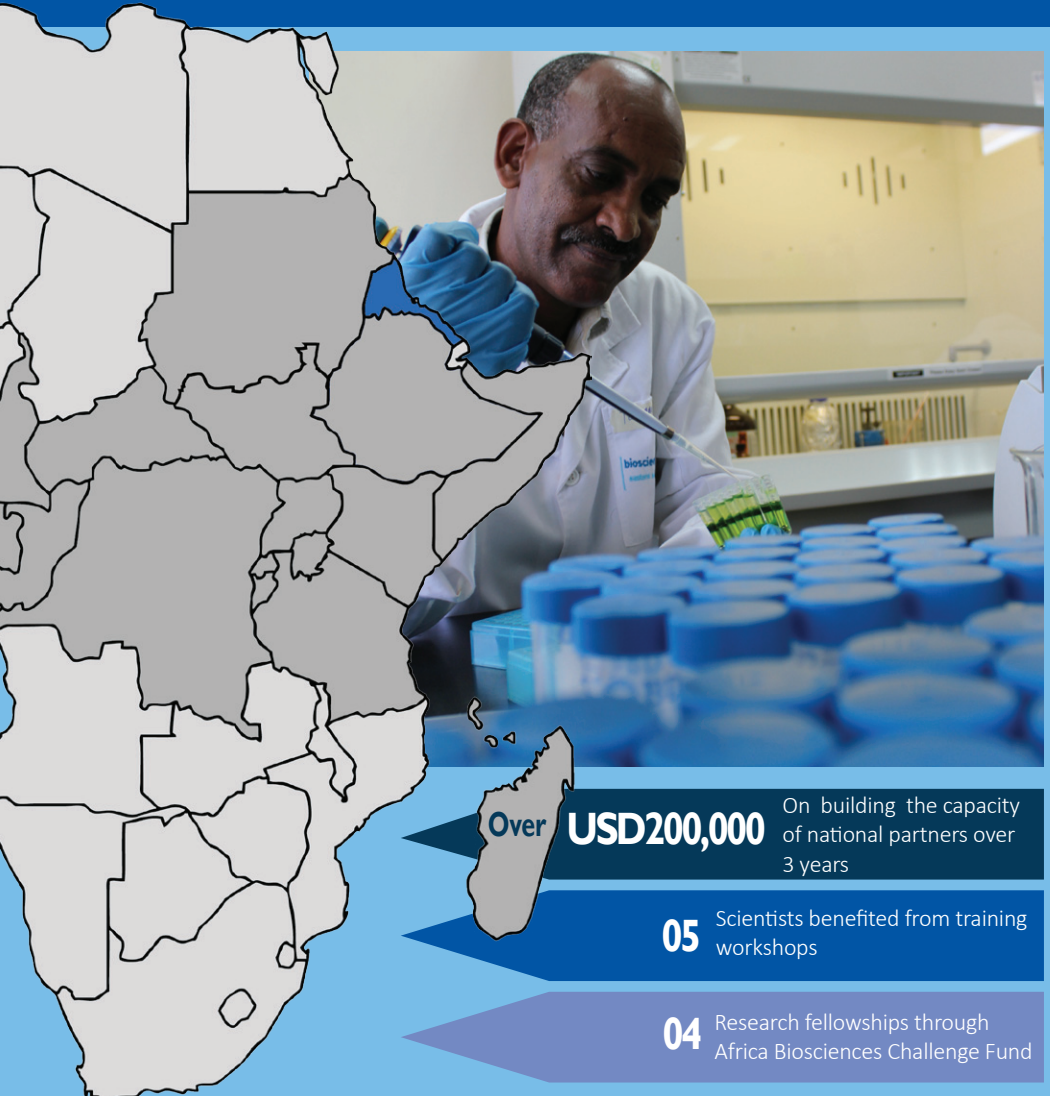


# BecA-ILRI Hub in Eritrea



Over **USD200,000**

On building the capacity of national partners over 3 years

**05**

Scientists benefited from training workshops

**04**

Research fellowships through Africa Biosciences Challenge Fund

**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 Eritrea

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 Eritrea. This is being achieved through partnerships with the country's national agricultural research system, development organizations and other stakeholders. The BecA-ILRI Hub has contributed to NARS in Eritrea through various engagements including:

## Collaborative research

The projects that the BecA-ILRI Hub is involved in 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 Eritrea.



*Brhan Khir Saleh, lecturer, Hamelmalo Agricultural College and Africa Biosciences Challenge Fund recipient at work at the BecA-ILRI Hub (photo: BecA-ILRI Hub/Marvin Wasonga).*

## Development and production of virus free potato mini-tuber

Potatoes are a priority crop in the highland and midland of Eritrea, and are among the main vegetables used as cash and food crops in the country. About 20 percent of the total area devoted to vegetable production in Eritrea is cultivated with potatoes.

However, potato viral diseases cause 40–90 percent yield losses and necessitate the annual importation of tons of foundation and certified seed potato tubers costing the country almost USD 2 million per annum. This in turn exposes the country to the possibility of introducing undetected new potato diseases to the country.

In August 2012 Mussie Fekadu Berhe, a scientist at the National Agricultural Research Institute (NARI) in Asmara, begun six months research at the BecA-ILRI Hub to develop locally certified potato seeds for production of virus free potato plants.

While Mussie was re-called to help establish a level-2 greenhouse facility in NARI before completion of his project, his research was completed and the clean planting material is available for planting in Eritrea.

## Identification and diversity studies of Eritrean potato genotypes

Biniam Mesfin Ghebreslassie, a lecturer at the Hamelmalo Agricultural College in Eritrea, spent eight months at the BecA-ILRI Hub from June 2014 conducting research to identify the potato genotypes grown in Eritrea and determine the genetic diversity among the different genotypes. The characterization and documentation of potatoes will provide critical information that will contribute to breeding programs and eventually increased potato production in Eritrea.

## Evaluation of the diversity of Eritrean local hot pepper

Brhan Khiair Saleh, lecturer at Hamelmalo Agricultural College, Eritrea and PhD student at the Jomo Kenyatta University of Agriculture and Technology, Nairobi, Kenya, conducted a six-month research on the diversity of Eritrean local hot pepper at the BecA-ILRI Hub from November 2013 to May 2014.

Pepper is an important vegetable crop in Eritrea, ranked second (after tomato) in the country's cultivated area and fourth in production (after

tomato, onion and potato). Consumed fresh, cooked or dried, pepper is also used as food dye and an ornamental plant. A source of capsaicin, an important ingredient in the pharmaceutical industry, pepper has potential for the export market. Only a small amount of the pepper consumed in Eritrea is locally produced and there exists unexploited potential to increase the production by improving the local varieties. The information from Brhan's research will be useful for to the development of pepper breeding programs in Eritrea.

## Strategic partnerships

By engaging key researchers and strategic agricultural research institutions and universities in Eritrea, 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.

Tesfamichael Abraha, a researcher from Hamelmalo Agricultural College, Eritrea, was awarded an Africa Biosciences Challenge Fund (ABCF) fellowship to conduct research at the BecA-ILRI Hub. The fellowship which ran for a period of seven months from June 2013 January 2014 enabled Tesfamichael to conduct analysis of different sorghum landraces in Eritrea for drought tolerance using molecular markers, and contributed to his PhD studies at the Jomo Kenyatta University of Agricultural Technology in Nairobi, Kenya.

Sorghum is a major staple food and a leading cereal crop in Eritrea making up 45 per cent of the total cultivated crop yield. Most of the sorghum produced in Eritrea is from traditional varieties on smallholder farms with the average yield falling below one tone per hectare. The local landraces perform better than improved varieties in adverse environmental conditions as they are well adapted and persist for long periods of time. However, the genetic make up of these Eritrean landraces are not yet fully evaluated and exploited to increase productivity.

Tesfamichael's work established that the genetic diversity of local landraces of sorghum in Eritrea is valuable resource for future breeding programs of this crop. He proposed a national conservation effort for Eritrean sorghum populations in general, and for the landraces found in Gash Barka and South region in particular, to safeguard and retain the rich and unique genetic diversity found in the country's local sorghum accessions.

On completing his research at the BecA-ILRI Hub, Tesfamichael made presentations about his work and his findings to 90 researchers from his home institution and a wider community of agricultural research experts in Eritrea. The presentations catalyzed the commitment by various stakeholders including policy makers towards applying his findings to improve sorghum farming for smallholder farmers in Eritrea.

In 2015, a delegation of senior officials from various research institutions in Eritrea visited the BecA-ILRI Hub to hold discussions on further research partnerships based on

broader national priorities. The delegation was led by Tesfamichael and included Prof Tadesse Mehari, Executive Director and Prof Zemenfes Tsighe, Director Bureau of Higher Education, Administration and International Linkages - National Board for Higher Education of Eritrea; Prof Tesfamichael Haile, Vice president - Eritrean Institute of Technology; Mr Semere Amleson, Dean - Hamelmalo Agricultural College; and

Dr Zekeria Abulker, Dean – College of Marine Science and Technology.

From conducting research to fulfill his PhD study requirements, Tesfamichael Abraha has grown to be a science leader, participating in discussions on the national direction in agricultural research and development in Eritrea.

## Capacity building

The BecA-ILRI Hub is expanding the base of expertise in agricultural research in Eritrea 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 four main categories of capacity building and training activities that have involved several scientists and graduate students from Eritrea:

### Post graduate students

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

### Small group training and short-term visiting scientists

Small groups of up to five participants have also received tailor-made training to enhance their capabilities in research leadership. The workshops aimed at equipping scientists to compete for funding opportunities; apply and integrate agricultural innovation systems and value chain development in proposal development, and research program implementation and

monitoring; and to make them more effective leaders, managers and mentors.

### Training workshops

A number of Eritrean 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 National Research Institutes and universities.

Through this program, Eritrean scientists have received support for their research fellowships, pilot project grants and training.

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