



FACULTY AREA



# Training of Trainers (ToT) on Soil Carbon Sequestration and Crop Production Course Module

Workshop Report



**AICCRA**  
Accelerating Impacts of CGIAR  
Climate Research for Africa



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## About AICCRA Reports

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

## Photos

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## About AICCRA



Accelerating Impacts of CGIAR Climate Research for Africa (AICCRA) is a project that helps deliver a climate-smart African future driven by science and innovation in agriculture. It is led by the Alliance of Bioversity International and CIAT and supported by a grant from the International Development Association (IDA) of the World Bank. Explore our work at [aiccra.cgiar.org](https://aiccra.cgiar.org)



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# **ABBREVIATIONS**

<b>AICCRA</b>	Accelerating Impacts of CGIAR Climate Research in Africa
<b>CCAFS</b>	Climate Change Agriculture and Food Security
<b>CGIAR</b>	Consultative Group of International Agricultural Research Centres
<b>CIAT</b>	Centro Internacional Agricultura Tropical
<b>CIS</b>	Climate information services
<b>CSA</b>	climate-smart agriculture
<b>FAO</b>	Food and Agriculture Organization of the United Nations
<b>GIS</b>	Geographic Information Systems
<b>IPCC</b>	Intergovernmental Panel on Climate Change
<b>KNUST</b>	Kwame Nkrumah University of Science and Technology
<b>SSA</b>	Sub Saharan Africa
<b>WASCAL</b>	West African Science Service Centre on Climate Change and Adapted Land Use

## **ABSTRACT**

As part of the AICCRA project, the West African Science Service Centre on Climate Change and Adapted land Use (WASCAL) and the Regional Universities Forum for Capacity Building in Agriculture (RUFORUM) are tasked to develop curricula and training materials to accelerate the mainstreaming of Climate Information Services (CIS) and Climate Smart Agriculture (CSA) into University's curricula in Africa. This report describes the activities of a training of trainers' (ToT) workshop on Soil Carbon Sequestration and Crop Production course module led by WASCAL as part of AICCRA curricula development activities. The training programmed was held at the Amonoo-Niezer Conference Centre, KNUST, KUMASI between 13th and 15th September, 2023. Forty-one (42) university lecturers, including nine women from three West African countries benefited from the training programme. The curricula consisted of four sessions on (i) Soils for Sustainable Crop Production, (ii) Climate Change and Crop Production, (iii) Soil Carbon Sequestration and (v) Spatial Estimation and Modelling of Soil Carbon. Four facilitators from the Kwame Nkrumah University of Science and Technology, Kumasi took participants through each of the sessions. For each session, there was theoretical as well as practical training, where participants went to the field and laboratory for data collection and analysis respectively. Participants suggested to contextualize the module contents of the course with practical case studies peculiar to/ practiced by the AICCRA Project Thematic Countries, i.e., Ghana, Mali, and Senegal, and to liaise with the Ministries of Education to help incorporate CSA and CIS in the curricula of basic and secondary level of education.

## INTRODUCTION

The Accelerating Impacts of CGIAR Climate Research for Africa (AICCRA) Project builds on the initiatives and achievements under the CGIAR Research Program on the Climate Change, Agriculture and Food Security (CCAFS) in Africa. With a focus on climate-smart agriculture (CSA) technologies and on climate information services (CIS), the AICCRA project includes an important capacity development component for the benefit of six (6) AICCRA intervention countries, but also for other African countries through spillover effect. The Regional Universities Forum for Capacity Building in Agriculture RUFORUM is a global partner to AICCRA to focus on West Africa and the East and Southern Africa regions but also to work at the continental level. RUFORUM has been working in West Africa with WASCAL which is a Regional Institution on Capacity Building and Science Services for Climate Change and Adapted Land Use to develop curricula and training materials that will be made accessible to other SSA countries, the knowledge on CSA and climate agro-advisory services generated in the six intervention countries. WASCAL has signed a contract with CIAT to achieve this objective under the global partnership that RUFORUM has with AICCRA to be able to stress on capacity development for actors' access to knowledge and tools related to Climate Smart Agriculture (CSA) and Climate Information Services (CIS).

The training programme under the AICCRA Project titled "Mainstreaming CSA and CIS into Universities' Curricula" was organized for WASCAL alumni from

Ghana and other selected West African countries as well as for lecturers from selected Universities in Ghana. The training programme took place at the Amonoo-Niezer (IDL) Conference Centre, KNUST, Kumasi from Wednesday 13th to Friday 15th of September, 2023 and had 42 university lecturers in attendance (Table 1). During the training, attendees shared opinions and suggestions on training materials and delivery of the developed Soil Carbon Sequestration and Crop Production module. The module consists of four (4) sessions: (i) Soils for Sustainable Crop Production, (ii) Climate Change and Crop Production, (iii) Soil Carbon Sequestration and (iv) Spatial Estimation and Modelling of Soil Carbon. The training programme was designed with a participant-centered approach because the target participants were able to identify present and/or existing issues, strengths, and the need for change. The objectives of the workshop were to:

- Create awareness by sharing with the participants the relevance of CSA and CIS as well as the impact of AICCRA project for Africa
- Conduct in person training of lecturers on the module "Soil Carbon Sequestration and Crop Production" developed for targeted participants involving lecturers that are WASCAL alumni from Ghana and other selected West African countries, as well as lecturers at KNUST.
- Collect feedbacks from trainees for further improvement of the module on Soil Carbon Sequestration and Crop Production.
- Disseminate the available training material developed for their future lecture

Table 1: Summary data of participants

Country	Institution	Participants	Male	Female
Ghana	Kwame Nkrumah University of Science and Technology (KNUST), Kumasi	16	16	0
	WASCAL HQ, Accra	6	3	3
	WASCAL GSP in Climate Change and Land Use, KNUST, Kumasi	10	6	4
	University of Energy and Natural Resources (UENR), Sunyani	2	1	1
	University of Environment and Sustainable Development (UESD), Somanya	3	3	0
	Koforidua Technical University (KTU), Koforidua	1	1	0
	IFDA, Accra	1	1	0
Mali	Institut Polytechnique Rural de Formation et de Recherche Appliquée (IPR-IFRA)	1	1	0
The Gambia	University of The Gambia	2	1	1
Total		42	33	9

## Day One: 13<sup>th</sup> September, 2023

### Morning session

During the first session, the Director of WASCAL KNUST, Prof. Wilson A. Agyare (Figure 1); the Chairman of the Scientific Advisory Committee of WASCAL, Prof. Brice Sinsin; the Provost of the College of Engineering, KNUST, Prof. Kwabena Biritwum Nyarko, who represented the Vice Chancellor of KNUST and the Director of WASCAL Capacity Building Department, Prof. Daouda Kone were on hand to give the welcome and opening addresses for the training programme. There was a self-introduction exercise to enable participants to get acquainted to each other. The training agenda was present by Prof. Daouda Kone and was validated by all participants. The expectations by participants and those from facilitators were shared. Prof. Benjamin Lamptey, a WASCAL Consultant gave a presentation on the 'Importance of mainstreaming CSA and CIS in University

Curricula'. The workshop schedule and training materials were shared with the Vice Chancellor of KNUST, who was represented by the Provost of the College of Engineering, KNUST (Figure 2) followed by a break for group photo session (Figure 3).



**Figure 1:** Opening remarks by the Director, WASCAL Climate Change and Land Use, KNUST, Kumasi





**Figure 2:** The Chairman of WASCAL Scientific Advisory Board, Prof. Brice Sinsin (right) sharing the training materials with the Provost, College of Engineering, Prof. Kwabena Biritwum Nyarko (left)

### Afternoon Session

A key presentation was given by Dr. William Amponsah, the Scientific Coordinator of WASCAL KNUST on the topic; “Gap Assessments on Capacity Building in Climate Smart Agriculture and Climate Information Services in Tertiary Institutions in Ghana, Mali and Senegal”. After this presentation, a general introduction of the training on Soil Crop Sequestration and Crop Production was given the Director of WASCAL KNUST, Prof. Wilson A. Agyare. The first session of the training titled “Soils for Sustainable Crop Production” was led by Dr. Andrews Opoku (Department of Soil Science, KNUST). The content of the first session of the training focused on soil properties and adaptation to water stress; soil degradation and conservation. The second session of the training titled “Climate Change and Crop Production” was led by Prof. Emmanuel Quansah (Department of Meteorology and Climate Science, KNUST). The content of this session included; impacts of climatic conditions on crop production, pest and diseases dynamics, adaptation and resilience strategies and instrumentation and data analysis. There were Q&A sessions after each of the training session.



**Figure 3:** Group picture of participants with the Provost, College of Engineering, KNUST, Kumasi

## Day Two: 14th September, 2023

### Morning Session

A recap of the activities of the previous day was given by the moderator (Dr. William Amponsah). The third session of the training programme titled “Soil Carbon Sequestration” begun following the recap of previous activities and was led by Dr. Enoch Bessah (Department of Agriculture and Biosystems Engineering, KNUST). The content of this session included; soil organic carbon and green-house gases, soil carbon measurement and monitoring, as well as carbon sequestration and global warming. The fourth training session titled “Spatial Modelling and Estimation of Soil Carbon” was led by Mr. Da-Costa M. Asare (Department of Geomatic Engineering, KNUST). The content of the session included remote sensing and GIS for soil carbon measurement and soil carbon modelling approaches. There were Q&A sessions after each of the training session.

### Afternoon Session – Practical Sessions

Following the training lectures, all participants undertook practical sessions on soil profile, soil sampling, determination of soil texture, laboratory analysis of bulk density and soil organic carbon, soil mapping and georeferencing using a drone. The practical sessions took place at the KNUST Soil Science experimental fields and laboratory.



### **Practical session 1: Soils for Sustainable Crop Production**

The field practical under this session was led by Dr. Andrews Opoku (Department of Soil Science, KNUST), who took all participants through the description of soil profile (Figure 4), the techniques of soil sampling for the determination of physical, chemical and biological properties, determination of soil texture using the FAO soil classification hand book, laboratory analysis of bulk density.



**Figure 4:** Soil profile description during the practical session at the Soil Science experimental fields, KNUST, Kumasi

### **Practical session 2: Soil Carbon Sequestration**

The practical training under this section was led by Dr. Enoch Bessah (Department of Agriculture and Biosystems Engineering, KNUST) with the help of a laboratory technician from the Department of Soil Science, KNUST. Participants discussed the equipment and procedures for soil sampling (Figure 5) as well as the titration methods that are required in determining the soil organic matter and carbon content using the standard equations (Figure 6). Dr. Enoch Bessah (Department of Agriculture and Biosystems Engineering, KNUST), the lead facilitator for the Session 3 also took the participants through the method for estimating carbon stocks using the laboratory results of bulk density and soil carbon concentration obtained from the fieldwork. He further explained the

techniques for carbon sequestration emphasizing on the production of biochar.



**Figure 5:** Soil sampling during the practical session at the Soil Science experimental fields, KNUST, Kumasi



**Figure 6:** Laboratory analysis of soil carbon during the practical session at the Soil Science laboratory, KNUST, Kumasi

### **Practical session 3: Spatial Modelling and Estimation of Soil Carbon**

Mr. Da-Costa M. Asare (Department of Geomatic Engineering, KNUST) explained the spatial prediction and assessment of soil organic carbon using Geospatial technology to the participants. He

took participants through how to fly a drone (Figure 7), and capture images for processing and developing soil maps (Figure 8). With the laboratory results of soil organic carbon concentration, soil profile data obtained from the fieldwork, Mr. Asare demonstrated a step-by-step tutorial to participants how to map soil organic carbon stock for an area using Arc Map and R software.



**Figure 7:** Drone flying session during the practical session at the Soil Science experimental fields, KNUST, Kumasi



**Figure 8:** Drone taking spatial data during the practical session at the Soil Science experimental fields, KNUST, Kumasi

### **Day Three: 15th September, 2023**

A recap of the activities of the previous day was given by the moderator (Dr. William Amponsah). Data obtained from practical sessions were analyzed together with all participants. This was led by Dr. Andrews Opoku, Dr. Enoch Bessah and Mr. Da-Costa M. Asare. All participants were provided questionnaire to fill and give their feedback on the training programme. To wrap up the training programme, all participants embarked on KNUST Campus Tour and a visit to Manhyia Palace

## **CONCLUSION AND WAYFORWARD**

Participants were enthused and expressed their immense gratitude to the opportunity to partake in the training programme through their contributions and queries to the presentations and also providing capacity building for lecturers regarding Climate-Smart Agriculture (CSA) and Climate Information Services (CIS).

A range of suggestions emerged from the discussions, which can be summarized into:

1. Encourage the involvement and participation of women in discussions and also bring them on-board to partake in high-level dialogue processes.
2. Participants were urged to be more proactive and extend information/education received at the workshops to their colleagues for an all-inclusive knowledge sharing and support movement groups interested in incorporating CSA and CIS into University Curricula



3. Develop a detailed manual for all practical sessions of the Soil Carbon Sequestration and Crop Productions for all participants to acquire first-hand knowledge on how field practical sessions will be carried out especially with the Remote Sensing and GIS module.
4. Contextualize the module contents of the Soil Carbon Sequestration and Crop Production course with practical case studies peculiar to/ practiced by the AICCRA Project Thematic Countries, i.e., Ghana, Mali, and Senegal.
5. Liaise with the Ministry of Education, Ghana to help incorporate CSA and CIS in the curricula of basic and secondary level of education.

## QUESTIONS RAISED DURING THE TRAINING

S/N	SESSION/ ACTIVITY	QUESTIONS
1	Expectation of the Training Programme: AICCRA	<ol style="list-style-type: none"> <li>1. Farmers inclusion policy. How are farmers included in the framework?</li> <li>2. The roadmap to the acquisition of data from the Ghana Meteorological Service should take into account what works best for each area in the implementation of the national framework.</li> </ol>
2	Gap Assessment on Capacity Building in Climate Smart Agriculture and Climate Information Services in Tertiary Institutions in Ghana, Mali and Senegal (Dr. William Amponsah)	<ol style="list-style-type: none"> <li>1. How possible is it to connect climate change data and climate-smart agriculture? How was the climate data assessed and what type of climate data was used?</li> <li>2. What are the relationships between climate information services (CIS) and climate-smart agriculture (CSA)?</li> <li>3. The target point of CIS and CSA should not only be on agriculture but also consider other fields.</li> <li>4. What are the study reports on the target group's needs (farmers)? Again, inquired about the publication status of the report.</li> <li>5. What could be done to gain access to solar radiation data?</li> <li>6. Were teachers at the various colleges of education included in the survey?</li> <li>7. What were the limits of the survey? What could be done for an extension of the number of respondents if possible?</li> </ol>
3	Session 1: Soils for Sustainable Crop Production (Dr. Andrews Opoku)	<ol style="list-style-type: none"> <li>1. What is the Twi word for Terrace?</li> <li>2. What are the key concepts to be developed since vegetation is not at the rainfall levels? How do plants avoid drought?</li> </ol> <p>Feasible factors to improve the soil in our setting should be more considered and not solely focused on the standards globally accepted but not feasible in our terrain</p>
4	Session 2: Climate Change and Crop Production (Prof. Emmanuel Quansah)	<ol style="list-style-type: none"> <li>1. Aspects of climate change were not discussed in your presentation as was presented in the manual provided. Specific indices should be used in the determination of the climatic changes and again drivers of climatic changes</li> </ol>

		<p>should be quantified for instance either natural or anthropogenic.</p> <ol style="list-style-type: none"> <li>2. There should be the development of early warning systems to solve the changing climatic impact on crops and as well develop specific systems for specific agroecological systems.</li> <li>3. There should be a seamless climate module as input prior to the development of the module for climate estimations.</li> <li>4. What are the essential benefits of instrumentation and climate estimations to students and farmers?</li> <li>5. Specific pests and diseases likely to emerge due to climatic changes could be identified and how best farmers could adapt to such.</li> <li>6. The presentation focused more on the measurement of parameters and laid very little emphasis on the mitigation strategies that would be beneficial to the benefactors of this course</li> </ol>
5	<p>Session 3: Soil Carbon Sequestration (Dr. Enoch Bessah)</p>	<ol style="list-style-type: none"> <li>1. What is a Biochar? What is the need for a biochar?</li> <li>2. Does temperature affect biochar? If yes what are the specific instruments to determine the temperature of a biochar?</li> <li>3. The correction formula for the volume of gravel (gravel content) in stoney soils was not captured in the presentation. FAO (2019) documents on carbon sampling in accordance with the IPCC protocols could be looked at for more details. <ul style="list-style-type: none"> <li>• What depth of sampling should be recommended according to IPCC?</li> <li>• Carbon sequestration takes into consideration how much carbon is stored in a soil fraction, mineral fraction, and particulate fraction.</li> <li>• Details on stone factor equations should be included.</li> </ul> </li> <li>4. Clarifications on the Thiers.</li> <li>5. How often as part of the monitoring does one have to determine the impact of carbon occurring on soil cropping systems?</li> <li>6. What are the key questions or hypotheses for which reason monitoring should be done?</li> <li>7. Has there been any conversations or training on soil carbon sequestration focusing not only on the above-ground carbon?</li> </ol>
6	<p>Session 4: Spatial Modelling and Estimation of Soil Carbon (Mr. Da-Costa Mensah Asare)</p>	<ol style="list-style-type: none"> <li>1. What sample distributors were used in taking the 30 soil samples at Anwomaso?</li> <li>2. 30cm carbon stock measurement is very okay but in other opinions for instance agriculture, the likelihood of getting the variations may be very low. Therefore, variations will be intense if well stratified (0-10cm, 10-20cm and 20-30cm)</li> <li>3. It was mentioned that satellite data was the method of collecting data but for the sake of the training are there alternative methods for collecting data?</li> </ol> <p>What were the countrywide areas of interest for this sampling?</p>



# APPENDIX

## APPENDIX 1 LIST OF PARTICIPANTS

S/N	NAME	ORGANIZATION
1	Prof. Kwabena Biritwum Nyarko	Provost, College of Engineering, KNUST
2	Prof. Daouda Kone	Director, WASCAL CBD, Accra
3	Prof. Brice Sinsin	Chair, WASCAL SAC
4	Prof. Wilson Agyei Agyare	Director, WASCAL GSP, KNUST
5	Dr. Yacouba Diallo	Director, WASCAL GSP, Mali
6	Prof. Eric Kwabena Forkuo	Deputy Director, WASCAL GSP, KNUST
7	Dr. William Amponsah	Scientific Coordinator, WASCAL GSP, KNUST
8	Dr. Mamma Sawaneh	Scientific Coordinator, University of The Gambia
9	Dr. Emmanuel Quansah	Facilitator, KNUST
10	Dr. Andrews Opoku	Facilitator, KNUST
11	Dr. Enoch Bessah	Facilitator, KNUST
12	Mr. Da-Costa Mensah Asare	Facilitator, KNUST
13	Prof. Benjamin Lamptey	WASCAL Consultant, Accra
14	Prof. Enoch Adjei Osekre	Dean, KNUST
15	Prof. Kwaku Amaning Adjei	Dean, KNUST
16	Prof. Jonathan Hogarh	HoD, KNUST
17	Dr. Thompson Annor	HoD/Alumni, KNUST
18	Prof. Jonathan Quaye-Ballard	HoD, KNUST
19	Dr. James Seutra Kaba	Expert, KNUST
20	Dr. Daniel Abgetiame	Expert, KNUST
21	Dr. Isaac Kankam-Boadu	Expert, KNUST
22	Prof. Vincent Logah	Expert, KNUST
23	Dr. Thomas Atta-Darkwah	Expert, UENR

24	Dr. Michael Tuffour	Expert, UESD
25	Dr. Nat Opoku Prempeh	Alumni, KNUST
26	Dr. Yaw Mensah Asare	Alumni, KNUST
27	Dr. Clement Nyamekye	Alumni, KTU
28	Dr. Naomi Kumi	Alumni, UENR
29	Dr. Isaac Larbi	Alumni, UESD
30	Dr. Andrew Manoba Limatol	Alumni, UESD
31	Dr. Williams Kwame Atakora	Alumni, IFDC
32	Dr. Ama Gyimah	Alumni, University of The Gambia
33	Selasi Weto	WASCAL HQ, Accra
34	Garvary Frimpomaa Akoto	WASCAL HQ, Accra
35	Peace Ahovi	WASCAL HQ, Accra
36	Mr. Kwabena Ampong	WASCAL GSP, KNUST
37	Akua Osaa Awuah	WASCAL GSP, KNUST
38	Theresah Sarpong-Peprah	WASCAL GSP, KNUST
39	Mr. Noble Adjei Donkor	WASCAL GSP, KNUST
40	Beatrice Baryeh	WASCAL GSP, KNUST
41	Doreen Aboh	WASCAL GSP, KNUST
42	Abdul Mumuni	WASCAL GSP, KNUST

## APPENDIX 2. AGENDA

Mainstreaming CSA and CIS into universities' curricula: training West Africa universities lecturers on four thematic modules in Africa 13-15 September 2023. IDL Conference Centre, KNUST Campus, Kumasi. Moderator: Dr. William Amponsah (Scientific Coordinator, WASCAL KNUST)

### Day 1: 13th September, 2023

ACTIVITIES		SPEAKERS/FACILITATORS
08h30 – 09h00	Arrival and Registration	Selasi Weto/Theresa Sarpong-Peprah
09h00 – 09h10	Welcome Remark and orientation	Prof. Wilson A. Agyare
09h10 – 09h20	Welcome Message – WASCAL	Prof Brice Sinsin
09h20 - 09h35	Opening Remarks	Prof. Kwabena Biritwum Nyarko, Provost, College of Engineering, KNUST
09h35 – 09h50	Self-introduction	All participants
09h50 – 10h05	Presentation and Validation of the Agenda	Prof Daouda Kone
10h05 – 10h20	Expectation of the Training Programme: AICCRA	Prof Daouda Kone
10h20 – 10h40	Importance of Mainstreaming CSA and CIS into University Curricula	Prof. Benjamin Lamptey
10h40-10h45	Sharing with the VC the package of training material	WASCAL representative
10h45-10h55	Group Photo	WASCAL IT & Media
10h55-11h10	Health Break	Selasi Weto/Theresa Sarpong-Peprah
11h10-11h30	Case study on elements and priority on CSA and CIS for communities in Senegal	Prof Daouda Kone
11h30- 12h30	Gap Assessment on Capacity Building in Climate Smart Agriculture and Climate Information Services in Tertiary Institutions in Ghana, Mali and Senegal	Dr. William Amponsah
12h30-13h00	Distribution of the training material to the grantees	
13h00-14h00	LUNCH	Selasi Weto/Theresah Sarpong-Peprah
14h-14h15	2- In-person Training Soil - Carbon Sequestration – Crop Production (General Introduction)	Prof. Wilson A. Agyare

14h15-15h30	Session 1: Soils for Sustainable Crop Production	Dr. Andrews Opoku
15h30-15h45	Q&A	All Participants
15h45-16h00	Break	
16h00-17h15	Session 2: Climate Change and Crop Production	Dr. Emmanuel Quansah
17h15-17h30	Q&A	All Participants
17h30-17h35	Closing remarks	

### Day 2: 14th September, 2023

ACTIVITIES		SPEAKERS/FACILITATORS
8h30-9h00	Arrival and Registration	All participants
09h00-10h15	Session 3: Soil Carbon Sequestration	Dr. Enoch Bessah
10h15-10h30	Q&A	All Participants
10h30-10h45	Health Break	Selasi Weto/Theresa Sarpong-Peprah
10h45-12h00	Session 4: Spatial Modelling and Estimation of Soil Carbon	Mr. Da-Costa M. Asare
12h00-12h15	Q&A	All Participants
12h15-13h30	Lunch break	Selasi Weto/Theresa Sarpong-Peprah
13h30-15h30	Practical session (KNUST Agric Farms, KNUST)	All participants
15h30-15h45	Health Break	Selasi Weto/Theresa Sarpong-Peprah
15h45-17h30	Practical session (KNUST Soil Science Laboratory)	All participants
17h30-17h35	Closing Remarks	

### Day 3: 15th September, 2023

ACTIVITIES		SPEAKERS/FACILITATORS
8h30-9h00	Arrival and Registration	All participants
9h00-11h00	Data Analysis	All Facilitators
11h00-11h15	Health Break	Selasi Weto WASCAL/Theresa Sarpong



11h15-12h00	Feedback on Training Programme	Module from RUFORUM
12h00-12h20	Certificate to the participants	
12h20-12h30	Closing remark	
12h30-13h30	LUNCH	Selasi Weto WASCAL/Theresa Sarpong
13h30-14h30	KNUST Campus Tour	James Oberko
14h30-18h00	Site visit to Manhyia Palace	All participants
19h00-21h00	Dinner	Selasi Weto WASCAL/Theresa Sarpong



# AICCRA

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Climate Research for Africa



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