From monotony to diversity

When the Kyalo family learned how to grow traditional vegetables, their dull daily diet of maize, beans and cabbage was transformed into a feast of flavor and nutrition

Machakos County lies in the semi-arid region of Kenya, in a stunning landscape with rocky hills stretched out over a vast area. The majority of its one million people depend on agriculture for their livelihoods, but agriculture in Machakos has its challenges. There are two short rainy seasons per year, prolonged droughts are common, and rains are generally unpredictable. As a result, many people are food insecure and poor, especially in rural areas. The staple food is maize, sometimes cooked with beans. Malnutrition is common and affects children’s growth and development.

Festus Kyalo is a farmer in Katulani village in Machakos. He is married and has a son, and he wants to feed his family well. His wife Anastasia used to buy whatever vegetable she could find in the market—most of the time only cabbage. She could only shop once a week, because the fare to travel to the market in Matuu was expensive. If she bought more vegetables, there was a risk that they would spoil at home because the family has no electricity or refrigerator.

Six months ago, a farmer group in which the Kyalos are members was invited by the local administration to participate in a meeting of the...
Homegarden Scaling Project, a joint initiative of the World Vegetable Center, Farm Concern International and Jomo Kenyatta University of Agriculture and Technology (JKUAT), funded by the United States Agency for International Development (USAID). During the meeting, the group learned about the perils of malnutrition, and ways of overcoming it by growing traditional African vegetables in home gardens. The project needed a few farmers who could train other farmers, and Festus was nominated by his group members for the role. They told him: “Get education for us.” He received training in good agronomic practices for vegetable production, such as seed selection, use of improved varieties, land preparation from seed bed to planting, weeding, spacing, manure application, and disease management.

After the training Festus set aside a 10 m x 20 m plot on his farm and planted seed of kale, pumpkin, cowpea, and two varieties of amaranth, which he received through the project. He followed the instructions for proper spacing. His first harvest came from the thinning of amaranth plants. The family was thrilled about the good taste of the improved varieties. Anastasia said: “I wish I had known this earlier. I used to collect amaranth from the wild, I didn’t know about these improved varieties and that they could be grown in plots.”

The other vegetables also have grown well and she now harvests a different vegetable every day. The family meals have become more varied and nutritious, with larger portions of vegetables and smaller portions of maize. “I don’t have to buy vegetables anymore,” said Anastasia. “My household spending has reduced, I only need to buy oil.”

Festus appreciates the fact that he is sure of the quality and safety of the food his family now consumes. He is sure his food is free of agrochemical residues because the vegetables are home-grown. “The vegetables people buy in the market are often unsafe because of those residues,” he said. “You can’t tell the safe ones from the contaminated ones.”

Now that he has realized the potential of growing his own vegetables, Festus has stepped up his game. “I have a dream: I want the supply the whole Matuu market with vegetables,” he said. “I want to set aside one acre of my farm for growing vegetables to achieve this. Vegetables are in high demand—neighbors are coming to my farm and asking if they can buy some. I have already sold some vegetables from the amaranth plot. What I need to improve now is my water harvesting system, so that I can irrigate the vegetables during the dry spells.”

Over the past two years, Festus has dug a well on his farm that is now 47 feet deep. Whenever he has time he digs it a bit deeper. He and a friend have dug channels in his farm and a big pit to divert rainwater into a big pond. It fills up completely after two or three days of good rain. He has decided to double the depth of the pond so that he can double the amount of water for irrigation.

Festus has become a community trainer and teaches other group members as well as other farmers in the village. He says other farmers sometimes approach him with a problem. They complain that they were given vegetable seed kits by the project, but the amount of seed is not sufficient to grow large plots. He advised them to grow and save their own seeds, and multiply seeds every season. If they become good at it, they can even sell seeds to other farmers. “Growing an acre of vegetables should be possible for everyone, as long as you are committed,” he said.
Welcome

**Anna Marie Medrano-Bahala** (Philippines) has joined the East and Southeast Asia/Oceania team as a Project Development Officer, with responsibilities for proposal development, regional networking and training. Anna previously coordinated funding and operations for urban infrastructure initiatives at the Asian Development Bank, where she also consulted on the bank’s internship program. Her background includes a research consultancy with the Ateneo Graduate School of Business in the Philippines, and service with the Philippines Department of Agriculture as an information officer. Anna holds a MS in Agricultural Economics from Michigan State University, East Lansing, Michigan, USA.

**Abhay K. Pandey** (India) has been appointed as Visiting Scientist – Pathologist in the South Asia office. Dr. Pandey was awarded the Prof. O.P. Mall Gold Medal in Mycology and Plant Pathology by the Indian Botanical Society in 2012. He has nine years of experience in different areas of plant pathology. He has reviewed IPM packages for different crops developed by the National Institute of Plant Health Management, Hyderabad and DPPQ & S, Ministry of Agriculture, Government of India. He also worked at the National Plant Quarantine Station, DPPQ & S, Rangpuri, New Delhi. Dr. Pandey is the author of more than 30 research papers in national and international journals; serves on the editorial boards of the American Journal of Agricultural Science and Global Journal of Botanical Sciences; and is associate editor of *Agriculture Research and Technology* and *EC Agriculture* journals. He is a member of several national and international academic societies, including the Society of Chemical Industry, London; ACS; IPS; IBS; and ISCA.

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**Recent research**

- **Dhillon NPS, Lin CC, Sun Z, Hanson PM, Ledesma DR, Habicht SD, Yang RY.** (2016). *Varietal and harvesting stage variation in the content of carotenoids, ascorbic acid and tocopherols in the fruit of bitter gourd (Momordica charantia L.).* PLANT GENETIC RESOURCES: CHARACTERIZATION AND UTILIZATION, online.


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**The World Vegetable Center’s Approach to Household Gardening for Nutrition**

Targeted interventions to optimize household garden production and consumption practices show great potential to reduce malnutrition. The World Vegetable Center has been involved in household gardening since the 1970s and has accrued a wealth of practical experience from various locations, crops, production systems and target groups.

The approach presented in this document is based on our experience and available evidence. It defines the World Vegetable Center’s approach to household gardening, emphasizing three synergistic components of gardening, nutrition and health, and support systems.
Visitors

(left): Heidi Gallant, (2nd from left) new Director of the Asia & Pacific Seed Association (APSA), toured headquarters on 16 May 2016. She met Director General Marco Wopereis and had informative discussions with Virologist Lawrence Kenyon and Tomato Breeder Peter Hanson. APSA has supported Center research in the past, and on 26 July APSA members will convene at HQ to explore options for future collaboration.

(right): A delegation from the Bureau of Animal and Plant Health Inspection and Quarantine (BAPHIQ), Council of Agriculture, Taiwan led by Dr. Feng, BAPHIQ Deputy Director General, met with Center staff on 1 June 2016 to review issues related to seed health and quarantine. DG Marco Wopereis welcomed the visitors and Su-Ling Shih, Assistant Specialist – Virology, briefed them on Center activities. They then toured the Seed Health and Quarantine Lab and the Genebank with Virologist Lawrence Kenyon, Genebank Manager Svein Solberg, and Assistant Specialist Yung-Kuang Huang, and also visited a net house and a tomato field.

Rajesh Ramdas Wankhade and Rajesh Govanakoppa, hot pepper breeders from Nunhems India Pvt Ltd/Bayer Crop Science Vegetable Seeds, discussed topics of mutual interest with Center plant breeders and researchers on 1-2 June 2016 at HQ.

Florine Poiroux, Research Manager, NOVAGENETIC/Technisem, France, visited headquarters on 13-14 June 2016 to learn more about Center operations and to discuss the terms of a new agreement between the Center and her company.

Nine students led by Irene Chou, Professor of Nutrition and Food Science, and Megan Chang, Professor of Occupational Therapy, San Jose State University, California, USA came to HQ on 20 June 2016 to learn about the Center’s activities and to interview gardeners about various aspects of field work. After a briefing by Communications Head Maureen Mecozzi, they visited the Demonstration Garden with Assistant Specialist Yi-Chin Wu, the Genebank with Yung-Kuang Huang, and the Nutrition Lab with Nutritionist Ray-yu Yang.
CORNUCOPIA

Seminars

**Rajesh Ramdas Wankhade**, hot pepper breeder from Nunhems India Pvt Ltd/Bayer Crop Science Vegetable Seeds, introduced Center staff to the company’s breeding strategies and practices in India in a seminar on 1 June 2016 at headquarters. The company has 32% of the pepper market share in the country, where it has four main breeding stations and five screening locations. It follows a 12-year variety development cycle to produce a range of hot chili types for India’s diverse market, beginning with an assessment of farmer preferences and analysis of required traits such as heat tolerance and virus resistance. Dr. Wankhade noted that more interaction between the Center and private companies would be beneficial for farmers and society. “World Vegetable Center CMS (cytoplasmic male sterility) lines have been very useful for us,” he said. “Many seed companies in India use the Center’s material to develop hybrids.”

**Florine Poiroux**, Research Manager, NOVAGENETIC, France, an offshoot of Technisem, gave a seminar about the company’s activities to HQ staff on 13 June 2016. The company draws about 90% of its income from West and Central Africa, where it has 15 exclusive and 5 non-exclusive distributors and more than 80 seed shops throughout the region. It maintains four breeding stations in Africa. NOVAGENETIC and the Center have agreed to work together to develop tropical vegetable varieties that meet the expectations of producers and consumers.

Several interns recently gave seminars on their projects at the Center:

- **Thu Giang Thi Bui**, from the Plant Resources Center, Vietnam Academy of Agricultural Sciences, presented her work in developing cost-effective genotyping on 3 June 2016. She explained how an enzyme extracted from celery can be used to make an inexpensive polymerase chain reaction (PCR) primer to mark single nucleotide polymorphisms (SNPs) for genotype evaluation.

- **Philmah Seta-Waken** from the Papua New Guinea National Agricultural Research Institute spent her three-month internship at the Center learning about seed regeneration, packing, and cataloging in the Genebank, and how to extract and analyze DNA with the Biotech team; the work was part of the Australian Center for International Agricultural Research project “Promoting traditional vegetable consumption for improved livelihoods in PNG and Northern Australia,” as she explained in her seminar on 7 June 2016.

- Philmah also helped fellow intern **Julian Curaba** prepare videos about pepper grafting and saving seed of amaranth, pumpkin, nightshade, eggplant and tomato. Those videos and others can be seen on the Center’s YouTube channel: [https://www.youtube.com/user/WorldVegetableCenter](https://www.youtube.com/user/WorldVegetableCenter)
DO THE MATH: Didit Ledesma, the Center’s biometrician, conducted a training course on Experimental Design and Data Analysis in Tashkent, Uzbekistan (24-25 May 2016) and Dushanbe, Tajikistan (27-28 May 2016). Organized by Ravza Mavlyanova, Regional Coordinator, the training in each country engaged about 30 young scientists and students in lectures and presentations, class exercises, and case studies. In Uzbekistan, participants included representatives from the Center’s national partners in the region; the Uzbek Research Institute of Vegetable, Melon Crops, and Potato; Research Institute of Plant Industry; and Tashkent State Agrarian University. In Tajikistan participants were department heads and senior research fellows from the institutes of Horticulture and Vegetables, Soil, and Farming—all under the Tajik Academy of Agricultural Sciences (TAAS); agriculture development officers from the USAID Tajikistan office; Nurali Saidov, in-country project coordinator of the USAID-World Vegetable Center “Tajikistan Nutrition-Sensitive Vegetable Technologies” project; and project staff. Didit also introduced all participants to CROPSTAT, a free software package that will enable them to perform basic statistical analysis and develop randomization and layout schemes.

OLD AND NEW FRIENDS: Robert de la Peña, Director of Vegetable Breeding for East-West Seed Group and Phillip Griffiths, Associate Professor at Cornell University and a world expert in cucurbit breeding, spent a morning with Vegetable Breeder Fekadu Dinssa at the Eastern and Southern Africa office. They were accompanied by Mathe Bastiaansen, Head of East-West Seed Group in Tanzania. Currently based in Thailand where he oversees all breeding work of his company, Robert was a vegetable breeder at the World Vegetable Center from 2006 to 2009, and was happy to be back at the Center!
Mungbean is a rich source of protein, minerals and vitamins and is a popular food in Pakistan. This warm season, short-duration crop can easily fit into existing cotton, rice, wheat and sugarcane cropping systems. Diversifying local production systems with mungbean can be profitable for farmers and also improves soil fertility—two goals of the Center’s “Beans with Benefits” project. Project partners Zahir Ahmad Zahir, from the Institute of Soil & Environmental Sciences, University of Agriculture, Faisalabad, and Maqshoof Ahmad, College of Agriculture and Environmental Sciences, Islamia University, Bahawalpur, shared a glimpse of their recent research:

Soil microbes play a significant role in soil fertility and crop growth, and bacterial inoculants have the potential to increase crop productivity even under different types of stress. Plants produce higher levels of ethylene under biotic and abiotic stresses, which inhibits growth, particularly root growth. Certain soil microbes have the ability to produce a specific enzyme: 1-aminocyclopropane-1-carboxylate (ACC) deaminase. This enzyme is capable of reducing ethylene stress, which consequently improves crop yield. Inoculating mungbean seed with a combination of Rhizobium and ACC-deaminase plant growth promoting rhizobacteria (PGPR) has the potential to induce stress tolerance in crop plants.

Our growth pouch and pot experiments conducted under axenic conditions in a growth room and net house under salt-affected conditions, as well as field experiments in Faisalabad and Haroonabad, have shown promising results for improving shoot and root growth in mungbean with PGPR treatment.

For example, in a pot experiment under ambient conditions in a net house, the combined use of two PGPR strains (Pseudomonas fluorescens (Mk20), Bacillus subtilis strain Y16 and Rhizobium phaseoli (M9) significantly increased the nodulation, root and shoot growth of mungbean compared with the uninoculated control under normal (1.53 dS m-1) and saline (5 dS m-1) conditions—and also performed better than sole inoculation of either Rhizobium or PGPR strains under salt-affected conditions.

More pot and field trials will be conducted in different agroecological zones (Faisalabad, Bahawalpur, Bhakkar and Vehari-Burewala). We are hopeful that this practice will be a step forward for sustainable mungbean production in salt-affected soils, to increase farmers’ profitability and enhance food security.
Feed the Future country partners in Asia gathered for a workshop in Kathmandu, Nepal, on 30 May-1 June 2016 to examine past accomplishments in the model packhouse development, value chain system research and capacity building programs, and firm up the final set of project activities and workplan. Eleven country team leaders and members from the Bangladesh Agricultural Research Institute (BARI), University of Dhaka (UD), Cambodia’s Royal University of Agriculture (RUA), and Nepal’s Agriculture and Forestry University (AFU), International Development Enterprises (IDE), Ministry of Agricultural Development (MAD) and National Agriculture Research Council (NARC) participated, along with five World Vegetable Center staff from the South Asia, East and Southeast Asia, and Bangladesh offices.

**Jun Acedo**, Postharvest Specialist and Program Manager of the Asia component of the Center’s United States Agency for International Development (USAID) Postharvest Program, stressed the importance of ensuring accurate and timely implementation of the remaining activities to achieve targets and desired outcomes, provide the groundwork for scaling and sustainability actions, and enhance international collaboration. He defined the target indicators of the project and reviewed past accomplishments in technology generation and capacity building activities that started in October 2014; the Asia component accelerated after the completion of value chain surveys in March 2015.

Three workshop sessions were devoted to the exchange of country findings and experiences, each followed by the formulation of a workplan to develop a model packhouse, training programs, and value chain innovation systems to harness the farm-packhouse-market system with key technologies and best practices. In the project evaluation and management session, **Shriniwas Gautam**, World Vegetable Center M&E Specialist, laid out the evaluation plan for the Asia component to be conducted in early 2017, while **Neeraja Kotamarthi**, South Asia Finance Officer, discussed project financial management. Discussions on scaling and sustaining activities highlighted possible actions that could be done within and beyond the project’s timeframe.

A technical tour brought participants to Namaskar Agriculture Farm, which produces safe vegetables in the off-season using simple rain shelters and natural inputs but lacks postharvest techniques, as well as to Kalimati Wholesale Fruit and Vegetable Market, where rotten vegetables littered walkways and packing areas. Challenges like these must be addresses to meet the United Nations Sustainable Development Goal 12.3 — to reduce food loss and waste by 50% in 2030.
Pakistan’s varied agroclimatic conditions favor production of a range of temperate, tropical and subtropical vegetable crops. However, this potential has not been exploited due to a lack of quality vegetable seed at affordable prices. Most seed requirements are met through imports.

To increase national vegetable seed production and supplies at the local level, the USAID Agricultural Innovation Program (AIP), in which the World Vegetable Center is a partner, initiated a large scale vegetable seed production program. Five public sector research institutes, two seed companies and a seed growers’ association were selected to participate in vegetable value chain activities. In 2014-15, a total of 14,446 kg seed of onion, tomato, chili, okra and peas was obtained from an area of 15.6 hectares. Seed was packed in pouches, cloth and jute bags with USAID/AIP and partners’ labels.

Varieties were selected according to market choice, consumer preferences and regional suitability. On the basis of a single production and marketing cycle, a simple but comprehensive diagram of the seed value chain was developed, which encompasses 14 steps from sowing to marketing. Regular field visits with producers and seed companies were essential for the successful completion of this chain.

Seed marketing was the main hurdle for growers. Mazullah Khan, World Vegetable Center Seed Specialist, suggested the growers invite seed dealers to see the standing crops in the fields—a way to inspect the goods before purchase. “This was a successful strategy, as all seed sold at premium prices,” said Mazullah. Onion seed sold at USD 25-45/kg, depending on the region. “Farmers were extremely happy with the prices they received,” said MianZada, President of the Shuga Seed Growers Association in Bunir, Khyber Pakhtunkhwa. Seed peas sold at USD 1.25-1.50/kg and okra seed sold at USD 1.50-2.50/kg. Whole chili fruits for seed were sold in the open market in Sindh at USD 1.80-2.00/kg. Farmer-to-farmer seed sales were also successful, as Tayyab Ali Shah, a farmer in Tandlianwala, Faisalabad, discovered.

Capacity building is essential for successful vegetable value chains. More than 800 men and women participated in a series of crop management, postharvest handling, seed packing, and marketing training sessions in Gilgit Baltistan, Punjab, Sindh, Khyber Pakhtunkhwa and Balochistan. “To intensify seed production, linkages between all stakeholders in the vegetable value chain should be strengthened and enhanced,” said Mansab Ali, AIP Team Leader.

Progress from Pakistan’s Agricultural Innovation Program

A simple but comprehensive seed value chain

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Promoting healthy vegetable seedlings in Pothwar

Plasticulture is gaining importance in Pothwar district, Punjab, Pakistan. To produce a successful vegetable crop undercover, growers must start with healthy seeds and seedlings. Previously, farmers lacked the technical knowledge to set up and manage their own seedling nurseries. When they purchased seedlings from the market, costs were high, quality was poor, and diseases were a common problem. Through Agricultural Innovation Program awareness and training activities, more farmers are learning how to raise their own seedlings. Farmers are encouraged to seek out certified seed and use affordable multi-hole plug trays to develop strong seedling root systems. Using compost as a growing medium produces vigorous, stocky seedlings. Seedling production is widely practiced in Chakri, Kahuta and other areas in Islamabad Capital Territory, and is becoming more popular in other parts of Pakistan. Farmers growing indeterminate tomatoes are also harvesting side shoots to plant in plug trays and raise as seedlings—another source of income.

All activities were undertaken as part of the Agricultural Innovation Program (AIP) for Pakistan funded by the United States Agency for International Development (USAID) and supported by the International Maize and Wheat Improvement Center (CIMMYT) and the Pakistan Agricultural Research Council (PARC).
HORTI Tengeru students take a tour

Sixty-two horticultural diploma course students (34 female and 28 male) and two teachers from the Horticultural Research and Training Institute, Tengeru, Tanzania visited the World Vegetable Center Eastern and Southern Africa on 20 May 2016 to connect what they are learning in the classroom to actual field situations.

Genetic Resources Specialist Tsvetelina Stoilova spoke to the group about “Conservation of traditional African vegetables for food security and sustainable development,” and discussed the main causes of genetic erosion, especially climate change. Tsvetelina shared her perspective on different methods of conservation, highlighting the advantages and disadvantages of each, and also explained genebank seed storage practices. She emphasized the need for seed quality for crop productivity, which sparked a discussion among the students on the meaning of “seed quality” and if it can be maintained at home. Students also learned they could request seed samples online from the Center for their future studies (http://avrdc.org/seed/seeds/).

The students discussed the nutritional composition of traditional vegetables and gave examples of vegetable landraces linked with their culture, such as pumpkin and special local cucumber. They talked about their home gardens and explained the advantages of growing vegetables at home.

After the presentation the group visited the seed repository, screenhouse, dryer room and demonstration garden. Tsvetelina gamely answered the students’ many questions. At the seed repository they were curious about the equipment used to control seed moisture content, how the germination chamber works, how to maintain the temperature and relative humidity inside in the storage room, and the different packaging materials used for seed storage.

In the screenhouse they saw amaranth, spider plant, vegetable cowpea, African nightshade, African eggplant, and tomato seedlings at various stages of growth. Halima Afan Othman, a student who spent one and half months with the Center in February-March to do her practical work, explained to her fellow students screenhouse procedures including germination testing, transplanting, and seedling characterization.

Research Assistants Martha Munisi and Abel Ngowi introduced different vegetable species in the demonstration garden, and talked about row and plant spacing for different crops, duration of the okra maturation cycle, using plastic sheeting for soil cover, and more. The students also received training materials and brochures about traditional vegetables.

Genetic Resources Specialist Tsvetelina Stoilova explained the processes involved in collecting, characterizing, multiplying and storing seed with students from the Horticultural Research and Training Institute, Tengeru, Tanzania.
Recently staff from the Eastern and Southern Africa office squeezed into the Center’s minibus along with plenty of pots and pans and headed to Ngare Nanyuki, a Maasai community 20 km from Arusha, Tanzania.

After surviving bumpy roads and flying cooking utensils, they arrived at Emmanuel Primary School to host a cooking day with four local primary schools. Children, teachers and parents learned new ways to cook the traditional African vegetables they have been growing in their school gardens.

Emmanuel Primary School sits atop a windswept hill and the school garden adds a welcome patch of green to the otherwise dry brown plains. The VINESA project team has been assisting a local agricultural officer who has coordinated training and established school vegetable gardens in this traditionally meat-eating community.

Like children in most parts of the country, many of Emmanuel’s students do not have access to a well-balanced diet. The lack of essential minerals and vitamins hampers their physical development and academic performance.

After a welcome ceremony, the children harvested leafy greens from the school garden and then the fun began. Using recipes developed by the World Vegetable Center, the older children produced five different dishes and everyone, from the smallest to the tallest, had the opportunity to taste. “We normally prepare vegetables the traditional way,” said Mary Sabuni, the school’s headmistress. “But today we’ve tried how the Center prepares them, it’s very delicious!”

The school garden initiative raises awareness of the importance of eating a variety of vegetables and gives schools the means to provide their students with nutritious vegetables in their midday meal. The Center aims to scale out home gardens by encouraging children who learn to garden at school to create gardens at home with their parents.

One teacher said that after receiving the training at school, she started a small garden at her house. “I saw the school garden and decided to try it myself at home—so far I have been able to harvest something for my family almost every day.”
Small farmers moving from subsistence agriculture into agribusiness need to adopt new methods of farming, including the use of high quality seeds, applying only certified fertilizers and pesticides when needed, and instituting practices to prevent vegetable losses after harvest. This shift in practice is possible only if small farmers are willing to change their behavior and budget their time and money, save some of their profits for the future, and take credit to help them expand their businesses. These three topics—budgeting, saving and credit—were the focus of training by Equity Bank, Tanzania for 25 VINESA farmers from Manyatta Village on 19-20 May 2016 at the World Vegetable Center Eastern and Southern Africa, Arusha. To date, Tanzania has trained 100 youth out of a target of 120 farmers on how to produce safer vegetables in a profitable way.

A farm budget—an estimate of returns and expenses for a given period of time—helps farmers know whether or not they are operating at a loss or profit. Stressing the importance of preparing a farm budget, Kaaya Kambuael, Equity Bank’s Credit Officer, pointed out that “although a farm budget takes time to prepare, it helps farmers to avoid spending their hard-earned money on unnecessary expenditures, allowing them to live within their means.” Other trainers from Equity Bank included Raphael Kimaro, John Masao and Zebedayo Mwafakabedo.

Savings help farmers overcome periods of decline in income due to crop failures from drought, floods, or pest and disease outbreaks. Any item—cash, crop, livestock, etc.—that has value can be kept aside for future use; such savings help farmers recover from emergencies, increase the value of an investment, and build discipline in the use of money. Some farmers keep their cash savings under their mattresses or in unsafe places, and may lose these hard-earned savings in case of a theft or fire. Equity Bank helped 20 farmers open bank accounts for safe custody of their savings. Equity has a loan portfolio for crop and livestock farmers. It does not charge a monthly account fee, an account opening fee, or for withdrawals. Equity’s loans have lower annual lending rates than other financial institutions in the region, thereby promoting development of small and medium crop and livestock enterprises.

“Auction of collateral for failure to repay a loan is the last resort—we educate potential loanees so that they can make informed choices on whether or not to take loans and where to source their loans from,” said Bella Mushongi, Equity Bank Manager, Arusha Branch. Mr. Bella emphasized why some farmers fail to repay their loans, even though the business venture may be worthwhile: failure to budget for their businesses, lack of savings, and failure to use the whole loan for the intended purpose. If farmers could do all these activities together—budget, save and obtain credit—there is no doubt that a few seasons down the line, they would definitely reap the benefits of their hard labor in farming.
Visitors to the annual vegetable fair at the Eastern and Southern Africa office on 12-13 May 2016 were welcomed with a winning theme: WIN: Women, Income, and Nutrition.

Women dominate many vegetable value chains in Tanzania. However, when it comes to interactions with agricultural institutions and input providers, their voices often are not heard. The fair emphasized the important role of women in agriculture and many local female farmers received special invitations to the event.

The fair was a collaboration between the World Vegetable Center, the Tanzanian Horticultural Research and Training Institute (HORTI) and the Tanzanian Horticultural Association (TAHA). More than a thousand farmers attended the two-day event, participating in tours of the fields, demonstrations, cooking shows, and Q&A sessions.

In the Q&A sessions farmers raised concerns about fake seed and how to access quality seed. Experts from TAHA and the Center acknowledged that the circulation of fake seed is on the rise, and advised farmers on where to access reliable seed or how to produce their own seeds to be sure of their purity and quality. Many farmers also asked questions about marketing. How to access markets and gain better prices was a question on many minds. A farmer from the Kilimanjaro region said “farmers need more education and assistance on how to access markets so we can expand.”

Pest management was another issue farmers were eager to discuss. Hassan Mndiga, World Vegetable Center trainer, had everyone laughing when he described the best way to deal with snails: alcohol. “A bit for you and then a bit for the snail,” Hassan joked. “Just watch out you don’t get wobbly and slip on all the snail shells.”

More than 25 seed companies, organic farming organizations, irrigation specialists and other input providers set up booths and participated in the Q&A sessions. Transport and travel can be difficult and expensive for many small-scale farmers and businesspeople, so it was a rare opportunity to meet with so many industry specialists in one place.

Inviolate Mosha, Research Assistant in Social Economics, and Aneth Joseph Kaaya, the Center’s chef, organized a traditional African vegetable cooking show and tasting. They prepared various dishes with traditional vegetables for the crowds to try. Several farmers commented that it was the first time they had tried such a variety of vegetables, despite being surrounded by these vegetables all their lives. The pumpkin soup and amaranth cake were the hits of the day, warming everyone’s stomachs on what was a particularly cold and wet week in Arusha. Despite the rains, farmers left invigorated, with new approaches to try and new contacts to help solve the challenges they face.
VINESA’s Best Practice Hubs graduate another group of young and eager farmers

On 13 May 2016, a group of 25 young male and female farmers from Manyatta Village in Tanzania basked in the admiration of their community during a graduation ceremony to mark the completion of six months of training through the Australian Centre for International Agricultural Research (ACIAR)-supported VINESA project (“Improving Income and Nutrition in Eastern and Southern Africa by enhancing vegetable-based farming and food systems in peri-urban corridors”). Tanzania has now equipped about 100 farmers with the skills to produce more and safer vegetables to sell in urban markets. By December 2016, VINESA aims to convert about 500 young farmers from Ethiopia, Malawi, Mozambique and Tanzania into professionals who are in the business of producing and marketing vegetables.

The ceremony coincided with the second day of the Tengeru Vegetable Fair at the Center’s Eastern and Southern Africa office in Arusha. Graduates sported red T-shirts, black caps and plenty of confidence as they demonstrated some of the skills they acquired during their training at VINESA’s Best Practice Hubs. The hubs provide small-scale vegetable producers with access to high quality seeds, impart improved practices and technologies, and provide simple but effective options for prolonging storage and increasing value.

Young farmers venturing into vegetable production are challenged by limited skills to manage pests and diseases; lack of knowledge about how to produce vegetables that meet the needs of high value markets. Through training, the VINESA farmers are now well prepared with the skills to produce healthy seedlings, get crop nutrition right, and make good compost. They also have a better understanding of how gender differences affect their access to farm resources. Microcredit institutions are teaming up with VINESA to train farmers to manage small agribusinesses, and marketing agencies encourage farmers to form producer groups that will enable them to supply quality vegetables to supermarkets, tourist hotels and green groceries in a consistent way.

“The hard part for you has just begun—implementing your acquired skills and converting your fellow farmers by changing the ways you do farming from now on,” John Macharia, VINESA Project Leader, told the graduates. Officiating on behalf of the Arumeru District Commissioner, Arumeru District Agricultural, Irrigation and Cooperative Officer (DAICO) Grace Solomon appreciated VINESA’s contribution to the country’s development agenda for improving nutrition, increasing income and reducing poverty. The 25 graduates were reminded that the government has made vegetable value chains a priority for Arumeru District due to its ample water resources, flat irrigable land and proximity to urban markets in Arusha City. “An opportunity can only be an opportunity indeed if seized and exploited,” remarked Ms. Solomon. Each graduate received a certificate of course completion and a seed kit to help them establish home gardens and to train peer farmers in their communities.
The Australia-Africa Plant Biosecurity Partnership (AAPBP) is a capacity development program using Australian expertise to strengthen the skills and capacity of professionals in African plant biosecurity agencies and institutions to address critical plant pest and disease issues. Participating countries include Burundi, Ethiopia, Kenya, Malawi, Mozambique, Rwanda, Uganda, Tanzania, Zambia and Zimbabwe.

The partnership’s second workshop was held in Arusha, Tanzania on 2 June 2016. More than 40 workshop participants visited the World Vegetable Center’s regional office to see first-hand some of the biosecurity issues related to vegetables. Tsvetelina Stoilova explained in detail all the requirements for receiving and sending vegetable seed across Africa and beyond. Never Mwambela gave an overview of the Center’s ongoing research against Tuta absoluta, a major invasive pest troubling tomato crops in several African countries. Participants toured the postharvest facility and were astounded by the diversity of traditional vegetables on display in the demonstration garden.

The partnership is led by Australia’s Plant Biosecurity Cooperative Research Centre (PBCRC), funded by the Australian International Food Security Research Centre (AIFSRC) within the Australian Centre for International Agricultural Research (ACIAR), and delivered by a consortium comprising PBCRC, ACIAR, the Crawford Fund and CABI. ACIAR representatives were pleased to see activities from the ACIAR-funded VINESA project, led by John Macharia.

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