



Workshop Report

Training on Climate Risk Management in Agricultural Extension (CRMAE) for Ethiopian Meteorological Institute (EMI) staff from Regional Meteorological Service Centres (RMSC)

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

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Abstract

A six-day training workshop was implemented from September 1-7, 2022, in Adama, Ethiopia by the International Research Institute for Climate and Society (IRI) in collaboration with the Ethiopian Meteorological Institute (EMI) and Ethiopian Ministry of Agriculture (MoA). The workshop, which was organized as part of the World Bank's Accelerating the Impact of CGIAR Climate Research for Africa (AICCRA) project, brought together 18 Ethiopian Meteorological Institute (EMI) staff from nine Regional Meteorological Service Centres (RMSC) to be trained on the topic of Climate Risk Management in Agricultural Extension (CRMAE). The major objectives of the training were to create a better enabling environment and improved RMSC capacity to support regional, zonal, and woreda-level Ministry of Agriculture staff, including Development Agents, to take advantage of the best-available weather and climate information and adapt recommended technology packages to local conditions.

Keywords

Ethiopia; agriculture; climate change; climate variability; food security; education; extension approaches; capacity development; climate-smart agriculture; climatology; monitoring systems; forecasting; participatory approaches; Goal 2 Zero Hunger

About the Authors

Amanda Grossi is a Senior Staff Associate at the International Research Institute for Climate and Society (IRI) of the Columbia Climate School. Within the AICCRA project, she is the IRI's Regional Manager for Africa where she coordinates the IRI's activities at the country-level in Ethiopia, Kenya, Zambia, Ghana, Mali, and Senegal. In this role, she provides critical support to the development and delivery of capacity building initiatives and digital innovations, including those associated with the IRI's Enhancing National Climate Services (ENACTS) approach.

Tufa Dinku is a Senior Research Scientist at the International Research Institute for Climate and Society (IRI) of the Columbia Climate School. Within the AICCRA project, he is the IRI's Team Lead for Ethiopia, Kenya, Zambia, Ghana, and Mali and also the lead for the IRI's Enhancing National Climate Services (ENACTS) initiative which has improved the availability, access, and use of climate data and information in more than 20 countries.

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The Climate Risk Management in Agricultural Extension (CRMAE) curriculum, and its associated teaching and learning materials represents a collaborative effort, made possible by input and iterative feedback from Ethiopia's Ministry of Agriculture (MoA), the Agricultural Technical Vocational Education and Training (ATVET) program, the Ethiopian Meteorological Institute (EMI), and the Ethiopian Institute of Agricultural Research (EIAR). This curriculum, and its shortened adaptation used in this workshop, were jointly prepared and organized through the Adapting Agriculture to Climate Today, for Tomorrow (ACToday) Columbia World Project and the AICCRA project.

Highlights



Enabling the regional staff of the Ethiopian Meteorological Institute to support regional, zonal, and woreda-level Ministry of Agriculture staff, including Development Agents, to take advantage of the best-available weather and climate information and adapt recommended technology packages to local conditions is critical for **building systems-level resilience**.



From September 1-7, 2022, a **six-day training** on the topic of Climate Risk Management in Agricultural Extension (CRMAE) was implemented in Adama, Ethiopia by Ministry of Agriculture and Ethiopian Meteorological Institute staff previously trained by the AICCRA project on this curriculum.



A total of **18 Regional Meteorological Service Centre staff from 9 regions were capacitated** on the CRMAE material, including how to access and use pertinent products from the Ethiopian Meteorological Institute's broad suite of online maproom visualizations and analytical tools.



The Regional Meteorological Service Centre staff who have been trained on the CRMAE curriculum will **share the knowledge, skills, and resources** gained from the training to other regional staff members, following the training of trainers (ToT) approach.



The training had participation from nine regional meteorological service centres in Ethiopia which are important in **extending the reach of climate information to the most local levels** and integrating it within the agricultural extension system and on-farm decision-making processes.



The **competency-based, skills-focused curriculum** covered four major topics: Climate Basics, Climate Information Products and Tools Available for Agriculture, Climate-Sensitive Agricultural Decisions, and Integrating Climate Services into Agricultural Extension.

1: Introduction

Improvements in the weather and climate information available in Ethiopia provide new opportunities for agricultural extension personnel to help farmers better manage the risks that they face, and to adapt recommended technology packages to local climatic conditions.

As such, a ten-day course called Climate Risk Management in Agricultural Extension (CRMAE) was previously developed through collaboration between the AICCRA and Adapting Agriculture to Climate Today, for Tomorrow (ACToday) projects, which targeted agricultural extension staff of the Ministry of Agriculture with the knowledge and skills to manage climate risk and take advantage of the best-available climate information from the Ethiopian Meteorological Institute (EMI) in their roles.

However, in order to create a positive enabling environment for their Ministry of Agriculture counterparts, it became readily apparent as well that it would be vital for EMI staff at the most local levels through Regional Meteorological Service Centres (RMSC) to be able to trained on the same curriculum such that they can support such agricultural extension staff, when necessary.

Participants listen to opening remarks on the first day of the training.



As such, a six-day course, which represents a shortened version of the ten-day course developed for Development Agents (DAs) and Extension Officers so that they access, understand and incorporate climate information into their professional work, was implemented in Adama, Ethiopia with 18 RMSC staff from 9 regions. Those regions and staff are summarized below:

List of Participating RMSC and Staff #s		
No.	RMSC region	Number attended
1	West Oromia	2
2	East and Central Oromia	2
3	Gambella	2
4	Afar	2
5	Benishangul	2
6	West Amhara	2
7	East Amhara	2
8	Somali	2
9	SNNPR	2

Due to high staff turnover rates within the EMI (Lennard et al., 2018) and to encourage peer-to-peer learning, two staff were invited from each RMSC to partake in the training. Staff from the RMSC for the Tigray region did not partake in the training due to the ongoing conflict there.

Moreover, while an intentional effort was made to have equal gender representation amongst participants, including a written request in the training invitation letter that one of two participants from each RMSC be female, low numbers of female staff within the RMSC staff, reflective of a wider persistent gender gap within science, technology, engineering and math in Ethiopia (Margo, 2014; Melak & Singh, 2021; Molla & Cuthbert, 2014), resulted in just two of these 18 staff being women. See **Box 1** for a full list of participants.

This shorter version of the CRMAE curriculum targeted these 18 agrometeorologist staff from the various RMSC to enable them work with and support DAs, other agricultural professionals, and farmers to integrate climate services into agricultural extension activities and other relevant practices.

In terms of the content of the material:

Module 1: Climate Basics provides foundational knowledge about climate concepts, data and common data analyses, and forecasts. A basic understanding of climate will provide necessary background and context for subsequent learning about the types and use of climate information to improve agricultural risk management. It also prepares participants to address client farmers' questions and concerns about weather and climate. The module includes probability concepts that are foundational for understanding and managing risk, and for interpreting and using climate information to support risk management.

Module 2: Climate Information Products and Tools Available for Agriculture provides an overview of relevant weather and climate information products and services that are [or will soon be] available through the National Meteorology Agency (NMA). It teaches participants how to navigate and use relevant historical, monitored and forecast information products available through NMA's web page and online Maprooms.

Participants reflect on some of the concepts and resources shared during the training.

Module 3: Climate-Sensitive Agricultural Decisions strengthens participants' understanding of the interaction between climate and farm decision-making. It enables them to perform basic analyses of climate-sensitive farm management decisions under uncertainty. A number of factors, in addition to crop and livestock productivity, influence farm management decisions, particularly at seasonal and longer time scales. To equip participants to provide appropriate support and guidance to their farmers, the module builds understanding of factors that lead to different management decisions by different farmers and under different climate conditions.

Module 4: Integrating Climate Services into Agricultural Extension equips participants to bring climate services into the services that they provide their client farmers. Building on learning from the other three modules, Module 4 equips them to lead farmers in a participatory seasonal planning workshop, informed by historical and seasonal forecast information. The course concludes with development and presentation of plans to integrate climate services into extension activities with participants' client farmers. These plans will address: information and support needed for key climate-sensitive management decisions; differing needs of different types of farmers; communication, training and support strategies; annual calendar of climate service activities; and monitoring and responding to feedback.



2: Approaches and Methods

The workshop aimed to enable the regional staff of the EMI to support regional, zonal, and woreda-level Ministry of Agriculture staff, including Development Agents, to take advantage of the best-available weather and climate information and adapt recommended technology packages to local conditions.

Towards this end, the workshop objectives were to:

- 1) Provide RMSC staff with foundational knowledge on climate and agricultural decision-making;
- 2) Introduce RMSC staff to practical online tools available through EMI to analyse climate-related risks;
- 3) Help RMSC staff to identify and guide MoA subnational staff on the use of appropriate weather and climate information to support agricultural decisions; and
- 4) Improve the ability of RMSC staff to communicate complex climate information to their counterparts in the agricultural sector as well as directly to farmers, to ultimately enhance the integration of climate services into agricultural extension activities.

In a positive demonstration of the local ownership and sustainability of previous training efforts by the AICCRA project in 2021 (Grossi et al., 2021) and 2022 (Grossi et al., 2022), this training of RMSC staff was led by one person from the Ethiopian Meteorological Institute and two people from the Ministry of Agriculture previously trained on the CRMAE curriculum. See **Box 2** for a full list of the trainers.

The training followed a six-day schedule covering each of the four modules (Climate Basics, Climate Information Products and Tools Available for Agriculture, Climate-Sensitive Agricultural Decisions, and Integrating Climate Services into Agricultural Extension) and culminated in a participatory exercise and group presentations. See **Section 6** for the full agenda of the workshop.



Dr. Tufa Dinku of the IRI shares the vision and objectives for the six-day training.

3: Key Results and Findings

All 18 RMSC staff from the 9 regions were capacitated on the CRMAE material, including how to access and use pertinent products from the [EMI's broad suite of online maproom visualizations and analytical tools](#).

Even though the participants were all meteorologists by background and training, they found the Climate Basics module (Module 1) very useful for their own understanding and for being able to explain such fundamental concepts to non-experts.

They also appreciated the knowledge and skills imparted by the training on the topic forecast interpretation and the practical guidance given on how to explain forecasts to farmers.

It is important to note that this was the first time the regional meteorologists were exposed to climate-agriculture concepts in Modules 3 and 4, which they appreciated very much.

In terms of constructive criticism for the course, the trainees from the Somali and Afar Regions complained about the fact that there were no Maproom products specific to the livestock sector available from the EMI's broad suite of maprooms or in the training content, as these are the dominant livelihoods of these regions.

All participants gave presentations about how they would incorporate the learnings from the training into their own work operationally.

“This training is very helpful to strengthen the capacity of experts to provide timely and accurate climate services and agricultural advisories at the **grassroots level.**”

—Fetene Teshome, Director of the Ethiopian Meteorological Institute



4: Conclusions and Recommendations



In terms of next steps, the RMSC staff who have been trained on the CRMAE material will return to their respective regions to pass along the knowledge, skills, and resources gained from the training to other regional staff members, following the training of trainers (ToT) approach.

The participants also asked for training on the other climate information services and tools co-developed with the IRI such as the Climate Data Tool (CDT) and Ethiopia's recently launched NextGen Agricultural Drought Monitoring and Warning System (NADMWS), which is a country-level adaptation of the FAO's global Agricultural Stress Index System (ASIS) enabling any user to freely monitor agricultural areas or "hotspots" with a high likelihood of water stress at the national, regional, zonal and woreda (district) levels (Grossi, 2022).

5: List of Participants and Trainers

Box 1

List of Trainees: CRMAE for EMI RMSC Training (September 1-7, 2022)

No.	Name	Gender	Organization/ Structure	Position/Title
1	Andamlak Kifle	M	West Oromia RMSC	Assistant Researcher
2	Mekuwanint Tariku	M	West Oromia RMSC	Researcher
3	Tadesse Mekonnen	M	Gambella RMSC	Researcher
4	Shimelis Shiferaw	M	Gambella RMSC	Assistant Researcher
5	Buzunesh Tsigie	F	Afar RMSC	Data and Climatology Expert
6	Dereje Baye	M	Afar RMSC	Agrometeorology Expert
7	Wondim Adugnaw	M	Benishangul RMSC	Researcher
8	Fentahun Temasgen	M	Benishangul RMSC	Assistant Researcher
9	Addis Zemen Amogne	M	West Amhara RMSC	Researcher
10	Begizew Getu	M	West Amhara RMSC	Researcher
11	Yimmer Mohammed	M	East Amhara RMSC	Agrometeorology Team Leader
12	Tenaw Ababu	M	East Amhara RMSC	Researcher
13	Mohammedamin Issa	M	East and Central Oromia RMSC	Researcher
14	Radiya Aliye	F	East and Central Oromia RMSC	Researcher
15	Gedamu Getinet	M	Somali RMSC	Researcher
16	Asmerom Birehane	M	Somali RMSC	Assistant Researcher
17	Deginet Gechamo	M	SNNPR RMSC	Assistant Researcher
18	Girma Mamo	M	SNNPR RMSC	Assistant Researcher

There were a total of 18 trainees, 2 of whom were women and none of whom were youth (under the age of 25).

Box 2**List of Trainers: CRMAE for EMI RMSC Training (September 1-7, 2022)**

No.	Name	Gender	Organization/ Structure	Position/Title	Email
1	Masresha Kebede	M	Ministry of Agriculture	Agrometeorologist and Team Leader	kebedemas@gmail.com
2	Kidus Belay	M	Ministry of Agriculture	Researcher	kidus.belay@gmail.com
3	Tolesa Dendoba	M	Ministry of Agriculture	Expert	Kenarabi.4@gmail.com
4	Tufa Dinku	M	IRI	Senior Research Scientist	tufa@iri.columbia.edu
5	James Hansen *remote	M	IRI	Senior Research Scientist	jhansen@iri.columbia.edu

6: Agenda

Module	Time	Content	Speaker	Time Allocation
Day 1 (Thursday)				
	8:30-9:00	Arrival and registration		15 minutes
Introduction	9:00-9:30	Opening Remarks and Welcome: Opening remarks by facilitator and any present dignitaries, introduction of participants	TBD	30 minutes
	9:30-10:30	Overview of training Overview of ACToday and AICCRA Introduction to Climate Services The ENACTS Approach	Tufa Dinku	1 hour
	10:30	Morning tea/coffee break		15 minutes
Introduction	10:45-11:15	Discussion: Discussion on the value of climate services and EMI's role	All	30 minutes
Module 1, Section 1	11:15-11:30	Lecture/Presentation: Basics Climate Concepts Definitions Dimensions of Climate Main Components of Weather and Climate	Asaminew / Kidus	15 minutes
Module 1, Section 2	11:30-12:30	Lecture/Presentation: The Climate of Ethiopia Main features of Ethiopian climate Temporal Characteristics of Climate in Ethiopia Main factors determining climate of Ethiopia Climate Variability in Ethiopia	Asaminew / Kidus	1 hour
	12:30-13:00	Activity: Review Exercises	Trainees	30 minutes
	13:00-14:00	Lunch		1 hour

Module 1, Section 3	14:00-15:00	Lecture/Presentation: Climate Data and Climate Information Types of Climate Data Climate Analyses	Asaminew / Kidus	1 hour
	15:00-15:30	Activity: Review Exercises	Trainees	30 minutes
Module 1, Section 4	15:30-16:15	Lecture/Presentation: Seasonal Climate forecasting Statistical methods Dynamical methods Formats of seasonal climate forecast	Asaminew / Kidus	45 minutes
	16:15-16:30	Afternoon tea/coffee break		15 minutes
Module 1, Section 4	16:30-17:00	Activity: Review Exercises	Trainees	30 minutes

Day 2 (Friday)				
	9:00-9:15	Review of the previous day.	ALL	15 minutes
Module 2, Section 1				
	9:15-9:45	Demonstration: Overview of EMI's web-based products	Kidus and All	30 minutes
Module 2, Section 2	9:45-10:30	Navigating through ENACTS maprooms	Kidus and All	45 minutes
	10:30-10:45	Morning tea/coffee break		15 minutes
Module 2, Section 2 (cont)	10:45-11:45	Demonstration: Climate Analysis Maproom	Kidus	1 hour
	11:45-13:00	Activity: Exploration of the Climate Analysis Maproom in groups	Trainees	1 hour 15 minutes
	13:00	Lunch		1 hour
Module 2, Section 3	14:00- 15:00	Demonstration: Climate and Agriculture Maproom	Kidus	1 hour
Module 3 Section 1	15:00-16:00	Lecture/Presentation: Climate-sensitive farm decisions	Jim Hansen	1 hour
	16:00-16:15	Afternoon tea/coffee break		15 minutes

Module 3 Section 4	16:15- 17:00	Lecture/Presentation: Decision making under uncertainty	Jim Hansen	45 minutes
	17:00-17:15	Wrap-up/Summary of the Day	Trainees	15 minutes

Day 3 (Saturday)

Module 2, Section 3 continued	9:00-10:00	Activity: Explore Agriculture maproom	Trainees	1 hour
Module 2, Section 4	10:00-10:30	Demonstration Climate Monitoring Maproom	Kidus	30 minutes
	10:30-10:45	Morning tea/coffee break		15 minutes
Module 2, Section 5	10:45-11:30	Demonstration: Forecast maproom	Kidus	45 minutes
Module 2 Project work	11:30-13:00	Activity: Trainees work on their presentation.	Trainees	1 hour, 30 minutes
	13:00-14:00	Lunch		1 hour
Module 3	14:00-15:30	Work on decision analysis activity (TBD)	Trainees	1 hours 30 minutes
	15:30-15:45	Afternoon tea/coffee break		15 minutes
Module 3	15:45-17:00	Work on decision analysis activity (TBD)	Trainees	1 hours 15 minutes

Day 4 (Monday)

	9:00-9:30	Overview previous week.	All	30 minutes
Module 2, Section 1	9:30-10:30	Activity: Learners complete maproom project presentation slides	Trainees	1 hour
	10:30-10:43	Morning tea/coffee break		15 minutes
Module 2, Section 1	10:45-13:00	Activity: Learners present maproom project work.	Trainees	2 hour 15 minutes
	13:00-14:00	Lunch		1 hour
Module 3, Section 1	14:00-15:00	The class debriefs on decision analysis exercise	Trainees	1 hour

Module 3, Sections 1, 5	15:00-16:00	Lecture/Presentation: Farm-level options for managing climate risk	Trainees, Jim	1 hour
	16:00-16:15	Afternoon tea/coffee break		15 minutes
Module 4, Section 2	16:15-17:00	<i>Lecture/Presentation:</i> Participatory seasonal forecast planning workshop	Jim	45 minutes
	17:00-17:15	<i>Wrap-up/Summary of Day 4:</i>	All	15 minutes

Day 5 (Tuesday)

	9:00-9:15	Overview previous day.	All	15 minutes
Module 4, Section 2	9:15-10:30	<i>Seasonal forecast workshop practice exercise</i>	Trainees	45 minutes
	10:30-10:45	Morning tea/coffee break		15 minutes
Module 4, Section 2	10:45-13:00	<i>Seasonal forecast workshop practice exercise</i>	Trainees	2 hour 15 minutes
	13:00-14:00	Lunch		1 hour
Module 4, Section 2	14:00-15:00	<i>Seasonal forecast workshop practice exercise</i>	Trainees	1 hour
	15:00-16:00	The class debriefs on seasonal forecast workshop practice exercise	Trainees, Jim	1 hour
	16:00-16:15	Afternoon tea/coffee break		15 minutes
Module 4, Section 1	16:15-17:00	Lecture/Presentation: Rural climate service communication strategies	Jim	45 minutes
	17:00-17:15	Wrap-up/Summary of Day 4	All	15 minutes

Day 6 (Wednesday)				
	9:00-9:15	Overview previous day.	All	15 minutes
Module 4, Section 1	9:15-10:30	Rural climate service strategy exercise	Trainees	45 minutes
	10:30-10:45	Morning tea/coffee break		15 minutes
Module 4, Section 1	10:45-13:00	<i>Rural climate service strategy exercise</i>	Trainees	2 hour, 15 minutes
	13:00-14:00	Lunch		1 hour
Module 4, Section 1	14:00-15:00	<i>Trainees present their rural climate service strategy exercise</i>	Trainees	1 hour
	15:00-16:00	The class debriefs on rural climate service strategy exercise	Trainees, Jim	1 hour
	16:00-16:15	Afternoon tea/coffee break		15 minutes
	16:15-17:00	<i>Final Discussion and closing</i>	Jim	45 minutes

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