

Senegal Climate Risk Management for Agriculture Curriculum Design Workshop

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Workshop Report



AICCRA
Accelerating the Impact of CGIAR
Climate Research for Africa



Senegal Climate Risk Management for Agriculture Curriculum Design Workshop



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Accelerating Impact of CGIAR Climate Research for Africa (AICCRA)

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Accelerating Impacts of CGIAR Climate Research in 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 AICCRA's work at aiccra.cgiar.org

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Acronyms

AICCRA	Accelerating the Impact of CGIAR Climate Research for Africa project
ANACIM	<i>Agence Nationale de l'Aviation Civile et de la Météorologie</i>
ANCAR	<i>Agence Nationale de Conseil en Agriculture Rurale</i>
CGIAR	Consultative Group for International Agricultural Research
EAS	Agricultural extension and advisory service
ICRISAT	International Crops Research Institute for the Semi-Arid Tropics
IRI	International Research Institute for Climate and Society
ISRA	<i>Institut Sénégalais de Recherches Agricoles</i>
UADB	<i>L'Université Alioune Diop de Bambey</i>
USSEIN	<i>Université du Sine Saloum El-Hâdj Ibrahima Niass</i>

Introduction

The Accelerating Impacts of CGIAR Climate Research for Africa (AICCRA) project aims to benefit millions of smallholder farmers in Senegal and five other target countries through climate information services and climate smart agriculture. Strengthening the capacity of next users, particularly agricultural extension and advisory service (EAS) providers who work to support farmers in Senegal and five other target countries, is crucial to achieving this goal. Therefore, AICCRA gathered the key EAS partners and stakeholders in a 5-day workshop, held in Dakar, 5-9 December 2022, to:

- design a curriculum to strengthen the capacity of EAS providers to incorporate climate services in their work with Senegal’s farmers and agropastoralists, and
- formulate a roadmap for implementing the curriculum.

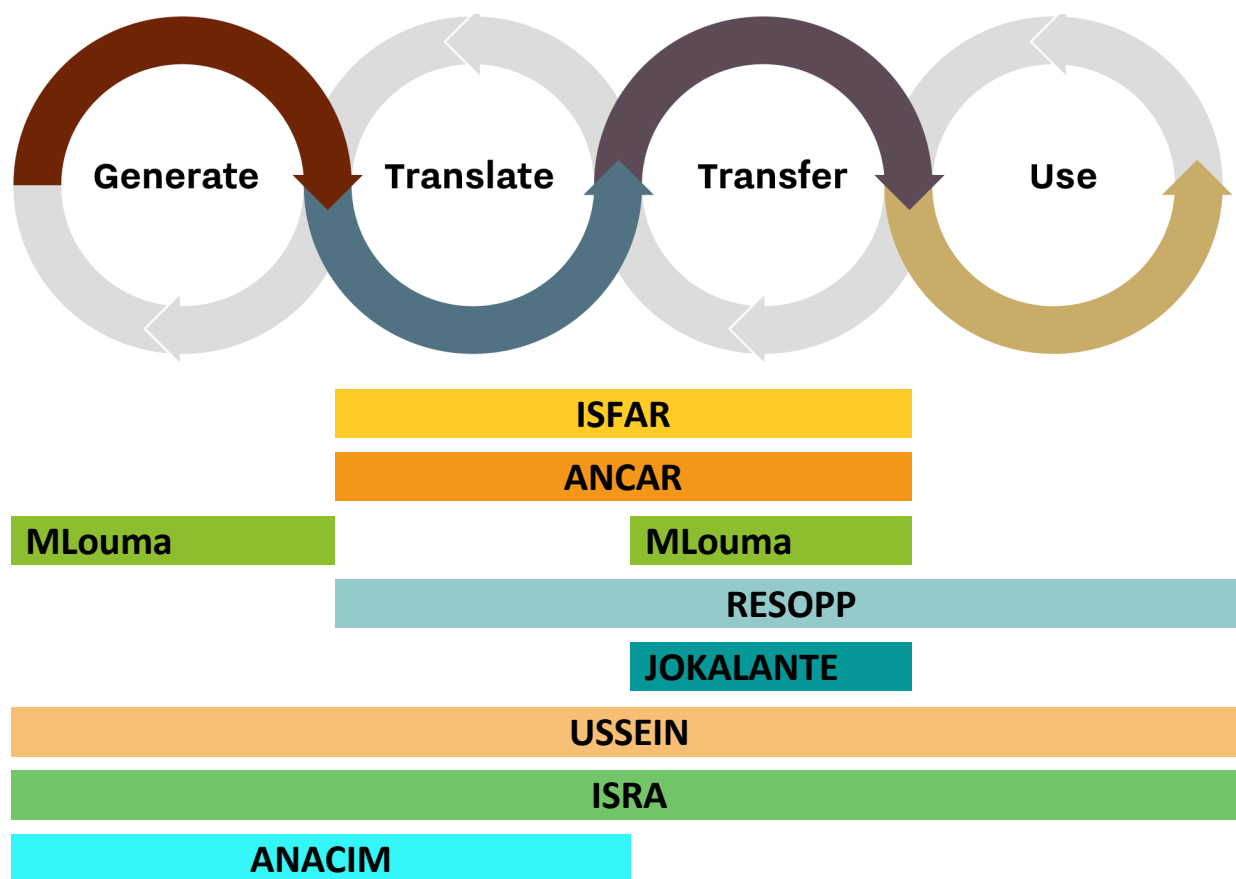
The workshop built on and advanced a collaborative curriculum design and planning process that was initiated in an earlier workshop, *AICCRA-Senegal Workshop on Capacity Development Priorities for Climate Services* (Dakar, 9 May 2022). During the May workshop, participants from ANACIM, ANCAR, ISRA, UADB, USSEIN, JOKALANTE, MLouma, Peace Corps, Trees for the Future, ICRISAT and IRI identified two priority target groups for curriculum development:

1. Professionals currently providing agricultural information and advisories to farmers, to accelerate the uptake of climate services in agriculture; and;
2. Students pursuing agriculture-oriented degrees to train future professionals capable to take advantage of climate services in their work

The participants recognized that strengthening capacity of professionals who interact with farmers aligns with the near-term priority of the AICCRA project, whereas university curriculum would meet a longer-term sustainability goal. Participants at this workshop agreed to continue the process of collectively defining priorities and a strategy for strengthening capacity of professionals through a *Working Group on Capacity Development for Climate Risk Management in Agriculture*. The working group met biweekly from September to November 2022. The working group made significant progress in discussing key actors in Senegal’s complex EAS landscape, clarifying profiles of professionals engaged in public- and private-sector agricultural advisory services, and exploring their potential training needs. However, a more focused and concentrated effort was needed to finalise the curriculum design and a roadmap for its implementation.

The workshop in December convened 15 experts (1 female, 14 males) from organizations in charge of climate information and agricultural advisories dissemination in Senegal such as ANCAR, RESOPP, MLouma or Jokalante as well as Agricultural Departments from the University Alioune Diop in Bambey and professionalization-oriented University of Sine Saloum El-Hâdj Ibrahima Niass (USSEIN), ANACIM and ISRA (see Appendix B Participant List). The participating institutions span all four pillars of the framework for climate services, as illustrated in Figure 1.

Figure 1. Four Pillars of Climate Services: Participating Institutions



Workshop Objectives and Process

The workshop agenda (Appendix A) was designed to achieve the following objectives:

1. Define the target audience and learner profile that AICCRA will prioritize in its 2023 capacity strengthening activities.
2. Identify and prioritize competencies and foundational knowledge needed to equip the target audience to support Senegal’s farmers with climate services.
3. Present and review existing curriculum materials to design a short-course curriculum that will provide priority competencies and foundational knowledge by identifying:
 - existing content that aligns with identified priorities;
 - relevant materials that require adaptation to Senegal’s needs; and
 - gaps that require development of new materials.
4. Formulate a roadmap for development and implementation of the curriculum, with AICCRA support.

The first day covered introduction to the workshop objectives and process, review of prior activities and decisions, and two key consensus decisions:

1. Priority target audience and learner profile; and
2. Format and duration of a training course.

Days 2-5 were devoted to detailed curriculum design grouped under four general topics:

1. Basic climate knowledge and concepts;
2. Climate information available for crop and animal agriculture;
3. Climate information for farm decision making; and
4. Communicating climate information and supporting its use.

To streamline curriculum design discussions, the workshop took advantage of the availability of an EAS professional training curriculum, *Climate Risk Management for Agricultural Extension* (CRMAE) that the IRI team co-developed with Ethiopia's agricultural extension system under the ACToday and AICCRA projects. Within each topical session, facilitators summarized Ethiopia CRMAE content, and invited participants to summarize any materials that they considered relevant. Participatory activities then guided participants to:

- Identify required competencies and foundational knowledge related to the session topic;
- Structure content needed to develop those areas of knowledge and competency; and
- Identify what content could be used or adapted from available materials and what required new content development.

The final day of the workshop focused on finalizing the overall curriculum structure, and a roadmap for its development and implementation under the AICCRA project. Workshop participants reviewed preliminary decisions about curriculum content and structure made during days 2-4, and refined the overall structure. The roadmap was designed through a plenary discussion taking into account the timing of the AICCRA support to curriculum development and implementation, and the steps necessary to carry it out, including: development of supplementary materials, Training of Trainers, and the roll-out of the pilot trainings before the start of the rainy season with the Ramadan scheduled for 03/22-04/20/2023. Participants agreed on the appropriate length, timing and modalities of the training itself, then discussed the logistics and timeline of the training of trainers as well as a strategy to scale up and ensure durability of the effort.

Workshop Outcomes

Target Audience and Learner Profile

The workshop began with a participatory exercise to elicit information on the learner profile of the targeted audience. The participants identified that the target audience would be agricultural technicians (CAR - Conseil Agricole et Rural ; Conseil agricole a l'exploitation familiale -CAEF) from a variety of institutions providing EAS in Senegal, including ANCAR, RESOPP, MLouma, and JOKALANTE.

Most participants indicated education levels of the target audience as ranging from the formal end of high school exam (Baccalauréat - BAC) or formal end of middle school exam (Brevet de Fin d'Etudes Moyennes – BFEM) + 3 years of formal technical or professional education to BAC +3 i.e., end of undergraduate college cycle. The consensus was to target the curriculum to the level of BAC or BFEM+3 so that it be accessible to a broad audience. Similarly, the participants noted that BAC is often the minimum level required when these organization hire those professionals. Participants identified a count of over 500 individuals that could potentially be trained.

Prioritized Competencies

Competencies are defined as necessary knowledge and skills needed for the target audience to fully support Senegal's farmers to effectively use climate services to management climate risk in agriculture. To identify the competencies that should be built in the curriculum participants were asked to write out their ideas and post them on walls. After presentations of the sample curriculum content developed for the Ethiopia context, they were then asked to organize the ideas developed by the group into three functions:

1. Understand and explain,
2. Analyze and diagnose, and
3. Act.

Competencies were developed for each of the four following topics:

- Topic 1: Basic climate knowledge and concepts;
- Topic 2: Climate information available for crop and animal agriculture;
- Topic 3: Climate information for farm decision-making;
- Topic 4: Communicating climate information and supporting its use.

The detail of the competencies falling into the three functions in each of the modules are summarized in the Table 2.

Curriculum Content

The workshop facilitators reviewed the Climate Risk Management for Agricultural Extension presentation materials as an example of curriculum that already exists, developed for the Ethiopian context. This effort helped to identify existing content that aligned with the identified priorities as well as relevant materials that require adaptation to Senegal's context and gaps that require the development of new materials. These findings are summarized in Table 3.

Workshop participants emphasized that training needs to be deeply grounded in local context and experience, and needs to provide learners with practical skills. This can be illustrated with two examples. First, there was a strong consensus that Climate Basics and Climate Information for Agriculture should be expanded to include translation into climate impacts on crops and livestock. This was captured in the additional sections to the topics. Second, other solutions and practices focused on Senegal and including the entire value chain as opposed to only crop production need to be presented as examples. Diversification as a tool to reduce risk was discussed at length and there was a wide consensus that concrete examples should be used rather than graphs, e.g., using watermelon (drought resistant) in combination with maize (requiring more water). Extension agents are used to the diversification but need to understand it in the context of climate risk reduction with concrete examples.



Table 2. Priority competencies identified for AES provider climate risk management curriculum

<i>Topic 1. Basic climate knowledge and concepts</i>	
Understand and Explain	<ul style="list-style-type: none"> ○ Describe and explain the basic concepts: weather, climate, climate change, forecasting, weather monitoring ○ Describe agroclimatic zoning
Analyze and Diagnose	<ul style="list-style-type: none"> ○ Determine the risks and impacts of weather/climate on production ○ Identify the risks of the different zones
Act	<ul style="list-style-type: none"> ○ Advise on the choice of technologies, practices, timing, location etc.
<i>Topic 2. Climate information available for crop and animal agriculture</i>	
Understand and Explain	<ul style="list-style-type: none"> ○ Explain and perform key climate analyses ○ Know the different sources of climate information
Analyze and Diagnose	<ul style="list-style-type: none"> ○ Search for relevant climate information ○ Interpret climate information to understand how it may impact activities in each area
Act	<ul style="list-style-type: none"> ○ Identify climate risks ○ Explain climate risks to producers
<i>Topic 3. Climate information for farm decision-making</i>	
Understand and Explain	<ul style="list-style-type: none"> ○ Explain the climate risk that influences local decisions ○ Describe the agricultural options for dealing with the risks ○ Know how to calculate the economic consequences in relation to the context and integrate them into the farm expense budget ○ Know how to identify the objectives, constraints and practices of the producer ○ Explain risk management tools ○ Master decision support tools
Analyze and Diagnose	<ul style="list-style-type: none"> ○ Identify the best risk management options ○ Estimate the return and profit of different options in relation to climate risk ○ Translate complex information into simple recommendations
Act	<ul style="list-style-type: none"> ○ Advise producers on their options based on climate risk ○ Use decision support tools ○ Use ICT tools

Topic 4. Communicating climate information and supporting its use

Understand and Explain

- Master the different channels of sharing climate information
- Know how to use digital and audiovisual media, ICT tools, message processing and use, including feedback systems
- Know how to write and transmit information
- Know how to translate information into local languages
- Know how to interpret ANACIM zoning
- Be aware of the different communication tools and techniques adapted to farmers and to the topic

Analyze and Diagnose

- Translation, transfer, communication
- Know where to find climate information and understand its window of usability based on accuracy and relevance for decisions
- Adapt content to the target profile
- Know how to interpret climate information to inform food security and income generation strategies

Act

- Disseminate adaptation planning options, plan interventions
- Display weather information (table, figure), make illustrated presentations
- Master the different communication tools and mechanisms: posters, radio, charts, smartphone platforms
- Know how to organize learning and knowledge sharing workshops
- Communicate with agricultural producers and general public

Participants also highlighted the need for tools, e.g., for exploring suitability of a given variety and on-farm practices under specific climatic conditions, that would be easy to manipulate. Such tools are being developed (e.g., SIMAGRI, iSAT) but are not operational yet. This highlighted the need for faster operationalization of research results and tools for larger audience.

Implementation Roadmap

The workshop culminated with a session to define the roadmap and implementation timeline for the curriculum development, training of trainers, and training for the target audience. It was determined that several pilot trainings with the target audience should be implemented in advance of the 2023 growing season, which begins in June/July. It was highlighted that agents will not be available after mid-May and that Ramadan is scheduled March 22-April 20, 2023. This timing drives the timing for the training of trainers. It was noted that the medium term goal would be for agents to spontaneously consult seasonal forecast information each year before the beginning of the growing season.



Table 3. Curriculum design, and content adjustments relative to Ethiopia Climate Risk Management for Agricultural Extension.

Sections	Sub-sections	Content to remove	Content to add
MODULE 1 : BASIC CLIMATE KNOWLEDGE AND CONCEPTS			
Basic climate knowledge and concepts	<ul style="list-style-type: none"> • Basic concepts • Average climate and variability • Spatial and temporal dimension • Spatial and temporal scales • What defines the local climate • Characteristics of the climate of Senegal • Agroclimatic zones and their characteristics 	<ul style="list-style-type: none"> • Remove strong reference to ENSO 	<ul style="list-style-type: none"> • Agroclimatic zones of Senegal and their characteristics (isohyets, isotherms, seasonal cycle, variability), leveraging existing content from ANACIM.
Agro-ecological climate zones and risks	<ul style="list-style-type: none"> • Review of technical data sheets • Identification of the risks of the different areas 		<ul style="list-style-type: none"> • Specific examples of climate risks in different areas. • Practical exercise to compare climate conditions with specific plant requirements using varietal datasheets from ISRA/CORAF-MITA/IFDC/WAPP-Senegal. • Case study on livestock (RESOPP), and on rainfed agriculture (ISRA).
MODULE 2: CLIMATE INFORMATION AND TOOLS AVAILABLE FOR AGRICULTURE			
Basic calculations in climate science	<ul style="list-style-type: none"> • Practical exercises on climate analysis • Different sources of climate information • Maproom navigation 		<ul style="list-style-type: none"> • ANACIM statistical modules
Finding and interpreting climate information	<ul style="list-style-type: none"> • Interpretation of the different types of climate information 		<ul style="list-style-type: none"> • Impacts on the activities in each agro-ecological zone • Develop a concrete case for a zone, with climatic information (humidity or drought), impacts on a farm with a portfolio of activities (University of Bambey, USSEIN)
Anticipating response to climate constraints in agriculture and livestock value chains			<ul style="list-style-type: none"> • Dynamic varietal map

Sections	Sub-sections	Content to remove	Content to add
MODULE 3: UNDERSTANDING CLIMATE SENSITIVE DECISIONS IN THE AGRICULTURE			
3.1 Climate-sensitive decisions in the agriculture and livestock value chains	<ul style="list-style-type: none"> • Different objectives and constraints for different farmers • The role of climate in agricultural and livestock decisions • Comparing climate conditions with varietal data sheets • The importance of timing • Describing risky decisions with decision trees 		<ul style="list-style-type: none"> • Example using SIMAGRI (ISRA, AICCRA) • Example on balancing potential economic benefits and risk using example of fishermen (ANACIM) • Example of maize and watermelon (University of Bambey and RESOPP)
3.2 Decision-making under uncertainty	<ul style="list-style-type: none"> • Risk aversion and related concepts • Analysis of decisions when preferences are unknown • Tools and data to analyze risky decision problems 		<ul style="list-style-type: none"> • Example of other parts of the value chain (ANCAR and University of Bambey)
3.3 Options for managing climate risk at the farm level	<ul style="list-style-type: none"> • Technologies across the value chain (incl. harvesting, storage, processing, preservation, marketing) • Adaptive management based on forecasts • Diversification • Index-based agricultural insurance • Enterprise budgeting • SIMAGRI • Key messages for agents 	<ul style="list-style-type: none"> • Remove mathematic formulas, too complicated (slide 18) • Simplify slides 19-20: currently too complicated, need to be illustrated with concrete examples such as maize and watermelon 	<ul style="list-style-type: none"> • Group work: identify examples across the value chain • Emphasize the link between agriculture and livestock in climate risk management • Include IRI-FIST index insurance game played with farmers as a resource • Include content on enterprise budget from IRI, add information about farm operating budget from ANCAR/MLouma/Jokalante. Add example about how climate information can inform operating budget (RESOPP) • Include content on SIMAGRI (IRI, ISRA) • Examples on the value chain (ANCAR) • Include clear description of what the agent is supposed to understand for himself, and what he is expected to communicate to producers

Sections	Sub-sections	Content to remove	Content to add
MODULE 4: COMMUNICATING CLIMATE INFORMATION AND SUPPORTING ITS USE			
4.1. Strategies for communicating climate services at the rural level	<ul style="list-style-type: none"> • Different communication needs for different types of producers • Exposure and vulnerability • Different communication needs for weather and climate information • Participatory communication process • Digital communication channels • Combining climate service communication channel • Importance of the communicator 		<ul style="list-style-type: none"> • Exposure and vulnerability • Differentiated climate impacts on and needs of minority groups • Participatory communication process: add PIPO (planning interventions by objective) • Importance of authority, trust and length of communication flows; importance of the role of the communicator • Digital and audiovisual media, ICT tools, message processing and use, including feedback systems (Jokalante)
4.2. Training and planning workshop for seasonal forecasts with the participation of producers	<ul style="list-style-type: none"> • Introduce the workshop objective and key concepts • Understanding past variability • Introduce the exceedance probability graph • Understand a seasonal forecast as a change in the historical probability distribution. • Introduce the current seasonal forecast • Plan operational management adjustments based on the forecast. • Scaling strategy (spatial and temporal scale) • Monitoring and evaluation of training • Lexicon in main languages 	<ul style="list-style-type: none"> • Remove El Niño content 	<ul style="list-style-type: none"> • Include a preliminary step asking for producers' expectations, in advance if possible. • Add a group activity on operational management adjustments based on the forecasts: summarize risk, management strategies in a simple table

Training of trainers. There was a strong consensus that the trainers will be the participant group itself as several institutions (e.g., ANCAR, RESOPP) have their own training programs, participate in some (e.g., ANACIM) or can add nodules in their curricula (e.g., UADB, USSEIN). Availability of participants and the length of the ToT were debated at length.

- **Duration:** 10 days. Begin on a Monday continue to the following Wednesday, with a break on Sunday
- **Number of people trained:** Same as workshop participants (15)
- **Who:** Same as workshop participants
- **Where:** TBD, non-Dakar preference
- **When:** March 2023

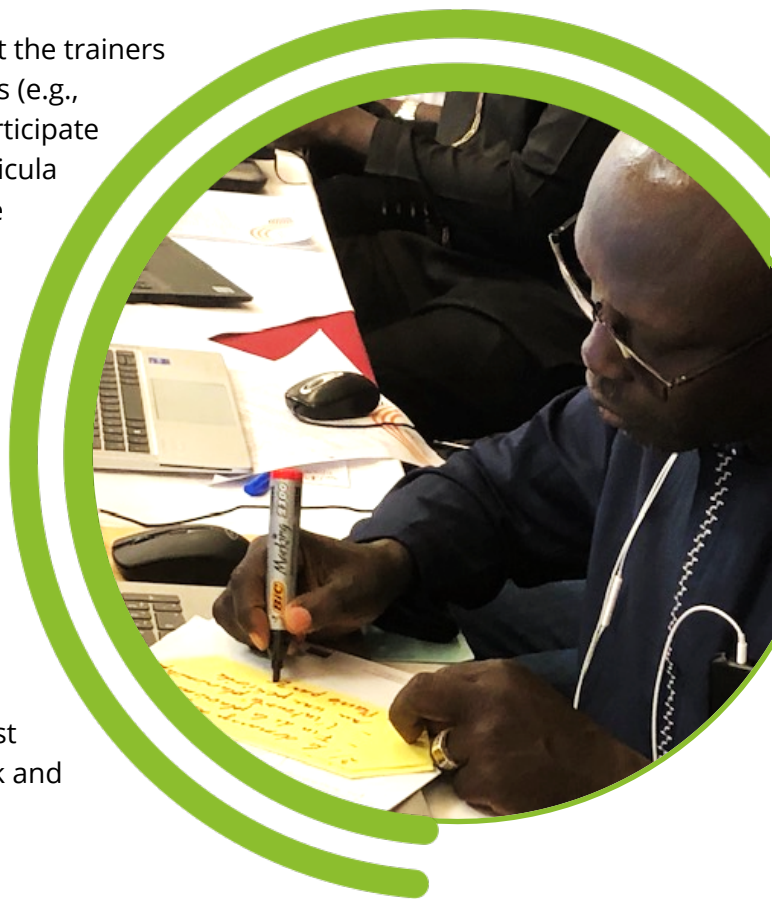
Training of agents. There was a consensus among the participants to pilot the training with more than one test group in parallel to gain more experience and feedback and involve more trainers, before the end of the project.

- **Duration:** 2 weeks
- **Number of people trained:** 3 pilot trainings for 25 agents each. Training will cover 3 of Segal's 6 agroecological zones. There will be 3 groups of 3-4 facilitators per agro-ecological zone.
- **Who:** Rural development/advisory technicians in the field plus other staff from participating entities.
- **Where:** 3 different agroclimatic zones where AICCRA is present.
- **When:** Before next growing season.

Content Development. The additional elements and the amendments to the current Ethiopian curriculum were discussed in details. Given the timing of the ToT and pilot workshops the following actions and timelines were agreed upon.

- **What:** (a) Reference Guide; (b) Facilitator's guide; (c) Visual presentation aids (slides).
- **When:** First draft of final content will be completed by the end of January 2023. Content will be finalized by the end of February 2023.
- **Who:** IRI to finish adapting the content of the Ethiopian content to Senegal taking into account comments from the participants.

Facilitator feedback workshop. After three initial pilot trainings of agents occur in May, the participants identified that it would be valuable to hold a feedback workshop to discuss the experience with the AICCRA team, and make adjustments or improvements as necessary and to share best practices.



Appendices

APPENDIX A: Workshop Agenda

Time	Topic
Monday, 5 December	
Morning	Workshop opening <ul style="list-style-type: none"> Workshop objectives, overview, context AICCRA training goal and strategy
	Report of working group progress
Afternoon	Key decisions <ul style="list-style-type: none"> Target audience and learner profile Format, duration of a training course
Tuesday, 6 December	
Morning	Topic 1: Basic climate knowledge and concepts <ul style="list-style-type: none"> Presentation of available materials Discussion on required competencies, foundational knowledge, structure, alignment of available materials with needs, gaps that require new materials
Afternoon	Topic 2: Climate information available for crop and animal agriculture <ul style="list-style-type: none"> Presentation of available materials Discussion on required competencies, foundational knowledge, structure, alignment of available materials with needs, gaps that require new materials
Wednesday, 7 December	
Full day	Topic 3: Climate information for farm decision making <ul style="list-style-type: none"> Presentation of available materials Discussion on required competencies, foundational knowledge, structure, alignment of available materials with needs, gaps that require new materials
Thursday, 8 December	
Full day	Topic 4: Communicating climate information and supporting its use <ul style="list-style-type: none"> Presentation of available materials Discussion on required competencies, foundational knowledge, structure, alignment of available materials with needs, gaps that require new materials
Friday, 9 December	
Morning	Summarize and finalize overall curriculum design <ul style="list-style-type: none"> Outline Available content Required new content Types, formats of materials needed
	Roadmap for 2023: <ul style="list-style-type: none"> Tasks and time line: Material development Training of trainers Implementation Resources Partner roles
	Workshop close

APPENDIX B: Workshop Participants

No	M/F	Organization	Location (Senegal)
1	M	Jokalante	Keur Massar
2	M	Agence Nationale de Conseil Agricole et Rural (ANCAR)	Dakar
3	F	Agence Nationale de Conseil Agricole et Rural (ANCAR)	Méouane, Thiès
4	H	l'Institut Supérieur de Formation Agricole et Rurale (ISFAR) / L'Université Alioune Diop de Bambey (UADB)	Bambey
5	H	RESOPP	Thiès
6	H	RESOPP	Thiès
7	H	International Crops Research Institute for the Semi-Arid Tropics (ICRISAT)	Thiès
8	H	MLouma	Dakar
9	H	Université du Sine Saloum El-Hâdj Ibrahima Niass (USSEIN)	Kaolack
10	H	Civil Aviation and Meteorology Service in Senegal (ANACIM)	Dakar
11	H	L'Université Alioune Diop de Bambey (UADB)	Bambey
12	H	Université du Sine Saloum El-Hâdj Ibrahima Niass (USSEIN)	Kaolack
13	H	Institut Sénégalais de Recherches Agricoles (ISRA)	Dakar
14	H	Centre d'Etude pour l'Amélioration de l'Adaptation à la Sécheresse (CERAAS) / Institut Sénégalais de Recherches Agricoles (ISRA)	Thiès
15	H	International Crops Research Institute for the Semi-Arid Tropics (ICRISAT)	Dakar



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