

ENGAGEMENT OF AGRICULTURAL, TECHNICAL AND VOCATIONAL EDUCATION AND TRAINING (ATVET) INSTITUTIONS

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Kawira

Workshop Report



AICCRA
Accelerating Impacts of CGIAR
Climate Research for Africa



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

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Titles in this series aim to disseminate interim climate change, agriculture, and food security research and practices and stimulate feedback from the scientific community.

About AICCRA

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Table of contents

Introduction	6
1. Baraka Agricultural College	7
2. Dairy Training Institute	9
3. Bukura Agricultural College	10
Conclusions and Recommendations	11
Annexes	12

Introduction

Egerton University, a member university of the Regional Universities Forum for Capacity Building in Agriculture (RUFORUM), held an engagement meeting with Technical Vocational Education and Training (TVET) institutions on 6th May 2022. The meeting was held under the auspices of the University-TVET forum. This forum sought to enhance the collaboration and working partnership between universities and TVET institutions to strengthen the education value chain. The University-TVET forum is part of an arrangement championed under the RUFORUM's Transforming African Agricultural Universities to meaningfully contribute to Africa's growth and development (TAGDev) programme.

Objectives Of the Forum

The Forum was convened with four objectives;

- To identify areas of comparative advantage for each ATVET institution
- To identify areas of complementation between Egerton University and TVET institutions
- To strategize the modalities for capacity building and co-creation of curricula in climate-smart agriculture and entrepreneurship.
- To explore the participation of universities in the curriculum review and accreditation process to be undertaken by TVET institutions.

The Forum was introduced to the Accelerating Impacts of CGIAR Climate Research for Africa (AICCRA) project (<https://aicra.cgiar.org/>), a CGIAR initiative currently coordinated by the Alliance of Bioversity International and CIAT (<https://alliancebioversityciat.org/>). The AICCRA project seeks to build up the technical, institutional, and human capacity of targeted regional countries to strengthen resilience to climate change impacts by increasing the dissemination and uptake of CGIAR and partners' research. Through this initiative, the CGIAR will focus its interventions in Kenya, Ethiopia, Zambia, Senegal, Ghana, and Mali with a regional benefit through the RUFORUM for higher education institutions.

RUFORUM is one of the implementing partners to the AICCRA project with a focus on higher education institutions for implementing climate-smart agriculture, including; designing and reviewing courses to integrate climate-smart agriculture and information services. RUFORUM, in collaboration with Egerton University, has strategically focused on engaging the ATVETs because of their central role in training the middle cadre agricultural workers that are central to the delivery of agricultural extension services. Secondly, ATVETs are critical players in influencing the adoption of various agricultural technologies, innovations, and management practices among farming communities.

Four ATVETs in Kenya

The four institutions that responded were Bukura Agricultural College, Baraka Agricultural College, Dairy Training Institute, and Njoro Polytechnic. As part of the needs assessment, these institutions had four key issues of interest to establish foundations for working together. All the ATVETs have been offering training in CSA and have been involved in CSA activities at various levels. The activities undertaken by Baraka Agricultural College included organic farming within the institute, agroforestry, apiculture, organic waste composting, integrated pest management, fish farming,

weather data collection, deployment of solar panels for alternative energy sources, biogas production, hydroponics and fodder production, and agroforestry among others.

Three ATVET institutions indicated have courses that incorporated climate-smart agriculture. Baraka Agricultural College had the following courses; Sustainable Agriculture for Rural Development and Apiculture. These courses were delivered modularly at various levels, including levels 3, 4, and 6. The Dairy Training institute had the following courses; Dairy production and processing (Diploma); Dairy production and management (certificate), Dairy technology and management (certificate), Dairy farm management (Diploma), Dairy plant management (Artisan course for six months), Dairy farm technician, and several other short courses such as Climate Smart Dairy Production.

Bukura Agricultural College had the following courses that had components of smart climate agriculture in them; Certificate in Agriculture and Community Development, Diploma in Agriculture and Biotechnology, Diploma in Horticulture, Diploma in Agribusiness Management and marketing, Diploma in Agricultural extension, Diploma in Education and Extension, Diploma in Animal production and health, Diploma in Irrigation and Drainage Engineering, Diploma in Animal Health, and Diploma in Farm business management. However, Njoro Polytechnic was relatively new in climate-smart agriculture and the integration of climate-smart technologies into their practices.

1. Baraka Agricultural College

[Baraka Agricultural College](#) started in 1974 as a farmers training place. It responded to the lack of skills as the white farmers were going back. The St. Franciscan Brothers were given complete authority. The Franciscan brothers were originally from Ireland, Piggery.

Crop production sector

The purpose of the training was to sell seeds to different farmers; this enabled the institution to be known by other farmers. During the recruitment, it provided the opportunity to get farmers from Baringo and Nakuru. Baringo is a bit dry, but some areas receive rain. They took the approach of engaging other agencies to help with recruitment. They focused on communities/persons that are marginalized. Identified the activities that the youth were involved in and looked out for the people with the motive.

Six weeks of training worked on the expectations of the farmers. This enabled the focus of the first two weeks on the foundations of sustainable agriculture. The skills included: Understanding the resources and their sources, understanding the changing circumstances/conditions, handling the soils, including identifying good soils through soil sampling and management of soils. Another skill was terracing because of the hilly locations. Through this, they are able to help the communities.

Knowledge of crops, with a focus on requirements for vegetable production; they were taught how to make compost for cropping so that they could begin to appreciate and use it. Other skills imparted were fruit identification against climatic conditions, seeds identification, sowing, potting, nursery management, managing fruits and diseases, harvesting, and post-harvest handling, especially processing farm produce in plenty. Milk and the production of yogurt are aimed at job creation. Fruit juice making to cater to the plenty of fruit harvest. Beekeeping skills include; siting of the apiary and the type of bee hives used.

Livestock production sector

Selected enterprises based on time are dairy, poultry, and beekeeping. Further, it extended to feed formulation that applies to dairy, poultry and fish farming. Skills gained include Slaughtering. Feed

conversation; silage making and haymaking, developing a formula, their own formula, and feeding regimes. Selection of different livestock enterprises based on market demand. Further, how to identify each animal based on need. Disease control and basics on treatment. Constructing houses for different livestock. Establishing different pastures and management. They were trained in the inspection of the meat. Land preparation for pastures, e.g., Brachiaria, etc. Breeding/reproduction skills were taught to get the trainees to appreciate basic issues such as; timely breeding records keeping, value addition, including how to produce cheese, value addition of carcass, fodder trees and intensification of fodder production. Heifer inspection, entrepreneurship, processing of honey and how to market. Entrepreneurship in terms of how to start their businesses, managing the business, cost-benefit advisory and then marketing.

Income generating unit (generate income for the college's sustainability, units are resource units for trainees, brand the college through the products that the college produces). The farm is the main resource centre; upgrading of facilities used on the farm. Earlier, there was a curriculum developed through RUFORUM support focusing on piggery. For the curriculum to be offered, the facilities needed to be upgraded to a level acceptable to enable quality training; this has not yet been done. Similarly, the dairy unit needed an upgrade, e.g., silage slab, cow handling structure with slurry pit. Development of basic seed production facility because potato seed has a high demand that team is currently unable to meet the demand. The team further seeks to work on the tissue culture facility to multiply the basic seed. This will enable them to expand their production capacity from this year's 5 acres level. In addition, there was a need to enhance irrigation capacity within the college because the irrigation system was lacking. Accordingly, with support from the EU, the college has constructed a rainwater-harvesting pond, from which the water for irrigation will be obtained. The college has also moved towards operationalizing its green energy; this was deemed necessary by adopting solar for lighting and bio-digesters for biogas.

The college undertakes an outreach program to contribute to increased food security, income, and environmental sustainability of rural communities. The college worked in three sub-counties. Activities focused on; water provision through the drilling and rehabilitation of boreholes and distributing water in a radius of 10 km and trained water community management committees. Capacity building in diversified food options among 650 households such that; 30% of these households have realized a reduction in household expenditure and 30% increase in household income. Further, the college has been involved in capacity building on nutrition and value addition. The outreach programme also trained smallholder farmers in entrepreneurship and savings. Capacity building on climate resilience within beekeeping as a flagship intervention around the Lakes and wildlife conservation areas (Lake Nakuru National Park), and the provision of energy-saving devices such as the local cook stoves (jikos). Beyond agriculture and income, the outreach programme also involved public health education, sanitation and hygiene in parts of Kisii Ndogo, focusing on ending open free defecation. Other cross-cutting issues; in post-election leadership, conflict resolution, and peacebuilding.

Avenues available for supporting Baraka college moving forward include; upgrading facilities, capacity building of staff from diploma to degree and degree to master, and capacity building in pedagogy to enhance teaching skills. Further support for curriculum development for levels 3, 4, and 6 and upgrading of science laboratory, including soil testing. They are establishing online learning systems since they are lacking and upgrading the online system and library.

Climate-smart agriculture-enabled activities

Baraka college has been engaged in CSA activities. The courses and activities that are CSA enabled include:

- Organic farming; promoting practices such as controlled composting, bio-fertilizers, biogas production
- Tree planting; promoting action for carbon sequestration, and multipurpose trees for income enhancement
- Apiculture-bee keeping; promoting environmental conservation/carbon sequestration, zero emissions production, and enhanced ecosystem services
- Circular Organic waste management
- Integrated pest management
- Irrigation and water harvesting
- Fish farming
- Weather station for climate data collection
- Value addition

Some CSA-enabled courses include; Sustainable Agriculture for Rural Development (SARD), Apiculture, and modular training. Approach-short courses and outreach on apiculture, SARD, and Soil conservation. Baraka college further seeks to develop level 3, 4, and 6 courses.

Baraka college team identified a number of gaps within its institution, including; limited digital competency for forecasting and early detection systems for weather/climate information and limited exploitation of CSA methods in animal production, e.g., vermiculture. Further, it was noted that CSA methods were not as effective as the conventional production approaches and were not competitive economically and practically. There were low adoption rates of CSAs because they are labor intensive and have low automation. There was a lack of premium pricing for products produced using CSA approaches and a limited innovation ecosystem around CSA.

However, there were possible areas universities could work with TVETs/Baraka to address the gaps; they include;

- Research and innovation
- Capacity development in areas of weather and climate information
- Funding for capacity development of staff and infrastructure

2. Dairy Training Institute

[The Dairy Training Institute \(DTI\)](#) has been engaged in CSA/I with several activities that included tree planting, circular economy through using fertilizers from animals, putting up solar panels, and engaging in value addition of produce.

DTI has had several curricula that were CSA-enabled. These included:

- Dairy production and processing (Diploma)
- Dairy production and management (certificate)
- Dairy technology and management (certificate)
- Dairy farm management (Diploma)
- Dairy plant management (Artisan course 6 months)
- Dairy farm technician
- Short courses, e.g., Climate-Smart Dairy Production

DTI team identified gaps in the institution that were observed and associated with CSA. They included: a lack of climate information services and tools, e.g., weather stations. Another observed gap was the lack of skills for collecting, analyzing and interpreting climate data. Lack of adoption and utilization of pasture and fodder development and production for adapting/mitigating climate variability.

Possible areas that the universities could work with TVETs to address the gaps observed included:

- Capacity building of staff to impart necessary skills
- Improve access to resources – finances and technologies
- Support production of dairy and value addition through CSA/circular economy

3. Bukura Agricultural College

The [Bukura Agricultural College](#) undertook curriculum development and review in the recent past, with the new and revised curriculum commencing in September 2022. The CSA activities undertaken in the institution include; conservation agriculture, agroforestry, pasture conservation, hydroponics and fodder production, renewable energy through biogas production, milk value addition, solar heating and lighting, especially poultry units and advocating for the implementation of existing policy on green energy for the campus.

The institution's curricular was CSA enabled; some of the curricula that were CSA enabled included:

- Certificate in Agriculture and Community Development
- Diploma in Agriculture and Biotechnology
- Diploma in Horticulture
- Diploma in AGBM in marketing
- Diploma in Agricultural extension
- Diploma in Education and Extension
- Diploma in Animal production and health
- Diploma in Irrigation and Drainage Engineering
- Diploma in Animal Health
- Diploma in Farm business management

Gaps identified that were associated with CSA included: limited tools and equipment in the institution, limited knowledge of diverse CSA practices, and in particular, what defines CSA. Possible areas identified as a potential locus where universities can work with TVETs to address the gaps include:

- Capacity building of staff: trainings/consultation opportunities both for long-term and short-term specialized training focusing on practical skills for CSA and climate information systems, and training of trainers
- Infrastructure support that is providing support for upscaling the equipment and providing associated equipment in different value chains development
- Improve on the institution industry linkages, e.g., developing a platform for engagement with the industry
- Long-term collaborations because of the ever-emerging issues. Also, collaborations aimed at helping the end users
- Support the incubation and innovation centres for students to incubate businesses and value-added products

Conclusions and Recommendations

The meeting with ATVETs concluded with identifying a number of gaps that affected the pace at which CSA in their institutions is implemented as well as its adoption. These include:

- Limited digital competency in forecasting and early detection systems for weather and climate information, lack of skills for accurately collecting, analyzing and interpreting climate data, and making use of an advanced source of climate information and services
- Limited use of modern climate-smart agriculture practices such as vermiculture
- Low adoption rates for CSA practices largely because they tend to be labor intensive and limited automation and have low returns on investment in large areas compared to the conventional approaches when deployed
- A lack of a premium price on the market for products produced using CSA approaches

The ATVETs recommended that there were several areas of convergence for collaboration with universities in the field of climate-smart agriculture, including:

- Capacity building of staff through the training of trainers in various aspects, including climate information services access, modern CSA practices, long and short-term specialized trainings for increasing the skills of staff, and skills in competitive proposals development for resource mobilization
- Support for infrastructure improvement for advancing a circular economy.

Annexes

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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.

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