



Developing capacity to accelerate scaling of climate-smart agriculture in West and Central Africa: Lessons learnt from the regional capacity building initiative

AICCRA Report



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Accelerating Impacts of CGIAR
Climate Research for Africa



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About AICCRA Reports

Titles in this series aim to disseminate interim research on the scaling of climate services and climate-smart agriculture in Africa, in order to stimulate feedback from the scientific community.

Photos

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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. Explore our work at aiccra.cgiar.org

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Abstract

Effective mainstreaming of climate-smart agriculture in agricultural policy and programs requires sustained capacity development. Thus, building and expanding technical capacity of agricultural development actors has the potential of enabling scaling of CSA technologies and innovations. In collaboration with the West and Central African Council for Agricultural Research and Development (CORAF) and in synergy with the Food System Resilience Program (FSRP), AICCRA has organized a regional capacity building workshop on climate-smart agriculture for National Agricultural Research Systems (NARSs) in West and Central Africa regions. This report documents the achievements and lessons learnt from the regional capacity building initiative. Specifically, the training program consisted of four interlinked modules: (i) the climate system, its components, and how its variations affect the earth system, (ii) how to analyze an agricultural system in the face of climate change, (iii) the concept of climate smart agriculture and how to evaluate agricultural practices, technologies and innovations and (iv) how to design, write and implement CSA projects and how to integrate CSA in ongoing projects. The capacity building focused on CSA concepts, and approaches and tools for scaling. About 31% of the 52 participants (30 from West Africa and 22 from Central Africa) were women. The training workshops enabled participants to learn tools and approach to objectively evaluate the climate-smartness of agricultural practices and technologies and how to mainstream CSA in ongoing projects and design a new CSA projects. Participants expressed their intention to apply the new knowledge for integrating CSA in their ongoing projects, developing new CSA projects. To contribute to the acceleration of CSA in West and Central African regions, most of the participants have decided to initiate such a training at country level as next-step activity.

Background

Climate change impacts in Africa threaten productivity of agriculture and food systems, affect food and nutrition security, ultimately jeopardizing contribution of the sector to economic development (Carr et al., 2022; Trisos et al., 2022). Addressing climate change impacts and risks in African agriculture and food systems is imperative for achieving the Sustainable Development Goals (SDGs).

Climate-smart agriculture (CSA) is an approach for developing actions needed to transform and reorient agricultural systems to effectively support development and ensure food security under climate change (Lipper et al., 2014). Through innovative policies, practices, technologies, and financing, CSA approach involves a set of objectives to provide globally applicable principles on managing agriculture for food security under climate change (Lipper et al., 2014). To achieve this goal, the concept encompasses three interlinked objectives: (i) increasing agricultural productivity to support increased incomes and food security (productivity pillar); (ii) adapting and building resilience to climate change across scales (from farm to nation; adaptation pillar); and (iii) reducing greenhouse gas emissions and increasing carbon sinks (mitigation pillar) (Lipper et al., 2014). CSA aims at (i) capturing synergies between productivity, adaptation, and mitigation amidst climate change, and (ii) mainstreaming specificities of these components into sustainable agricultural development policies, programs, and investments at all scale (Lipper et al., 2014).

Even though the CSA approach goes beyond a set of practices and tools, its implementation requires assessment of science-based practices and technologies with the lens of pertinent “triple win” criteria from adaptation, mitigation, productivity (Torquebiau et al., 2018; World Bank, 2013). This major constrains can be justified by the context-specific nature of the CSA approach. Indeed, climate-smart practices and technologies applied in a given location may not be applicable in another, due to the differences in agroecological conditions, market opportunities, and stakeholders’ priorities (Torquebiau et al., 2018). However, CSA options need to be assessed individually to enable choosing adequate ones that are relevant for a particular area and condition. van Vijk et al. (2020) screened about 15 frameworks and tools that can be used to assess CSA practices and technologies and concluded on their divers’ capacities in evaluating the climate smartness of potential agricultural practices and technologies. Beyond tools and methods for evaluating CSA options, the availability of the required human resources for conducting and implementing CSA concept at different scale is crucial.

Strengthening technicians and other stakeholders’ capacities remains a major challenge for the effective design and implementation of agricultural programs. Capacity development refers to a process of change in which people, organizations and institutions improve their performance and refine,

strengthen, and adapt their capacity over time in response to changing circumstances (Oronje et al., 2022; Kumari and Khanduri, 2019). Empowering agricultural development actors will significantly contribute to the scaling of CSA approach. Indeed, Bayala et al. (2021) concluded that the future opportunities for improving the implementation of CSA and Climate Smart Villages (CSV) include capacity building for adequate human resources availability, additional research on existing practices and tools, the development of knowledge product, among others. In addition to the theoretical underpinning of the scaling processes of the CSA approach, the practical aspects should also be transferred to increase the mass adoption of CSA practices and technologies (Zerssa et al., 2021). For Njeru et al. (2016) and Tsegaye et al. (2017), training is an important capacity-building tool to disseminate CSA practices and for agricultural extension workers to pass on their knowledge to the farmers in a targeted manner. Within the framework of the Accelerating Impacts of CGIAR Climate Research for Africa (AICCRA) project funded by the World Bank and implemented by the Alliance Bioversity and CIAT, several capacity building activities are scheduled. Indeed, developing capacity through curriculum development and training is an important part of the AICCRA project (Diop et al., 2022). In collaboration with the West and Central African Council for Agricultural Research and Development (CORAF) and in synergy with the Food System Resilience Program (FSRP), AICCRA has organized a regional capacity building workshop on climate-smart agriculture for National Agricultural Research Systems (NARSs) in West and Central Africa regions. This report documents the achievements and lessons learnt from the regional capacity building initiative. Specifically, the training program consisted of four interlinked modules: (i) the climate system, its components, and how its variations affect the earth system, (ii) how to analyze an agricultural system in the face of climate change, (iii) the concept of climate smart agriculture and how to evaluate agricultural practices, technologies and innovations and (iv) how to design, write and implement CSA projects and how to integrate CSA in ongoing projects. The capacity building focused on CSA concepts, and approaches and tools for scaling. These capacity building workshops were held in (i) Abidjan, Cote-d'Ivoire for West Africa region and (ii) Doula, Cameroon for Central Africa region and were tailored to (i) researchers and technicians of the National Agricultural Research System (NARS) of the 23 countries members of CORAF and (ii) members of the regional alliances on Climate Smart Agriculture (CSA-Alliances). This report presents the highlights of these two regional training workshops, the achievements, perceptions of the participants and lessons learned from these experiences.

Workshops objectives and expected outputs

The main objective of these training workshops was to build capacity of the participants for using appropriate methods and tools to assess the climate-smartness of potential CSA practices and technologies and apply them for developing bankable CSA projects. Specifically, the workshops were designed to:

- Facilitate the exchange of knowledge between actors of NARS and CSA Alliances from their experiences on climate change and climate smart agriculture,
- Train participants on how to use adequate methods and tools for assessing the climate-smart characteristics of potential CSA practices and technologies,
- Build capacity of the participants in designing, writing, and implementing bankable CSA projects,
- Advocacy to encourage stakeholders to make greater use of the knowledge acquired in carrying out their future day-to-day tasks.

It was expected at the end of the training sessions that participants:

- improve their understanding on CSA concept and its recent evolutions;
- be familiarized with methods and tools to evaluate climate smartness of practices and technologies;
- improve their project writing and implementation skills in line with the requirements of CSA and suggest idea of development projects.

Categorization of participants to the various regional training workshops

A total of 52 participants from West and Central African countries were trained on the CSA subject. About 31% of the participants are women (16 women and 36 men). Women were more represented during Central African training workshop than in West Africa (Figure 1). Countries involved in these regional trainings are categorized in figure 2, with 16 from West African region and 4 from Central Africa.

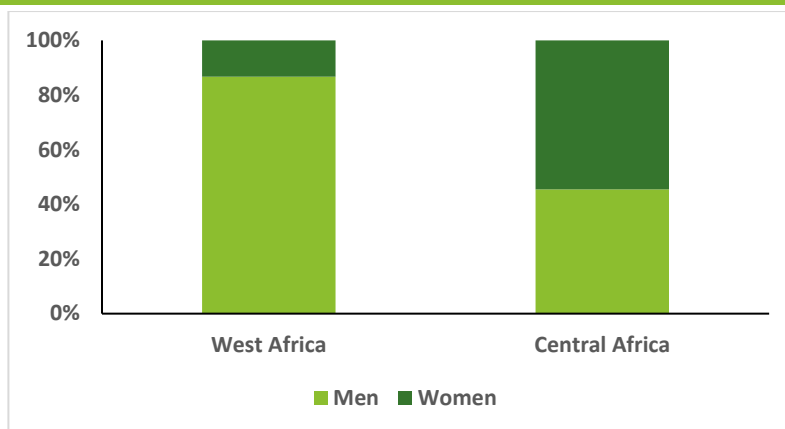


Figure 1: Categorization of participants per genre and sub-region

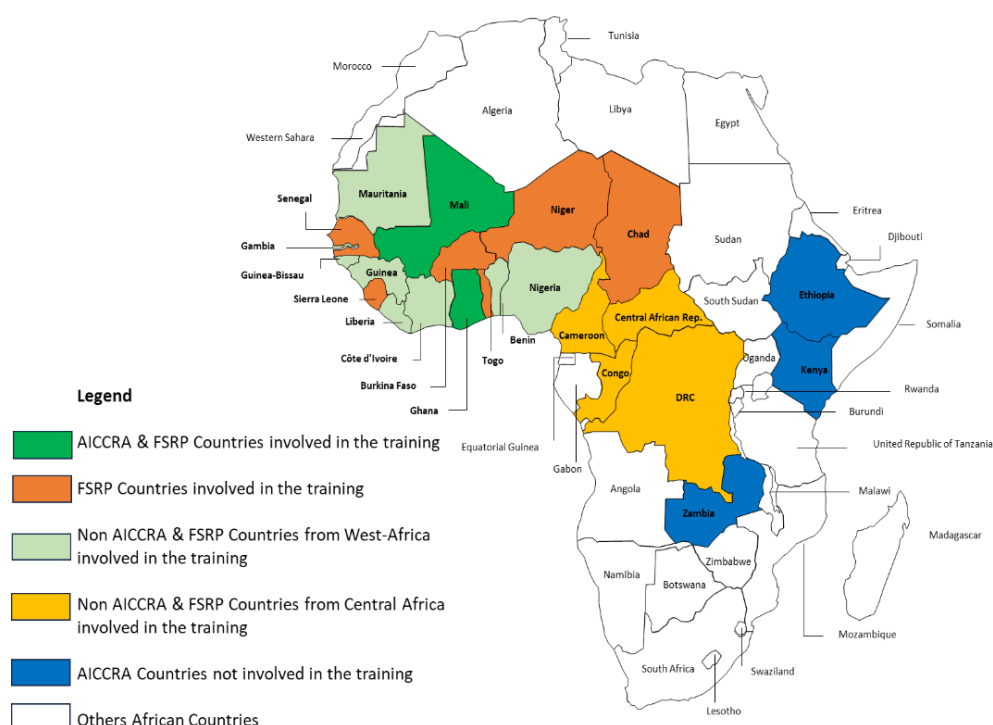


Figure 2: Mapping of countries involved in the training

Participants to the West Africa regional training workshop

The West African training workshop was held from 26 to 28 July 2023 in Abidjan, Cote d'Ivoire. Attendees of this workshop were about 30 participants (04 women and 26 men) (Figure 3) from 15 West African countries, including Benin, Burkina Faso, Côte d'Ivoire, Chad, Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mali, Mauritania, Niger, Nigeria, Senegal, and Togo. The institutions involved are Agricultural Research Council of Nigeria (ARCN), Central Agricultural Research Institute (CARI), Centre National

Center of Agricultural Research (CNRA), CNRADA, Conseil du Coton et de l'Anacarde / Projet de Promotion de la Compétitivité de la Chaîne de valeur de l'Anacarde (CCA/PPCA), Council for Scientific and Industrial Research (CSIR), CSIR- Ghana, INRAB, Institut de l'Environnement et de Recherches Agricoles (INERA), Institut de Recherche Agronomique de Guinée, Institut du Sahel, Institut National de la Recherche Agronomique du Niger (INRAN), Instituto Nacional da Pesquisa Agraria, ISRA, ITRA-CRAF. Participants from FSRP countries also benefited from this training.

Participants to the Central-Africa regional training workshop

The Central African training workshop was held from 6 to 8 September 2023 in Douala, Cameroon. Attendees of this workshop were about 22 participants (12 women and 10 men) from different countries plus trainers and organizers (Figure 4). These participants came from 08 institutions based in 05 countries from central Africa: Cameroon; Central African Republic; Republic of Congo Brazzaville; and Democratic Republic of Congo. Research institutions invited to this training were: ICRA, INERA, IRA, IRAD; plus, one university (Université de Bangui), and two regional institutions such as PRASAC and PROPAC.



Figure 3: Participants from West-Africa



Figure 4: Participants from Central-Africa

Technical content of the CSA regional training workshops

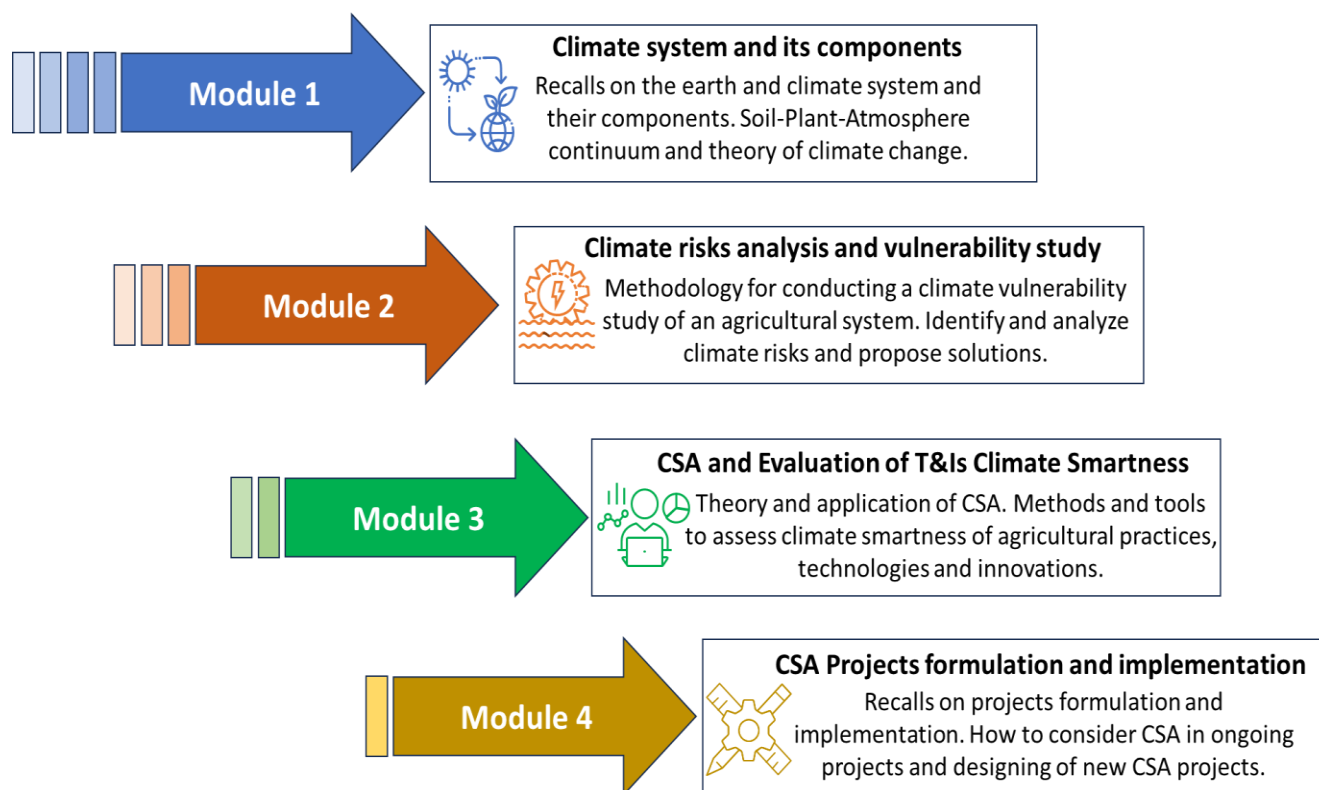


Figure 5: Description of the different modules used during the CSA trainings.

Modules course delivery

Power-Point presentations were prepared and presented for each module. The modules were presented in form of interactive discussions followed by questions and answers. At the end of each module, a summary was made to draw key take-home messages. Table 1 summarizes the content of the various modules, the structure of the training course, the activities, and delivery methods used.

Table 1: Structure of the training course

Activities	Delivery methods
DAY 1	
<ul style="list-style-type: none"> Opening ceremony 	<ul style="list-style-type: none"> Officials
Break time	
<ul style="list-style-type: none"> Climate system and its components: Basics concepts and theory Challenges related to climate change and the need for adaptation measures. 	<ul style="list-style-type: none"> PowerPoint presentation Explanations Short video Questions-Answers

<ul style="list-style-type: none"> Adaptation measures: Importance, categorization, choices et implementation 	
Break time	
<ul style="list-style-type: none"> Diagnostic of an agricultural system in the context of climate change: Climate risks analysis et conduction of vulnerability analysis Theory behind Climate Smart Agriculture (CSA) Brief Story of CSA, evolution, and current state of implementation Success stories of CSA in the World and Africa 	<ul style="list-style-type: none"> PowerPoint presentation Explanations Short video Questions-Answers Succes-stories: from individual experience
<ul style="list-style-type: none"> Success stories of CSA: experiences from each participant and group work per country. Practical session on climate risks analysis Presentation of results from group works 	<ul style="list-style-type: none"> Individual tasks and group work
End of Day 1	
DAY 2	
<ul style="list-style-type: none"> Spotlight on classical methods for evaluating agricultural practices: methods and tools from literature. Presentation of the methodological framework for evaluating the climate-smartness of agricultural practices, technologies, and innovations. Practical Session: Demonstration on the tool Presentation of the results Practical Session: Individual tasks to evaluate one practices, technologies, or innovations of choice. 	<ul style="list-style-type: none"> PowerPoint presentation Explanations Questions-Answers Individual tasks and group work
Break time	
<ul style="list-style-type: none"> Presentation of the ToRs for group work Formation of group Practical Session: group work on application of the tool to evaluate list of practices, technologies, and innovations. 	<ul style="list-style-type: none"> Word presentation Explanations Questions-Answers Individual tasks and group work Assistance from trainers
Break time	
<ul style="list-style-type: none"> Presentation of the results per group Case study of the best-bet CSA practices: from each sub-sector (crop production, livestock, fisheries and aquaculture, forest and agroforestry, environment, value chains development. General discussions 	<ul style="list-style-type: none"> PowerPoint presentation per group Questions-Answers
End of Day 2	

DAY 3	
<ul style="list-style-type: none"> • Projects development and management: theoretical basis • How to conceptualize a bankable CSA project? • Important aspects to consider when writing a CSA project? • How to integrate CSA aspects into ongoing projects? • Initiation to climate-smart villages 	<ul style="list-style-type: none"> • PowerPoint presentation per group • Questions-Answers • Experience sharing
Break time	
<ul style="list-style-type: none"> • Presentation of the ToRs for group work • Formation of groups • Practical Session: CSA projects formulation • Presentation of the Pitch of CSA project • General discussions 	<ul style="list-style-type: none"> • Word presentation • Explanations • Questions-Answers • Group work • Assistance from trainers • Speech: from groups' rapporteurs
Closing ceremony and prizes awarding	Officials
End of the training workshop	

Practical sessions

Hands-on 1: Climate risks analysis and vulnerability study

This practical session related to mastering and analyzing climate risks was carried out in groups. Components of climate vulnerability analysis (exposure, sensitivity, and adaptive capacity) were presented and explained during the theoretical session. The practical work consisted of identifying and categorizing climate risks. Thereafter analyzing each risk based on elements from each vulnerability component (exposure, sensitivity, and adaptive capacity). Results from that 2nd step contributes to determine the vulnerability level of a given area of choice. Depending on the climate hazards identified, each group had to suggest adaptative/resilient measures linked to exposure hazards, and sensitivity factors. These exercises were run with the support of the trainers for individuals and for the groups.

Hands-on 2: Climate Smartness Index (CSI) calculation

A tool was designed using theory behind the multicriteria analysis. The methodological framework and the adapted tool for assessing the climate smartness of agricultural practices were presented to the participants. After explaining the rationale behind using existing tools in the literature for assessing agricultural practices, demonstration was done on the CSA tool. Later, the tool was made available to each participant, who were able to apply it to assess the climate-smart characteristics of the various practices and technologies previously identified. After the individual work, participants were divided into

groups of 4-5 to facilitate harmonization of the results and exchanges of knowledge on the evaluation of the different practices. Potential practices and technologies were selected from the mapping of agricultural practices previously developed (Ganyo et al., 2022). Selected practices and technologies were then evaluated according to their level of contribution to each CSA pillar. This assessment was made using a basket of criteria for each pillar, for which data were collected and used to calculate the Climate Smart Index (CSI). The CSI were used for comparison and prioritization of the practices and technologies. Additionally, participants were informed that the CSI alone is not enough to make a final decision on the smartness of a practice or technology, it is equally important to examine the scores of the different CSA pillars, which must guide for better chosen a practice or technology.

CSA projects formulation and presentation of pitch

Results from previous activities and presentations were used to identify challenges and formulate projects idea in line with CSA. Group activities were related to CSA project idea development (climate challenges, project development objectives, solutions/main activities) and presentation (pitch of CSA project). The pitches were defended in front of a “panel of investors” composed of three members from the trainers and organizers to act as potential climate financial institutions. CSA practices and technologies to be promoted in their CSA projects ideas by each group are presented in table 2. Erratic rainfall and droughts are the main climate vulnerability factors identified by the groups with Climate Information Services (CIS) and improved crop varieties as the suggested CSA practice, technologies, or actions (Table 2).

Table 2: Potential CSA actions identified by participants to be promoted in their CSA projects.

Group Number	West Africa		Central Africa	
	Climate vulnerability factor	Suggested CSA practice/technologies or actions	Climate vulnerability factor	Suggested CSA practice/technologies or actions
Group 1	Erratic rainfall	Climate information services Scaling of CSA technologies through Innovative Platforms	Shorten of rainfall season and agro-pastoralism	Improved crop varieties Water conservation practices Agricultural wastes processing and valorization
Group 2	Rainfall deficits	Improved crops varieties Climate Information Services	Droughts in livestock production and fishery sector	Forage production and conservation Observatory on the management of agro-sylvo-pastoral and aquaculture sector
Group 3	Climate variabilities leading to loss of crop	Improved crops varieties Climate Information	Erratic rainfall and water deficit	Improved crop varieties Mulching and agroforestry

	productivity	Services		
Group 4	Drought spells	Precision agriculture Agroforestry	Changing of rainfall patterns	Climate Information Services Updating of agricultural calendars Improvement of agricultural extension services
Group 5	Deforestation	Climate Information Services Agroforestry (Cocoa + Annual crops)		
Group 6	Droughts	Improved crop varieties Irrigation		

Workshops achievements and perceptions of the participants

West Africa regional training

Among participants from West Africa only 33% have attended in the past at least one training workshop on climate smart agriculture. This category of participants therefore has the basic knowledge about CSA before the training, while the majority (67%) have never attended a CSA course, but some of them have heard about it. First, the course provided theoretical background on CSA to cover the need to comprehend CSA for most of the participants. While this stood as revision for the other 33%, and later deepened in the subject by providing means and tools for evaluating the climate smartness of agricultural practices and technologies for the benefits of all the participants. This is the main reason why most of the participants showed their satisfaction (45% satisfied and 52% very satisfied) after the training sessions (Figure 6). To verify this achievement, it was asked participants to mention three key new knowledge and/or skills they have gained from this training workshop. Cloud words made from their responses revealed that "*evaluation*", "*CSA*", "*practices*", "*projects*", "*climate*", were the most common words mentioned by the participants (Figure 7). In terms of key knowledge, speeches analysis revealed that (i) climate smart index calculation, and (ii) integration of CSA in projects were the main two skills gained by the participants from the training workshop.

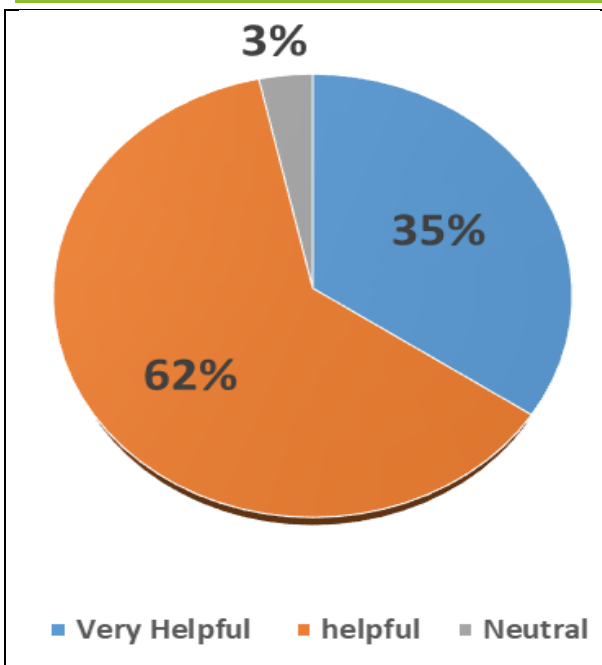


Figure 8: Impressions of the participants from West-Africa about the training materials

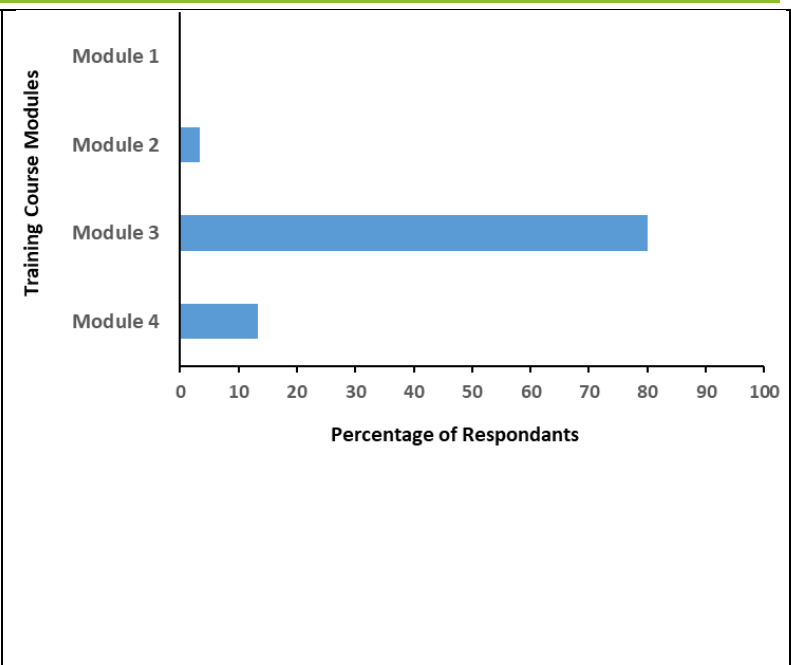


Figure 9: Perceptions of the participants from West-Africa about the content of the training course

Dr Daminatou Sanogo
ISRA, (SENEGAL)



Dr. Komlan Ablede
ITRA, (TOGO)



“I really appreciated this training course in the sense that we often hear about climate-smart agriculture. It's the first time I've had this kind of training, and I was able to acquire some very important new knowledge that will enable me to be much more competent in my day-to-day activities.”

Dr Musa, Musa
ARCN (Nigeria)



“This training unveils me the opportunity to see how it is done. It is something that it did not take me much time to understand because I already know the process that is involved only that I have not gotten the opportunity to do it practically like I have done here. And with my colleagues also, it has added value to this learning because different questions different case studies from countries added to my understanding.”

Dr. Edith Nnemeka
ARCN, (NIGERIA)

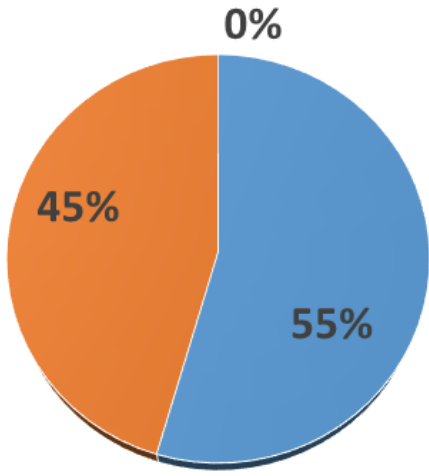



“I am so happy to be here. This training on elaborating Climate Smart Agriculture (CSA) and mainstreaming it into many projects I have gained a lot because every day we are facing various aspects of climate change.”

Figure 10: General impressions of the participants from the West-African training workshop

Central Africa regional training

Among participants from Central Africa, only 14% have attended in the past at least one training workshop on climate smart agriculture. This category of participants therefore has the basic knowledge about CSA before the training, while the majority (86%) have never attended a CSA course, but some of them have heard about it. Hence, the course, first provided theoretical background on CSA to cover the need to comprehend CSA for most of the participants. While this stood as revision for the other 14%, and later deepen in the subject by providing means and tools for evaluating the climate smartness of agricultural practices and technologies for the benefits of all the participants. This is the main reason why most of the participants showed their satisfaction (45% satisfied and 55% very satisfied) after the training sessions (Figure 11). To verify this achievement, it was asked participants to mentioned three key new knowledge and/or skills they have gained from this training workshop. Cloud words made from their responses revealed that “evaluation”, “CSA”, “projects”, “practices”, and “climate” were the most common words mentioned by the participants (Figure 12). In terms of key knowledge acquired, speeches analysis revealed that (i) climate smart index calculation, (ii) climate change vulnerability analysis and, (iii) how to design, develop and implement CSA projects were the main skills gained by the participants from the training workshop.

 <p>0% 45% 55%</p> <p>■ Very satisfied ■ Satisfied ■ Neutral</p>	
<p>Figure 11: Satisfaction level of participants about the training in Central-Africa</p>	<p>Figure 12: Key words of the knowledge acquired by the participants after the training in Central-Africa</p>

These results were achieved because of the technical and organizational efforts and preparation put in place by the two institutions (CORAF and Alliance Bioversity & CIAT) through facilities made available by the AICCRA project. This enabling environment favored the group of trainers by providing them suitable conditions for the preparation of the training materials. Indeed, training materials were found to be helpful and easily understandable by all the participants (100%) (Figure 13). Participants found the content of the course interesting with more emphasis on module 3 (climate smart agriculture concept and evaluation of climate smartness) (Figure 14). The overall impressions of the participants (figure 14) after the training workshop were positive and encourage for taking future actions within the framework of CSA in Central Africa. However, some points of improvement were suggested by the participants. These suggestions are related to (i) increasing the duration of the training (from 3 to 5 days), (ii) focus more on the practical sessions.

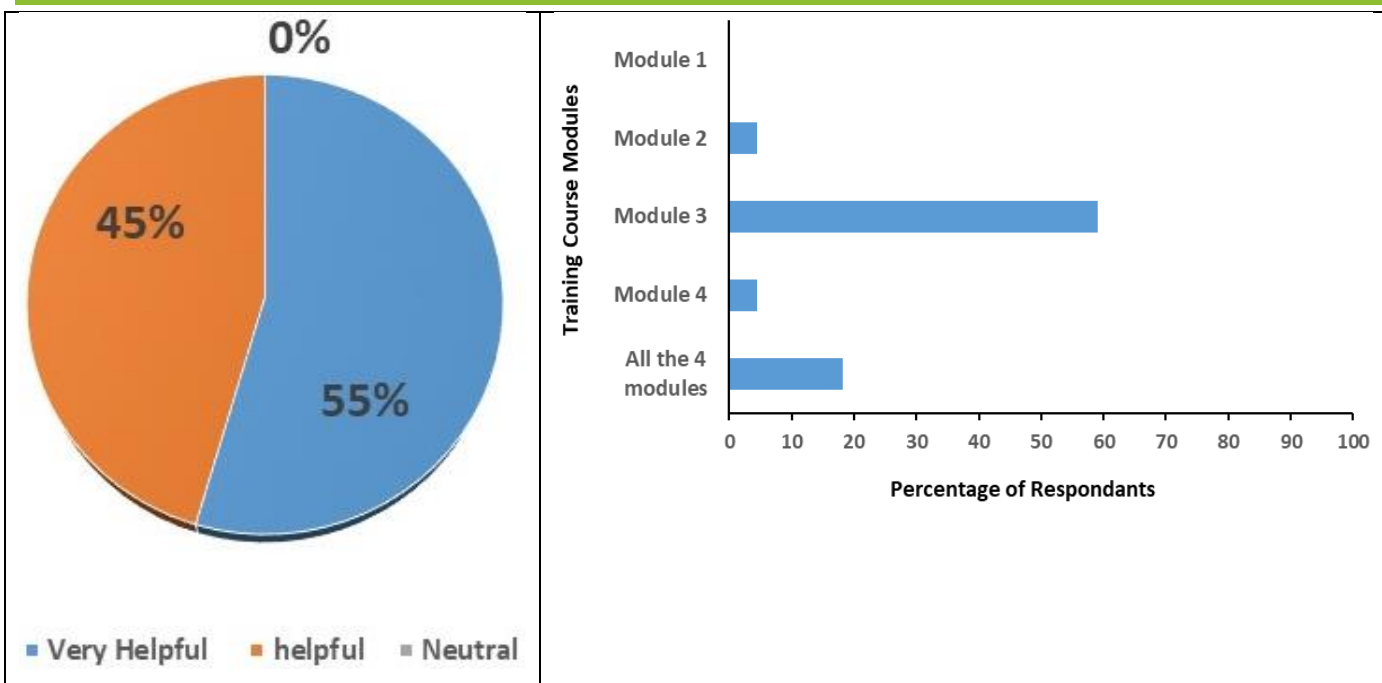


Figure 13: Impressions of the participants from Central-Africa about the training materials

Figure 14: Perceptions of the participants from Central-Africa about the content of the training course

Dr. Hortense Mafouasson
IRAD, CAMEROON



Dr. Didier Begoude
IRAD, CAMEROON



"This training workshop is a particular opportunity that we must seize to improve our skills, especially in terms of the innovations, that have been developed in the field of climate-smart practices, so that we can disseminate them and share them with the stakeholders in the rural communities."

Dr. Aba Toumnou
University of Bangui, RCA



Dr. Claude Bibalou
IRAD, CONGO



"Today, thanks to the experts and trainers who have given us this very important knowledge on CSA, knowledge, we have been able to put our finger on this practical and try to apply it ourselves, and take it as methods for coping with climate change."

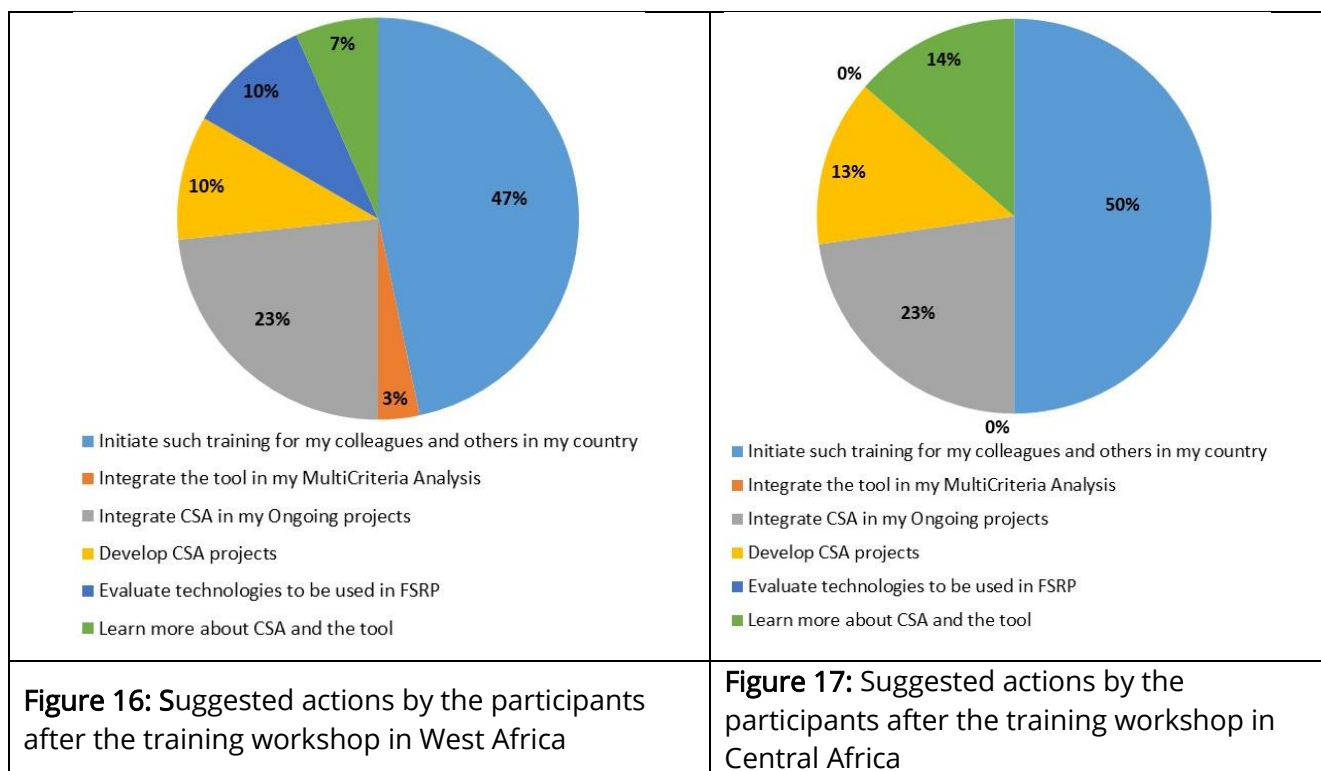
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Figure 15: General impressions of participants from the Central-African training workshop

Lessons learned and ways forward

West and Central Africa farming systems facing exacerbated effects of climate change need adequate and sustainable solutions. Solutions proposed by the CSA concept based on the triple win advantages from its pillars (productivity-adaptation-mitigation) can be used to significantly overcome climate change in the region. Accelerating the scaling process of CSA requires filling the gap of knowledge by building capacities of stakeholders starving for practical knowledge on CSA. These regional training workshops on CSA significantly contribute to filling this gap. Moreover, bringing (i) researchers working in the national agricultural research system from different countries and background and (ii) stakeholders and members of the regional CSA alliances, significantly contribute to strengthen networking and partnerships among these various actors. Practical knowledge acquired from these training courses can be used to prioritize CSA practices and technologies. Such prioritization will lead to identifying suitable CSA practices for scaling. These regional training workshops also fall in line with CORAF and partners objectives for revitalizing regional alliances on CSA (Kpadonou et al., 2023). In addition, the workshops provided skills for integrating CSA into the ongoing projects, thereby speeding-up the scaling of the concept. As mentioned by the participants in the satisfaction survey, it is now easy to rationally show and justify the choice of CSA practices and technologies, especially when designing and developing new

projects. Therefore, it is expected in the few coming years development projects tailored toward climate-smart agriculture in the regions.



In terms of next steps at regional level, CORAF has planned a series of activities to the benefit of the CSA regional Alliances. Among these, is the initiation and development of a regional CSA projects to be hosted and implemented by the Alliances (Kpadonou et al., 2023). After the regional meetings for the co-construction of the elements to be used for the development of such regional projects, CORAF has now recruited a group of consultants to start this activity in Central African region, while that of West Africa is scheduled for 2024. At individual level, participants have decided to (i) initiate such kind of training to their colleagues and other stakeholders at country level, (ii) integrate CSA in their ongoing projects, (iii) develop CSA projects, (iv) continue learning about CSA and tools. National training suggested by the participants, can be facilitated by their institutions, and supported by their government and/or any other technical and funding organization. Integrating CSA in ongoing projects will contribute to reshape activities planned for those projects and if applicable looking for additional funding. It is obvious that knowledge gained from these regional training workshops will significantly facilitate development of new projects.

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