for banana	
11:45- 13:00	◎ Visit to Artificial Insemination Centre ◎ Receive brief information on various activities conduct in respect to climate change.	Dr. Rose Ubwe
13:00- 14:00	◎ Travel back to the hotel	Dr. Rose Ubwe
14:00 – 15:00	**Lunch**	**Hotel**
15:00 – 16:00	General discussion on lessons learnt from Tengeru and Artificial Insemination Centre	Dr. Joel Meliyo and Dr. Rose Ubwe
16:00- 17:00	**Tea/Coffee Break and End of Day 4**	**Hotel**
DAY 5: FRIDAY 8/07/2022: BENCMARKING EXERCISE TO CO0CREATE KNOWLEDGE THROUGH MULTI STAKEHOLDER PARTNERSHIPS TO IMPLEMENT CSA INITIATIVES		
08:00 – 10:00	◎ Roadmap for documenting the success stories of the 2022 benchmarking exercise ◎ Supporting participants of ASARECA benchmarking exercises to document their success stories & evidence of strengthened capacity	Genevieve& Blaise ASARECA
10:00 – 13:00	◎ Panel discussions by participants of the benchmarking exercise on lessons learnt and how they plan to use this knowledge and skills	Panelists Farmer group leaders and Junior Researchers BUR, CAR, DRC, MDG, RoC, SUD, ERI, CMR Moderator Dr.ElirehemaSwai
13:00 – 14:00	**Lunch**	**Hotel**
14:00 – 14:20	Statement from the NFP Tanzania	Dr. Joel Meliyo TARI
14:20 – 14:40	Statement from the Tanzania representative on the ASARECA CSA Alliance Steering Committee	Dr. ElirehemaSwai TARI
14:40 – 15:00	Way forward & Closing Remarks of the CSA training and benchmarking exercise	Blaise Amony ASARECA
15:00- 17:00	**MARKETING FARMERS PRODUCE** ◎ Meet with RIKOLTO International an organization working in Arusha to increase food safety in grains and horticulture ◎ Travel to the market in Arusha ◎ Learning visit to Kilombero Market ◎ Meeting with women processing cereals in Mbauda	Dr. LucySsendi and Dr. Elirehema Y. Swai Arusha City Trade Officer
17:00 – 18:00	**Tea/Coffee Break and End of Day 5**	**Hotel**

	END OF THE ASARECA CSA TRAINING AND BENCHMARKING EXERCISE	

Annex 1. Takeaway Assignment: List of Field Operations & Agricultural Resources - for Climate-Smart Aspects of the CSA Approach

List of Field Operations & Agricultural Resources: for identifying and describing Climate-Smart Aspects of the CSA Concept/ Approach

Resource management smartness of agricultural approaches and methodologies (using technologies and practices, services, & policies) – Study the matrices below and identify the climate lens (objective) that needs to be taken care of in each farming activity or at each farming stage represented – both for commodity research and factor research. You may add any item that is missing

Table 1a: Climate-Smart Crop Choices

Selected enterprise…… ……

Below is a list of crop farming or value chain activities planned for each enterprise (as they normally take place – e.g., land prep, seed sourcing, planting, weeding, harvesting, etc.)	List a detailed breakdown of each activity, in terms of technologies and practices involved	Identify and list CSA aspects of each technology and practice of the broken-down items (what climate/ weather risk is being targeted?)		
		Productivity (yield gains)	Adaptation/ Resilience (Mitigation of Climate Risk)	Mitigation of Climate Change
1. Seasonal weather timing in the locality (for purposes of on-farm cropping)				
2. Seed sourcing/ planting/starter materials (e.g., crops or forage materials)				
3. Land preparation				
4. Soil nutrient (fertility) management				
5. Planting				
6. Weed control				
7. Pest control				
8. Disease control				
9. Harvesting				
10. Transportation				
11. Processing				
12. Storage				
13. Trading				
14. Insurance (type and nature of insurance)				

Table 1b: Climate-Smart Livestock Choices

Selected enterprise…… ……

Below is a list of livestock farming or value chain activities planned for each enterprise (as they normally take place – e.g., land prep, seed sourcing, planting, weeding, harvesting, etc.)	List a detailed breakdown of each activity in terms of technologies and practices involved	Identify and list CSA aspects of each technology and practice of the broken-down items (what climate/ weather risk is being targeted?)		
		Productivity (yield gains)	Adaptation/ Resilience (Mitigation of Climate Risk)	Mitigation of Climate Change
1. Seasonal weather timing in the locality (especially for plant-based feed sources and for disease surveillance)				
2. Dairy input supplies				
3. Animal husbandry activities (specify them)				
4. Growing fodder (refer to fodder crop stages)				
5. Making of silage/concentrates				
6. Feeding animals				
7. Veterinary services/disease control				
8. Calf rearing				
9. Milking				
10. Transportation to collection/aggregation centre				
11. Transportation to processing centre				
12. Bulking milk				
13. Chilling/cooling/freezing milk				
14. Processing and Packaging				
15. Transportation to processing centre				
16. Storage				
17. Transportation to wholesaling/ distribution points				
18. Delivery to retail market				
19. Trading/Sale to consumers				
20. Insurance (type and nature of insurance)				

Table 1b: Climate-Smart Fisheries Choices (finfish and shellfish)

Selected enterprise…… ……

Below is a list of Fisheries farming or value chain activities planned for each enterprise (as they normally take place – e.g., land prep, seed sourcing, planting, weeding, harvesting, etc.)	List a detailed breakdown of each activity, in terms of technologies and practices involved	Identify and list CSA aspects of each technology and practice of the broken-down items (what climate/ weather risk is being targeted?)		
		Productivity (yield gains)	Adaptation/ Resilience (Mitigation of Climate Risk)	Mitigation of Climate Change
1. Seasonal weather monitoring and timing in the locality (especially for fisheries but also for aquaculture)				
2.				
Capture fisheries				
1.				
2.				
3.				
Culture fisheries and aquaculture				
1. What are the major farm level aquaculture practices on the site?				
2. How productive is the fish farm compared to the nearest fish farms?				
3. ecosystem-based adaptation/ landscape-oriented adaptation				
4. improving efficiency in the use of natural resources under aquaculture				
5. improved feeding by reducing waste and improving “Fish In-Fish Out” ratios				
6. Reducing losses from disease in aquaculture, especially where rising temperatures adversely affect farmed species				
7. reduction of pre-harvest and post-harvest losses				
8. What challenges are the farmer facing?				
9. How do factors such as rainfall, river flows, lake levels or thermal structure affect aquaculture in the region?				
10. water resource management: How is water and other NRs managed and utilised in the fish farm to produce the fish?				
11. What is the balance of demand for land, water, energy and feed				

Below is a list of Fisheries farming or value chain activities planned for each enterprise (as they normally take place – e.g., land prep, seed sourcing, planting, weeding, harvesting, etc.)	List a detailed breakdown of each activity, in terms of technologies and practices involved	Identify and list CSA aspects of each technology and practice of the broken-down items (what climate/ weather risk is being targeted?)		
		Productivity (yield gains)	Adaptation/ Resilience (Mitigation of Climate Risk)	Mitigation of Climate Change
resources between the aquaculture component of the farm and the other components?				
12. For aquaculture, feed is considered the primary determining factor for emission levels, with fertilizers being a secondary factor. How are these resources managed in the system visited?				
13. Fuel and energy used to exchange and treat the water, and to power vehicles and equipment also generate carbon dioxide emissions. How is this emissions source dealt with in the site visited?				
14. The effects of methane and nitrous oxide in sediments and the water column, which are relatively undetermined, are also potentially important and require further study. What is the possible state these parameters in the site visited?				
15. In the processing stages, energy use is the primary determining factor for greenhouse gas emissions. How does this link up for site visited?				
16. There are wide variations in emissions depending on local practices and inputs (e.g., species, sourcing, quantity and quality) and operating efficiency. Is it possible to get data on what needs to be known on this for site visited?				
17. Water used in food processing may also be an important factor in determining greenhouse gas emissions. Is it possible to get data on what needs to be known on this for site visited?				

Below is a list of Fisheries farming or value chain activities planned for each enterprise (as they normally take place – e.g., land prep, seed sourcing, planting, weeding, harvesting, etc.)	List a detailed breakdown of each activity, in terms of technologies and practices involved	Identify and list CSA aspects of each technology and practice of the broken-down items (what climate/ weather risk is being targeted?)		
		Productivity (yield gains)	Adaptation/ Resilience (Mitigation of Climate Risk)	Mitigation of Climate Change
18. Aquatic foods may travel considerable distances in a range of forms and in various states of perishability. Is it possible to get data on what needs to be known on this for site visited?				
19. During transport, greenhouse gas outputs are usually directly related to fuel and energy use in handling. Is it possible to get data on what needs to be known on this for site visited?				

Table 2: Technical support services

Selected farming system (in terms of major enterprises or major activities or both) .....

Question: What can be considered CSA technology or practice or service in the different resources/ concepts/ approaches listed? – pick only the ones you understand. You may add others that you know but are not listed

Thematic areas to interrogate for climate-smartness: Technical support areas that may require attention in a CSA intervention	List/describe the usual farming or value chain activities for each thematic area (as they normally take place under each thematic area)	List a detailed breakdown of each activity, in terms of technologies and practices involved	Identify and list CSA aspects of each technology and practice of the broken-down items (what climate/ weather risk is being targeted?)		
			Productivity (yield gains)	Adaptation/ Resilience (Mitigation of Climate Risk)	Mitigation of Climate Change
1. **Seasonal climate/ weather calendar:** weather timing in a locality; Weather Based Crop Agro-Advisory; Crop Insurance					
2. **Germplasm**: (seed or breed material/ planting material or starter material)					
3. **Soils**: e.g., soil organic matter management on-farm					

Thematic areas to interrogate for climate-smartness: Technical support areas that may require attention in a CSA intervention	List/describe the usual farming or value chain activities for each thematic area (as they normally take place under each thematic area)	List a detailed breakdown of each activity, in terms of technologies and practices involved	Identify and list CSA aspects of each technology and practice of the broken-down items (what climate/ weather risk is being targeted?)		
			Productivity (yield gains)	Adaptation/ Resilience (Mitigation of Climate Risk)	Mitigation of Climate Change
4. **Water**: e.g., water use management on-farm					
5. **Nutrients**: Nutrient management					
6. **Energy:** e.g., Conservation tillage; Solar driven Pumps, Biogas, PUEs, Solar drying, wind driven cyclone roof ventilators, Mechanization – ripper, planter, Thresher, potato harvester etc.					
7. **Biodiversity**: diversification/ biodiversity management on-farm/ agroforestry and on-farm tree management					
8. **Knowledge & Information**: CSA Planning; Sourcing materials; etc.,					
9. **Digitalization/ services**: ICT-based services					
Etc.					

Annex 3: List of participants

ASARECA

ATTENDANCE SHEET

ASARECA - CSA ALLIANCE TRAINING, STEERING COMMITTEE MEETING AND BENCHMARKING

4-8 JULY 2022, SG PREMIUM RESORT ARUSHA TANZANIA

04/07/2022

	NAME	INSTITUTION/COUNTRY	SIGNATURE
1	NIYOKWIZIGIRA LAMECK	ISABU / BURUNDI	
2	Saliou Moussa	IRAD/Cameroun	
3	KANYAMUNEZA Calmène	ISABU/ Burundi	
4	Ayaat A.S. Saleem	Agricultural researche (ARC) sudan	
5	Joab Osumba	ILRI – Kenya	
6	Rose M. Ubwe	TARI Selian-Tanzania	
7	RACHEL N. MUSISI	ASARECA	
8	Kamal Abdala Ammar	Farmer Sudan	
9	JOSHUA OKONYA	ASARECA	
10	Evelyne Mpashe	TARI HQ	
11	Taban James Francis	MAFS South Sudan	
12	NKURUNZIZA Claudette	ISABU / BURUNDI	
13	Athanase Rusanganwa Gyamwesthi	RAB, Rwanda	
14	EDWARD QORRO	DAILY NEWS TZ	
15	Straton Banani	Interpreter	

ASARECA

ATTENDANCE SHEET

ASARECA - CSA ALLIANCE TRAINING, STEERING COMMITTEE MEETING AND BENCHMARKING

4-8 JULY 2022, SG PREMIUM RESORT ARUSHA TANZANIA

04/07/2022

	NAME	INSTITUTION/COUNTRY	SIGNATURE
1	Denden Teklay	NARI/ERITREA	
2	NIVOTIANA Marie Agnes	FOFIFA /MADAGASCAR	
3	DISY Zara Elina	FOFIFA/MADAGASCAR	
4	[illegible] RASOLOFO	FOFIFA/MADAGASCAR	
5	MICHAEL OKOTI	KALRO/KENYA	
6	OBILI ydiki dy Ben-C	IRA/Congo BZV	
7	MONDI IKOBO Sophia	IRA/ Congo(Roc)	
8	Oliver Kishero	Farmer Uganda	
9	Dr. Kountunge Evelia	SRO - NARO Uganda	
10	Dr. Bashir M. Ahmed	ARC/Sudan	
11	Mohamed A. Mohamed	ARC/ Sudan	
12	Dr. Lucie ABA-TOUMNOU	University/CAR	
13	Dr KABONGO TSHIABUKOLE Jean Pierre	INERA/UPN/DRC	
14	Dr PONGI KHONDE GERTRUDE	INERA/UPN/ DRC	
15	Dr. SALI Bourou	IRAD/CAMEROON	

ASARECA

ATTENDANCE SHEET

ASARECA - CSA ALLIANCE TRAINING, STEERING COMMITTEE MEETING AND BENCHMARKING

4-8 JULY 2022, SG PREMIUM RESORT ARUSHA TANZANIA

04/07/2022

	NAME	INSTITUTION/COUNTRY	SIGNATURE
1	BANJABE IL-MATAI	IRAD/CAR	
2	ASHU Augustine TAMBE	CASD/CAMEROON	
3	DOMBETI Irène	Centrafrique	
4	KOYAKOUSALET Patience A	Centrafrique	
5	JOHN WARKER RECHA	ILRI-KENYA	
6	MAKAYA NAKOSSO YEBAS Lydie	IRA/Congo	
7	GEOFFREY MKAMILO	TARI TANZANIA	
8	ENOCK WARINDA	UGANDA ASARECA	
9	WILSON K. HOUNTGU	INTERPRETER	

About AICCRA

Accelerating Impacts of CGIAR Climate Research for Africa (AICCRA) is a project that helps deliver a climate-smart African future driven by science and innovation in agriculture.

It is led by the Alliance of Bioversity International and CIAT and supported by a grant from the International Development Association (IDA) of the World Bank.

Discover more at aiccra.cgiar.org

AICCRA is supported by the International Development Association of the World Bank:

AICCRA Eastern and Southern Africa is led and hosted by OneCGIAR centers:

Alliance

Bioversity International

CIAT

ILRI

CGIAR Research Program on Livestock

IDA International Development Association WORLD BANK GROUP