



Annual Report 2014

Going climate smart





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The Association for Strengthening Agricultural Research in Eastern and Central Africa (ASARECA) is a not-for-profit sub-regional organisation. ASARECA comprises 11 member countries: Burundi, the Democratic Republic of Congo, Eritrea, Ethiopia, Kenya, Madagascar, Rwanda, South Sudan, Sudan, Tanzania and Uganda.

Vision

To be a regional leader in agricultural research and development for improved livelihoods in Eastern and Central Africa.

Mission

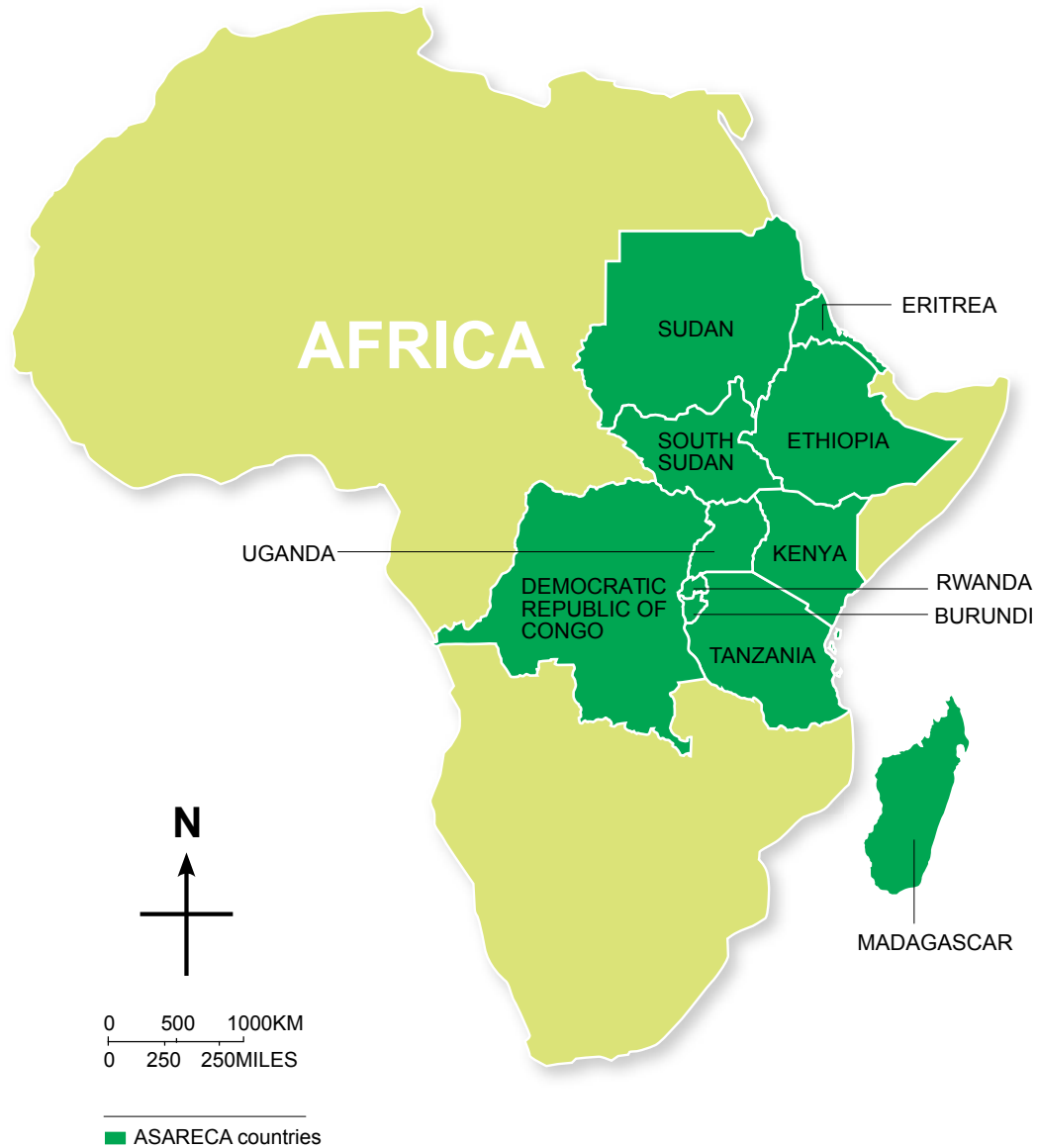
To enhance regional collective action in agricultural research for development, extension and agricultural training and education to promote economic growth, fight poverty, eradicate hunger and enhance sustainable use of resources in Eastern and Central Africa.

ASARECA brings together scientists and development workers from the national agricultural research institutions of the 11 member countries to work collectively with farmers, regional and international research, extension, and training organizations; public and private sector actors; NGOs; the regional economic communities and development agencies to generate, share and promote knowledge and innovations to assist smallholder farmers to practice productive and profitable agriculture.

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ASARECA coverage



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All ASARECA themes are tailored to promote the three pillars of Climate Smart Agriculture (CSA) namely: ensuring sustainable increase in agricultural productivity for better incomes and food security, adapting and building resilience to climate change, and reducing and removing green house gas emissions.

Saluting partnerships and collective action

Dr. Fidelis Angelo Myaka, ASARECA Board Chairman

In 2014, ASARECA embarked on a journey to complete the second segment of its long-term Plan (2007—2016). This effort came with a bill of clean health following the impressive achievements in the first segment of the Plan. Some of the successes are highlighted in the Executive Directors communication. They are also available on www.asareca.org. A rating by development partners, declaring our work “satisfactory”, provided us the vigour to walk the final stretch of ASARECA's Strategic Plan. For this, I salute ASARECA stakeholders and partners of all categories for the fruits of our collective actions.



With unwavering oversight from the BOD and patron ministers, ASARECA new projects approved by the BOD for implementation in the next five year are clustered into four themes namely:

- Natural Resource Management and Ecosystems Services.
- Markets, Market Linkages and Trade.
- Sustainable Agriculture, Food Security and Nutrition.
- Knowledge and information hub

All the themes were tailored to promote the three pillars of Climate Smart Agriculture (CSA) namely: ensuring sustainable increase in agricultural productivity for better incomes and food security, adapting and building resilience to climate change, and reducing and removing green house gas emissions.

Through these themes, and in particular, the four projects launched in 2014, ASARECA expanded its scope of inclusiveness by providing critical support to the less-resourced national agricultural research systems (NARS) and incorporated most member countries in new projects.

Aware that we are duty-bound to support capacity development of the NARS to perform better, ASARECA provided training to the less-resourced NARS and other partners through a collaborative agreement with BecA-ILRI Hub.

The initiative focused on delivering six short and targeted skills enhancement courses. Through this arrangement, research scientists from less participating NARs received skills in proposal writing; Agricultural Innovations Systems (AIS) and Value Chain Development approaches, including integration of gender into value chains, among others.

Continuous training is critical to member countries and I wish to thank ASARECA secretariat for arranging this initiatives.

As part of our efforts to make agriculture an attractive economic option for our people, ASARECA continued to promote the scaling up and out of prioritized technologies, innovations and management practices through UniBRAIN, an apprenticeship model.

ASARECA is strategically motivating youth to join the agricultural value chains through the UniBRAIN entry point among others. A success story demonstrating how apprenticeship can bring the youth on board is profiled on page 19 of this report.

You are welcome to share our experience.



Let's celebrate!

ASARECA @ 20

Dr. Fina Opio, ASARECA Executive Director

To all our esteemed partners and colleagues, let's celebrate! ASARECA is 20. Yes, this year—2014, ASARECA made 20 years since it was established in September 1994. The year is also unique in other ways: It marks the first year of ASARECA's Second Operational Plan (2014—2018) following the successful completion of the 1st Operational Plan (2009-2013). These two plans are based on the 10-year Strategic Plan (2007-2016), which ASARECA is using as a long term direction for research for development interventions in the sub-region.



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The year also marked the successful completion of the evaluation of the ASARECA's OPI. The evaluation report shows stellar achievements. Just to mention a few; the report shows that a total of 250 different agricultural technologies, innovations and management practices (TIMPs) were either generated or improved to suit farmers' demands. In addition, 300 TIMPs were availed for uptake by targeted stakeholders, leading to significant benefits to the beneficiaries.

The report also shows that over 4,600 ha of land were dedicated to improved TIMPs, especially for the production and multiplication of quality pre-basic, basic and certified seeds of selected crops. As a result of this, over 800 metric tons of quality seed were produced and either sold or distributed to farmers for further multiplication.

It also showed that a total of 422,176 rural households directly benefited from ASARECA-related support initiatives, and over 2.5 million individuals directly benefited from an assortment of ASARECA support initiatives. The overall impact of these and other achievements was a net crop production value of US\$73.4 million within the OP1 period, according to the report. (Full report is available on www.asareca.org).

In 2014, ASARECA also started implementing the thematic approach, which is aimed at creating sustainable interest in adoption of new technologies across a widened range of stakeholders. In this spirit, we started implementing the following projects:

- Sustainable management of agricultural water productivity for improved food and nutrition security in ECA. This is underway in Kenya, Eritrea, Madagascar, Ethiopia, Uganda and Burundi.

- Integrated Management of Maize Lethal Necrosis Disease in Eastern and Central Africa. This is in Kenya, Burundi, Tanzania, Uganda, Rwanda and Ethiopia.

- Enhancing Wheat Productivity and Value Chains in Rwanda and Burundi.

- Capacity Development for Sustainable Plant Genetic Resource Utilization and Conservation in Eastern Africa. This is underway in Burundi, Eritrea, Ethiopia, Kenya, Madagascar, Rwanda, Sudan and Uganda. The project is expected to extend to South Sudan, Somalia and Djibouti.

We enter 2015 with confidence that regional collective action, which we preside over, will continue to yield good results.





ASARECA Board of Directors, Development Partners and senior staff during the 20th BOD meeting at Serena Lake Victoria Hotel in Uganda, June 2014 .The meeting was graced by the Minister of State for Agriculture, Uganda, Prof. Zerubabel Nyiira (in cream jacket centre)

New Direction

ASARECA work in Eastern and Central Africa is implemented in four themes. The themes are designed in the Climate Smart Agriculture (CSA) orientation. These themes are:

- Natural Resource Management and Ecosystem Services.
- Markets, Market Linkages and Trade.
- Sustainable Agriculture, Food Security and Nutrition.
- Knowledge and Information Hub.



Youth in Madagascar use a locally fabricated tool to map contour lines. The lines are crucial in planning water and soil management activities such as landscaping, construction of terraces and water benches etc.

Four themes, four projects

The implementation of themes under Operational Plan II started in 2014. The themes include:

Natural Resource Management and Ecosystem Services

This theme addresses the following key aspects:

- Improving agricultural water productivity.
- Soil health improvement.
- Adoption of climate-smart forestry, agroforestry and biodiversity.
- Enhancing resilience of dryland agricultural systems.
- Gender-responsive climate-smart policies and governance for sustainable natural resource management.
- Managing ecosystems for quality, equitable and sustainable services.

Markets, Market Linkages and Trade

This theme encompasses issues such as:

- Policies for enabling domestic and regional trade.
- Developing and promoting institutions for enhanced market access.
- Upgrading value chains.
- Business incubation of generated innovations.

Sustainable Agriculture, Food Security and Nutrition

This theme is concerned with:

- Development and promotion of breeds, varieties and management practices for adoption to climate change and variability.

- Management of diseases and pests of strategic crops, livestock and fisheries.
- Promotion of enabling gender-responsive policies for sustainable agriculture, food and nutrition.
- Post-harvest handling and processing of crop, livestock and fisheries resources.
- Sustainable intensification of crop, livestock and fisheries systems.
- Conservation and utilization of plant, animal and fish genetic resources.
- Food and nutrition security for improved health.

Knowledge and Information Hub

Under this theme ASARECA is:

- Establishing and operationalising a learning and innovation centre for agricultural research and development, including a think tank and clearing house for technologies and information.

Under the themes, four projects were implemented. They are:

- Sustainable management of agricultural water productivity for improved food and nutrition security in ECA.
- Integrated management of maize lethal necrosis disease in Eastern Africa.
- Enhancing wheat productivity and value chains in Rwanda and Burundi
- Capacity development for sustainable plant genetic resources (PGRS) utilization and conservation in Eastern Africa.



Cover photo: A farmer from Makindu, Kenya, a once degraded landscape, displays a good maize harvest after he adopted climate smart initiatives.

From lamentations to action:

Using water as a weapon against climate change

From just 1/8 of an acre of land, which she prepared late December 2014, **Ms Veronica Musyoki** realized a bumper harvest of tomatoes, which earned her about Khs 50,000 (about US\$555) in January 2015. Motivated, she planted more tomatoes in an adjacent ½ acre plot to avoid possible pests and plant recycling. These have also matured and are ripening. “I have so far harvested and sold the second crop twice and earned about Ksh20, 000 (US \$222),” she reveals. Veronica estimates that she will harvest four more times before the crop is depleted. “I could get up to 90,000 (about US\$1,000),” she adds.



Veronica accompanied by her son shows off the benefits of drip irrigation

Besides, Veronica has 700 cabbage plants in the acre where she got her first tomato harvest. She planted cabbages to diversify her efforts to adapt to effects of climate change. “One month from now, I will fetch up to Ksh 35,000 (US\$388) from the cabbages,” she predicts. Her prediction is based on the now obvious good health of the plant, thanks to efficient use of the scarce water through drip irrigation. From these and other farm-based initiatives, Veronica hopes to earn over US\$3,500 this year, which places her at \$10 per day level compared to the below one dollar majority.

Ms Mary Kyule, Veronica's neighbour is in the same league. She planted tomatoes on 1/4 acre and is sure to earn about Ks 50,000 (about US\$555) after harvesting about three to four times. Besides, she has maize on 1/2 acre, which she will sell, while still fresh. "We have been advised to avoid growing maize when the season is predictably marginal unless we put into place water harvesting and moisture conservation facilities," she explains. "As you can see, my plot is furrowed and irrigated, so I am sure to get a good harvest." Mary plans to sell the maize while still fresh so that she can harvest the stalks and use them to feed her livestock during the dry season.

From 1/10-acre plot, **Margaret Koiko**, another neighbour to Veronica, harvests Sukuma Wiki, a popular leafy Kenyan vegetable, earning about Ksh 9,000 (US\$100) every month.

As long as she continues irrigating the crop, she will continue harvesting twice weekly for two more months. Though this is a relatively small earning, Veronica notes that it is only a day-to-day sustenance crop as she waits for income from compound bulb onions. "I can predict that I will



\$3,500
Annual farm income
expected by one woman
in Machakos

Mary explains how she is able to grow maize in marginal land

harvest over 1,000kg from onions and when I sell at Ksh 40, it comes to about Ksh 40,000 (US\$445)," she forecasts.

Veronica, Mary and Margaret represent increasing efforts by women, men and the youth in Mwanja watershed to ensure their children continue to go to school, the families purchase supplementary food for adequate nutrition and invest back to the landscape.

All the farmers in Mwanja watershed, a densely populated location in Machakos County in Kenya, who are participating in water and landscape management activities, are unanimous about one thing—growing tomatoes, onions and other fast maturing crops, is more profitable and water-use efficient than growing maize or beans.

Through ASARECA project, Sustainable agricultural water productivity enhancement for improved food and nutrition security in Eastern and Central Africa, the Kenya Agricultural and Livestock Research Organisation (KALRO) scientists and extension staff have been training farmers on how to harvest water using water tanks, open furrows and tied ridges and use it to grow high value crops such as tomatoes, onions and leafy vegetables. Every evening, the farmers release water from the holding tanks to water and keep the crops cool throughout the night.

Madagascar

In Avaratrambolo watershed in Madagascar, several areas that were previously exposed to soil erosion and floods did not experience as much havoc in 2014. Farmers who



Margaret is able to harvest vegetables from the same crop for three months

were mobilized to reclaim the once devastated villages from the forces of nature, say since they established canals and swales, runoff has been tremendously slowed down.

This, the farmers say, means that people living and farming downstream are protected from falling rocks and floods. “Soil erosion has been reduced, and availability and retention of water for farm use and recharge of springs has been boosted,” they noted.

These are stories told just less than one year since ASARECA launched a project meant to increase efficient use of water to improve food and nutrition in Eastern and Central Africa.

Through the project, ASARECA seeks to use climate smart agriculture initiatives to diversify water management benefits in the sub-region and stop the over 20% harvest losses associated with dry spells and land degradation.

Researchers, farmers join hands

In Ambohitrakely and Ampahitrizina Fokontany in Madagascar, demonstration sites were established with volunteer farmers.

The project technical teams, through participatory coaching, facilitated the farmers at the landscapes to dig swales to improve water retention and avoid soil erosion and destructive flow of water. Now, say the farmers, their crops will not be washed away and water can be stored for crop and for family use.

Riding on good work

This and other initiatives across the sub-region were motivated by impressive outcomes of a project on agricultural water productivity, which ASARECA concluded in 2013.

New phase promises even more

The current phase, officially kicked off late 2014, is scaling up innovations and best practices from the earlier project to address farmer's needs. It offers them assurance to invest in high-yielding varieties, fertilisers, and basic machinery, which they wouldn't do if they lacked water.

The US \$ 2 million project titled, "Sustainable agricultural water productivity enhancement for improved food and nutrition security in Eastern and Central Africa", is implemented by institutions in seven of the 11 ASARECA countries. They are: Kenya Agricultural and Livestock Research Organisation, Kenya; Artelia and Centre National de Recherche Appliqué au Développement Rural, Madagascar; Mekelle University and National Agricultural Research Institute, Ethiopia; National Agricultural Research Laboratory, Uganda; Institut des Sciences Agronomiques du Burundi; and Agricultural Research Corporation, Sudan.

Sites

The project is implemented in two agricultural watersheds in each of the participating countries. The sites are typically mixed crop-livestock farming systems with low agricultural water productivity due to variable and erratic rainfall and excessive runoff. In Most of these sites, common agricultural value chains are based on cereals, high value crops (citrus, vegetables), dairy and local poultry, which may be enhanced through utilization of best bet water management technologies.



Project teams and communities in Buso watershed, Amhara region, Ethiopia share information on how to construct benches.

Ethiopia

In Ethiopia, the project is implemented at landscape and farm levels in areas completely devastated by soil erosion, deforestation and severe droughts. Here, the communities have been sensitised in soil and water conservation activities.

At landscape level, farmers in Buso and Zata watersheds received training and used the skills to construct deep trenches with soil bunds at upper and middle levels of their catchments. Using such skills, they created percolation ponds to recharge underground water and reduce runoff to downstream areas.

They established check-dams such as gabion checkdams, brush check-dams and are planting trees and grass to balance the eco-system. Appropriate crops have been identified at farm level in readiness for the rainy season. As the farms got set, a study was underway to establish a valuable market network to enable them gain from their crops.



Communities construct bench terraces in Buso watershed, Amhara region, Ethiopia



Communities construct bench terraces and deep trenches in Zata watershed, Tigray region, Ethiopia.



Communities construct gabion check-dams in Zata, Tigray, Ethiopia.

Burundi

In Burundi, soil management and water conservation activities were carried out at landscape and farm level in Kibimba and Muhembuzi watersheds. While terracing and value chain arrangements were conducted at the landscape level, organic manure composition, bean and vegetable farming was done at farm level.

Farmers received training on the use of organic manures such as urine, animal and chicken waste, leaf foliage, ash etc., to improve their soil.

The project has supported farmers to earn income as well as improve nutrition by triggering change through seven farmer associations. Acting as transformation agents, the association established vegetable nurseries for cabbage, amaranthus, African eggplant, tomato and sweet pepper, which they shared among themselves. They also planted high yielding climbing bean varieties, AND10, MUHORO, G13607 and MAC44 after receiving training on different staking options.

Soil erosion has been checked through terracing and contour planting. Banna grass (*penisetum spp* and *trypsacum spp*) and agroforestry trees are being introduced.



Planting trees for Agro-forestry in Burundi

Meanwhile, multi-stakeholder discussions, especially among traders and farmers are ongoing to ensure that vegetables, beans, banana and goat milk, which are expected from the farm efforts will get ready market.

Other sites are Amadir and Molqi watersheds in Eritrea, Kibwezi watersheds in Kenya; Ongino watershed in Kumi district and Kwapa watershed in Mbale district, Uganda; and the Central clay plains watershed and the Western watershed in Sudan.

Much of the past ASARECA work focused on managing rain-water at farm level. Efforts were also made to combine farm level conservation and water harvesting technologies with storage components to enable supplemental irrigation. However, large-scale water management technologies, when implemented by smallholder farmers, were not successful due to the associated labour demands and high costs.



Youth dig a water bench in Madagascar

To address this, the new project is introducing the agricultural innovation systems (AIS) approach, which is about engaging target stakeholders in identifying technologies suitable for their settings.

This is expected to increase the level of adoption. The approach also brings on board other relevant stakeholders, who may be able to support the introduction of technologies that farmers may not be able to manage without technical support.

Why water initiatives are critical to ECA?

The economy of Eastern and Central Africa (ECA) is predominantly dependent on the agriculture sector, which contributes approximately 40% of the Gross Domestic Product.

Agriculture also employs over 60% of the total labour force and supports the livelihoods of over 80% of the rural population.

Yet, agriculture in the ECA is predominantly rain-fed, highly variable and poorly distributed. When it rains, the amount of runoff is devastating to the soils.

The semi-arid locations of Kenya, Tanzania, Ethiopia, Eritrea, Madagascar and Sudan suffer high incidences of dry spells leading to low actual soil water infiltration, degraded lands with limited biomass to create soil moisture ideal for crops, poor soils and low nutrient status, leading to low agricultural productivity.

Together

The project engages the communities to fully participate in activities to transform their environment for food security



Young entrepreneurs from Uganda at a business incubation centre in Nairobi, Kenya. ASARECA has been promoting learning and knowledge sharing to motivate youth to join agri-business

Hold my hand:

Youth start-ups get support from business incubation

Molly Allen earns Ushs 50million (about US\$19,500) annually after selling coffee seedlings. In 2010, when she started off, she earned only Ushs 2.5million (about US\$960) after selling 5,000 coffee seedlings. "I produce 100,000 seedlings on demand every year and sell each seedling at Ushs 500. My main clients are Hima Cement factory in Uganda. Hima provides seedlings to communities around the cement plant in Kasese district, as part of their social corporate responsibility. I also supply the district National Agricultural Advisory Services (NAADS) programme," she says.

Allen's story

Allen went into this business only four years ago after realising the need for a proper seed source in her home district. With the last salary savings from her formal

job as a research assistant at the National Agricultural Research Organisation (NARO), she headed to Kasese, 400 km away from Uganda's capital, Kampala to grow the seedlings.

"I had a burning desire to put into use my university knowledge on plant breeding, horticulture and nursery management," she remarks. "I used the little money I had to open up a company, Agriworks Uganda Limited; buy seed and nursery pots," she recalls. "My father, a retired teacher, offered me land and I made him a co-director. Water was on site and we used family labour then."

\$19,500

What the young entrepreneur earns annually from selling coffee seedlings

At the beginning of 2014, Allen was linked up with the Consortium for enhancing University Responsiveness to Agribusiness Development (CURAD). CURAD is the only coffee agri-business incubator in Uganda. It is one of the facilities established under the Universities in Business and Research in Agricultural Innovation (UniBRAIN) initiative to promote business incubation in Africa. The UniBRAIN initiative is co-implemented by the Forum for Agricultural Research in Africa (FARA), ASARECA and other partners. ASARECA leads in implementation of the initiative in Eastern and Central Africa.

CURAD offered Allen support in business management training. This enabled her to grow into a successful entrepreneur. Agriworks Uganda Ltd now employs five

technical staff and four casual staff. While the technical team receive a cash incentive of 30% from major sales after settling production costs, the casual workers are paid according to the days worked. The rest of the money is ploughed back into the business.

Agriworks plans to expand into other segments of the coffee value chain by processing coffee for sale in the local and international markets. "We are in talks with an American friend, who plans to purchase equipment for wet coffee processing. Wet processing involves washing the coffee until it is dry into parchment. This will enable us to earn USh. 4,800 per kg, which is twice the amount earned from ordinary processing," Molly notes.

Another young entrepreneur, who testifies to the benefits of business incubation, is Gerald Katabazi from Western Uganda. Over the last seven years, Katabazi has seen his coffee processing business grow from a capital of barely Ushs 1.7million (about US\$654) in 2007 to over Ushs 10million (US\$3,850) today.

Gerald has also invested in constructing a house near Kampala. This house is home and a store for coffee that he buys from farmers. He has been roasting and packing coffee for sale to hotels, restaurants and cafes, an approach that he has termed HORECA (hotels, restaurants and cafes).

Although Katabazi started roasting and packing coffee in 2007, his services did not make an impression on the market. It was only in 2008, when he registered a company, Volcano Coffee, as a flagship, and linked up with CURAD, that dynamism reigned in. "CURAD supported me with training in planning and developing a brand. They also offered me advice

\$3,850
Annual earnings of one Ugandan youth who is involved in roasting and selling coffee



Incubatees get a briefing on product development at Jomo Kenyatta University of Agriculture and Technology.

on targeting the product," says Katabazi. More than ever before, Katabazi today is on track expanding his dream to establish Volcano coffee shops countrywide in Uganda.

Getting off the ground

Molly and Gerald are only two of 91 business start-ups that have been supported (incubated) under UniBRAIN to overcome challenges that often 'kill-off' small and medium enterprises before they can realize their potential.

UniBRAIN enables universities, businesses and agricultural research institutions to commercialize agricultural technologies and produce graduates, especially youth with entrepreneurial and business skills.

Business incubators are organizations or arrangements through which emerging entrepreneurs are hand-held to get off the ground through mentoring, financing, facilities, and providing critical business networks.



Incubatees get briefed on various products made at Kenya Industrial Research Institute incubation initiatives

UniBRAIN is a joint effort to use human resources, technical skills, financial support and institutional facilities from universities, the private sector and the National Agricultural Research Institutes to make agricultural innovations profitable and attractive to the youth.

It is a continental programme in which the sub-regional organisations (ASARECA in Eastern and Central Africa, CORAF/WE CARD in Western Africa, and CCARDESA in Southern Africa) are playing a critical role of ensuring that research addresses bottlenecks along the various value chains.

ASARECA loops in NARIS

In Eastern and Central Africa, ASARECA has leveraged its network of national agricultural research and extension systems (NARES) to ensure that the UniBRAIN model works. ASARECA participated in establishing three agricultural innovation incubators; CURAD for the coffee value chain, Sorghum Value Chain Development Consortium (SVCDC), and Afribanana products for the banana value chain. This was achieved by sensitising researchers on the concepts of agribusiness incubation and encouraging them to develop joint proposals with universities and the private sector.

Using this network, ASARECA is supporting the business incubation programme by identifying research products that are ready for commercialisation and enhancing capacities of researchers and incubators on intellectual property rights and technology valuation. ASARECA has positioned the National Agricultural Research Institutes to add value to research by acting as foot soldiers for applied market research to strengthen value chains.

“We are encouraging the NARIS to focus their new and old research on value chains and engage incubators to identify researchable topics along the technology generation, dissemination and adoption lines,” says Dr. Joseph Methu, the head of partnerships and capacity development at ASARECA and coordinator of UniBRAIN in the ASARECA region.

In Uganda and Kenya, ASARECA is working with the three incubators: Afribanana products, SVCDC, and CURAD.

What are incubation centres?

Incubation centres are focal areas for exchanging experiences and sharing resources and knowledge. The centres are designed to guide incubatees from



(1,2,3,4) Some of the products promoted by the various incubatees from Uganda and Kenya

conceptualization to implementation of business ideas, scaling up technologies, and creating competitive agribusiness enterprises. The incubation centres supported by ASARECA are already creating an impact and improving livelihoods in Kenya and Uganda.

Coffee

According to Appollo Segawa, the Managing Director, CURAD, which is constituted by Makerere University, the National Union of Coffee Agribusinesses and Farm Enterprises (NUCAFE) and the National Agricultural Research Organization of Uganda (NARO), the coffee incubator has supported nine business start-ups, two existing SME's and successfully commercialized one technology.

As a result of these pilot initiatives, 99 jobs have been created and 105 farming households have been positively affected by incubation programmes as direct beneficiaries from supported SME's, or as suppliers.

99/105

Number of jobs created and families touched through a simple incubation initiative in Uganda

The incubator has brought agro processing equipment nearer to farmers, enabling them to add value to coffee and attract premium prices.

54 students have been supported to develop their ideas and build business plans. Of these, 35 university students were recruited into various coffee businesses along the value chain through the "Earn as You Learn" (EAYL) programme.

This covers enterprises like coffee shops, agro processing, coffee nurseries, transportation and managing collection and bulking centres.

CURAD has provided 180 off-site "contact support" to incubatees. As a result of these efforts, 140 new jobs have been created.

Adding value to bananas

Afribanana Products, a banana value chain incubator in Uganda, is contributing to the development of the banana sub-sector. According to Prof. George Byarugaba-Bazirake,



the Chairman of Afribanana, the incubator is nurturing innovative early-stage enterprises with a high growth potential to become competitive in the Banana value chain. “Afribanana is providing them training in business development, marketing and financial management, besides introducing them to business networks.

Afribanana is also supporting enterprises to make biodegradable bags, banana fabrics, banana juice, banana wine, charcoal briquettes, and tissue culture planting materials,” he notes.

Over 20,000 high-yielding and disease resistant tissue culture seedlings have been distributed to small and medium enterprises in Uganda and Kenya by Afribanana. The incubator has also reduced waste production by converting banana peelings into high-value products such as banana briquettes and biogas. A number of incubatees have acquired



skills in these areas. They are conversant with these innovations and can put them into use. Besides, Afribanana has diversified into new products such as banana syrup, ready to eat snacks, banana fibre tissue etc.

Making the best out of sorghum

The Sorghum Value Chain Development Consortium (SVCDC) is promoting maximum use of sorghum through the 4F approach (Food, Feed, Fuel, Fibre).

The consortium is constituted by Jomo Kenyatta University of Agriculture and Technology, Kenya Agricultural Research Institute, Agritrace and Farm Support International Limited. It is supporting seven food ventures, three fuel ventures, four feeds ventures, 14 seed ventures and one education venture.



Some of the hybrid calves produced through the EAAPP programme are already creating an impact in the region.

EAAPP score card:

More collaboration, increased sharing, better land use and improved lives

In January 2015 the Dairy Regional Centre of Excellence based in Kenya, provided the national dairy programme of Uganda 300 straws of high quality AYSHIRE breed semen. According to Kenya's Director for Animal Production in the Ministry of Agriculture, Livestock and Fisheries, Mr. Julius Kiptarus, the Dairy centre identified the AYSHIRE breed because of its potential to survive conditions that are common to the four EAAPP countries.

The globally reputed breed, from New Zealand, is known for high milk yields, tolerance to some diseases that are rampant in Africa, and flexibility in feeding habits. Besides, it can feed on many Ugandan livestock forage.

High quality semen shared with Uganda

The semen was given to the National Animal Genetic Resources Centre (NAGRIC) on behalf of the government of Uganda. NAGRIC will use it to improve their stocks as part of the national high quality livestock breeding programme.



Tanzania and Ethiopia EAAPP teams join their counterparts from Uganda to receive breeding materials from Kenya.

NAGRIC will also distribute some straws to elite farmers in Uganda as part of the first efforts to increase the number of farmers on the breed improvement initiatives. It is understood that the breeding efforts will produce both bulls and heifers with the AYSHIRE genes. This is expected to eventually benefit more farmers.

This is only one of the many collaboration avenues and sharing deals that Uganda, Kenya, Tanzania and Ethiopia have been involved in over the last years, a relationship put in place through the Eastern Africa Agricultural

Productivity Programme (EAAPP). Started in 2009, EAAPP is promoting collaborative agricultural research for development and sharing research outcomes among member countries and beyond.

Providing leadership

Under the arrangement, the four member countries provide leadership to others as centres of excellence in chosen commodities. The centres ensure that outcomes from their work benefit the others. Kenya is the centre of excellence for dairy, Uganda for cassava, Ethiopia for wheat and Tanzania for rice.

ASARECA keen on cross-border learning

According to the Executive Director, ASARECA, Dr. Fina Opio, exchange of information, knowledge, technologies and innovations is an essential milestone of EAAPP.

"ASARECA has been keen on maximising the sharing of research materials among member countries. EAAPP is about countries benefitting from each other. Under the arrangement, and based on the M&E data consolidated at the ASARECA Secretariat, a total of 128 researchers were brought together to carry out joint and collaborative research in 33 regional projects on cassava (8), wheat (10), dairy (5), rice (10)," Dr. Opio said.



Rice improvement initiatives in Tanzania

128

Number of scientists working together on cassava, wheat, dairy and rice under EAAPP

According to Mr. Vincent Akulumuka, the regional coordinator for EAAPP, based in ASARECA, as the region awaits formal harmonized policy instruments for exchange of research outputs, EAAPP is using country-to-country agreements, imports/export permits and Standard Material Transfer Agreements.

Besides the semen, the dairy centre of excellence has shared collections of improved Napier grass to Uganda and a livestock breed survey tool to Tanzania, while Kenya received descriptions of cross breeding practices for livestock from Uganda. Nine Napier grass collections from Kenya are being tested in other EAAPP countries. So far, two out of nine are showing promising results and may be



Wheat variety enhancement in Ethiopia

released and registered in Uganda.

Rice

The rice centre of excellence has shared to Uganda, Kenya and Ethiopia four rice varieties TXD306, Tai, Komboka and Ziada, which were developed in Tanzania. From these, Kenya has officially released two varieties (Komboka and TXD306), Uganda has released two (Komboka and Ziada) and Ethiopia has released one (TXD306) into their national seed release systems. This means that they can be available in the seed market very soon.

Cassava

The cassava centre of excellence, led by Uganda, shared a vacuum emasculator for rice breeding to Tanzania, Kenya and South Sudan. The cassava centre also shared

botanical seed of cassava to Ethiopia, including the cassava botanical seed sprouting technique.

The sharing includes protocols for quality management for multiplying clean materials of cassava, which were shared to Kenya and Tanzania; virus diagnostic procedures shared to Tanzania and Kenya, and cassava processing machines (chipper and graters) shared from TONNET (Uganda) to INTERMECH (Tanzania).

Cassava varieties from Uganda have also been shared to South Sudan, DR Congo and Kenya. Meanwhile, Tanzania shared elite cassava materials tolerant to cassava brown streak disease to Uganda. Kenya also shared cassava processing machines (chippers and graters) from DN (Kenya) to South Sudan.

Wheat

A total 951 lines of bread-wheat from Ethiopia are being tested in preliminary trials in Kenya and Uganda. Of these, 72 elite lines are in advanced trials in Kenya and Uganda. Uganda and Ethiopia have shown interest of acquiring a seed dresser and wheat thrasher developed in Kenya, just as Kenya and Uganda have shown interest of acquiring a row planter and wheat thresher developed in Ethiopia. Kenya shared its elite wheat variety (kingbird) to Ethiopia and is under seed multiplication for wider dissemination.

Cross border farm visits

EAAPP has been facilitating learning. For example, farmers from Kenya were facilitated to visit Tanzania to learn about rice innovations; Ugandan farmers visited Kenya to compare notes on dairy and pasture seed; Kenyan farmers visited India to get a glimpse of their sophisticated dairy technologies; while Ugandan farmers visited Ethiopia to learn what makes Ethiopia a leader in wheat production.

Farmers from Kenya and Tanzania established a cross border innovation platform for cassava and other technologies at Busia boarder. As a result of sharing, there have been significant improvements in the production and marketing of the four commodities.



Elite cassava varieties produced in Uganda

Collaboration up from 10% to 76%

According to Mr. Enock Warinda, ASARECA M&E specialist, who has been tracking EAAPP performance, regional specialization and collaboration has grown from 10% before EAAPP to 76% in 2015. This increase is attributed to more organized joint planning and implementation of agricultural research, training and dissemination activities among the partners.

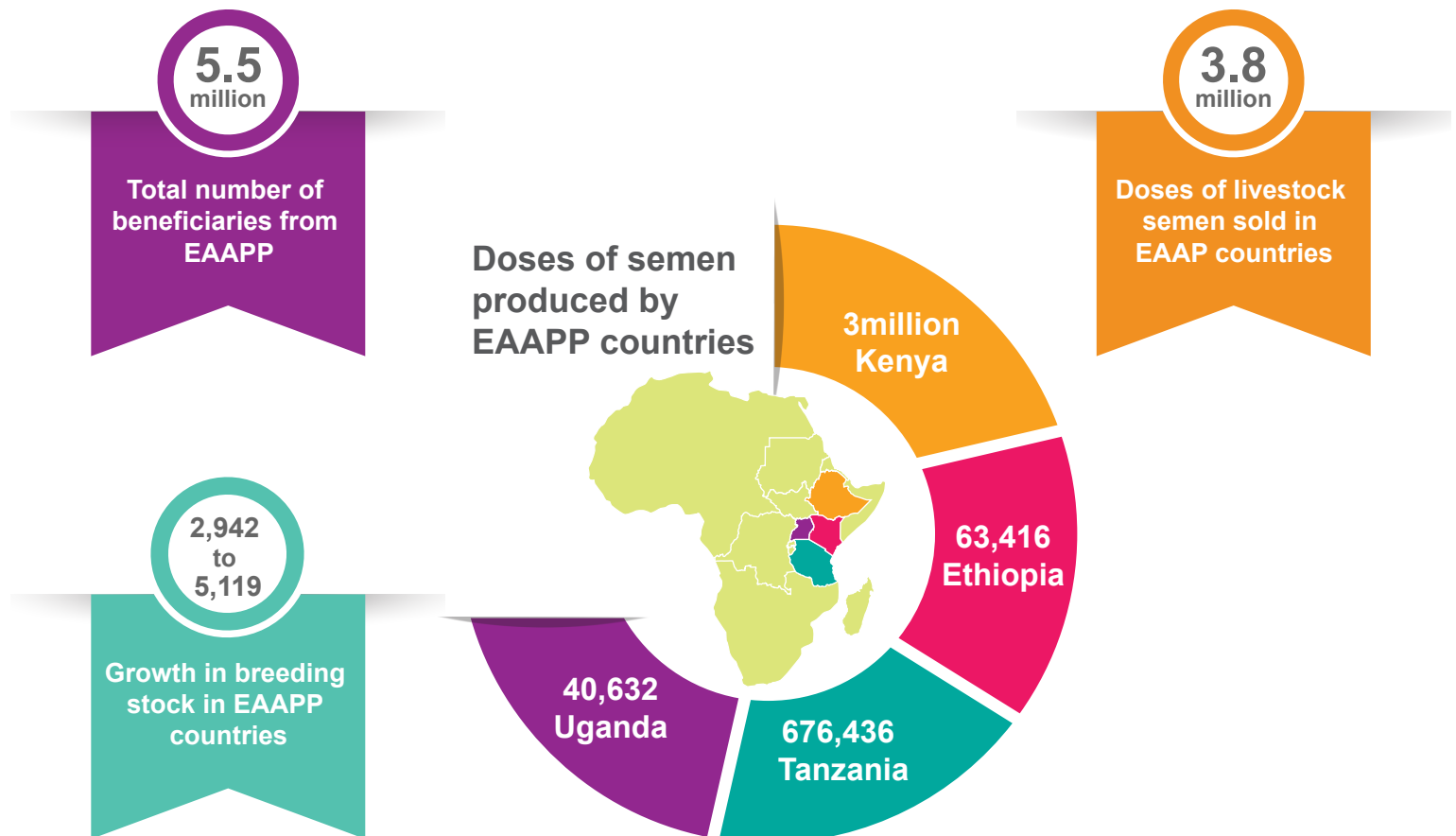
Overall, more land was dedicated to wheat, cassava and rice production. In Uganda for example, over 1,200 ha were dedicated for cassava bulking and 41 ha for rice seed multiplication.

Other countries have dedicated more land to expansion of the technologies for multiplication and sale. An average of 3.5% increase in new land acquisition has been noted in all the countries. Research institutions have produced over 990 MT of breeder seeds and planting materials of selected commodities, and these have been availed to targeted groups for further multiplication and sale.

In addition, over 3.8 million doses of livestock semen have been sold within the collaborating countries and beyond. Out of these, Tanzania produced 676,436 doses of semen, Ethiopia 63,416, Uganda 40,632 and Kenya, the regions leader, over 3 million. The number of breeding stock has also grown steadily, from 2,942 in 2010 to 5,119 in 2014.

It is noteworthy that the overall level of stakeholder satisfaction with the availed technologies, including varieties, semen vials, forages, among others, has grown steadily from 22.9% in 2009 to 69.4% in 2014.

EAAPP benefits





OFSP chips being processed in a solar drier at a farmers cooperative centre in Kenya

A potato that touches life and maize that attracts money

Deep inside the Kenyan village of Bar-Atheng, Siaya sub-county, there lives a happy woman. Jenipher Awino, is cheerful because the 'Orange Sweet Potato (OFSP) has touched her life.' Every month, Ms Awino, earns US\$300 from the sale of OFSP products. She was introduced to OFSP by ASARECA project implementing teams only two years ago.

Specifically, ASARECA partners, the Kenya Agriculture and Livestock Research Organisation (KALRO) and ACRC, an NGO, introduced Awino to a variety known as Kabode (*the one with a huge body mass*), and provided her training in processing OFSP products, and how to posture them for a profitable market.

Awino took this seriously, bought basic processing equipment and started making potato chips, crackers and OFSP/Soya composite flour, which she has been selling to nearby secondary schools. Awino is excited because, she can now feed four orphans left to her to fend for since her husband died years back.

Meanwhile, in the DR Congo, feeding chicken on Quality Protein Maize (QPM) has led to exponential increase in the



Awino with a friend at her home in Bar Atheng

\$300

Income that Awino earns monthly from OFSP sales

production of eggs.

Compared to contemporary feedstuffs, exclusive feeding on QPM has proved cheaper and better. Due to the successes registered in the QPM poultry feed demonstrations, the Central Government has made available a grant of US\$40,000 to carry out further poultry feeding demonstrations in the two Provinces of Kasai Oriental and Maniema. Outputs from this work will be further scaled out to other provinces



OFSP products made by entrepreneurs in Kakamega, Kenya

for wider adoption. These are just a few of the modest achievements scored by ASARECA and partners in efforts to scale up OFSP and QPM technologies and innovations using the Innovation Platforms for Technology Adoption (IPTA) approach. Kicked off in 2013, the scaling up initiatives have led to rapid growth from the production of seed to actual impact on livelihoods.

In 2014, a total of 1.5 hectares of land were established for

primary multiplication of orange fleshed sweet potato (OFSP) cuttings in Kenya and Tanzania. From this, 365,400 cuttings (enough to plant 27.2ha of land) were produced and distributed for secondary multiplication.

Specifically, a total of 40 secondary multiplication sites, measuring 0.1 acres each, were established in western Kenya alone, with 12 farmer groups multiplying OFSP vines. Material from these was made available to farmers for root production.

In Handeni, Tanzania, 10 metric tonnes of quality protein maize seed was harvested from a crop planted at the end of 2013. Tanzanian farmers associated with the five existing IPTAs and harvested about 400 MT of QPM maize grain. In Kanaga province in DRC, 0.799MT of breeder seed was made available to start QPM production. The seed has the capacity to plant 40 ha.

Implemented under the Promotion of Science and Technology for Agricultural Development in Africa (PSTAD) programme, the project strengthened the capacity of farmers to produce improved OFSP root and QPM seed.

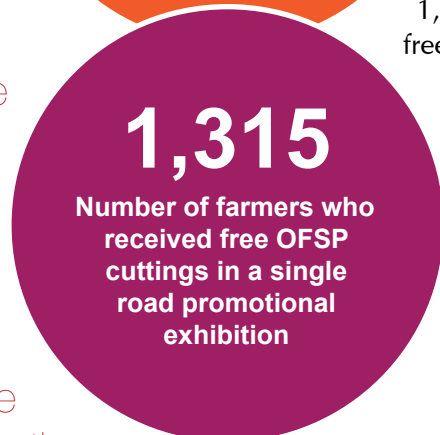
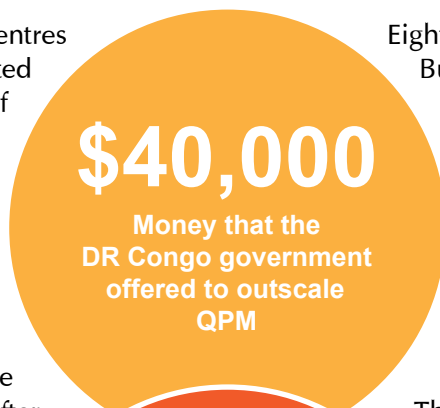
For example, eight farmer commercial clusters comprising 240 farmers were established in Western

Kenya and provided with collection centres and linkages to market OFSP. Motivated by this, the farmers planted a total of 73 hectares with OFSP for the roots, which they harvested and sold in local markets and a processing unit located in Bungoma County.

The project has played a major role in linking potato root producers to vine multipliers through agro-vet stores. The IPTAs identified nine agro-vet stores, after which, they conducted meetings and joint training workshops attended by agro-vet stores, vine multipliers and root producers.

The agro-vet stores were also trained to provide private extension services to farmers. As a result, mutual interests were cultivated and each party returned to work aware of how their part of the value chain would benefit the other.

Seeing the benefit, by the close of 2014, about 51 smallholder vine multipliers had been linked to nine agro-vet stores. Through this, many farmers saw the opportunity to generate income through selling both OFSP vines and roots.



Eight OFSP commercial clusters formed in Bungoma, bulked and sold off OFSP roots. These groups were linked to Equity Bank, which provided training on financial literacy and how to access bank loans.

They were also linked to and received training from the Kenya Agricultural Commodity Exchange (KACE) on marketing of root and processed products.

The IPTA approach has been instrumental in increasing the uptake of OFSP and QPM technologies, as well as in establishing linkages between producers and other actors along the value chain thereby promoting value addition and utilization.

For example, youth in the Bungoma IPTA conducted a 10 km road show promoting OFSP, which attracted about 1,600 visitors. Of these, 1,315 were given free cuttings to start off OFSP farming.

A one week product and business development show on OFSP product utilization for health improvement also attracted over 600 visitors who were given information packs on OFSP production and utilization.



A farmer devastated by effects of MLN

Rising up to the occasion

ASARECA moves to
control maize monster

Maize growers in Eastern and Central Africa can breathe a sigh of relief following the launch of a collaborative initiative to combat the spread of the maize lethal necrosis (MLN) disease, which is, perhaps, the worst enemy of the crop in recent times.

Since 2012, when it was first reported in Kenya, MLN has destroyed the maize crop in maize growing areas in Ethiopia, Kenya, Rwanda, South Sudan, Tanzania and Uganda, rendering it a transboundary challenge.

MLN prevalence in Eastern Africa is estimated to cover about 40% of the maize area, causing yield losses of more than 50%. If not urgently tackled, the disease will lead to loss of income and hunger for more than 24 million households in ECA.

With support from the Multi Donor Trust Fund of the World Bank, estimated at US\$1.9



Typical look of maize crop affected by MLN virus.

million, ASARECA in 2014 launched a two-year initiative dubbed; “Integrated Management of Maize lethal Necrosis Disease in Eastern and Central Africa”.

The new project is planned to run for four years. The first phase of two years is meant to develop and validate MLN management technologies, which include tolerant varieties. The second phase, also lasting two years, will be for out scaling.

The project is a follow up to the MLN strategy that was developed in Nairobi in August 2013 and complements efforts of other initiatives in the region such as KAPAP in Kenya and Africa Rising in Tanzania and work of other partners such as CIMMYT and AGRA. The project is implemented in partnership with the national agricultural research systems of the MLN affected countries together with CGIAR and private sector seed companies.

Among other activities, the screening for varieties that are tolerant to the disease, introgressing resistance into adapted varieties, testing and promoting vector and crop management combinations in an integrated manner, besides developing human and infrastructure capacity to manage MLN in the region.

40%

The land area affected by the MLN virus in Eastern and Central Africa.

50%

Crop losses from MLN virus in Eastern and Central Africa

Because of the risk of entry of the disease into Burundi, it was included in activities to screening MLN tolerant materials to mitigate the risk. ASARECA has also partnered with CIMMYT to enable member countries share locally adapted materials for crossing with CIMMYT lines and subsequent screening in their countries.

CIMMYT is also providing access to utilize the MNL screening facility at Naivasha and the double haploid facility at Kiboko in Kenya to fast track the development of resistant and tolerant varieties or member countries.

ASARECA is working with CABI Africa to create public awareness on how to control the spread of the disease.



Wheat improvement efforts under the EAAPP initiative

Quality and price:

Supporting Rwandan, Burundian wheat farmers to gain

Joseph Gafaranga, a wheat farmer in Musanze district in Rwanda, has spent most of his life growing wheat, but the gains from it are not commensurate with his effort. "I invest a lot of time and energy in growing this crop, only to be paid Rwf200 per kilogramme," Gafaranga laments.

Well, this situation could change soon, following the focus that ASARECA and the CGIAR research program on wheat (WHEAT), led by CIMMYT (International Maize and Wheat Improvement Center) have placed on the challenges faced by Rwandan and Burundian wheat farmers in a new project.

The initiative, meant to secure wheat-based livelihoods by promoting small-holder wheat value chains, was launched late 2014 in Rwanda's capital Kigali.

According to the Director General, Rwanda Agricultural Board, Prof. Jean Jacques, Mbonigaba Muhinda, the project is extremely important for Rwanda and the region, because wheat has asserted an important



Wheat seed multiplication farm

\$300,000

Money committed to the wheat project by ASARECA and the WHEAT program

nutritional position, especially in the urban settings. "The government of Rwanda places high value on wheat. That is why we have been subsidizing it. The project will boost solutions to existing challenges in the value chains that affect productivity," said Mbonigaba.

the project is facilitating the formation of partnership arrangements to enable the value chains meet the ever-growing demand for wheat and increase productivity. Rwanda and Burundi have conducive environments for the production of wheat. However, the yield in Rwanda



Enabling farmers to get it right when it comes to wheat quality

averages 2t/ha and in Burundi 0.8t/ha, which is way below the region's potential of 4-5 t/ha.

The project is implemented by ASARECA (supported by the Multi Donor Trust Fund administered by the World Bank), in collaboration with WHEAT (<http://wheat.org>) from the CGIAR Fund.

ASARECA and WHEAT have each committed US\$150,000 (USD\$300,000 in all) over the next two years for the project. "This project is about three firsts," remarks Victor Kommerell, the WHEAT program manager. "ASARECA, Burundi and Rwanda are taking on the challenge of finding out how to make smallholder

wheat production profitable and sustainable, given rapidly increasing demand, currently met by costly imports. Second, this project could be a role model for other African countries in a similar situation".

Thirdly, Kommrell notes, "this is a new kind of collaboration between a CGIAR research program and an African sub-regional organization based on previous research-for-development outcomes—in this case, ASARECA taking the lead."

Through this project, ASARECA will facilitate Rwanda and Burundi to access technologies, innovations and management practices that have been developed under the Eastern Africa Agricultural Productivity Project (EAAPP). The two countries are currently not under EAAPP, but are bound to benefit from improved varieties and small farm implements that have been developed by the Wheat Regional Centre of Excellence and experiential learning initiatives.

The pilot phase of the project is implemented in Burera and Rutsiro districts in the Northern and Western provinces of Rwanda and Burundi respectively.

Why wheat?

Wheat is a major staple food crop in Rwanda and Burundi. Its demand is growing faster than any other major food grain.

Currently, the increasing gap between domestic production and consumption is met through imports, which strain the limited foreign exchange reserves of the two fragile economies.

According to Innocent Habarurema, the RAB wheat programme coordinator, over 80 per cent of the wheat consumed in Rwanda is imported, costing the country about \$13 million annually.

The project is addressing constraints to markets and technology access, low levels of farm mechanization, poor access to credit, uncertain prices, and unsupportive policies. It is making concerted efforts to transform Knowledge, Attitudes and Practices to create responsive environments for production.

It is also facilitating the establishment of strong, multidisciplinary teams along the wheat value chains in the two countries.

Burera and Rutsiro

Rwandan and Burundian
districts where the wheat
project is underway





Key project team members at the launch of EAPGREN phase II in Nairobi, Kenya

Conserving while using:

New EAPGREN project seeks to maximize benefits

Ensuring that conserved plant genetic resources in the sub-region are conserved, moved from gene banks and value added to them by researchers for use by farmers, developing human resources and increasing infrastructure for conservation of plant genetic resources. These are some of the key issues that the second phase of the region's plant genetic resources project (EAPGREN) is addressing. Besides, raising awareness among policy makers on the need for conducive policies for conservation and use of natural resources have been highlighted as some of the key drivers for conserving while using natural resources.

Bent on achieving these objectives, ASARECA and partners launched the five-year second phase of the project, "Capacity development for sustainable plant

genetic resources utilization and conservation in Eastern and Central Africa" in Kampala, Uganda.

According to Dr. John Mulumba Waswa, the curator of the gene-bank at the National Agricultural Research Organisation (NARO-Uganda), plant genetic resources conservation is vital for current and future research to address plant constraints such as climate change, yield, taste, tolerance to water deficiency, pestes and diseases, among others.



Unlike the first phase of EAPGREN (ended in 2013), which covered eight countries namely Burundi, Eritrea, Ethiopia, Kenya, Madagascar, Rwanda, Sudan and Uganda, the second phase was designed to include South Sudan, Somalia and Djibouti.

The project underscores the emphasis to conserve agricultural ecological systems in a more integrated and broader geographical area and the vision to achieve food security, economic growth and development.

The second phase builds on achievements scored in the first phase. As of 2013, a total of 140,000 accessions of crop plants had been collected and conserved in the various national gene-banks in the partner countries. Of these, over 27,000 accessions were adequately characterized and 1,416 accessions evaluated for various agricultural and nutritional qualities, yield potential and for drought tolerance.

EAPGREN phase 1 also provided national gene banks with relevant gene-banking facilities and equipment including deep freezers, drying rooms, conservation facilities, computers, vehicles, and facilitated the construction and operationalisation of two new gene-banks, besides renovating two run-down gene-banks.

The first phase also successfully conducted community level and post-graduate training on plant genetic resources management for agricultural communities and plant genetic resources scientists.

Besides three (3) PhD candidates were fully funded, and 12 plant genetic resources researchers were facilitated to do MSc. degrees in and outside the region.

The project also acquired hardware and software for developing the regional plant genetic resources information and documentation hub at Entebbe, Uganda. Similar facilities were installed at the national gene-banks of Burundi, Eritrea, Sudan and Uganda.

The second phase is in time to use the capacity built in EAPGREN 1 for sustainable development.

Eastern and Central Africa is one of areas in the world where crop plants were



Some of the foods that can be conserved and used

140,000

**Number of crop species
collected and conserved
in gene-banks in
Eastern Africa**

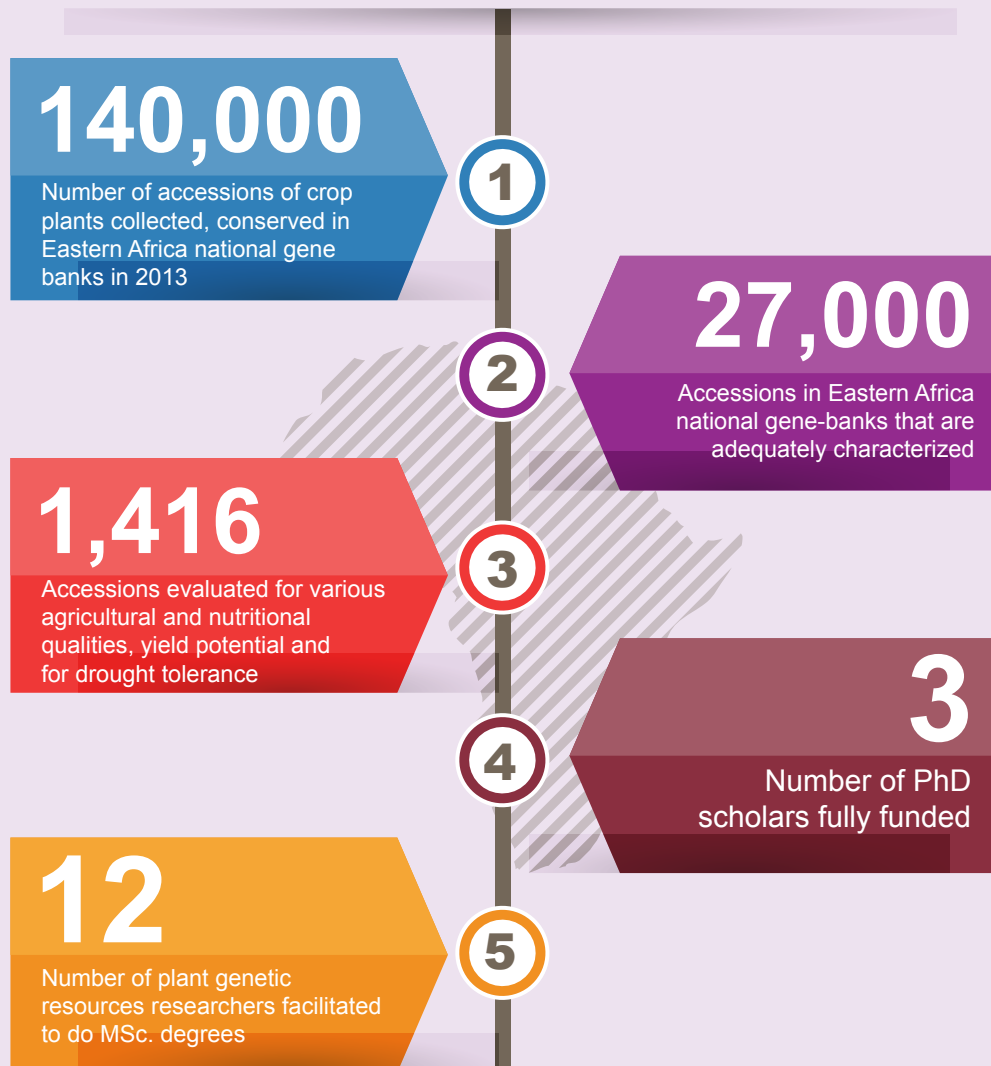
originally domesticated from wild species. The region is home to a number of crop wild relatives and diversities including pearl millet, finger millet, sorghum, cowpea, African rice, yams, coffee, teff, among others.

These varieties, however, are under threat from climate change, natural habitat degradation, social and political unrest, invasion

of alien species, inadequate recognition of the value of indigenous knowledge, desertification, deforestation, overgrazing, expanding population pressure and urbanisation.

Both the first (2003-2013) and the second phase (2014) have been funded by the Swedish International Development Agency (Sida) and implemented by ASARECA in her 11 member countries.

EAPGREN milestone





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Annual report 2014

Going climate smart



Agence canadienne de
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Sida

