



University Climate Curriculum Knowledge Sharing and Co- Design Workshop for RUFORUM Curriculum Platform

Workshop Report



AICCRA
Accelerating Impacts of CGIAR
Climate Research for Africa



Amanda Grossi | Tufa Dinku | James Hansen |
Florence Nakayiwa | Majaliwa Mwanjalolo |
Todd Crane | Robert Zougmore | Dawit Solomon |

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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.

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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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ABBREVIATIONS

AICCRA	Accelerating Impacts of CGIAR Climate Research in Africa
ATVET	Agricultural technical and vocational education and training
CCAFS	Climate Change Agriculture and Food Security
CGIAR	Consultative Group of International Agricultural Research Centres
CIS	climate information services
CGC	Columbia Global Centre
CRM	climate risk management
CSA	climate-smart agriculture
EAC	East African Community
EAS	extension and advisory service
ENACTS	Enhancing National Climate Services
ESA	East and Southern Africa
ILRI	International Livestock Research Institute
IRI	International Research Institute for Climate and Society
IUCEA	The Inter-University Council of East Africa
JKUAT	Jomo Kenyatta University of Agriculture and Technology
MEL	Monitoring, Evaluation, and Learning
MoE	Ministry of Education
MoU	Memorandum of Understanding
NEPAD	New Partnership for Africa's Development
NGO	non-governmental organisation
PGIF	President's Global Innovation Fund
RUFORUM	Regional Universities Forum for Capacity Building in Agriculture
SASSCAL	Southern African Science Service Centre for Climate Change and Adaptive Land Management
WASCAL	West African Science Service Centre on Climate Change and Adapted Land Use

01. INTRODUCTION

Tackling the climate crisis means equipping the youth with the knowledge and skills they need to manage climate risk. Universities across Africa have an enormous role to play towards this end. By equipping the next generation of researchers, policymakers, and leaders with the knowledge and skills they need to build resilient societies, education systems represent an important avenue for sustained capacity building beyond project life cycles.

Context

Climate change and year-to-year climate variability have resulted in widespread, pervasive impacts to ecosystems and people in Africa, including increases in the intensity of weather extremes such as droughts and floods. While these shifting and varying temperature and precipitation patterns have affected the productivity of many climate-sensitive sectors, the agricultural sector has been the most impacted, resulting in reduced food availability and increased food prices, ultimately jeopardising food security, nutrition, and livelihoods of millions of people.

Despite the enormous role that climate information can and has played in supporting resilience of agricultural and food systems and the availability of high-quality climate information in many Africa countries, including through the Enhancing National Climate Services (ENACTS) initiative, however, the effective use of climate information in decision-making processes to support climate adaptation has remained limited. This reality persists despite strong policy and enabling environments in many of these countries and despite significant investments in climate information and services through national and sectoral strategies, policies, and programs.

Part of the problem stems from a lack of foundational capacity and common understanding of climate basics, including a shared vocabulary and knowledge of basic terminology and dynamics to both articulate and engage in meaningful collaborations and design of solutions. Another part stems from the reality that even when available, climate information may not be easily accessible or transformed to decision-relevant formats for those working in the agricultural sector to act upon, or that there is poor awareness of products that do so.

Still, another major issue with the exploitation of climate information for agricultural decision-making and adaptation lies with poor conceptual understanding of how climate impacts agriculture and the pragmatic climate-sensitive decisions that farmers and the network of actors that support them must make as a result of these impacts.

Because its graduates go on to work with and even lead initiatives with key institutions and actors within the agriculture and food system—such as the agricultural extension system, non-profits, development organisations, and disaster risk management and reduction agencies—the formal education system and especially agricultural universities in Africa have an enormous role to play in addressing these challenges. Moreover, beyond a theoretical understanding and knowledge of these challenges and potential solutions, they can play a catalytic role in advancing the practical skills needed to analyse, assess, and ultimately address climate-related challenges in the agriculture and related sectors.

Workshop Objectives

Acknowledging these gaps and the resultant enormous opportunity to professionalise the agricultural sector with the knowledge and skills to support climate resilience, the [Accelerating Impacts of CGIAR Climate Research for Africa \(AICCRA\) project](#) has been working to co-design and co-implement curricula targeting universities (Grossi et al., 2022; Mwamburi et al., 2022) and agricultural extension systems (Grossi et al., 2023; Hansen et al., 2022; Grossi et al., 2023a; Grossi et al., 2023b; Grossi et al., 2023c) in each of the six AICCRA target countries, to build foundational knowledge and skills to manage climate risk.

Moreover, it has been working to ensure these resources and others on climate risk management (CRM), climate information services (CIS), and climate-smart agriculture (CSA) are shared more widely with others on the continent confronting similar challenges through the establishment an **online curriculum platform** (Curtis, 2022a; Curtis 2022b) in close

collaboration with the Regional Universities Forum for Capacity Building in Agriculture (RUFORUM; Rukarwa et al., 2022), a consortium of 163 universities in 40 countries in Africa aimed at strengthening the capacities of universities to foster innovations responsive to demands of smallholder farmers (RUFORUM, 2023).

In tandem with these efforts, and as a hub for global curriculum and scholarly outreach in the region, the Columbia Global Centre of Nairobi (CGC-Nairobi) through the complimentary President's Global Innovation Fund (PGIF) Linking Education on Adaptation and Resilience with National Systems in Ethiopia (Ethiopia-LEARNS) project (Columbia Global Centres, 2023) has been working to catalyse awareness, mobilise resources, and share knowledge to support the expansion and scaling of such high-need curriculum development to other countries, or even other sectors beyond agriculture, in the East African region or continent of Africa.

To harmonise and advance the co-development of climate-related curricula at the university level for African universities, as well as its sharing via the RUFORUM online curriculum platform under development, the AICCRA and PGIF projects jointly hosted workshop on Monday, July 17, 2023, at the Safari Club in Nairobi, Kenya. The overarching aims of this workshop were to:

- 1) Provide an overview of the existing CRM/CIS/CSA curricula that have already been developed or are under development by the AICCRA project, including their goals, target audiences, scope, structure, and format, as well as share lessons learned from their development and implementation.

Given the role that some universities play in training agricultural extension in Africa, this included both agricultural extension curricula and university curricula developed through AICCRA, with an emphasis on university-targeted curricula.

- 2) Document the perspectives of key education stakeholders in East and Southern Africa (ESA) and the wider continent on the value of the CRM/CIS/CSA curricula and the online curriculum platform effort, including alignment with needs and demand.
- 3) Identify priorities (target learners, topics, length and format of courses) for ESA universities, as well as regional and continental educational networks and stakeholders.

RUFORUM



The **Regional Universities Forum for Capacity Building in Agriculture (RUFORUM)** is a consortium of 163 universities in 40 countries in Africa aimed at strengthening the capacities of universities to foster innovations responsive to demands of smallholder farmers.

- 4) Identify and articulate opportunities and challenges for implementing the RUFORUM curriculum platform.
- 5) Gain insights and recommendations for future engagement and promotion of climate curricula in the ESA region and wider continent (strategic vision), as well as piloting, embedding, and otherwise scaling such curricula in different contexts.



Florence Nakayiwa, Deputy Executive Secretary of RUFORUM, opens the floor for African universities to share their perspectives on the need, urgency, and kinds of climate curricula that should be pursued for both educators and students.

02. APPROACHES AND METHODS

A variety of climate curricula targeting different learners have emerged through the AICCRA project. Regional and continental organizations, alongside innovations in technology, play an important role in making sure such curricula are shared, scaled, and sustained in different African settings. Before this happens however, it is important take stock of and share lessons from the development and implementation of climate curricula in different settings, to learn from and harmonize efforts to meet the critical capacity building challenge confronting both instructors and students on the continent. A July 2023 knowledge sharing workshop in Nairobi, Kenya brought together almost 30 universities, regional organizations, and climate experts to do just that.

Towards its overarching goal of sharing knowledge on AICCRA-developed curricula at the undergraduate and graduate levels on the topics of climate information services (CIS), climate-smart agriculture (CSA), and climate risk management (CRM) and informing the development of the RUFORUM curriculum platform and capacity building strategy on these topics moving forward, a wide range of stakeholders were invited to partake in the workshop, including various regional bodies and African universities. Both RUFORUM and the International Research Institute for Climate and Society (IRI) jointly moderated the event.

In doing so, participants were sensitized to goals of the AICCRA project and its capacity building goals and strategy as it pertains to climate education, as well as the RUFORUM e-Learning platform development effort. The latter included an overview of the RUFORUM e-Learning platform partnerships, past needs assessments to inform its design, and commitments and timelines to advance the sharing of climate curricula continentally.

Participants, which included both project partners and stakeholders, heard five presentations about curricula co-developed in a variety of contexts for different target learners through the AICCRA project, alongside the challenges and lessons learned from each of those co-development efforts. While a full agenda of the workshop is available in the [Appendix](#), these broadly included the following:

1. New curricula targeting public and private extension and advisory service (EAS) providers on the topic of CRM in Ethiopia, Kenya, Zambia, Senegal, and Mali;
2. New curricula targeting graduate and postgraduate university students on the topic CRM in Ethiopia;
3. New and revamped curricula on the topics of CRM, CIS, and CSA targeting undergraduate students at 31 universities in Ethiopia and being scaled through partnerships and policy with the Ministry of Education (MoE);
4. New curricula on the topic of CSA targeting undergraduate and graduate students at four universities in Kenya;
5. New curricula on the topic of CIS and CSA developed through RUFORUM.

While each of these curricular efforts emerged in response to clear demand from in-country stakeholders, harmonization of these complementary efforts provide opportunities for expanded reach and impact.

Participants

The following organizations and structures were represented at the workshop:

Regional Organizations

The following regional organizations partook in the workshop:

- [The Inter-University Council of East Africa \(IUCEA\)](#), which oversees higher education curriculum for the East Africa region. IUCEA coordinates inter-university cooperation in East Africa, facilitates the strategic development of member universities, and promotes internationally comparable higher education standards and systems for sustainable regional development.
- Relevant regional educational and capacity building networks in both ESA and West Africa with which AICCRA must coordinate and harmonize its curricular efforts
 - [The West African Science Service Centre on Climate Change and Adapted Land Use \(WASCAL\)](#)
 - [The Southern African Science Service Centre for Climate Change and Adaptive Land Management \(SASSCAL\)](#)

African Universities

The following African universities partook in the workshop:

- A subset of Kenya's main agricultural universities, including the deans, directors, or chairs of departments for:
 - [Egerton University](#)
 - [Jomo Kenyatta University of Agriculture and Technology \(JKUAT\)](#)
 - [Moi University](#)
 - [Meru University of Science and Technology](#)
 - [University of Embu](#)
 - [University of Nairobi \(agriculture and climate centres\)](#)
 - [Taita Taveta University](#) (previously targeted with AICCRA-Kenya curricula)
 - [Chuka University](#) (previously targeted with AICCRA-Kenya curricula)
 - [Murang'a University of Technology](#) (previously targeted with AICCRA-Kenya curricula)
 - [Laikipia University](#) (previously targeted with AICCRA-Kenya curricula)
- Select universities from the East and Southern Africa (ESA) region which have expressed interest in scaling AICCRA-initiated university curricula:
 - [Makerere University](#) (Uganda)
 - [Sokoine University of Agriculture](#) (Tanzania)

- AICCRA partners spearheading CRM/CIS/CSA curriculum development on the continent and implementing the online curriculum platform:
 - [Regional Universities Forum for Capacity Building in Agriculture \(RUFORUM\)](#)
 - [The International Research Institute for Climate and Society \(IRI\)](#)
 - [The International Livestock Research Institute \(ILRI\)](#)
- AICCRA-Kenya partners which have already developed accredited CSA curricula in Kenya (graduate)
 - [Alliance of Bioversity International and CIAT \(ABC\)](#)

A full list of participants and their institutional affiliations can be found in the **Appendix**, in **Box 1**.



The map above indicates the countries represented at the University Climate Curriculum Knowledge Sharing and Co-Design Workshop for the RUFORUM Curriculum Platform on July 17, 2023.

03. KEY RESULTS AND FINDINGS

While the themes and topics touched upon with national and regional education stakeholders were many, discussions reinforced the urgent need for skills-based climate curricula on the continent. Beyond this, they also highlighted the need to robustly measure outcomes and impact where implementation of such curricula has already occurred, to improve programming and make the case to funders policymakers for continued investment.

The presentation of the various CIS, CSA, and CRM climate curricula developed and/or revitalized under AICCRA resulted in discussions that touched on several repeated themes, outlined here. The complement these discussions, a survey was sent out to all participants after the workshop gather additional insights on the role of universities in advancing climate-related capacity building, the value of the various AICCRA curricula, and the way forward. The results of this survey are discussed in detail in [Section 4](#) (Conclusions and Recommendations). All presentations and PowerPoints from the workshop are available and were shared with participants in a publicly accessible shared Google Drive [here](#).

RUFORUM e-Learning Platform



The **RUFORUM e-Learning platform** through Moodle meets a shared and pressing need for foundational, dynamic content on climate-related topics across African countries. It is a living resource to enable institutions to establish and continually develop curricula that support key competencies in climate-related topics prioritized by stakeholders in Africa.

Target Learners

The main target audiences for the various CIS, CSA, and CRM curricula identified by the workshop participants were: 1) instructors 2) students, and 3) professionals.

Instructors

Many participants highlighted that while there is a need to educate and professionalize students on these topics, university instructors themselves are generally not equipped with the necessary competencies, do not feel confident in teaching some of these topics, and/or find it challenging to remain up-to-date on the latest and often continuous advances in these curricular topic areas. As such, in terms of capacity building through the AICCRA project and the subset of curricula that will be made available continentally through RUFORUM's e-Learning platform, participants underscored the point that while capacity building of students and instructors may be pursued simultaneously or in parallel, capacity building of instructors and teachers on these topics should be first prioritized.

University Students

All participants agreed that cultivation of climate-literate students to address the various climate-related challenges in their countries and regions was a high and also an urgent priority. Imparting understanding of climate basics, including fundamental definitions and concepts, was especially highlighted.

The West African Science Service Centre on Climate Change and Adapted Land Use (WASCAL), for example, shared experiences on how it is engaging students in informal education to go out and help build capacity with farmers in a number of areas, but consistently faces the challenge of equipping student with skills to explain basic concepts to these farmers. Not only is there a capacity gap, but there is also an unmet need for locally-tailored and contextually appropriate training materials and curricula in local languages—something one of WASCAL’s recent assessments of its student program showed.

In addition to this, it was also noted that current curricula on the topic of climate tend to focus on longer-term climate change rather than shorter-term variability and poorly integrate hands-on, skills-focused, and practical teaching that emphasize local knowledge and data needed for decision-making. The AICCRA curricula were generally appreciated for addressing this gap. Empowering students with analytical capacities to understand, analyse, and visualize climate data, for example, was deemed very important for countries being able to generate their own research and solutions to address the climate challenge.

Professionals

Despite workshop participants overwhelmingly coming from the university and formal education space, there was a strong and clearly articulated vision for the kinds of curricular materials being developed through AICCRA and RUFORUM to also be made available and leveraged for professionals, including those working with non-governmental organizations (NGOs) and those who comprise extension and advisory (EAS) services. In fact, many of the universities present indicated that, though there may be complementary agricultural college systems—including Agricultural technical and vocational education and training (ATVET) programs and institutions—in their countries, universities nonetheless often play a significant role in training various actors within their own extension systems, or those who interact with it. RUFORUM indicated that for universities to be trained on the newly developed modules under its e-Learning platform (Moodle), 20% are already targeted to be from agricultural extension systems, and that this is an area already identified for further development moving forward.

As evidence of demand from NGOs and the development community, the AICCRA-Kenya team shared that it already has several staff from the World Food Programme (WFP) enrolled in its Masters-level courses related to CSA short course in Murang’a. The question was posed to the group on how such curricula might be monetized to sustainably fund their continuity and expansion, though no conclusion was reached. However, it was agreed that rolling out, testing, and proving the impact of the courses through robust monitoring, evaluation, and learning, would be key towards articulating the value of such courses if such a path to monetization were pursued.

“I believe this curriculum [initiative] will provide the opportunity for higher education to interface with local communities to support resilience and build additional capacity.”

Dr. Jonathan Mbwambo, Inter-University Council for East Africa (IUCEA)



Leveraging Informal and Formal Education and Indigenous Knowledge Systems

On the note of which education systems CIS, CSA, and CRM curricula should target, participants agreed that both formal (university) and informal (for example, technical colleges) education systems should be targeted for a systems-strengthening approach. Beyond this, however, there was also a resounding demand from those present to ensure the integration of indigenous knowledge into all curricula. Several participants highlighted the richness of local knowledge systems and that communities are not blank slates to which knowledge or training should flow unidirectionally; rather, capacity building programs should acknowledge and be framed around incorporating local knowledge of communities and on-the-ground experiences to deliver on their aims.

AICCRA Learning Zone



The **AICCRA Learning Zone** is a convenient one-stop shop for analytical resources — case studies, training guides, articles and videos — that empower farmers, policymakers and communities to make informed decisions in agriculture that work for people, nature and planet. Universities were made newly aware of this resource at the workshop and encouraged to contribute to it.

Cultivating Partnerships

Throughout the course of the discussions, to tackle the grand challenges associated with climate education and capacity building, innovative partnerships were underscored as a key area that ought to be cultivated. While networks like those of RUFORUM help to connect universities to each other to strengthen their capacities to foster innovations responsive to demands of smallholder farmers, Centres of Excellence in Africa through the New Partnership for Africa's Development (NEPAD), which conduct a variety of trainings in the climate sciences, were also identified as an untapped partnership to help advance such curricula and capacities. Some of these Centres of Excellence are even hosted within RUFORUM-participating universities.

Another recurring sentiment expressed across multiple regions was that it is difficult to be regularly connected to new and emerging advances in the field of climate, climate change, adaptation, and a variety of related topics, including regularly and intentionally interacting and learning from each other intra-continently. To help address this challenge, the AICCRA team shared about its [AICCRA Learning Zone](#), which is an open-access one-stop-shop database of resources (case studies, training guides, articles, videos, and more) on climate information services and climate-smart technologies and practices across Africa. Participants were encouraged to both contribute to and harness the resources on this database to stay up-to-date and learn about advances in other parts of the continent, their own region, or even their own country. Beyond the lifespan of the project, however, more sustainable communities of practice, transfer of this AICCRA hub management to local partners, or new hubs may need to be established.

Monitoring, Evaluation, and Learning (MEL) to Support Mainstreaming and Scaling

To support the mainstreaming, institutionalization, and scaling of sustained capacity building on CIS, CSA, and CRM topics, robust MEL of all co-development, training, and pilot activities was highlighted as a necessary component. Especially given policymakers increasingly striving to be evidence-driven in their programs, strong MEL to support connections with decision-makers at higher levels of influence was deemed mission-critical.

Beyond this, however, participants from Kenya highlighted that MEL may also present good opportunities to strengthen research and programming in this area. It was noted that, for example, there is a lot of misinformation out there about climate change and certain concepts. Through strong MEL including baseline assessments whereby preconceptions and misconceptions about climate and climate change can be documented prior to course implementation, for example, coursework could not only be better improved to address recurring misconceptions or misinformation better, but could prove informative in a wider research space to address the sources of such misconceptions or misinformation prevalent on the African continent.

New Courses versus Revitalized Courses

The presentation about Ethiopia's Memorandum of Understanding (MoU) with more than 31 universities to revamp existing undergraduate curriculum in parallel with the development of new courses spurred discussion on how much effort should be spent revitalizing and infusing existing courses with CIS, CSA, and CRM content versus the creation of new courses, and especially short courses. These actions are not mutually exclusive and can be pursued in parallel, and participants agreed existing coursework ought to be infused with such content to truly "entrench" them on a systems-level and not artificially through piece-meal efforts.



"There is a lot of value in sharing experiences, but most importantly having linkages with various actors in this [curriculum effort], from academia all the way down to decision-makers and extension workers, to reach end users."

Professor Oliver Wasonga, University of Nairobi

IUCEA



The **Inter-University Council of East Africa (IUCEA)** is an institution of the East African Community (EAC) which oversees higher education curriculum for the East Africa region. IUCEA coordinates inter-university cooperation in East Africa, facilitates the strategic development of member universities, and promotes internationally comparable higher education standards and systems for sustainable regional development.

communities), despite the importance of such livelihoods on the continent and especially in East and Southern Africa.

Demand for curricula integrating knowledge, skills, and especially digital innovations and CIS/CSA tools targeting actors working in livestock production system was strongly articulated. Participants from Kenya and Ethiopia noted that the International Livestock Research Institute (ILRI) offices in their respective countries might collaborate towards this end, alongside national and regional experts.

In addition to this, some participants identified “the blue economy” (aquaculture) as an un-addressed area in the curricula for future work.

Demand for Accreditation

In diagnosing the problem of African university curricula generally struggling to keep pace with advances in CIS, CSA, and CRM, some participants noted that they felt their curricula have remained static due to failures in lobbying or effectively engaging with regional organizations such as the Inter-University Council of East Africa (IUCEA), which oversees and coordinates higher education curriculum and inter-university cooperation in East Africa, including strategic development and promotion of educational standards for sustainable regional development. Poor technological and infrastructural capacities—for example, not having clearly identified centres or computer labs to take students to learn and conduct hands-on exercises—might be addressed through more effective lobbying or coordination with such bodies, some participants noted.

RUFORUM as a Catalyst for Policy-Level, Systemic Change

As an institution representing a consortium of 163 universities in 40 countries (and counting), the role of RUFORUM and its participating universities to not only advance such curricula but to play an advocacy or “lobbying” role at the policy level was brought up. Given the universality of demand for skills-based CIS, CSA, and CRM curricula targeting the continents’ instructors, youth, and professionals towards a more resilient future, the idea was proposed for RUFORUM, the workshop participants, and possibly others to come together to make a **joint statement** on the need to address these issues as an outcome of the workshop.

Missing Pieces: Underserved Groups

Participants observed that each of the five types of curricula presented by the different presenters heavily focused on crops and not mixed livelihoods or livestock production systems (rangeland and pastoral

In addition to this, other participants voiced the idea that accreditation of courses would help them to gain traction and ultimately scale and influence regionally or continentally.

On the note of the several short courses developed or revitalized through AICCRA, the IUCEA which was represented at the meeting indicated that there is no regional accreditation for short courses. However, if a training program or curriculum is accredited nationally first, it can also be accredited regionally.

Gender Equality and Social Inclusion

In discussing the planned addition of climate-related modules to RUFORUM's e-Learning platform, concerns were raised, and a plea was made by certain participants to explore and consider more fully implications of online learning for gender equality and social inclusion (GESI). In all online learning modules, for example, the request was made for a GESI expert to examine how to ensure those with disabilities (such as hearing or visual impairments) might also be able to benefit from the learning modules, not as an afterthought but intentionally in the outset of design in the beginning. It was agreed that an expert in these matters would be consulted to ensure good practices like alternative text (alt text), audio options, appropriate colour and design choices, and options for those with poor internet connectivity could be integrated and adhered to, as appropriate.

"Students need to develop skills to analyse and interpret climate data and information products, to create their own research on these topics."

Dr. Tufa Dinku, International Research Institute for Climate and Society (IRI), Columbia Climate School



04. CONCLUSIONS AND RECOMMENDATIONS

Moving forward, plenary discussions and a detailed post-workshop survey with participants revealed important insights in how to move forward with content development, e-Learning platform design, and capacity building on these topics in African contexts.

The Way Forward

Following from the proceedings of the July 17, 2023 Africa-Wide University Climate Curriculum Knowledge Sharing workshop, the following conclusions and recommendations can be drawn:

- **Universities have a significant role to play** in advancing key competencies (knowledge, skills, attitudes) around the topics of CIS, CSA, and CRM, and in professionalizing students to meet the climate challenge in their future roles as leaders, practitioners, policymakers, or otherwise.
- **Climate curriculum capacity building activities should prioritize foremost instructors as target learners**, alongside university students and professionals, including and especially those working in agricultural extension systems.
- **Curricula can and should target both formal and informal education systems**, as well as acknowledge **and integrate indigenous knowledge** to be contextually appropriate and locally driven.
- **Cultivating new partnerships with regional and continental institutions will be instrumental for operationalization of new climate -related coursework and scaling for impact.** However, there remains a need for strengthened platforms (including technological platforms) and partnerships for knowledge and experience sharing on these topics and educational initiatives intra-continently and regionally, that can extend beyond the life of the AICCRA project.
- **Robust monitoring, evaluation, and learning (MEL) of the entire climate curriculum development effort**—inclusive of co-design, training, implementation, and scaling— is not only instrumental but **mission-critical in building the evidence support mainstreaming and scaling, especially through policy.** These MEL processes also offer exciting opportunities for research.
- Given the urgency and longstanding need of curricular content to address CIS, CSA, and CRM, **new courses can be pursued in parallel and in synchrony with the revitalization of existing courses** with CIS, CSA, and CRM content. Lessons from Ethiopia, where strong partnerships and a memorandum of understanding (MoU) with the Ministry of Education (MoE) have been pursued with more than 30 universities to mainstream climate basics nationally in undergraduate curricula, provide valuable insights for the mainstreaming and accelerated uptake of high-need curricula.

- **There is significant and resounding demand from universities for more CIS, CSA, and CRM content tailored for livestock production systems.** Content tailored for those working with aquaculture was also requested. The International Livestock Research Institute (ILRI), which is leading AICCRA project efforts in three of the six core target countries, has an important role to play in catalysing action towards this end.
- **Gender equality and social inclusion (GESI) needs to be considered** and intentionally and proactively addressed in all aspects of the RUFORUM e-Learning platform design and user experience. GESI has important implications for the ultimate use of the platform by several user groups, including those with various disabilities or limited connectivity.

Post-Workshop Survey Insights

In addition to the above recommendations, various insights were gathered from a post-workshop survey distributed to all 29 participants of the workshop for which there was a response rate of only 25% (7 people), primarily from Kenyan universities and institutions. Those insights are summarized below:

Strong Role of Universities in Addressing the Climate Challenge

All survey participants indicated unanimously that higher education (universities) have a very strong role to play in helping their countries or regions to address the climate challenge.

Unmet Need for Regular Knowledge and Experience Sharing Opportunities on Climate Education

The workshop presented a variety of curricula developed through the AICCRA project that target different audiences (undergraduates, graduates/postgraduates, agricultural extension systems) with foundational knowledge and skills on climate risk management (CRM), climate information services (CIS), and climate-smart agriculture (CSA). In asking survey respondents how aware they were of the existence of such curricula being developed through AICCRA prior to the workshop, only 17% of respondents indicated that they were aware climate of any curriculum development efforts through the AICCRA project, with the overwhelming remainder (83%) either completely unaware (33%) or only partially aware (50%) of such curriculum initiatives. These responses underscore the need also highlighted during plenary discussions for spaces and avenues for regular and intentional knowledge and experience sharing on climate education initiatives and efforts.

AICCRA-Developed Curricula Well-Aligned with Partner and Stakeholder Needs

All participants indicated that the various types of AICCRA-developed or revitalized curricula presented during the workshop were either strongly (29%) or very strongly (71.4%) pertinent to their institutions.

Highest Priority for Climate Information Service (CIS) and Climate-Smart Agriculture (CSA) Curricular Content Moving Forward

While curricula on the topics of Climate Information Services (CIS), Climate-Smart Agriculture (CSA), and Climate Risk Management (CRM), as well as various sub-topics were presented during the workshop, survey respondents were asked which topic areas were most needed in terms of curriculum development and training for their particular institutions.

The topics of CIS and CSA were indicated unanimously by all respondents, followed by:

- Climate Policy (71%)
- Gender (29%)
- Climate education (14%)
- Training on crop modelling tools (e.g. APSIM and others); 14%

AICCRA partners spearheading curriculum development and revitalization efforts may therefore consider strengthening aspects related to understanding the policy environment as it relates to climate adaptation and mitigation in the various countries.

Participants were also asked what the **highest priority** topic area needed in terms of curriculum development and training for their institution is (if they could only pick one). An overwhelming 71% indicated CSA as the top priority, followed by CIS (14%) and climate education broadly (14%).

Anticipated Use of RUFORUM e-Learning Platform is Mixed and Requires Further Exploration

Asked how likely they are to use the RUFORUM e-learning platform that was presented during the workshop on a scale from 1 (not likely) to 5 (extremely likely), there were mixed results.

While the majority of participants (57%) indicated that they were likely (14%, rating of 4) or very likely (43%, rating of 5), still almost half 42.9% indicated a neutral answer (rating of 3) on whether or not they would use it, signalling some reticence about the platform.

AICCRA partners including RUFORUM should therefore unpack further university and regional partner perceptions about the value and expected use of the e-Learning platform, to address any barriers or concerns that the intended users have, as well as build upon any opportunities that those expressing high likelihood of use may see.

Priority Target Group for RUFORUM e-Learning Platform is Teachers and Graduate/Postgraduate Students

Asked who they see as the main priority target group(s) for using this platform and climate-related content (the target learners) and aligned with discussions during the workshop plenary, 86% of respondents indicated that teachers and professors are the main priority, and 86% also indicated that graduate and post-graduate students are the main priority for use of the platform and its content. Undergraduate students were the next highest priority (43%), followed by NGOs/nonprofits (29%) and agricultural extensionists (29%).

When asked to expand further on who they see as the **top priority** (if they could only pick one) target group for using the platform and climate-related content, the answer given by the majority of respondents (57%) was teachers and professors, followed by graduate/postgraduate students (29%) and undergraduate students (14%).

Important Features Identified for RUFORUM e-Learning Platform

Asked which features that respondents would like to see integrated within the RUFORUM e-learning platform design, the following responses were given:

- E-Learning platform should be easy to use
- Interactive multimedia platform
- Multimedia content
- Access to climate data
- Feedback and satisfaction surveys
- Video content, interactive sessions, live sessions, evaluation after every session

Potential Barriers Identified for RUFORUM e-Learning Platform Use

Asked which barriers respondents anticipate in using the RUFORUM e-Learning platform, the following responses were given:

- Internet availability, accessibility, and stability across the learning environment
- Lack of smart phones or laptops to access content
- Quality issues and efficacy
- Coordination amongst different stakeholders
- Flexibility and commitment to the platform
- Lack of awareness
- Power outages and lack of electricity

High-Priority Topics and Sub-Topics for Inclusion in the RUFORUM e-Learning Platform

Participants were asked to rank their priority of 17 pre-identified topics for integration with the curriculum platform on a scale from 1 to 5 (1=not a priority; 2=low priority; 3= medium priority; 4= high priority; 5= essential priority).

While the full results from this survey question are available upon request, the responses can be summarized as follows:

Topic areas where “High Priority” or “Essential Priority” was indicated either unanimously or by majority of respondents:

- **Policy:** Using foresight and visioning to set long-term climate action goals (high priority, unanimously)
- **CSA:** Gender and Social Inclusion (GSI) Mainstreaming in CSA (high priority dominant answer)
- **CIS:** Integrating Climate Services into Agricultural Extension (essential priority dominant answer)
- **CIS:** Communicating Climate Information and Supporting its Use (high priority dominant answer)
- **CIS:** Climate-Informed Agricultural Decisions (high priority dominant answer)
- **CIS/CSA:** Bundling CIS and CSA Practices (essential priority dominant answer)
- **CIS:** Climate Basics (essential priority dominant answer)
- **CIS:** Climate Information Products and Tools Available for Agriculture (essential priority dominant answer)
- **CIS:** Climate Impacts on Agriculture (essential priority dominant answer)

- **CIS:** Climate Risk Management in Agricultural Development (essential priority dominant answer)

A close examination of the above indicates that **CIS topics were considered most “essential”** in terms of frequency, though CSA topics and especially **bundling CSA and CIS practices were also a “high priority.”**

Asked to indicate any priority topics what were not included in the pre-identified options, the following answers were given:

- Carbon inventory tools adapted to tropical and sub-tropical agricultural systems
- Climate modelling and projecting climate impacts on agriculture

Harmonization of AICCRA Curriculum Initiatives with Existing Content

To leverage upon and not duplicate development or revitalization of curricula on the topics of CIS, CSA, and CRM where efforts are already underway, respondents were asked if their institution has developed any content that they would like to suggest for inclusion in the RUFORUM e-Learning platform.

All respondents indicated that they do not have suggested content for incorporation, except one respondent from Chuka University in Kenya, which has developed both undergraduate and graduate CSA curricula that “could be easily packaged in online content.”

The RUFORUM development team is therefore advised to follow up with the participant from Chuka University.

Short Courses and Professional Development Courses Preferred Modality for Content Delivery

Asked which learning options would be preferred for integration of curriculum content (on the e-Learning platform) into university activities and coursework, the overwhelming preference was for short courses or professional development courses (86%), followed by formal integration with academic courses (57%). Informal or ad hoc capacity building activities (14%), and developing a common course for first-year undergraduate students (14%) were less commonly indicated answers.

Indirect and Direct Engagement with e-Learning Platform

Asked if respondents that their institutions’ learners would engage directly with online e-Learning platform content or if would they want their own instructors to implement these courses, respondents were split between student learners engaging directly with online content (71%) and instructors using the platform content to develop and implement their own courses or trainings (71%). Only 14% of respondents indicated that they prefer a blended mode of delivery for acquisition of skills. These answers are also consistent with consensus answers reached during plenary discussions.

Operationalization of Capacity Building Activities

Asked what kinds of training might be needed to implement (operationalize) the kinds of curricula covered during the workshop, responses demonstrated that capacity building is needed not just on the new CIS/CSA/CRM topics proposed for integration but on how to use the platform itself. 86% of respondents indicated that they would need training on the new CIS, CSA, and /or CRM topics presented to operationalize the content in their institutions, while 43% said they would need training on how to use the RUFORUM e-Learning platform itself to actually operationalize the use of the content at universities.

Moving forward, therefore, RUFORUM and AICCRA implementing partners should allocate sufficient resources to support training both on content and on the technological e-Learning platform itself, if operational goals are to be met.

Potential Expanded Partnerships

Beyond the organizations present at the workshop, respondents were asked if there were any important stakeholders missing or that ought to be considered for inclusion in curriculum and e-Learning platform development efforts. A common response was that ATVET and TVET colleges and institutions should be integrated within conversations and decisions around CIS, CSA, and CRM curricula, as well as private stakeholders, NGOs, farmers, and out-of-school youth. In the case of Kenya with its devolution of services to the county level, county agricultural offices and County Executive Committee (CEC) education offices were also recommended for future inclusion in AICCRA education efforts and initiatives.

APPENDIX

List of Participants

Box 1 List of Participants: University Climate Curriculum Knowledge Sharing Workshop (July 17, 2023)					
No.	Name	Country	Gender	Organization/ Structure	Contact
1	Dr. Florence Nakayiwa	Uganda	F	RUFORUM Secretariat	f.nakayiwa@ruforum.org
2	Prof Majaliwa Mwanjalolo	Uganda	M	RUFORUM Secretariat	m.majaliwa@ruforum.org
3	Judith Nakyobe	Uganda	F	RUFORUM Secretariat	j.nakyobe@ruforum.org
4	Mr. David Martin Amitu	Uganda	M	RUFORUM Secretariat	d.amitu@ruforum.org
5	Dr Alex Nimusiima	Uganda	M	Makerere University	animusiima@gmail.com
6	Prof Anthony Kibe	Kenya	M	Egerton University	kibeanto@gmail.com
7	Bernard Kirui	Kenya	M	Egerton University	bkkirui@egerton.ac.ke
8	Prof Oliver Wasonga	Kenya	M	University of Nairobi	oliverwasonga@uonbi.ac.ke
9	Dr. Jonathan Mbwambo	Uganda	M	IUCEA	jmbwambo@iucea.org
10	Justine Namaalwa	Uganda	F	Makerere University	namaalwa.justine@gmail.com
11	Dr. Martin Mbewe	Zambia	M	SASSCAL	martin.mbewe@sasscal.org
12	Berhanu Belay	Ethiopia	M	ILRI	berhanubelayab@gmail.com
13	Prof. Losenge Turop	Kenya	M	JKUAT	losenge@agr.jkuat.ac.ke
14	Dr. Richard Onwonga	Kenya	M	University of Nairobi	dr.onwonga@gmail.com
15	Todd Crane	Kenya	M	ILRI	T.Crane@cgiar.org
16	Pauline Muthoni	Kenya	F	Columbia Global Center of Nairobi	pwm2117@columbia.edu
17	Jasmine Kouyate	Kenya	F	Columbia Global Center of Nairobi	jak2335@columbia.edu
18	Dr William Amposah	Ghana	M	WASCAL	willzamponsah@gmail.com
19	Dr. Grace Abucheli	Kenya	F	Chuka University	gabucheli@chuka.ac.ke
20	George Mose	Kenya	M	Murang'a University of Technology	gmose@mut.ac.ke
21	Dr. Mwamburi Mcharo	Kenya	M	Taita Tavata University	mwamburim@ttu.ac.ke
22	Dr. Barnabas Kurgat	Kenya	M	Laikipia University	bkurgat@laikipia.ac.ke
23	Catherine Sang	Kenya	F	University of Nairobi	catherine.sang@uoeld.ac.ke
24	Prof Cromwell Lukorito	Kenya	M	University of Nairobi	cbusolo@uonbi.ac.ke
25	Prof Christopher Oludhe	Kenya	M	University of Nairobi	coludhe@uonbi.ac.ke
26	Amanda Grossi	USA	F	International Research Institute for Climate and Society (IRI)	amanda@iri.columbia.edu
27	Tufa Dinku	USA	M	International Research Institute for Climate and Society (IRI)	tufa@iri.columbia.edu
28	James Hansen	USA	M	International Research Institute for Climate and Society (IRI)	jhanzen@iri.columbia.edu
29	Noel Templer	Kenya	M	Alliance of Bioversity and CIAT (ABC)	N.Templer@cgiar.org

Agenda

Monday, July 17	
Morning	<p>Workshop opening:</p> <ul style="list-style-type: none"> • Opening remarks (RUFORUM, IRI, ILRI) • Introductions by participating organizations and institutions <p>Overview of the AICCRA project and its training goals and strategy</p> <p>Overview of workshop objectives and context</p> <p>Overview of curriculum platform (needs assessment results, design specifications, commitments, timelines)</p>
Afternoon	<p>Presentation of existing available curricular materials (CIS and CSA) developed through AICCRA, alongside experience sharing on implementation (pilots, where possible):</p> <ul style="list-style-type: none"> • Climate Risk Management in Agriculture (CRMA) graduate and postgraduate university curriculum (IRI, ILRI), including experience sharing from Ethiopian implementation <p>Discussion of relevance of materials for ESA universities at undergraduate, graduate, and postgraduate levels</p>
Tuesday, July 18	
Morning	<p>Short recap of topics and information shared in Day 1</p> <p>Continued: Presentation of existing available curricular materials (CIS and CSA) developed through AICCRA, alongside experience sharing on implementation (pilots, where possible):</p> <ul style="list-style-type: none"> • Climate Risk Management in Agricultural Extension (CRMAE) curriculum (IRI, ILRI), including experience sharing from Ethiopia, Senegal, Zambia, and Kenya implementation • Climate Information Services for Climate Smart Agriculture (CIS/CSA) curriculum (RUFORUM) • Climate Smart Agriculture curriculum (graduate) recently accredited by Kenya Commission for University Education (ABC) <p>Discussion of relevance of materials for ESA universities at undergraduate, graduate, and postgraduate levels</p>
Afternoon	<p>Working session: Detailed review and markup of 1) CRMA, 2) CRMAE, 3) RUFORUM CIS/CSA, and 4) AICCRA-Kenya CSA curricular materials</p>
Wednesday, July 19	

Morning	<p>Participatory Discussion on Partner Priorities for Way Forward:</p> <ul style="list-style-type: none"> • Target learner profile (Faculty and instructors for 2023? For beyond in possible Phase 2 of AICCRA: Undergraduates? Graduates? Postgraduates?) • High-priority competencies for CIS and CSA curricula • Target length of course(s) • Learning environment and modality of instruction with curriculum platform resource (Fully online/self-guided asynchronous learning vs. hybrid synchronous learning) ? <ul style="list-style-type: none"> ○ Target teacher/professor profile for pilot? (if hybrid synchronous learning) • Material revision and adaptation needed for curricular platform • Target universities for online content pilot? (Phase 2 of AICCRA?)
Afternoon	<p>Roadmap Development for Adaptation of AICCRA Curricular Content for Online Curriculum Platform</p> <ul style="list-style-type: none"> • Summary of discussions and feedback throughout week on various AICCRA-developed curricula • What to keep, what not to keep • Types and formats of materials needed • Tasks and timeline for: <ul style="list-style-type: none"> ○ Material revision and adaptation for curricular platform ○ Training of teachers on use of curricular platform ○ Monitoring, Evaluation, and Learning strategy for implementation of content on curricular platform • Resources and timeline for implementation • Partner roles and responsibilities
	Workshop close (IRI, RUFORUM, ILRI)

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Climate Research for Africa



aicra.cgiar.org

info@cgiar.org

[CGIARAfrica](https://twitter.com/CGIARAfrica)