IRRI in East and Southern Africa

Rice is a staple food in many African countries and there have been consistent increases in demand for rice in the continent. However, the majority of rice-producing countries in Africa import between 50% and 99% of their rice requirements.[1] IRRI has responded to the challenge of helping the continent reach rice self-sufficiency by providing countries in East and Southern Africa (ESA) with improved varieties and technologies, expertise, and training.

IRRI's contribution to Africa started in 1965 with the transfer of rice germplasm to Tanzania where agriculture accounts for more than a quarter of the GDP and employs about 76% of the labor force. IRRI also trained African technicians and scientists in rice production technologies developed under the first Green Revolution.

In 1984, the institute had some staff in Madagascar, where rice is the main subsistence crop and about 85% of the farmers grow rice, and launched the IRRI-Madagascar Rice Research Project. The project developed an agroclimatic map of the island to guide breeders and agronomists.

In 2004, an IRRI scientist was stationed in Nigeria to strengthen collaboration between IRRI and the Africa Rice Center or AfricaRice (then the West African Rice Development Association). IRRI was tapped to assist in raising and sustaining the productivity of African farmers and strengthening national research capacity.

In 2006, IRRI and AfricaRice created the East and Southern African Research Program for Mozambique, Tanzania, Uganda, and Kenya. The program focuses on rice breeding, varietal release, seed and crop production, postharvest practices, the rice value chain and agricultural policy, improving rice production and capacity building at the village level. Burundi, Rwanda, and Malawi joined the program in 2007.

Key achievements

- **Improved rice varieties.** A total of 15 IRRI-bred rice varieties have been released in ESA from 2011 to 2016. Six new varieties are being evaluated in national prformance trials for release.
- **Empowered women.** In 2010, around 400 ex-combatant women were able to participate in the farmer field school (FFS), where they learn more about rice production under a joint project between IRRI and CARE. They now have access to rice land and earn their keep. Some have even become entrepreneurs while others have become leaders of women associations. They were also part of the participatory varietal selection for demand-driven breeding. The FFS system is being adopted by rice farmers in the marshlands in Ngozi and Kirundo. Since 2012, 1,800 farmers have been already trained.
- **Established a regional research hub.** The ESA rice research and breeding hub with adequate facilities and laboratories has been built to conduct a targeted breeding research program in Burundi. The hub aims to benefit the breeding programs in other countries in the region.
- **Fast-tracking the breeding pipeline.** A demand-driven research program in ESA has developed product profiles for irrigated lowland, rainfed lowland, and high elevation rice ecologies for faster breeding. In addition, some breeding schemes, including the Rapid Generation Advancement system, have been developed.

  Recently, four blast resistance genes have been confirmed useful for the ESA region. Sources of resistance genes for rice yellow mottle virus and brown sheath rot disease have also been determined.
- **Strengthened breeding network.** In 2013, IRRI-ESA held the 7th Annual Regional Breeding Workshop that resulted in sharing the progress of the reinforcement of regional breeding nurseries and assessment of breeding lines. Thirty-two rice breeders from Burundi, Benin, Tanzania, Uganda, Malawi, Mozambique, Kenya, Rwanda, the Democratic Republic of Congo, Ethiopia, Zambia, and Zanzibar attended the workshop.
- **Capacity building.** Since 1962, IRRI has hosted and supported 778 scholars and trainees from Africa, including 694 on short-term courses, 84 on-the-job trainees, 25 PhDs, and 40 MSc. Six PhDs and 7 MSc graduates are from ESA.

Around 2,250 farmers in Burundi, and 390 farmers in Mozambique have been trained in rice production resulting in an increase in their yield from 2–4.5 tons per hectare.

[1] Rice production in Africa: Current situation and issues. See www.fao.org/docrep/003/x2243t/x2243t05.htm.

In 2008, the Japan International Cooperation Agency (JICA), in partnership with Alliance for a Green Revolution in Africa, launched the Coalition for African Rice Development (CARD). The coalition, where IRRI is a supporting member, supports the efforts of African countries to double rice production in the continent within 10 years. Through the support of JICA, IRRI has partnered with the Philippine Rice Research Institute to offer training courses on rice and quality seed production for young researchers, research technicians, and extension agronomists from the 23 CARD member countries: Cameroon, Ghana, Guinea, Kenya, Madagascar, Mali, Mozambique, Nigeria, Senegal, Sierra Leone, Tanzania, Uganda, Benin, Burkina Faso, Cote d' Ivoire, Central African Republic, Democratic Republic of Congo, Ethiopia, The Gambia, Liberia, Rwanda, Togo, and Zambia.

Since the establishment of CARD, IRRI has established a regional research center in Burundi to support the development of the rice sector in Africa as well as offices in Mozambique, Kenya, and Tanzania. ■

Current research and development initiatives with ESA

Breeding climate-smart rice varieties. Rice varieties that can withstand floods, droughts, and salinity are being developed through the Stress-Tolerant Rice for Africa and South Asia project to help African farmers cope with climate change. The project is funded by the Bill & Melinda Gates Foundation (BMGF).

Breeding Green Super Rice. IRRI and AfricaRice are working together to develop rice varieties that can withstand stresses while using less fertilizer and water under the Green Super Rice for the Resource-Poor of Africa and Asia. The project is funded by BMGF.

Intensifying rice faming. The *Village-level market driven rice intensification* project in Mozambique, aims to develop and document a sustainable model that enhances food security and improves incomes of rice farmers in Zambezi and Gaza provinces.

IRRI is conducting *Increasing economic and food security in Burundi through rice production,* a project funded by philanthropist George Chung Hang Liang through the IRRI Hongkong Fund.

Improving hybrid rice. Through the IRRI-led Hybrid Rice Development Consortium, several hybrid rice developed in the Philippines, China, and India are being tested in ESA countries for productivity and other regionally important traits.

Capacity building. A JICA-funded project, *Extension capacity development for rice food security in Africa,* aims to help improve the national research and extension systems in Africa.

Transforming the breeding pipeline. The *Transforming rice breeding efficiency* project uses modern breeding tools and approaches to help secure the food and income of resource-poor farmers in ESA. The project is funded by BMGF.

Future perspectives

In line with IRRI's strategy for Africa, the institute is working to develop the rice sector in ESA through the following:

- modernizing national breeding programs,
- introducing better management practices,
- promoting the adaptation of mechanization and postharvest technologies,
- developing closer collaboration between IRRI and national seed systems,
- providing more training programs for technical staff, extension personnel, and farmers,
- encouraging more private sector engagement, and
- targeting women and youth in technology development and deployment.

International Rice Research Institute (IRRI)

The International Rice Research Institute (IRRI) is the world's premier research organization dedicated to reducing poverty and hunger through rice science; improving the health and welfare of rice farmers and consumers; and protecting the rice-growing environment for future generations. IRRI is an independent, nonprofit research and educational institute founded in 1960 by the Ford and Rockefeller foundations, with support from the Philippine government. The institute, headquartered in Los Baños, Philippines, has offices in 15 rice-growing countries in Asia and Africa, and about 1,180 staff members of some 40 nationalities.

Working with in-country partners, IRRI develops advanced rice varieties that yield more grain and better withstand pests and disease as well as flooding, drought, and other destructive effects of climate change. More than half of the rice area in Asia is planted to IRRI-bred varieties or their progenies. The institute develops new and improved methods and technologies that enable farmers to manage their farms profitably and sustainably, and recommends rice varieties and agricultural practices suitable to particular farm conditions as well as consumer preferences. IRRI assists national agricultural research and extension systems in formulating and implementing country rice sector strategies.

IRRI

www.irri.org *Rice science for a better world*

Contact

Joseph Bigirimana
IRRI regional coordinator for East and Southern Africa
j.bigirimana@irri.org

August 2016