

Research Application Summary

**Universities responding to advancing community transformation through
action research in Africa**

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Abstract

Universities have a critical role to play in community transformation through technology and knowledge transfer whilst staying on course with teaching and research functions. Community action research is a remarkable approach to facilitating research in development. The Regional Universities Forum for Capacity Building in Agriculture (RUFORUM) runs the Community Action Research Programme PLUS (CARP+) that engages universities to work with communities, private sector, and Technical and Vocational Education and Training (TVET) institutions. The CARP+ is a competitive grant under the RUFORUM Competitive Grants Scheme (CGS) whose integrated suite of grants are focused towards supporting agricultural transformation in Africa. Under the CARP+, a grant is competitively awarded to a principal investigator to support agricultural research and the training of at least one PhD, five MSc. students, five undergraduate intern students and a cohort of TVET based students. This CARP+ call is the second in a series of action research calls since the launch of the CARP+ grants component. A total of 38 proposals were received, and all 38 complied with the application guidelines. About sixteen percent (15.8%) were led by female principal investigators. Forty two percent of the proposals focused on crop production, 34 % on animal production, 10.5% in cross-cutting thematic areas (agri-business management, rural development and socio-economics, food science and nutrition, climate change and natural resources management as well as agricultural extension, communications and information systems) and the remainder of the proposals addressed farm management and agriculture/natural resource economics (3%), land, soil and water management (5%) and other production systems (5%). Disaggregated submissions by commodity focus showed that 18.4% of the proposals focused on cereals and another 18.4% focused on ruminants. Less attention was given to some thematic areas, like farm management and natural resources; land, soil and water and, agroforestry. Given the low responses to other thematic areas, it is paramount that RUFORUM undertakes strategic interventions to empower the universities' scientists to be competent in these areas and uplift the participation of women scientists in the CARP+ process.

Key words: Agricultural research and training, Community Action Research Programme PLUS, RUFORUM, TVET

Résumé

Les universités jouent un rôle essentiel dans la transformation communautaire grâce aux technologies et au transfert de connaissances tout en observant les fonctions d'enseignement et de recherche. La recherche pratique avec les communautés à la base est une approche remarquable pour faciliter la recherche en développement. Le Forum régional des Universités pour le renforcement des capacités en agriculture (RUFORUM) coordonne un programme de recherche pratique avec les communautés (CARP+) qui amène les universités à travailler avec les communautés, le secteur privé et les établissements d'enseignement et de formation techniques et professionnels (EFTP). Le CARP+ qui est une subvention compétitive, tout comme les autres subventions du Programme de Subvention Compétitive (CGS) de RUFORUM, vise à soutenir la transformation agricole en Afrique. Plus précisément, dans le cadre du CARP +, une subvention est attribuée suite à une compétition à un Investigateur Principal pour soutenir la recherche agricole et la formation d'au moins un doctorant, cinq du niveau Master, cinq du niveau Licence et une cohorte d'étudiants des EFTP. Suite au deuxième appel à propositions des projets CARP+, au total, 38 propositions ont été reçues, toutes étant conformes aux conditions d'éligibilité. Environ seize pour cent (15,8%) de ces projets étaient dirigés par des chercheuses principales. Quarante-deux pour cent des propositions portaient sur la production végétale, 34% sur la production animale, 10,5% sur des thématiques transversales (gestion agro-commerciale, développement rural et socio-économie, science alimentaire et nutrition, changement climatique et gestion des ressources naturelles), ainsi que la vulgarisation agricole, les systèmes de communication et d'information) et le reste des propositions concernait la gestion agricole et l'économie agricole / des ressources naturelles (3%), la gestion des terres, des sols et de l'eau (5%) et d'autres systèmes de production (5%). Les soumissions désagrégées par cultures ont montré que 18,4% portaient sur les céréales et 18,4% sur les ruminants. Une attention moindre était accordée à certains domaines thématiques, comme la gestion des exploitations agricoles et les ressources naturelles; la terre, le sol et l'eau et l'agroforesterie. Compte tenu des faibles réponses à d'autres domaines thématiques, il est primordial que RUFORUM entreprenne des interventions stratégiques pour appuyer les scientifiques des universités dans ces domaines et augmenter la participation des femmes scientifiques dans ces programmes CARP +.

Mots clés: Recherche et formation agricoles, Programme de recherche communautaire, RUFORUM, EFTP

Introduction

The role of African universities as major drivers of development is well established, and this role is envisaged to increase as further changes in technology impact Africa (Blackie, 2016). While higher agricultural education has contributed to community transformation, it has often been deficient in adjusting its curricula and management to respond to the changes affecting the communities in Africa. The focus has mainly been on providing education and services geared to the professional development of those responsible for agriculture and rural development. Calls for universities to adapt and respond to the

changing character and needs of society are not a new phenomenon (Kohoutek *et al.*, 2017) but have been increasing than ever before (University of Oxford, 2017). To remain competitive in light of these changes, Africa needs to improve productivity and adopt an innovative spirit. African universities have the capacity, knowledge, and research necessary to help achieve these goals. In order to be relevant in agriculture and rural development universities and university systems may be influenced more by what is happening in the wider developmental space.

Acting among many partnering organizations in communities, universities offer unique contributions to a change process. Universities play an important role as leaders in teaching and learning, in education, research and technology development and transfer (Bozic and Dunlap, 2013). In teaching activities, universities provide the professional training, as well as the education necessary for the development of the personality. The part of the universities is very important to community transformation, they play an important role in providing with the new knowledge and skills needed to meet the challenges of sustainable development in communities, in raising public awareness and providing preconditions for informed decision-making, responsible behavior and consumer choice. The most important task they have been assigned is the production of highly skilled manpower and research output to meet perceived targets. Additionally the universities instrumental in the building of new institutions of civil society, in developing new cultural values, and in training people of new social era.

New learning paradigms including interactive learning, the incorporation of indigenous knowledge and use of participatory methodologies are lately being adopted by universities in Africa. These have proven successful in community transformation as the case of Egerton and Gulu universities (Kalule *et al.*, 2016). These universities are offering systemic approaches to introducing innovations in teaching and learning. Students are provided with experiential learning through practical and attachment programs, among other approaches. Attachment on farms provides students with an opportunity to learn and to utilize theoretical knowledge acquired in class, understand the opportunities and challenges that farmers deal with and propose mitigation approaches to some of the challenges (Mungai and Njuguna, 2016). The farm attachment program provides linkages between the university and farming community stakeholders so as to enhance agricultural productivity and competitiveness (Kalule and Ongeng, 2016). This is because the platform allows students to interact with surrounding rural communities and businesses through students' farm attachments across the years in a continuous relationship that strengthens the scholars experience and the uptake of technologies by communities.

RUFORUM Interventions

The Regional Universities Forum for Capacity Building in Agriculture (RUFORUM), a network of 85 Universities in 35 African countries (Figure 1) has continued to strengthen its role in championing the rejuvenation of training and capacity building in higher education in Africa.

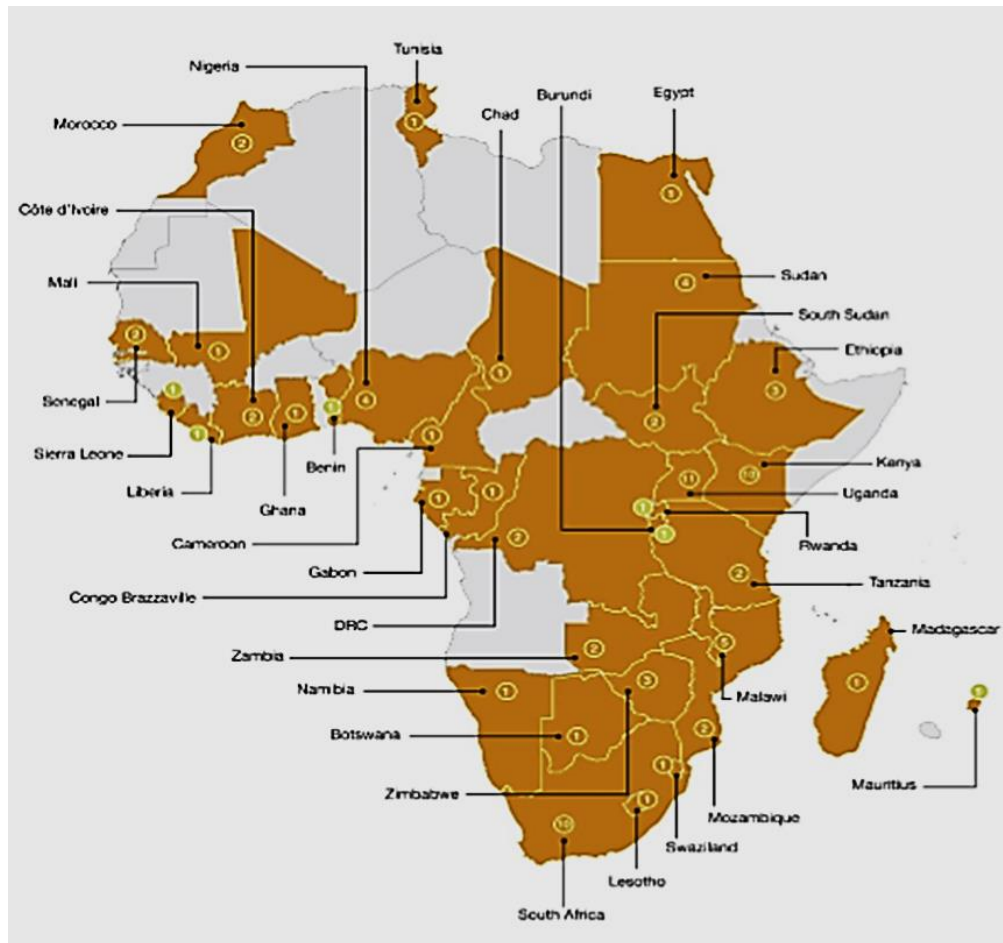
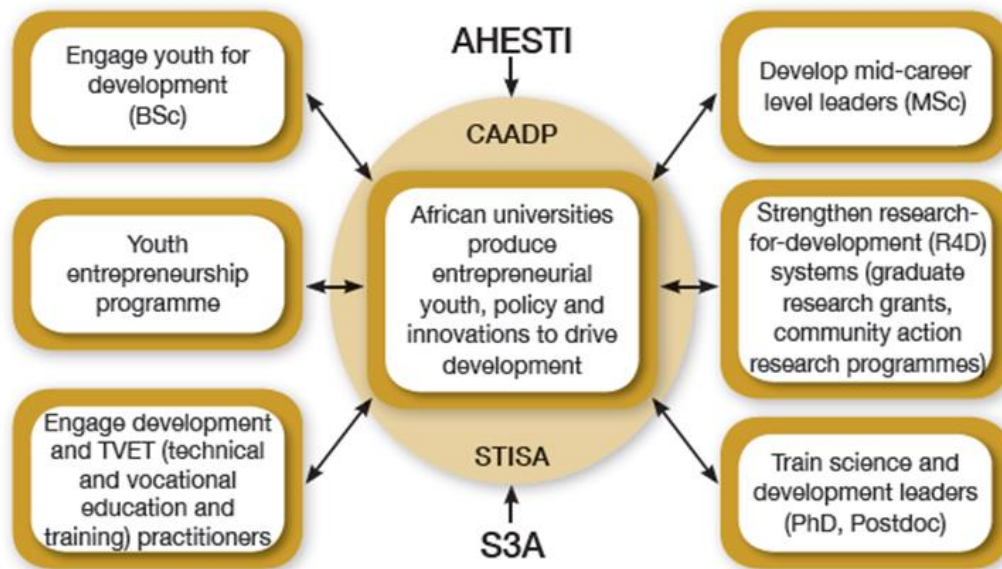


Figure 1. RUFORUM Network member countries

RUFORUM is an impact driven organization guided by its motivation and commitment that is focused on transforming agriculture in Africa through innovative scientific research, education and training approaches. In achieving this focus, the organization runs a Competitive Grants Scheme (CGS) that entails different grant types which include Graduate Research Grants (GRG), the Community Action Research Programme (CARP), Field Attachment Programme Awards (FAPA) and Institutional Strengthening Grants (ISG) and the Doctoral and Post-Doctoral Research Grants (Figure 2)

The RUFORUM CARP was designed to encourage universities to develop and invest in more comprehensive and sustained action research and to establish a “platform” for engagement with all the stakeholders. Each CARP involve graduate and undergraduate students and is required to focus on a particular geographic area, or in a selected commodity, and to nest their research along the full commodity value chain. The CARP was designed based on the successful scaling out of university research and particularly those that have demonstrated potential. The ‘platform’ provides an innovation hub around which action research is operationalized with smallholder farmers and relevant actors along the value chain. In principle, the CARP provides priority to refinement of knowledge and promote its usage to enable farmers add value to commodities that enhance farmer income.



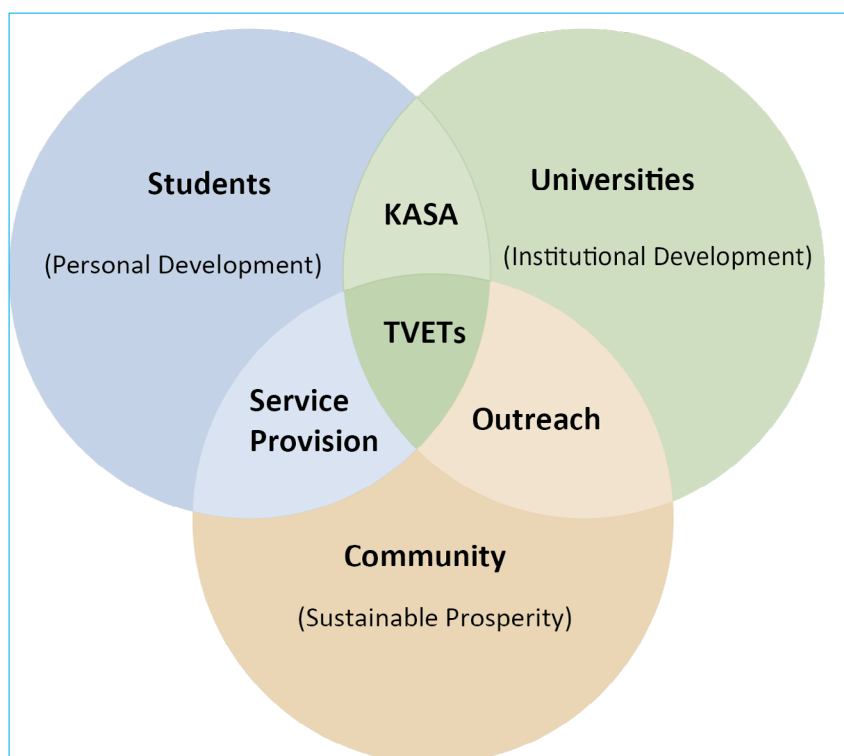
AHESTI = African Universities' Agenda for Agricultural Higher Education, Science, Technology and Innovation; S3A = Science Agenda for Agriculture in Africa

Figure 2. RUFORUM's integrated approach to transforming Agriculture in Africa

Structure and Design of the CARP+

To enhance the CARP, RUFORUM in partnership with mastercard foundation has implemented an eight year programme known as "Transforming African Agricultural Universities to meaningfully contribute to Africa's growth and development (TAGDev)". The TAGDev Programme seeks to transform African agricultural universities and their graduates to better respond to developmental challenges through enhanced application of science, technology, business and innovation for rural agricultural transformation. Under TAGDev, a specific focus to include Technical and Vocational Education and Training (TVET) institutions within the implementation of the CARP so as to enhance on-farm and Community University led impact as well as strengthen the educational value chain connectivity between universities and TVET institutions (Figure 3). The Programme is thus known as the Community Action Research Programme PLUS (CARP+). In this framework it is envisaged that there will be acquisition of knowledge and skills, outreach and service provision to ensure community transformation.

The TVET constitutes an important element of the education system that has previously been neglected but with potential to provide skills to a wider group of Africa's growing youth population and enable them support Africa's economic growth. The TVETs facilitate youth inclusion in the economic development by skilling them for gainful employment, technology transfer and enterprise development.



KASA = Knowledge and Skills Acquisition; TVET = Technical and Vocational Education and Training

Figure 3. Framework for the RUFORUM CARP+

The CARP+ projects are implemented through competitive awards to senior faculty of RUFORUM member universities to support research and training of university students for a period of forty eight months. This grant type had two windows. Window one is restricted to pilot universities (Gulu and Egerton University). All applications from these universities are envisioned to utilize this window as this CARP+ grant matches to the overall TAGDev project grant which is implemented by the two universities. This window has a maximum of US\$200,000. The successful project under this window is meant to train at least one PhD, five MSc. students and ten undergraduate students within the project in each university. The second window is open to all other RUFORUM member universities. This window is part of the scaling-out of the CARP+ projects and has a maximum of US\$350,000. Each successful project will support the training of at least one PhD, five MSc. students, four undergraduate intern students and a cohort of TVET students.

The CARP+ Call

Building on the achievements and lessons learnt from the 1st CARP+ call, in March 2017 and other previous CARP calls, RUFORUM announced the 2nd competitive CARP+ call for proposals that closed on the 31st of October, 2017. The proposals were expected to be focusing on crops and livestock sector value chains of strategic importance in African

countries that provide opportunity for moving a significant number of smallholder farmers out of poverty and food insecurity sustainably. Applications were required as per the call guidelines to clearly show a strong focus on facilitating value chain development, action research and integration and participation of TVET institutions as a mechanism to demonstrate sustainable and profitable livelihoods in agriculture.

The 2nd CARP+ proposals were submitted via an automated electronic proposal submission process using the RUFORUM Information Management System (RIMS). In the RIMS, principal investigators were required to specify the focus area, proposal theme and sub-theme. The submission process started on a low note, with only few proposals submitted by the second day to the deadline. Majority of the proposals were submitted on the final day. The process was not without challenges as depicted through the frequently asked questions on email (mcf@ruforum.org). To help the applicants, the RUFORUM Secretariat operated a standby team that provided feedback to the applicants' questions. Although a couple of research teams failed to successfully use the platform and get their submission in; a total of 41 proposals were submitted.

Characterization of proposed interventions

Out of the 41 proposals, three proposals were submitted twice. A total of 38 proposals were compliant. Submissions were from 11 countries (Figure 4) in 22 RUFORUM member universities (Figure 5). Applicants from member universities in Uganda and Kenya submitted 36.8% and 28.9% of the proposals respectively making the largest number of overall submissions (Figure 4). In addition, a total of six female principal investigators responded to the call, representing 15.8% of the total applications received.

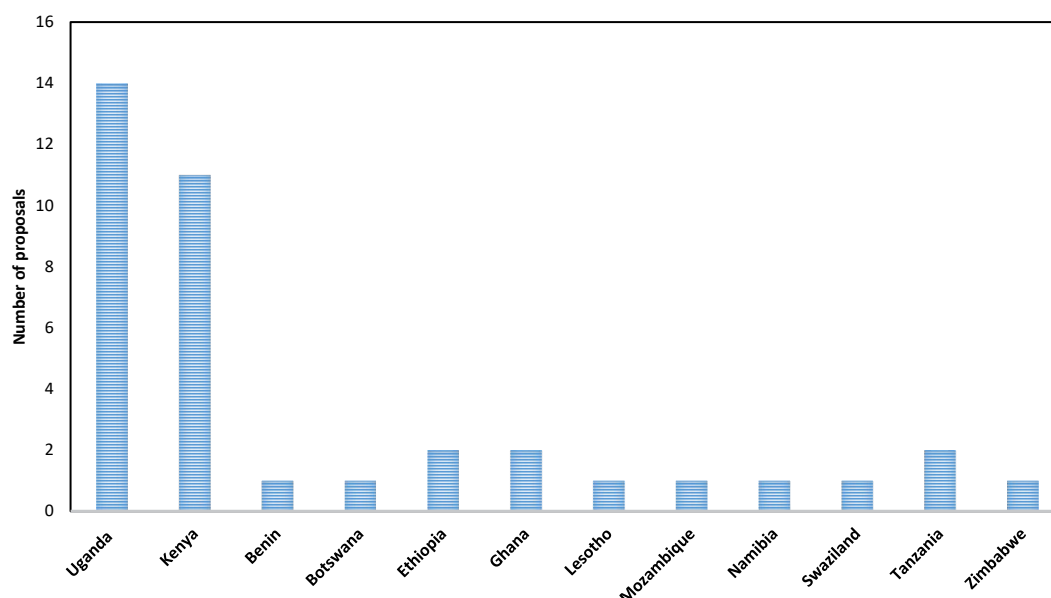


Figure 4. Number of proposals submitted by country

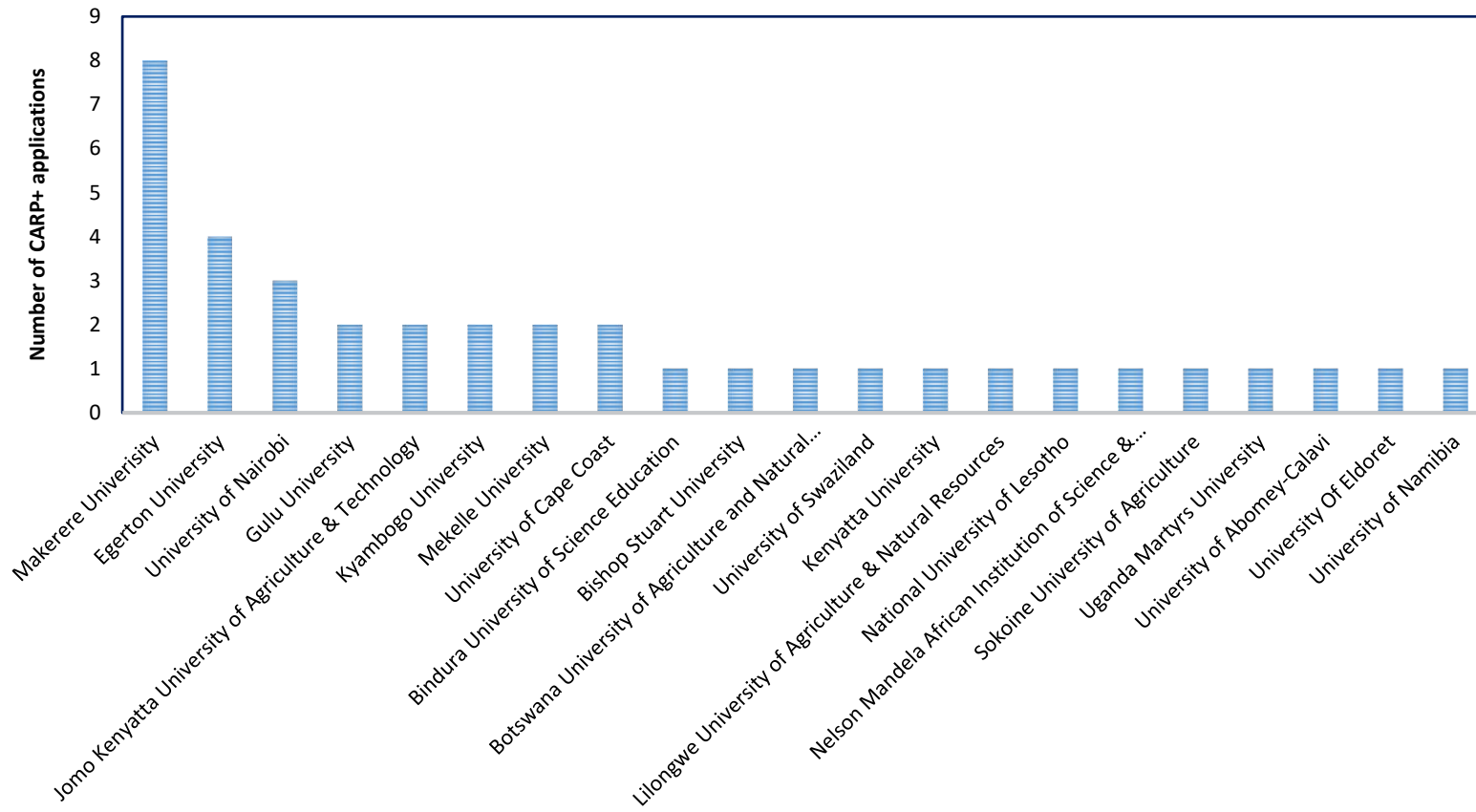


Figure 5. Number of proposals submitted by member universities

Themes addressed by the proposed interventions

The proposals submitted fell under the six thematic areas namely crop production, cross-cutting issues, animal production, farm management and agriculture/natural resource economics, land, soil and water management and other production systems (Figure 6). A majority of the proposals submitted were related to crop production (42%), animal production (34%), 10.5% on cross-cutting thematic area (agri-business management, rural development and socio-economics, food science and nutrition, climate change and natural resources management as well as agricultural extension, communications and information systems). A few proposals addressed farm management and agriculture/natural resource economics, land, soil and water management and other production systems.

Under the crop production theme 31.3% of the proposals addressed post-harvest management (on farm storage, processing), 25% focused on seed and seed systems (plant breeding, biotechnology, agro-biodiversity, distribution systems); another 25% focused on agronomy and agricultural engineering (cropping and pasture systems, agricultural machinery) and 18.7% focused on diseases and pest control including integrated pest management (Table 1). In the animal production theme, 65.1% addressed livestock nutrition and management, 23.1% addressed animal production (including nutrition and agricultural engineering), 7.7% focused on animal diseases and pest management, including veterinary science and TADS and the other 7.7% focused on animal breeding and other animals biotechnology.

The commodity focus varied amongst the proposed university interventions including grain legumes, roots and tubers, fisheries and aquaculture, ruminants, cereals, poultry, swine, vegetables and mushrooms, pastures, agro-forestry and fruit trees, commercial crops and other animals (Figure 7). A disaggregation based on commodity focus showed that majority of the proposals were focused on ruminants (18.4%) and cereals (18.4%). A number of proposals were spread among the commodity focus the above mentioned commodity focus.

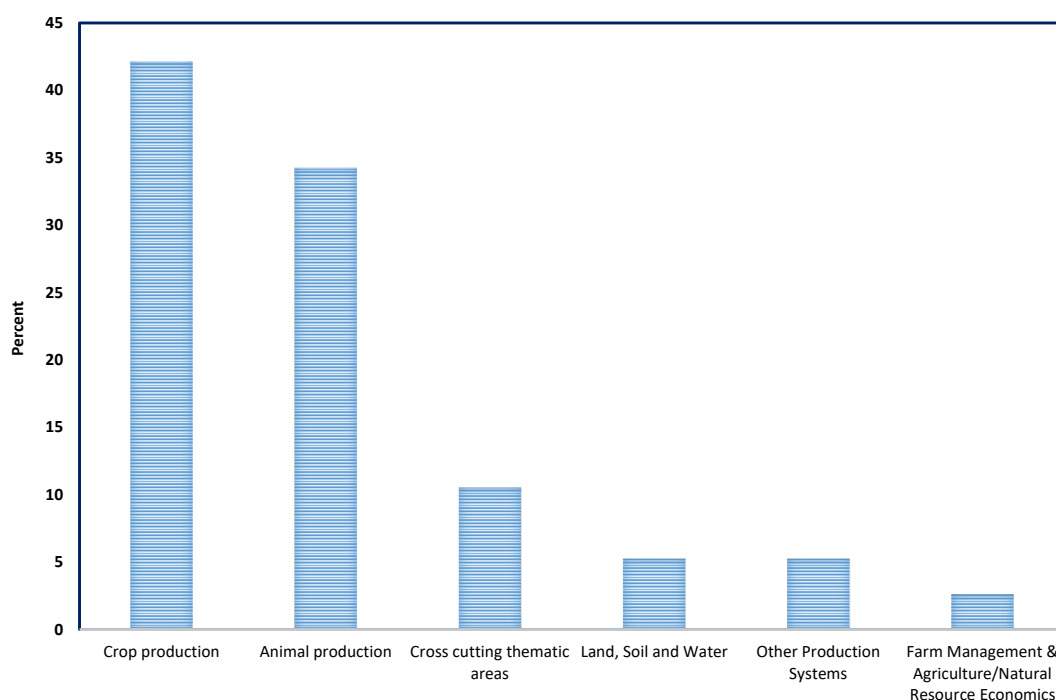


Figure 6. Disaggregation of proposed interventions submitted according to thematic areas

Table 1. Proposed interventions by African Universities for community transformation

Thematic area	Proposal focus area	% area of focus
Crop Production (16)	Post-harvest management (on farm storage, processing)	31.3
	Seeds (plant breeding, biotechnology, agro-biodiversity, distribution systems etc.)	25.0
	Agronomy and agricultural engineering (cropping and pasture systems, agric. machinery)	25.0
	Disease and pest control including integrated pest management	18.7
Animal Production (13)	Livestock nutrition and management	61.5
	Animal production (including nutrition and agriculture engineering)	23.1
	Animal disease and pest management, including veterinary science and TADS	7.7
	Animal breeding and biotechnology	7.7
Cross cutting thematic areas (4)	Food science and nutrition	25.0
	Agri-business management	50.0
	Rural development and socio-economics	25.0
Land, Soil and Water (2)	Soil Science	50.0
	Water access, tenure and management	50.0
Other Production Systems (2)	Aquaculture and fisheries	50.0
	Agro-forestry	50.0
Farm Management and Agriculture/ Natural Resource Economics (1)	Agribusiness (agro-processing, business, economics, entrepreneurship)	100

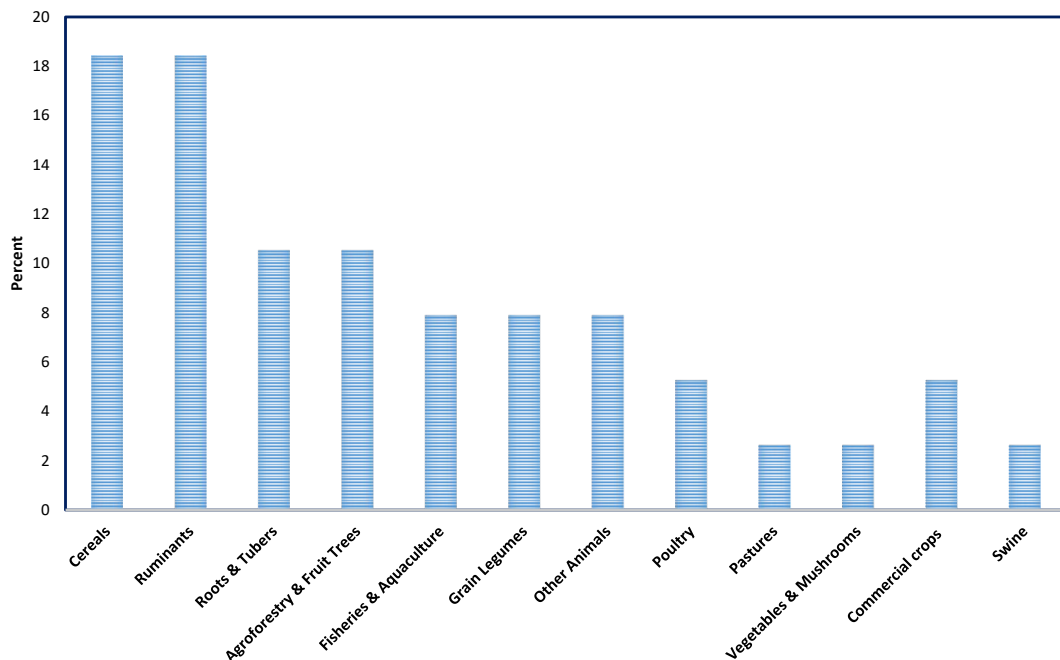


Figure 7. Submitted proposal by commodity focus

Insights from the proposed university interventions

The uniqueness of this call was that it required scientists to focus on crops and livestock sector value chains of strategic importance in African countries. This strategic focus was partially arrived at to address the ever increasing demand on attention to be given to commodity value chains including marketing and access to markets. The crop production theme featured prominently in the submissions. Most proposals under this theme were focusing on post-harvest management (on farm storage, processing. In reality post-harvest losses are a major problem in Africa. A report by the World Bank (Zorya *et al.*, 2011) pointed out that, each year, significant volumes of food are lost after harvest in sub-Saharan Africa between 20 and 40%. In addition, such losses are estimated to be equivalent to the annual caloric requirement of 48 million people. This high level of food losses in Africa could have driven the university scientists to focus on researching in this area. Reducing postharvest losses as an intervention from the CARP+ will be a key pathway to food and nutrition security in sub-Saharan Africa. Other interventions like seeds (plant breeding, biotechnology, agro-biodiversity, distribution systems etc.), agronomy and agricultural engineering (cropping and pasture systems, agric. machinery) and disease and pest control including integrated pest management featured in the submissions. Considering the growing population and the increase in smallholder's agriculture, sustainable production of any cropping system, the proposed interventions will ensure enhanced productivity together with the maintenance of other ecosystem services. On the long road to reach sustainable crop production in Africa, the proposed strategies received considered the large heterogeneity in socio-cultural and technical conditions, farmer typologies and production objectives, which portray the African smallholder agriculture. Improving crop production

is particularly important in Africa, where most of the population still suffers from high levels of poverty.

Furthermore, 13 proposed interventions fell under the animal production issues. The livestock nutrition theme had more proposed interventions for different commodity focus ranging from fisheries and aquaculture, poultry, swine, ruminants and other animals. Feed is at the very interface of the positive and negative effects of animal production on food security, income and livelihoods and the environment (Rosenfelder *et al.*, 2013). Lack of adequate feed (quantity and quality) and affordable is a major constraint to smallholder farmers in animal production systems. Specific technology options targeted to the value chains described in these interventions will help to increase animal productivity. Placing feed/nutrition research in the context of specific value chains, and working through innovation approaches proposed will help circumvent some of pitfalls of feed research.

About 32.7% of the interventions focused on other thematic areas including i) cross cutting issues, ii) farm management and agriculture/natural resource economics, iii) land, water and wildlife and iv) other production systems such as aquaculture, agroforestry, forestry and woodland management. This might be attributed to limited expertise in the areas, probably most scientists would not want to venture into these grey areas. In addition the interventions were expected to be focusing on crops and livestock sector value chains of strategic importance in African countries, as a result most scientists limited themselves to the theme focus. Nonetheless, the next call should not limit the scientists on the themes to focus on.

Review and review observations

Upon receipt of a proposal, a preliminary review to ensure completeness and conformance with RUFORUM requirements, which are outlined in the guidelines for applicants (Reference: RU/MCF/CARP+/2017/02) was conducted. Proposals were assessed to ensure that they meet RUFORUM compliance requirements. Adherence to these requirements was strictly enforced. All compliant proposals are then sent for external review. RUFORUM identified three external reviewers to review the proposals. The RUFORUM guidelines for the selection of reviewers are designed to ensure selection of experts who can give the team proper information needed to make a recommendation in accordance with the approved criteria for selection of projects. The selected reviewers had special knowledge of the agriculture and related sciences involved in the proposals they were reviewing to evaluate competence, intellectual merit, and utility of the proposed activity. The reviewers also had broad knowledge of the infrastructure of the agricultural enterprise, and its educational activities, to evaluate contributions to community transformation.

External reviewers' analyses and evaluation of the proposal provided information to RUFORUM Technical Committee in making recommendations regarding the proposal. The three reviewers evaluated all submitted proposals through an internally designed tool for merit review criteria. Reviewers were asked to consider the following elements in the review i.e. i) project summary; ii) need statement; iii) goals and objectives; iv) project description; v) support for the project; vi) management plan vii) evaluation plan; viii) key personnel (stakeholders and students); ix) sustainability of project; x) budget and budget justification.

The reviewers scored applications poorly based on the extent to which community partners were involved in shaping the research. Reviewers pointed out that many of the proposals were just ordinary presentations with no clear articulation of “the innovative nature (niche issues). They also pointed out that most principal investigators did not provide details of any relevant and related project(s) linked to their proposals, did not indicate the value chain their projects fell in. Many authors presented their methodology poorly and the proposals were not up to standard. In addition, significant scientific weaknesses were observed by reviewers and they scored applications accordingly. Review comments provide strategies to strengthen proposed interventions and make them more community-engaged.

Moving forward

The emergence of CARP+ in RUFORUM represents new opportunities to create transformative change in both academic institutions and communities seeking to improve agricultural productivity and facilitate farmer transition from subsistence to agripreneurship. Typically, like in any proposal submission process, some challenges were observed in the online submission in RIMS; these particularly relating to last minute rush submissions clogging the system. In moving forward with the CARP+ calls the following actions are recommended for the future action by the RUFORUM Network and stakeholders in higher education:

- Considering the trend in CARP+ proposal submissions, it is important for RUFORUM Secretariat to design mechanisms for continued engagement with the network to urge for timely submissions. Such avenues include the RUFORUM weekly newsletter, email alerts and active participation of the Principals and Deans.
- Considering the relatively low number of applications received from the female scientists, RUFORUM Secretariat needs to provide a supporting mechanism for increasing the participation of female scientists in competitive grants development including deliberate targeted trainings to build their capacity.
- There is need to take deliberate focus on the thematic areas that have not received considerable attention by scientists yet these are critical development components such include climate change, land husbandry, trans-boundary animal diseases.
- RUFORUM Secretariat urgently needs to address gaps in the RIMS set up to make it more user friendly and address some of the technical gaps identified. Specifically there is need required documents for the proposal.
- There is need to further disaggregate the current disciplinary options (e.g. vegetables and mushrooms under water access, tenure and management) whilst maintaining the thematic and commodity focus and value chain approach. This will allow for a proper tagging and analysis of the submitted proposals.
- Throughout the course of application development, a specific support desk at the RUFORUM Secretariat should offer one-on-one assistance to all potential principal investigators so that research teams can effectively prepare strong, competitive applications that meet CARP+ goals. Education is critical.

Acknowledgments

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