

BecA-ILRI Hub in Rwanda



USD 449,476 Funding allocated to research and capacity building in 3 years

Over 30 Scientists benefited from training workshops

08 Research scholarships through Africa Biosciences Challenge Fund since 2011

04 Partner institutions

Biosciences eastern and central Africa-International Livestock Research Institute (BecA-ILRI) Hub was established in Nairobi, Kenya, with the aim of increasing the use of cutting edge bioscience technologies to address Africa's agricultural, health, and environmental challenges. There are 18 countries in the BecA region - Burundi, Cameroon, Central Africa Republic, Congo Brazzaville, Democratic Republic of Congo, Equatorial Guinea, Eritrea, Ethiopia, Gabon, Kenya, Madagascar, Rwanda, São Tomé and Príncipe, Somalia, South Sudan, Sudan, Tanzania and Uganda.

The BecA-ILRI Hub in Rwanda

In empowering African researchers and institutions to exploit biosciences opportunities, the BecA-ILRI Hub contributes to addressing key agricultural constraints in food production, nutrition and animal health in eastern and central African countries including Rwanda. This is achieved through partnerships with the country's national agricultural research system (NARS), development organizations and other stakeholders. The BecA-ILRI Hub has in the last three years contributed to NARS in Rwanda through:

Collaborative research

The projects, which include national partner-led research projects, are demand driven, responding to the high priority themes identified for increasing the productivity of food and improved agricultural systems in Rwanda.

Climate-smart Brachiaria grass for sustainable livestock production in eastern Africa



Mokamorigo Tamali, a smallholder from Okara Sector, harvests Brachiaria from her field to feed her cattle, Okara Sector, Rwanda (photo: CIAT/Stephanie Malyon).

Livestock, which contributes to 35 percent of the agricultural gross domestic product in sub-Saharan Africa (SSA), is greatly hampered by the shortage of quality forage. The inherent ability of Brachiaria grasses to grow in drought and marginal soils makes them ideal forages for the over 54 percent of SSA which comprises arid and semi-arid zones.

Collaborative research with the Rwanda Agriculture Board (RAB) on Brachiaria grass began in June 2013. Activities being implemented in the country with Dr Mupenzi Mutimura of RAB as the lead national partner, include multi-location testing of eight improved Brachiaria cultivars, farmer training on Brachiaria grass

production and strengthening the capacity of RAB scientists in forage research. Participatory variety evaluation was conducted with 21 farmers in 2013 and four best bet Brachiaria cultivars were identified. Seeds of these best bet cultivars were imported (100 kg of each cultivar) and distributed to farmers. By April 2015, a total of 56 farmers and two farmer groups (each with about 50 members) had received training and begun growing Brachiaria grasses. The number of farmers growing Brachiaria exceeded 500 by mid-2015.

The response of livestock productivity (change in milk and/or live weight gains) to Brachiaria feeding is being studied on 56 farms. A subset of forty farms that collect both milk and meat will be used to estimate the feeding responses.

A faculty member from University of Rwanda, Marie Christine Dusingize, completed an eight month fellowship at BecA-ILRI Hub working on 'genetic diversity of Rwandan Brachiaria ecotypes and associated microbial communities' in March 2015. During her fellowship, Marie examined genetic structure of Rwanda Brachiaria local ecotypes and gene bank accessions, evaluated the importance of these materials and characterized the fungal community associated with local ecotypes. She also learned various microbiology, molecular biology, genomic and bioinformatics techniques that will be transferred back to her home

Strategic partnerships

By engaging key researchers and strategic agricultural research institutions and universities in Rwanda, the BecA-ILRI Hub is playing a key role in driving change in the country's agricultural research system. Technical and advisory support on best practices and cost effective management of facilities as well as institution specific interventions have resulted in enhanced agricultural biosciences capability.

In 2015, the BecA-ILRI Hub technology manager and a senior scientist visited Rwanda to evaluate the country's agricultural bioscience priority needs as well as identify potential areas for collaboration with RAB. Key areas identified include plant and animal disease diagnosis; tissue culture and transformation for the country's major root crops; training in integrated plant breeding, plant pathology (mycology and virology), and integrated plant diseases management; food safety and nutrition research on groundnut, maize and rice; climate change and adaptation in relation to performance in milk, meat and egg production; animal genetics and diversity studies; molecular characterization of genetic materials from gene bank; resource mobilization; animal feed and feeding research; and procurement of laboratory supplies.

Through the RAB-BecA partnership, RAB scientist Doreen Mutoni was hosted at the BecA-ILRI Hub to use the high-end facilities in developing molecular markers that will enhance breeding of biofortified beans. Production of iron-fortified beans is a strategy adopted by the Rwandan government to combat iron deficiency. Mutoni's research was supported by scientists from the John Innes Centre, UK as part of the cutting edge technology transfer and capacity building activities that Rwandan and other eastern and central African scientists have access to through the BecA-ILRI Hub research for development network.

Collaborative resource mobilization initiatives between the BecA-ILRI Hub and RAB are also on-going.

Capacity building

The BecA-ILRI Hub is expanding the base of expertise in agricultural research in Rwanda by hosting scientists and graduate students to conduct research, and by conducting training programs. Research placements combine training in the latest technologies, as well as opportunities to conduct research on topics addressing food and nutritional insecurity and livestock health.

There are five main categories of capacity building and training activities that have involved several scientists and graduate students from Rwanda:

Post graduate students

Post graduate students (MSc and PhD candidates) have conducted research at the BecA-ILRI Hub either by being attached to existing Hub hosted-research projects or through stand-alone thesis projects.

Small group training and short-term visiting scientists

Smaller groups of up to five participants have received tailor-made training and laboratory work programs. Visiting scientists from Rwandan universities or other research institutes have come to the Hub to use the facilities or equipment to advance their research projects.

Training workshops

A number of Rwandan scientists have benefited from group training workshops which emphasize problem-solving, hands-on training, seminars, discussions and laboratory practical work. These trainings are developed within the BecA-ILRI Hub's core competencies such as genomics, bioinformatics, diagnostics, molecular marker development and applications, DNA sequencing and genotyping, and scientific paper writing.

Africa Biosciences Challenge Fund (ABCF)

This is a competitive fund which facilitates access to the BecA-ILRI Hub for scientists and students from African NARS. Through this program, Rwandan scientists have received support for their research fellowships, pilot project grants and training.

The following Rwandan scientists have benefited from the Africa Biosciences Challenge Fund fellowship program:

Bancy Waweru Rwanda Agricultural Research Institute (ISAR) November 2012–April 2013 Project title: Identification and characterization of passion fruit viruses in Rwanda	Prime Gahunga Rwanda Agriculture Board 4 February–19 September 2013 Project title: An assessment of changes in microbial diversity during in vitro gas production
Angelique Ingabire Rwanda Agriculture Board 2 December 2013–16 April 2014 Project title: Understanding the epidemiology of African swine fever (ASF) in Rwanda and its implication on disease control	Godelieve Mukamurezi Rwanda Agriculture Board 1 December 2014–30 May 2015 Project title: Occurrence and distribution of mycotoxins in grain, case study: aflatoxin in rice from Rwanda
Kizito Nishimiwe University of Rwanda 1 October 2014–27 February 2015 Project title: Characterization of mycotoxins and mycotoxigenic fungi in maize sold in principal retailers markets of Kigali	Doreen Mutoni Rwanda Agriculture Board 16 June–15 August 2015 Project title: Genotyping preferred bean varieties for marker discovery
Marie Christine Dusingize University of Rwanda 1 July 2014–27 March 2015 Project title: Genetic diversity of Rwandan Brachiaria ecotypes and associated microbial communities	Richard Habimana University of Rwanda 10 August 2015–9 February 2016 Project title: Assessment of genetic variation in indigenous chicken populations in Rwanda

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