

Research Application Summary

**Centre of Excellence in Sustainable Agriculture and Agribusiness Management
(CESAAM): An Eastern and Southern Africa Higher Education Centres of
Excellence Project at Egerton University, Kenya**

Guliye, A.Y.¹, Owuor, G.², Ouma, J.P.³, Omwamba, M.N.⁴, Mwonga, S.M.⁵ & Ogendo, J.O.⁶

¹Department of Animal Science, Faculty of Agriculture, Egerton University, P. O. Box 536-20115, Egerton, Kenya

²Department of Agricultural Economics and Agribusiness Management, Faculty of Agriculture, Egerton University, P. O. Box 536-20115, Egerton, Kenya

³Department of Crops, Horticulture and Soils, Faculty of Agriculture, Egerton University, P. O. Box 536-20115, Egerton, Kenya

⁴Department of Dairy, Food Science and Technology, Faculty of Agriculture, Egerton University, P. O. Box 536-20115, Egerton, Kenya

⁵Department of Crops, Horticulture and Soils, Faculty of Agriculture, Egerton University, P. O. Box 536-20115, Egerton, Kenya

⁶Faculty of Agriculture, Egerton University, P. O. Box 536-20115, Egerton, Kenya

Corresponding author: guliye@egerton.ac.ke, guliye@gmail.com

Abstract

Food insecurity and poverty remain the major challenges to Africa's development, affecting about 33% of its population. Among the key contributing factors to food insecurity are occurrence of frequent droughts, rampant crop and livestock diseases, poor infrastructure, poor policies, poor market access, high input costs, inadequate technical capacity and limited technologies and innovations. One key approach in addressing the above challenges is to build capacity along the agricultural value chain through strengthening of agricultural training, promotion and up scaling of promising technologies. The Centre of Excellence in Sustainable Agriculture and Agribusiness Management (CESAAM) at Egerton University, Kenya, is modelled to address the above issues. Egerton University has a long history of agricultural training and research, and is centrally placed within the Eastern Africa region. The region has a number of countries emerging from conflict that need to re-build their human capacity to address food insecurity. The broad objective of CESAAM is to contribute to sustainable agricultural and agribusiness management through capacity development, research and technology transfer for enhanced food security. The specific objectives are: (i) to develop capacity along the Agricultural Value Chain (AVC) in the Eastern and Southern Africa region, especially for the fragile and post-conflict states, (ii) to undertake innovative research, including use of biotechnology and climate smart agriculture, for increased crop and livestock productivity, (iii) enhance the capacity of the Egerton University's Agro-Science Park to assist partner universities establish a similar model for incubation of technological innovations, and (iv) to develop evidence-based agricultural policy briefs and disseminate best practices

through Agricultural Knowledge Centres at Egerton and partner universities. Key activities of CESAAM are focused towards: building capacity of partner institutions to undertake quality teaching and research, improving research laboratories, and improving innovation and incubation capacities of national and regional partner institutions to support agro-enterprise development. CESAAM will contribute towards the Comprehensive Africa Agriculture Development Programme (CAADP) pillar 4 thrust on strengthening agricultural research, technology dissemination and adoption. Thus, its expected outputs include increased capacity to conduct quality training and research nationally and regionally, well equipped and functional research laboratories, increased innovation products, increased dissemination of agricultural best practices and evidence-based policy briefs. The cumulative impacts of these outputs are increased productivity along the value chain and improved food and nutrition security.

Key words: ACE II, Agribusiness Management, Centres of Excellence, Egerton University, Eastern and Southern Africa, Sustainable Agriculture

Résumé

L'insécurité alimentaire et la pauvreté demeurent les principaux défis au développement de l'Afrique, qui touchent environ 33% de sa population. Parmi les principaux facteurs contribuant à l'insécurité alimentaire sont l'apparition fréquente de sécheresses, les maladies endémiques végétales et animales, la médiocrité des infrastructures, des politiques pauvres, le faible accès aux marchés, les coûts élevés des intrants, la capacité technique insuffisante, et des technologies et des innovations limitées. Une approche clé pour relever les défis ci-dessus est le renforcement de capacités le long de la chaîne de valeur agricole à travers le renforcement de la formation agricole, la promotion, et mise à l'échelle des technologies prometteuses. Le Centre d'excellence en agriculture durable et la gestion agro-alimentaire (CESAAM) à l'Université d'Egerton, Kenya, est modélisé pour résoudre les problèmes ci-dessus. L'Université d'Egerton a une longue histoire de la formation agricole et de la recherche, et elle est placée au centre de la région de l'Afrique de l'Est. La région a un certain nombre de pays sortant des conflits qui doivent reconstruire leur capacité humaine pour lutter contre l'insécurité alimentaire. L'objectif général de CESAAM est de contribuer à la gestion agricole et agroalimentaire durable par le développement des capacités, le transfert de la recherche et de la technologie pour améliorer la sécurité alimentaire. Les objectifs spécifiques sont: (i) développer la capacité le long de la chaîne de valeur agricole (CVA) dans la région de l'Afrique orientale et australe, en particulier pour les états fragiles et sortant des conflits, (ii) entreprendre des recherches novatrices, y compris l'utilisation de la biotechnologie et agriculture intelligente climatique, pour une meilleure productivité agricole et animale, (iii) renforcer la capacité du Parc d'Agro-science de l'Université pour aider les universités partenaires à établir un modèle similaire pour l'incubation des innovations technologiques, et (iv) élaborer des notes d'orientation agricole fondées sur des preuves et diffuser les meilleures pratiques par le biais de centres de connaissances agricoles à Egerton (CESAAM) et des universités partenaires. Les principales activités de CESAAM sont axées vers: le renforcement des capacités des institutions partenaires pour entreprendre l'enseignement et la recherche de qualité, l'amélioration des laboratoires de recherche et l'amélioration des capacités d'innovation et d'incubation des institutions partenaires nationales

et régionales pour soutenir le développement des entreprises agricoles. CESAAM contribuera au pilier 4 du programme détaillé de développement de l'agriculture africaine (PDDAA) concernant la recherche agricole, la diffusion et l'adoption des technologies. Ainsi, ses résultats escomptés comprennent la capacité d'effectuer une formation de qualité et la recherche à l'échelle nationale et régionale, les laboratoires de recherche bien équipés et fonctionnels, l'augmentation des produits d'innovation, l'augmentation de la diffusion des meilleures pratiques agricoles, et l'augmentation des notes d'orientation basées sur des données fiables. Les effets cumulatifs de ces résultats escomptés sont une productivité accrue le long de la chaîne de valeur et l'amélioration la sécurité alimentaire et la nutrition.

Mots clés: ACE II, Gestion agro-alimentaire, les centres d'excellence, Université Egerton, Afrique orientale et australe, l'agriculture durable

Background

In the last decade, Africa has experienced robust growth driven by rising commodity prices, domestic demand and stronger trade and investment ties with emerging economies. Despite this optimism for growth, Africa remains the most food insecure continent. Hunger and poverty continue to ravage the continent and the number of people going hungry and living in extreme poverty is still expected to grow. Recent Global Hunger Index indicates that about 33% of the African population (H²200 million people) is undernourished (IFPRI, 2014). The hunger situation is projected to worsen over the next two decades unless drastic measures are taken. There are a number of factors that contribute to food insecurity in Africa but key among them include frequent droughts, rampant diseases (crop and livestock), poor infrastructure, poor policies, limited market access, high cost of farm inputs, political instability, inferior plant and animal genetic resources, inadequate technical capacity and limited technologies and innovations. Over the years there have been a number of initiatives geared towards addressing these challenges.

One of the key approaches to address the above challenges is through enhanced capacity building for actors across the AVC. This can be achieved through targeted higher education training and research along AVCs and promoting the incubation and up-scaling of promising technologies to the farming communities and agribusinesses thereby increasing productivity. A centre of excellence modelled around these themes is expected to play an important role in developing an effective and responsive human capital capable of addressing food and nutrition insecurity in the region, particularly among the fragile and post-conflict states.

Egerton University is centrally placed within the Eastern and Southern Africa (ESA) region where a number of countries are emerging from conflict and trying to re-build their human capacity. These countries (Burundi, Rwanda, and South Sudan) will benefit from Egerton's long experience in agricultural research and training as they endeavour to re-establish their agricultural institutions. Therefore, the newly established CESAAM will contribute to regional food security by focusing on technical capacity development, innovative agricultural research, incubation and transfer of technologies, and evidenced based policy development.

The overall objective of CESAAM is to contribute to sustainable agriculture and agribusiness management in ESA region through capacity development, research and technology transfer for enhanced food and nutrition security. Specifically, CESAAM will pursue the following:

- a) Capacity development along the Agricultural Value Chain in the Eastern and Southern Africa region, especially for the fragile and post conflict states;
- b) Undertake innovative research, including use of biotechnology and climate smart agriculture, for increased crop and livestock productivity;
- c) Enhance the capacity of the Egerton University Agro-Science Park to assist partner universities establish a similar model for incubation of technological innovations; and
- d) Develop evidence based agricultural policy briefs and disseminate best practices through Agricultural Knowledge Centers in Egerton (CESAAM) and partner universities.

Implementation of CESAAM

Many development reports have pointed out gaps in addressing capacity constraints for policy making and best practices for enhanced food and nutrition security (see e.g. FARA, 2011; EGU, 2012; AUC, 2014). CESAAM will utilize its high calibre faculty staff, equipment and linkages developed over the years in agricultural sciences. This is expected to enhance policy making and improve productivity through programs that meet national and regional needs, particularly to students from fragile and post-conflict states of Burundi, Rwanda, South Sudan and Uganda. The focus on fragile and post-conflict states is based on the premise that these states are in the process of reconstruction and require relevant skills to formulate appropriate economic policies and sound agricultural/agribusiness management strategies. By putting more focus on this group, it is expected that such states would be able to jump start the stabilization of food production and enhance their economies. The training will extend to short-term courses for re-tooling of agricultural extension personnel, mentorship and internship programmes. The mentorship programme will provide young scientists opportunities to enhance their skills by networking and working with the region's top researchers. The internship fellowships are expected to be used as a tool to enable graduates to smoothly transit into society and contribute to agricultural development and also provide avenues for employment. The usual classroom programmes will be complemented with relevant field visits to farms and agribusinesses where students and extension personnel will have an opportunity to adopt best practices that they can then domesticate after graduation.

Other than training, the second most important challenge is lack of innovative research and incubation of such results for use by farmers and agribusinesses to address the rampant food and nutrition insecurity in the region. CESAAM will utilize research experience and facilities to address this gap. Of particular focus will be the use of biotechnology based research for increased crop and livestock production. This will be done in addition to developing innovative climate smart agricultural technologies to enable farmers and agribusinesses reduce the impacts of climate change in their operations and productivity. A participatory approach will be key in providing best practices through demonstrations, on-farm trials, partnerships and farmer field schools. CESAAM will also endeavour to reach out to farmers, extension personnel and agribusinesses in post-conflict and fragile states through targeted short courses.

In addition CESAAM will support setting up of participatory agricultural knowledge centres to disseminate appropriate information and technologies.

The other challenge pertains to ineffective policy environment emanating from inadequate conceptualization of research recommendations. In order to address this, CESAAM will partner with relevant government departments to develop relevant and effective agricultural policies. This will be complemented by conducting consultative meetings with stakeholders including the industry and farmers associations through dissemination forums. Although Egerton University has a long history in agricultural training and research, the successful implementation of CESAAM objectives will require different kinds of partnerships. Partners fall in three categories: The following partners are supporting the implementation of CESAAM:

- i) **Key partners.** CESAAM key partners are regional peer universities and regional and national research institutions. CESAAM will contribute towards capacity building for the partner institutions, specifically for KALRO (the largest agricultural research institute in Kenya) and four peer regional universities (University of Burundi, University of Rwanda, University of Juba and Gulu University). The Bio-Sciences Eastern, Central África at International Livestock Research Institute (BecA-ILRI) Hub is a key research institution and will host CESAAM fellows during the Project. The partners will make contributions through collaborations in capacity building, hosting and co-supervision of graduate trainees and dissemination of agricultural knowledge. In addition the key partners will participate in decision making through representation in the Steering Committee meetings.
- ii) **Partners.** CESAAM will draw from the experience of the partners as and when it is necessary and on a voluntary basis. Partners will collaborate in student internships, staff exchange, regulatory services, commercialization of innovations and policy analysis. CESAAM draws her public and private partners globally from Africa, Asia, Europe, and America.
- iii) **Associate partners.** The associate partners will help in linking CESAAM to farmer groups, and support agricultural knowledge dissemination and technology transfer. CESAAM has enlisted the following as associate partners: Kenya National Farmers Federation (KENAFF), Access Agriculture, and Association of Kenya Feed Manufacturers (AKEFEMA).

Expected results and outputs

CESAAM is modelled to generate tangible outputs for the benefit of humanity in the ESA region during its implementation period (2016-2021). A key output will be the capacity building of high calibre manpower (160 trained) with unique knowledge and skills in sustainable agriculture and agribusiness management. This is expected to spur agricultural productivity (crops and livestock), agri-enterprise development, formulation of farmer-friendly policies and improved livelihoods in the ESA region. Summarized are CESAAM's expected results and anticipated impacts (Table 1).

Table 1. Summary of CESAAM's envisioned results and outputs (2016-2021)

Expected result	Anticipated outcome and impacts
Objective 1: Capacity development along the AVC in the ESA region especially for the fragile and post conflict states	
30 PhD graduated (At least 30% female; and 35% regional students)	PhD scientists trained regionally in sustainable agriculture and agribusiness management
60 MSc graduated (At least 30% female; and 35% regional students)	MSc scientists trained regionally in relevant areas of sustainable agriculture and be regional agribusiness management
50 Internships and 10 post-doctoral fellowships in the areas of the CESAAM disciplines which are co-supervised across the region and internationally	Internships and Post-doctoral fellowships developed and operational in the areas of the CESAAM disciplines across the region
At least 4 short courses and 2 graduate programmes developed/reviewed to incorporate elements of sustainable agriculture and agribusiness management	CESAAM core disciplines of sustainable agriculture and agribusiness management mainstreamed in university curricula
Exchange programme between CESAAM faculty (Egerton) and faculty at partner institutions developed and operationalized	At least 16 academic staff exchanges/ visiting scholars realized
At least 3 graduate students' summer schools held on soft skills and research data management and analysis for enhanced research capacity	Enhanced quality of graduate student researches in ESA through targeted summer schools
Teaching and research equipment purchased.	Teaching and research facilities upgraded.

Table 1. Contd.

Expected result	Anticipated outcome and impacts
Objective 2: To undertake innovative research, including use of biotechnology and climate smart agriculture, for increased crop and livestock productivity	
Faculty conduct targeted research in CESAAM thematic areas	At least 12 action based research projects funded by CESAAM
Evidence-based research publications including expanding the use of e-journals	At least 66 research outputs successfully published in peer reviewed journals
Use of ICT platform up scaled for teaching and research for MSc / PhD students and faculty	Use of ICT platform operational for teaching and research for PhD students and faculty
Dissemination workshops on CESAAM research outputs held targeting diverse stakeholders in the agricultural sectors in the region	At least 1 dissemination workshop held annually targeting diverse stakeholders in the agricultural sectors
Equipment procured to boost capacity of major CESAAM laboratories	Modern equipment purchased and installed in at least 2 CESAAM laboratories
Academic programmes developed or reviewed to incorporate sustainable agriculture, agribusiness management and related areas including neglected and underutilized species)	At least 2 academic programmes developed or reviewed and operationalized to incorporate elements of sustainable agriculture, agribusiness and related areas including neglected and underutilized species
CESAAM develops exchange programme for visiting scientists, including emeritus professors and PhD students, to undertake collaborative research and with industry	At least one exchange programme developed and operationalized for visiting scientists, including emeritus professors and PhD students, on collaborative research with CESAAM and with industry

Table 1. Contd.

Expected result	Anticipated outcome and impacts
Enhance university-farmer-industry practicum learning platform for sharing knowledge	University-farmer-industry practicum learning platform for sharing knowledge established and operational. This will be for showcasing success stories for both the farmers and industry
Objective 3: Enhance the capacity of the University's Agro-Science Park and demonstration units to assist partner universities establish a similar model for incubation of technological innovations	
Rehabilitate Agro-Science Park, Tatton Agricultural Park and construct CESAAM centre so that to enhance innovations and incubation and up-scaling of the same to the community	Agro-Science Park and Tatton Agricultural Park upgraded and equipped and CESAAM centre constructed
Patents developed for funding as part of sustainability	At least 1 product developed and patented to boost funding for sustainability.
Students trained on Agri-entrepreneurship and assisted to undertake projects at the Agro-Science Park	At least six (6) student groups supported in agri-entrepreneurship projects at the Agro-Science Park

In pursuit of the above, CESAAM will pay special attention to the following:

- a) **Quality Assurance.** CESAAM will be guided by the Egerton University's quality assurance policy and ISO procedures to assure quality of programmes and centre management. Prior to admission, all CESAAM prospective students will undergo oral interviews to ascertain suitability. CESAAM supported research will be conducted within the framework of the University's research policy. These policies have an M&E implementation framework which ensures maintenance of quality.
- b) **Equity Dimensions.** The Centre will ensure excellence through admission of qualified applicants in addition to enhancing gender and regional balance, including disability. The Centre proposes to award at least 30% of fellowships to applicants from regional post-conflict and fragile states, and a further 5% to applicants from regional non-conflict states. Overall, about 40% of all the scholarships will be for women applicants. Special considerations will be given to people with disabilities.
- c) **Attracting Academic Staff and Students regionally.** The Centre will develop its own website which will be used for communication and dissemination of information. CESAAM will attract academic staff by supporting sabbatical arrangements, availing of post-doctoral positions and provision of modern research facilities for scientists. Students will be attracted to the centre through scholarships advertised in the centre's website and other relevant networks, especially that of the Regional Universities Forum for Capacity Building in Agriculture (RUFORUM), a network of 60 Universities in 25 African countries. Students who are not proficient in English will be provided with remedial language training. CESAAM will conduct student placement, internship and mentorships in collaboration with national and regional industry partners and their facilities to enhance smooth transition into contributing to agricultural development. This will contribute towards increasing the number of young African scientists and agricultural development practitioners in the country and the region.
- d) **Regional Academic Partners.** CESAAM will purposely engage its national and regional academic partners for enhanced academic (learning and teaching) and research performance through joint curriculum development and review, content development, student supervision, student placement, and exchange programs (staff and students) and collaborative research activities. The proposed activities under this action plan are: identify, in collaboration with partner Universities, prospective students to be trained at CESAAM; undertake staff and students' exchange programmes between CESAAM and partner Universities; develop new, and review existing programmes for CESAAM and partner Universities; undertake collaborative research and consultancies in agriculture and on cross cutting issues in the region; creation of agricultural knowledge centers in Egerton university and other partner Universities; and sharing guidelines on innovation processes from the agro-science park with partner Universities.
- e) **National and Regional Research and Industry Partners.** CESAAM will use the existing Egerton University linkages with research, advocacy and industry institutions

such as KALRO, KENAFF, Faida Seed Ltd, KEPHIS, BecA-ILRI Hub and AICAD to address its capacity development and research innovation objectives. In particular, CESAAM will implement the following activities; identify, in collaboration with national and regional partner institutions, prospective staff to be trained at CESAAM for enhanced quality human and research capacity; undertake staff exchanges programs with national and regional partner institutions for enhance teaching and research excellence and improved networking among national and regional researchers; develop and conduct short courses targeting national and regional partner institutions. The outputs from this activity will be enhanced staff competences in research, innovations and outreach.

- f) **Collaboration with International Academic Partners.** CESAAM will take advantage of the many active linkages that Egerton University has with academic institutions outside Africa including Europe, North America, and Asia in the areas of training and multidisciplinary research projects. The centre will deliberately implement the following activities is this connection: Identify and undertake academic staff and student exchanges in collaboration with international academic partners; and develop joint research proposals and undertake research in collaboration with international academic partners.

Management and Governance of CESAAM

The CESAAM centre will be governed by four key organs: the Vice-Chancellor, the Steering Committee, the CESAAM Secretariat and the Chair of Thematic Training and Research leaders (Fig. 1). The Vice-Chancellor is the administrative head of the University and is tasked with the overall oversight of the centre. The Secretariat will be responsible for the day to day running of the CESAAM. The Steering Committee will be composed of Egerton University's Dean of the Faculty of Agriculture and the Directors of Postgraduate School, Quality Assurance and one representative from each of the key partners, industry and farmers' associations. The Committee will be the main decision making body on proposed programs and major activities, and will be meeting twice a year. An integrated ICT system which includes video conference facility will be used to enhance communication and virtual consultative meetings for the various organs of the centre. The CESAAM webpage will be created and used for all data sharing including advertisements for various vacancies, scholarships/fellowships, internships, events, and decisions of the Centre.

Looking ahead

A key issue will be the sustainable financing of CESAAM. Accordingly, CESAAM will seek to expand its resource base by identifying new revenue sources for the advancement of the Centre. The Centre will develop a Sustainability Business Plan to operationalize various strategies for successful resource mobilization. Key approaches in the proposed business plan include: ensuring quality of the academic programmes, enhanced student enrolment; development of market driven short courses; engagement in demand driven consultancies; commercialization of innovations; and development of fundable grant proposals.

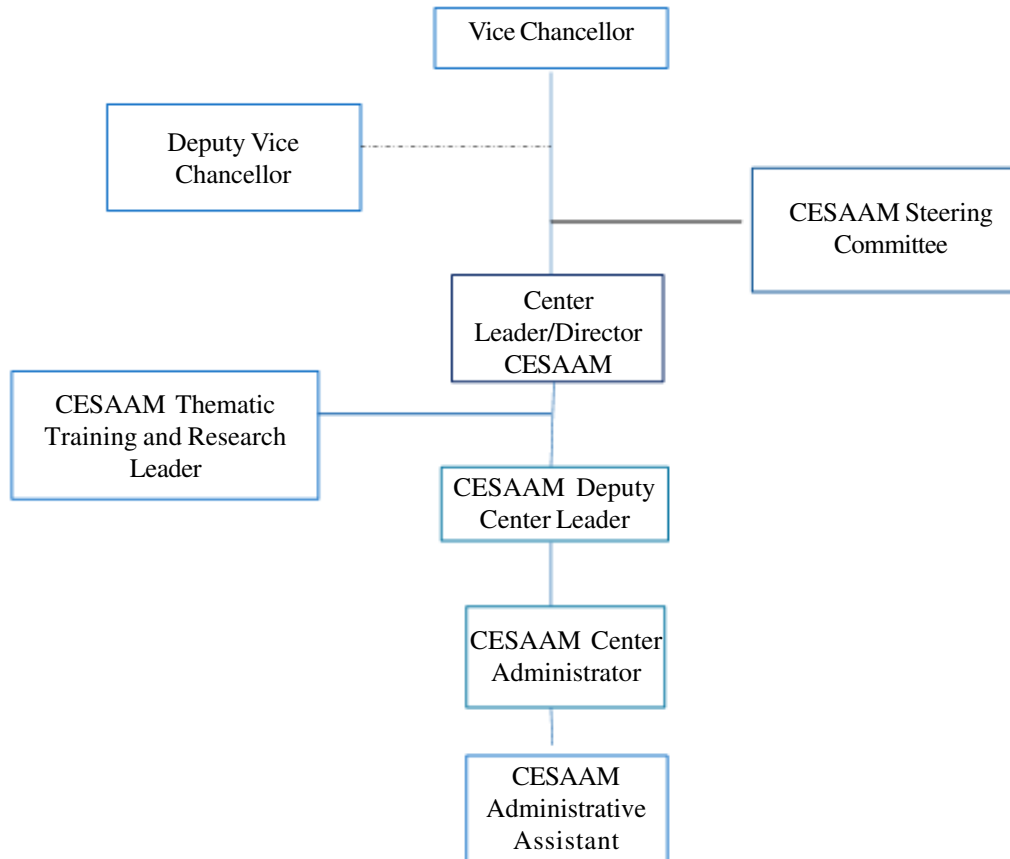


Figure 1. The CESAAM Organization Chart

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