



Building a new generation of agricultural scientists in Africa: networking universities – capturing economies of scale

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Creative problem-solving and highly motivated human capital are vital to Africa's agricultural development strategy. Efforts aimed at increasing smallholder productivity and transforming raw materials into value-added products through the uptake of locally relevant research and development outputs and investments in robust market strategies are directly related to the knowledge and skills of the human resource base that will lead, design and implement national agricultural programmes. It will be a major challenge for African countries to meet their human capital needs for a dynamic agricultural sector that can advance their economies over the coming years.

Currently, Africa records the lowest numbers of PhDs per 1000 inhabitants and the lowest contribution to global knowledge resources ($\approx 2\%$), worldwide. The recent surge of renewed interest in the agricultural sector as an engine of economic growth in Africa has resulted in many new initiatives and the strengthening of ongoing programmes that have been identified as successful. This article focuses on the experiences of an African-led and -managed organisation, the Regional Universities Forum for Capacity Building in Africa (RUFORUM), designed to capture regional economies of scope and scale, to support curriculum design innovation, fill crucial gaps in postgraduate degree offerings, and ensure a quality standard for courses. RUFORUM has improved both the relevance and quality of post-graduate education and research in member universities¹. To date, it has served over 1197 postgraduate students (1005 MSc and 192 PhD) and 2,340 faculty, with nearly 40% of the student grants awarded to women.

Mandate and milestones

RUFORUM has grown, under the guidance of senior African professionals, from a crop-based network of 10 agricultural faculties into a regional broad-based consortium of 32 universities in eastern, central and southern Africa. Its strategic goals assume the following: Firstly, that development is more likely to occur where there is an active, well-informed critical mass of locally based agricultural professionals

¹Created technologies include macro-propagation of bananas, passion fruit disease control and artificial insemination for pigs to control disease, and curly virus control. Work on beneficial rhizobia has now been adopted by the Uganda Sugarcane Industry. The sorghum team at Makerere has developed new varieties and bio-fortified foods (Fitzgerald and Lindow, 2013).

to conduct relevant problem-solving research; Secondly, such research results are more likely to be applied when strengthening a demand-driven research agenda – via linkages to smallholder farmers, small- and medium-sized agro-based enterprises post the farm gate, community organisations, and policy-makers ensure research relevance and impact, and matching training and education to the potential job market.

Operating in 18 countries, RUFORUM has a mandate to oversee graduate training and specialisation networks in the Common Market for Eastern and Southern Africa (COMESA) countries. Its agenda is derived largely from a number of continent-wide policy frameworks, especially the Comprehensive African Agricultural Development Program (CAADP) and the African Union Policy Framework on Revitalising Higher Education in Africa.

The RUFORUM Secretariat, hosted by Makerere University, on behalf of the Uganda Government, provides the basic platform upon which activities are built. Its unique core programme structure consists of three MSc and seven PhD regional collaborative degree programmes² – together with quality assurance; competitive grant programmes, including hundreds of MSc graduate research grants, associated field attachments, programme awards, community action research programmes and institutional strengthening grants; supported by advanced work on ICT and M&E. Through these initiatives, it ensures that postgraduates have relevant experience and skills not only to meet the needs of national agriculture systems, but also to become individual entrepreneurs active in the private sector and NGOs.

Overall network guidance is provided by its Board³, who are vice-chancellors of member universities, plus five other persons representing government, business, NGOs and national/regional research institutions. Other organs of the network include a Deans' Committee, an International Advisory Panel, a Technical Committee that oversees quality assurance, and National Forums that frame the agenda for targeting of research and training activities. As a research and training network organisation, RUFORUM plays an important regional public goods role that enables spillover and improvement across its constituent countries and universities. The RUFORUM model is a high-leverage concept that influences much broader change in universities. It uses practical experience through competitive sub-grants together with specialised training sessions and intensive knowledge-sharing to expose universities to both the opportunities and need to produce more relevant graduates and research to service poor rural communities. Through its learning network it has impacted on attitudes, curricula and pedagogy and on university partnerships with smallholder farmers and diverse agricultural development agencies.

RUFORUM graduates acquire the training and skills needed to serve the needs of the agricultural bodies within the region, from national agricultural research and outreach institutes, to the private sector, and other key stakeholder organisations. They help transform production prospects, incomes, and food security in the agriculture sector, particularly for long-neglected smallholder farmers.

² RUFORUM's three collaborative MSc programmes focus on disciplines and skills not widely offered in the region, such as applied statistics, communication, seed systems and molecular biology. Its regional PhD programmes are Drylands Resource Management at the University of Nairobi, Plant Breeding and Biotechnology at Makerere, Aquaculture and Fisheries at the University of Malawi, Soil and Water Management at Sokoine, Agricultural Economics at the University of Malawi, Food Science and Nutrition at Jomo Kenyatta University of Agriculture and Technology in Kenya and Agriculture and Rural Innovation managed jointly between Makerere, Egerton, and Sokoine.

³ All Vice-Chancellors pay membership fees to RUFORUM on behalf of their universities and cover their own travel costs to meetings. While this revenue generation is insufficient to cover RUFORUM operational costs, it reflects the value that vice chancellors accord to RUFORUM.

RUFORUM combines ground-based, credible, specific initiatives together with focused regional activities to facilitate scale-up and impact.

In short, RUFORUM, through its innovative programmes in its member university system and its established regional convening power is an effective advocate for transformation of tertiary agricultural science training and research. In 2014-2018, it will strengthen and scale essential core activities, while stepping up its representational role for higher education with its enormous convening power – at many regional and international meetings, its Biennial Regional Conferences and its high-level gatherings with Ministers of Education and Ministers of Agriculture, the two sectors that RUFORUM straddles.

Looking to the future: quality and focus

For agricultural transformation to be central to sub-Saharan Africa's poverty alleviation strategy, a step change in the quality and focus of the services supporting the sector is needed. This will involve expanding and strengthening access to agricultural inputs, improving research and extension services, introducing smallholder-friendly technologies, improving access to local and international markets, reducing land shortage and degradation, increasing investment in irrigation, and developing farmer co-operatives and associations. The generation of technology is insufficient in itself: the technologies have to reach – and be adopted by – many who have been bypassed by previous efforts. For much of the past thirty years, the major employer of agricultural graduates was the public sector, either in research in universities or public-sector research agencies. Today, however, employment is growing in civil society and the private sector, particularly self-employment. The seed industry illustrates the potential growth for private-sector demand for graduates. Private seed companies in southern and eastern Africa are performing well – maize seed sales increased by 54% between 2006 and 2007 and sales revenue, by 35% (Blackie, 2008). The seed industry needs skilled agronomists and marketing specialists who can build alliances and run demonstrations under a variety of situations, as shown by a 19% growth in employment over two years. Universities must now broaden their training from a heavy emphasis on research and technology generation to providing graduate capacity throughout the value chain. Data collected by Blackie *et al.* (2009) on demand for agricultural graduates in east and southern Africa, suggests that for every scientist working directly on developing solutions to farmer-identified problems, approximately a further eight skilled professionals (in fields such as marketing, entrepreneurship and finance) will be required. Agricultural universities and their graduates will need to engage directly with communities to spur rural transformations.

Lynam *et al.* (2013) reported that RUFORUM provides a platform for catalysing change in African higher education, incorporating innovations from elsewhere such as elements of the *Escuela de Agricultura de la Región Tropical Húmeda* (EARTH) University education model in Costa Rica (<http://www.earth.ac.cr/en/about-earth/course-catalog/>) and engagement of universities in communities, akin to the US Land Grant Universities. RUFORUM has shown African universities can (a) produce competitive graduates suited to a differentiated labour market, (b) enhance relevant research targeting smallholders along several agricultural supply and value chains, and (c) create a dynamic regional platform that fosters collaboration, coordination and learning amongst member universities.

Conclusion

The RUFORUM Secretariat provides high leverage for RUFORUM's work at the regional and international level. RUFORUM will intensify capacity-building in a few pilot countries and enhance the use of digital technology, and focus on sustainable value chains in both crops and livestock, scale out and better align one or more of the regional MSc programmes, explore new forms of knowledge management and exchange including Open Education Resources (OER) and Massive Open Online Courses (MOOCs) adapted to local ICT and capacity constraints. Learning from these pilots will generate public goods that will serve the entire network and open new opportunities for innovation and complementary resource flow.

References

Blackie, M. 2008. Review of the Seeds of Development Programme - South Africa. A report for the UK Department for International Development, London, UK.

Blackie, M., Mutema, M. and Ward, A. 2009. Factors determining demand for agricultural graduates in the SADC and ASARECA region: for SCARDA and RUFORUM. Report commissioned by RUFORUM, Kampala, Uganda.

Fitzgerald, M. and Lindow, M. 2013. *Dirty Hands, Fine Minds: The story of an Agricultural Research and Training Network in African Universities*, RUFORUM, Kampala, Uganda.

<http://repository.ruforum.org/sites/default/files/Dirty%20Hands,%20Fine%20Minds.pdf>

Lynam, J., Medvecky, B. and Lyakurwa, W. 2013. An Evolving Regional Platform for Higher Agricultural Education: A Review of RUFORUM. Report commissioned by the Bill and Melinda Gates Foundation, Seattle, WA, USA.

<http://repository.ruforum.org/documents/evolving-regional-platform-higher-agricultural-education-review-ruforum>

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