Traveling Tanzania in search of women gardeners

Through the Australian Volunteers for International Development (AVID) program, videographer Rhiannon O’Sullivan has brought her skills and expertise behind the lens to the World Vegetable Center. Based at the Center’s Eastern and Southern Africa office in Arusha, Tanzania, Rhiannon captures the daily lives of local farmers along with the Center’s work and activities throughout the region. She shared her perspective on a recent trip to Kijungu village in central Tanzania:

In the driest region of Tanzania not one drop of water can be wasted. A bucket of water used to irrigate Mwanaidi’s garden is an investment. It’s expensive and has to be hauled from a lake several kilometers away. However, Mwanaidi has discovered that buying water to grow her vegetable garden is cheaper than buying vegetables at the market.

Mwanaidi lives in Kijungu village, a dusty speck on the map in central Tanzania. I met her while capturing success stories on video for the World Vegetable Center in Arusha, Tanzania, where I’m working as an AVID volunteer. On this trip my colleagues and I were focusing on the Center’s home garden projects. These projects support women to create small vegetable gardens for home consumption.

Mwanaidi doesn’t know her exact age but she’s probably in her fifties. She is a widow with three young grandchildren to support, and before joining the project her family didn’t consume many vegetables. She wasn’t aware of the nutritional value of vegetables or the health problems caused by malnutrition. After receiving training and

(...continued on page 2)
mentoring on vegetable farming techniques and a seed kit with improved seed varieties produced by the World Vegetable Center, her gardening journey began.

So far Mwanaidi has successfully completed two growing seasons. She can ensure that her family receives enough vegetables in their diet, and since she started producing seed to sell to neighbors she’s generating a modest income.

There are other benefits to home gardens that are less easy to quantify. When I asked Mwanaidi if she liked having a garden she smiled broadly and said, “before I had nothing to do, now I wake up and go out to my garden. I am proud that I can provide my grandchildren with vegetables every day.” When we filmed her harvesting leafy greens with her granddaughters, her confidence and joy in showing them what to do was another success I was excited to capture.

Further up the highway we met Janeth. Life in Janeth’s village is hard, the women we spoke to live on low incomes, have had little, if any, formal education, and often aren’t aware of the possibilities available to them. Also a grandmother, Janeth lives in a neat mud hut with her husband, son and two grandchildren. The green of her garden punctuates the vast rust coloured plains that surround her house. Access to water is an issue in her village, but so are hungry chickens and thieving neighbors who come through her garden “like rampaging goats”. Janeth is constantly fixing a fence made of sunflower and maize stalks. The fence is a commitment that she’s willingly entered into. For the first time in her life she is growing a vegetable garden. “I like knowing that my family is now getting what they need to make their bodies healthy,” she said.

On the last day of the trip we visited a primary school that is also participating in the project. The children learn about gardening and nutrition and the vegetables they grow are used in their school lunches. Eager to show off what they had learned, we filmed them cutting sticks and staking their tomatoes. Afterwards, a young girl approached us and with the help of her teacher, who translated, told us that with seeds from the school she had started a garden at home. Very quietly she said, “I have sold my vegetables and bought pens and a notebook so I don’t have to ask my parents for these things.”

While meeting these women and capturing their experiences in the project, I have been training my eye to spot the small things. Like the green shoot of a seedling breaking through the earth, a fledgling garden could be easy to overlook when we think of the big picture: of food security, nutrition and women’s role in Tanzanian society. But after following these women on their daily activities, and swallowing a fair bit of dust, I’ve seen that with help, nothing can stop a determined woman from growing a garden. At least not water shortages, rogue chickens, or thieves. And I’ve been reminded that their small successes are in fact the big picture.
Recent research

The contribution of international vegetable breeding to private seed companies in India

Crop breeding research by international agricultural research centers usually serves public sector crop breeding, but does it still have a role when research and development have shifted to the private sector?

This paper explores this question for vegetables in India using data from 27 private companies and 9 public organizations. It focuses on tomato (Solanum lycopersicum L.) and chili pepper (Capsicum annuum L.)—two of India’s most important vegetables—and the role of international germplasm received from the World Vegetable Center.

Results show that as the role of the private sector in vegetable breeding increased, and with it the share of hybrids in the market, the role of international agricultural research shifted from the provision of ready-made varieties to the provision of specific resistance traits.

Still, international germplasm continued to be used in varietal development with 11.6 t (14% of the total market) of hybrid tomato seed and 15.0 t (13%) of hybrid chili pepper seed sold in 2014 containing international germplasm in its pedigree. We estimate that over half a million farmers use such seed.

We conclude that for tomato and chili pepper, international breeding needs to focus on prebreeding research, capacity strengthening of smaller seed companies, and the delivery of open-pollinated varieties for marginal environments.


Seminars

Willie Chen, Postdoctoral Fellow-Agronomist/Plant Protection Specialist, discussed his impressions of “Vegetable Grafting in Taiwan, Japan and Italy” on 30 June 2016 at headquarters. Each country uses various combinations of manual and mechanized grafting methods to produce grafted tomato, cucurbits, melons, eggplant, peppers and other crops. Grafting can improve plant vigor; address flooding and soil-borne disease problems; and be used as an alternative to methyl bromide, an ozone-depleting fumigant for pest control.

Derek Barchenger, one of 23 Borlaug Fellows for 2016, is conducting research at the World Vegetable Center with the pepper breeding group. Derek gave a talk on “Recent Progress in Chile Pepper Breeding at New Mexico State University” on 12 July 2016 at headquarters to brief colleagues on his background and the work of the university’s Chile Pepper Institute, an international nonprofit organization devoted to Capsicum research. Among many avenues of research, the institute is studying “super-hot” peppers (1,000,000+ Scoville Heat Units) for medicinal purposes; the use of ethephon for easier release of flowers and fruit for breeder seed production; and restoration of fertility (Rf) markers. Derek has an interest in breeding peppers for resistance to Phytophthora capsici, a virulent pathogen that produces new races every year. Derek is pursuing a Ph.D. in Plant and Environmental Sciences at NMSU.
WILLIE’S CHILIES: Researcher Willie Chen grafted six different chili varieties onto a chili rootstock to create a “pepper tree” capable of producing seven different kinds of chilies. Grafting is a method vegetable farmers can use to overcome soil-borne diseases, flooded soils, and other field problems.

Ready to unleash your horticultural creativity? Watch this video for some pepper grafting tips:

http://avrdc.org/pepper-grafting-tutorial/
NEW VISITORS FROM NEW ZEALAND: On 16 June 2016 a group of 17 farmers (and 1 tour leader) from New Zealand visited the World Vegetable Center Eastern and Southern Africa office in Arusha, Tanzania. They got a look at *Tuta absoluta* colonies being reared in the laboratory and the ongoing experiments using biopестиcides made from fungus, and were introduced to zero energy cooling chambers and a Wakati (a solar powered storage method) to extend the shelf life of produce. Seed producers in the group appreciated the tour of the genebank. The group also visited the demonstration garden, where flourishing amaranth, African eggplant, Ethiopian mustard, and African nightshade, and technologies including tomato grafting and plastic mulch are on display.

TAPPING TECHNOLOGY FOR RESEARCH: Following a recommendation by the Research Management Committee (RMC), the World Vegetable Center Eastern and Southern Africa socioeconomics team (Victor Afari-Sefa, Justus Ochieng, and Radegunda Kessy) has migrated from paper-and-pencil interviewing to computer-aided personal interviewing via tablet to conduct faster, more efficient field surveys. Using a tablet makes data collection and storage simple, and eliminates the need for data entry from paper, which is prone to human error. The tablets with SurveyCTO and Open Data Kit software are being used for the first time in a study to analyze willingness to pay for dried vegetables among rural consumers in central regions of Tanzania. The questionnaire was pretested 1 July 2016 at Makiba village in Arusha, and the survey is ongoing in Dodoma and Singida regions. The study aims to understand consumer attitudes, perception of dried vegetables, and willingness to pay for vegetables that have been dried using solar dryers. Solar-dried products have better color and texture, retain more nutrients, and have lower microbial counts compared to products dried directly under the open sun.
Director General **Marco Wopereis** attended the “Food Security Forum: Safe, Nutritious, and Affordable Food for All” from 22-24 June 2016 at the Asian Development Bank (ADB) in Manila, Philippines. He took part in a partnership dialogue on the 22nd, presenting the Center’s perspective on food safety issues alongside representatives from several CGIAR centers (ICARDA, IFPRI, CIMMYT, CIP, IRRI, WorldFish), other agencies (FAO, CABI, Asian Farmers’ Association, GrainPro Inc., Murdoch University, WFP) and donors (USAID, Australia, Global Agriculture and Food Security Program (GAFSP) World Bank Group, GIZ/BMZ Germany, Syngenta Foundation for Sustainable Agriculture, IFAD, JICA).

On the 24th, during a discussion forum with the topic: “Safe, quality and nutritious food: Are we eating right?” Marco emphasized five critical points (see sidebar) regarding the role of vegetables in human health and healthy economies. On the 25th, Marco headed to the International Rice Research Institute (IRRI), Los Baños, Philippines to discuss opportunities for collaboration.

His takeaway from the forum: “There is an urgent need to get a better overview of trends observed in vegetable production,” Marco said. “We need to know more—about vegetable consumption, imports, exports, role of women and youth, profitability, postharvest losses, share of value added in the value chain among actors from production to processing to marketing, and how vegetables stack up in comparison with cereals, fruits, and other cash crops.”

### Vegetables and food safety: 5 points

1) **The potential and complexity of vegetable value chains:** Vegetables can provide nutrients to alleviate or prevent malnutrition; they can be grown on small areas, often by women, and can be highly productive and profitable. Yet there are many risks in vegetable production, more so than in cereal cropping. The challenge is to produce sufficient quantities of quality vegetables responding to market demand at the right time, and then get the produce to consumers fast. Considerable postharvest losses occur due to poor storage and the many players that intervene from farm to wholesale market to retail markets to consumers.

2) **Vegetables and food safety:** Pesticide misuse is a concern. A survey in Central Luzon showed that farmers applied insecticide on average 56 times (41 l per ha) per season to combat fruit and shoot borers in eggplant. Integrated pest management techniques can drastically reduce the need to rely on insecticides. Vegetables are also prone to microbial contamination.

3) **Strengthen research partnerships in horticulture:** The Center’s breeding lines are taken up by public and private sector partners. For example, over the last 10 years, nearly 100 of our breeding lines have been directly released as varieties in central Asia. In India, 15% of hybrid tomato and chili pepper seed have been bred with parental material provided by the Center. The diversity and complexity of vegetable production systems and value chain is huge and cannot be tackled by one organization. Given the importance of horticultural crops for nutrition security and the challenges of food safety, there is an urgent need to strengthen regional collaboration.

4) **Enhance collaboration between research and development organizations:** Research outputs must be put to the test and successful ones scaled out. For varieties this is relatively straightforward, but most technologies and approaches are knowledge intensive and require participatory research with partners in the field. The Center has good experience with packhouse systems, where vegetable produce is aggregated, cleaned, sorted, bagged, labeled and commercialized for specific markets. Farmers’ groups can discuss and test new technologies and approaches across the value chain, from production to processing to marketing. The best chance of success for scaling out is obtained if these action research sites are located in regions where there already is a strong effort by the public and/ or private sector to develop the vegetable sector.

5) **Raising awareness works:** The World Vegetable Center has communicated the nutritional value of different types of food to tens of thousands of women and assisted them to produce vegetables in their own household gardens. While promoting vegetable cropping and consumption at the household level, the Center also emphasizes the importance of sanitation, water quality and hygiene to ensure the gardens provide safe as well as nutritious food. Evidence from Bangladesh shows this approach indeed leads to significantly greater consumption of vegetables in households.
In 2015, the World Vegetable Center in partnership with Department of Agriculture – Thailand (DoA) and the Asian Food and Agriculture Initiative (AFACI) agreed to conduct training to develop the capacities of postharvest professionals in AFACI member countries, where postharvest losses of 50% are common. The first course was held in June 2015, with key experts from DoA, the Rural Development Administration – South Korea (RDA), Kasetsart University (KU), King Mongkut’s University of Technology Thonburi, AFACI, and WorldVeg.


Waraporn Prompoj (Deputy Director General, DoA), Buncha Chinnasri (Acting Assistant to the President for International Affairs to President, KU), Ji Gang Kim (AFACI and RDA-Korea representative) and Tesfaye Beshah Asfaw (Capacity Development Specialist, World Vegetable Center) spoke about ways to further regional collaboration. Shrinivas Gautam, World Vegetable Center Monitoring and Evaluation Scientist, led the design and implementation for both training sessions and opened the training along with colleagues Tesfaye Beshah, who discussed training expectations; Ray-yu Yang, who highlight nutrition aspects; and Jun Acedo and Ngoni Nenguwo, covering postharvest issues in Asia and Africa respectively. During on-site training at farms and at the Packing House Royal Project in Bangkok, Talad Thai, River Kwai, the Hydroponic Agriculture Technology Complex at Kasetsart University, and Sunshine International Company Co. Ltd., the participants learned about the influence of global, regional and national demographics on production patterns, market demand, and opportunities for implementation of technical options to address postharvest problems.

In country reports, participants shared and discussed their country’s specific concerns with food loss and waste. Following the training, each participant proposed solutions in targeted action plans to be implemented on return to their respective countries. Participants also joined the Asia Postharvest Working Group (established during the first training course in 2015) to continue networking.

All trainees received a training manual and the presentations made during the course, and were encouraged to use these materials to convey the importance of postharvest loss reduction to others. Each received a certificate of completion, presented by Fenton Beed (World Vegetable Center Regional Director) and Chawalert Trikarunasawat (Postharvest and Processing Research and Development Division, DoA). Bangladesh and the Philippines received best Country Report and Action Plan presentations, respectively, based on a poll of participants.

Participants evaluated the training program as unique in offering advanced postharvest knowledge, firsthand experience of the progress made in Thailand, and the opportunity to build a network with like-minded professionals in Asian countries. AFACI country representatives are now empowered to reduce regional postharvest losses to help attain food and nutritional security and reduce poverty, as envisioned by the UN Sustainable Development Goals.
Mariam Mustapha stands in a field of cabbages and offers the wisest advice a small-scale Tanzanian farmer is ever likely to hear: “Stop thinking of farming as just looking for something to eat each day, and start thinking of it as any other formal business.”

Mariam was talking to trainee farmers who travelled to the lush Usumbara Mountains in northeastern Tanzania on 6-8 July 2016 for a three-day study tour sponsored by the VINESA project.

She went on to explain how a farmers’ group functions: “It’s impossible to succeed as a small-scale farmer in Tanzania without being a member of a group,” Miriam said. In Mariam’s group, each farmer works their own land, but they join together to coordinate planting and harvesting rosters to meet the needs of the same buyers under their group name. This way they are able to supply their buyers with quality produce throughout the season. Mariam’s group has contracts with buyers of high quality vegetables such as supermarkets, hotels and airports in Nairobi and Dar es Salaam. The problem, she says, is that some farmers don’t understand contract farming. “They think they will lose their independence as they will always be told what to do,” she said. “This is because they don’t understand the benefits of being a member of a farmers’ group.”

Eager to convince the trainee farmers of these benefits, Mariam told them she has built two large houses and given her children a good education with the income she has received from group contract farming. For the young farmers in the VINESA project who are making the transition from subsistence farming to agribusiness, this is what they have been dreaming of.

Over the next three days, VINESA trainees interacted with several inspiring farmers, learned grading and packaging techniques, and saw vegetables they have never encountered before— such as iceberg lettuce, parsley, and red radish. The tour is the culmination of a six-month training course that aims to prepare young farmers with the skills to produce and sell quality crops to high value markets.

Participants are selected from the same village and at the end of the training it is expected that they will form their own groups.

At the end of the tour the trainees each pledged Tsh 5,000 (US $2.5), to start a kitty to officially register their group. Project team leaders also presented the group with money raised from the sale of vegetables they grew during their training at the VINESA Best Practice Hubs. From now on they will be known as AMKENI Farmers Group, which means “wake up”. And wake up they must, if they are to reap profits from vegetables as their Lushoto counterparts do.

“In the village I come from, a big percentage of us were practicing subsistence farming,” said trainee Emmanuel Maturo. “Since I joined this training, I have learned many ideas that we were lacking. I wish to thank VINESA for offering us a unique training that we have never come across before.”
Addressing contamination of vegetables from farm to table

Few consumers are aware that vegetables, like meat or milk, can be contaminated by microbes that cause diarrhea and other gastrointestinal problems.

A team of experts from Sokoine University of Agriculture (SUA) held a three-day training for the VINESA (Improving Income and Nutrition in by Enhancing Vegetable-based Farming and Food Systems in Peri-urban Corridors) project team from the World Vegetable Center, the Horticultural Research and Training Institute and the Tropical Pesticide Research Institute on 12-14 April 2016 at the Center’s Eastern and Southern Africa office in Arusha, Tanzania to increase the team’s understanding of the scientific protocols used for collecting, handling and transporting vegetable samples from urban markets for microbial analysis.

“All fresh fruits and vegetables require attention to ensure food safety,” said Hellen Kanyagah, a microbiologist from SUA and the lead trainer. “If not washed or cooked well, produce contaminated with microbes can pose a serious threat to human health.” This is especially true for vegetables handled in unhygienic conditions before and after harvesting and washed using unsafe water before display and sale. Transporting and storing vegetables using unhygienic vehicles and facilities, the use of untreated waste water for irrigation, and application of contaminated manure are all means of introducing undesirable microorganisms in vegetables.

The human gastrointestinal tract contains many microbes called coliforms that are beneficial to the body if contained within their natural environment. When these microbes escape and get into the human food supply, trouble is sure to follow. Microbes including *Escherichia coli*, *Salmonella*, *Listeria*, *Cholera*, *Shigella* and *Proteus* cause diseases such as diarrhea, typhoid and cholera.

To ensure a true picture of the types and levels of contamination from each coliform can be properly assessed, it is necessary to collect samples in aseptic bags; handle, weigh and label samples using sterilized gloves; and transport samples using sanitized cooler boxes. Samples should be delivered to the laboratory for analysis within 24 hours after collection.

A total of 132 samples were collected by the VINESA project team under guidance from SUA experts at the Kilombelo Wholesale Market, Soko Kuu Retail Market and Nakumatt Supermarket. After packing, these samples were transported to the laboratory in Morogoro the same night for analysis. The analysis of the level and types of contamination from different vegetables will help VINESA develop strategies for farmers, retailers and other stakeholders to minimize contamination. This will give vegetable consumers a measure of confidence in the quality and safety of their local food supply, lead to an increase in the purchase and consumption of vegetables, and to higher profits for producers from increased volume of sales.
Delivering nutrition messages via public-private partnerships

In April 2016, the World Vegetable Center started a new small grant project on nutrition funded by the German Federal Ministry for Economic Cooperation and Development (BMZ). The Nutrition Sensitive Vegetable Production Promotion Project (NutriSenseProm) aims to influence key vegetable value chain stakeholders towards household consumption decisions that will lead to positive nutritional outcomes and growing of diverse and nutrient-rich crops. This could be an effective approach to build public-private partnerships for nutrition promotion, which requires substantially fewer resources than awareness campaigns directed only at consumers. The project will design, test and fine-tune a strategic approach specifically for vegetable producers.

On the project team: Andreas Gramzow, Ray-Yu Yang, Peter Hanson, Justus Ochieng, Alaik Laizer and Charles O. Onyango from the World Vegetable Center, Gudrun Keding from the Global Horticulture Initiative, Charity Muchoki from the Kenyan National Commission for Science, Charles Onyango from German International Development Cooperation (GIZ), and Michael Ngugi and Robert Musyoki from the private seed company Simlaw Seeds.

In close collaboration with the public extension service in Kakamega County, the pilot region of the project, NutriSenseProm will develop two types of nutrition messages that will be disseminated to ten farmer groups through two alternative message delivery systems. Two nutrition messages will be communicated to groups through the public extension system, while two other messages will be disseminated using Simlaw Seeds’ private extension system. Three control groups will serve to analyze the impact of the nutrition messages and the message delivery systems.

In May and June 2016, the project conducted a comprehensive baseline survey along with expert interviews and six focus group discussions. Based on the information gathered from the survey and discussions, nutrition messages will be developed and introduced to public extension and Simlaw Seeds extension staff, who will then disseminate the information to the final beneficiaries.

In November 2017, an endline evaluation survey will be conducted with beneficiaries, secondary knowledge recipients (neighbors of beneficiaries), and in the control groups to analyze the impact of the nutrition messages and message delivery systems. The most successful nutrition messages and delivery systems will be selected and incorporated into existing manuals for the public extension service and Simlaw Seeds extension staff in Kenya.
Director General Marco Wopereis made his first visit to the West and Central Africa office in Bamako, Mali from 14-17 June 2016 to meet Center staff and representatives from several of the Center’s key partners, including the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), World Agroforestry Center, International Livestock Research Institute (ILRI), the lead of the Climate Change, Agriculture and Food Security (CCAFS) program (all based at the ICRISAT-hosted Samanko Research Station), as well as the Institut d’Economie Rurale (IER), and the Faso Kaba Seed Company. Marco also interacted with Asamoah Larbi, Chief Scientist of the Africa RISING Sudano-Sahel West Africa project and Country Representative of the International Institute of Tropical Agriculture (IITA), Ghana who was on an official visit at Samanko.

Accompanied by Victor Afari-Sefa, Acting Regional Director, and other key Center staff, Marco met Daniel Siméon Kelema, Secretary General of Mali’s Ministry of Agriculture and Bourema Dembele, IER Director. Both government officials stressed the need to reinforce existing cooperation between the World Vegetable Center, the ministry and development partners within the agriculture sector in Mali. They reiterated their determination to strongly promote the horticulture sector to policymakers and to position the sub-sector as a vibrant driving force for economic growth. Both noted that the Malian government seeks support to develop its horticultural sector, especially the vegetable seed sector.

Marco also met with representatives from the United Stated Agency for International Development (USAID). USAID has provided funding for the Center to implement vegetable and home garden scaling technologies in East and West Africa. In Mali, USAID supports the Mali Horticultural Scaling Project, which involves the introduction and adaptation of selected technologies in the southern (Sikasso) and northern (Mopti and Timbuctoo) regions of the country.

During his visit to Faso Kaba Seed Company in Bamako, Marco was briefed by Maimouna Coulibaly, who explained that her seed company has partnered with the World Vegetable Center since 2008. Faso Kaba has joined the Center’s participatory variety selection and multilocation trials. The company is currently commercializing the Center’s improved vegetable varieties, including ‘Konica’ tomato. In the upcoming rainy season, Center staff will train Faso Kaba’s seed producers in best practices for quality seed production.

Local vegetable farmers chatted with Marco at their cooperative near Samanko; most of them produce vegetable seed with the West and Central Africa team to improve the local supply seed system. Marco held individual meetings with key Mali staff to understand the nature of their work and share his vision for the Center and the region. He also took the opportunity to make history and lay the first stone for the new World Vegetable Center office to be constructed at Samanko. The two-storey building is expected to be completed by the end of 2016; it will house 19 offices, three laboratories and a conference room, and will be able to accommodate all staff based in Bamako at one location.
Household gardens thrive in Uganda

Malnutrition in Uganda is rampant due to lack of vitamins and minerals in the diet. As a result, 38% of children under 5 years of age are stunted and 73% are anemic, which permanently affects their physical and mental development. Vegetables, particularly traditional African vegetables, are rich in micronutrients that can combat malnutrition. The World Health Organization recommends a daily intake of 400 grams of vegetables and fruit, but this standard is rarely achieved in rural Uganda.

To address this problem, the World Vegetable Center together with Voluntary Efforts for Development Concerns (VEDCO) trained groups of smallholder farmers, mostly women, on methods of growing high-yielding African traditional vegetables in small plots near their homes. Training sessions also cover improved nutrition and meal preparation.

Robina Nasozi is a farmer who participated in the training and received a seed kit with 7 different types of vegetables. She planted all of them, but she particularly enjoyed nakati (leaves of African eggplant) and dodo (amaranth). “I like these leafy vegetables very much,” she said. “They are tastier than the ones we collect from the wild, not so bitter. When the plants in the home garden started flowering, I let them mature and I collected their seeds. I then prepared more seed beds and I now have many plots.

“The vegetables are also very marketable, they sell at Ughs 1000 (USD 0.30) for a small bunch of 5 cuttings. During Easter I was able to sell nakati worth Ughs 20,000. Last year I earned Ughs 50,000 with the proceeds of vegetable sales, which I used to pay the school bills of my grandchild, who stays with me.”

Robina is a well-respected person in Katogo village of Mukono District. She runs a primary school with 84 students. She was selected by her community to be their leader in the Homegarden Scaling Project, which is funded by the United States Agency for International Development. She has taught many other farmers simple but effective methods of seed bed preparation, sowing, harvesting, and cooking. “Members of the farmer groups I teach all got their seed kits from the World Vegetable Center, but there are many other people who ask me for seeds,” Robina said. “So I not only preserve seeds for myself, but I also share my seeds with others.”

To illustrate her point, Robina guided visitors to the fields of neighbors who established home gardens with nakati, spider plant, and amaranth, and to her school, where several classes were in session. Robina said she uses the vegetables she grows to prepare school lunches for the students. The students looked very healthy and cheerful indeed.

The experience of Robina and her neighbors in Katogo shows that even though farmers have access to local vegetables from the wild, the careful selection, evaluation and breeding of those lines by the World Vegetable Center has resulted in types that are even more appreciated by farmers and are now in high demand. Working with innovative and influential farmers such as Robina increases the impact of seed kit distribution initiative, because she multiplies the seeds and distributes them to other farmers. The combination of providing improved seeds, training of farmers, and education of children is a powerful way of tackling malnutrition in Uganda.

“After being taught by this project, I know how to grow vegetables in better ways,” she said. “Now I want every student in my school to cultivate a small plot—I give them a space. Some of the vegetables that they grow I will use to cook lunch for them, but most of the vegetables they can take home, and teach their parents what they have learned here. After I started this project I have noticed that children haven’t fallen sick as much as before. I have become very popular this way and now more people bring their children to my school.

“I also grow a lot of vegetables for myself. For you to believe in me, I have to be successful myself. My grandson has discovered that I make good money by selling nakati and dodo. He has now started his own plot there behind those bushes. It is much hidden because he doesn’t want anyone to notice it and steal his vegetables.”
Abdul Rahman, a farmer in Tamale, Northern Ghana, watched with concern as local vegetable varieties were lost over the years due to neglect and lack of seed. So, when traditional African vegetables from other parts of Africa were introduced in his locale through a World Vegetable Center project funded by the West and Central Africa Council for Agricultural Research and Development (CORAF/WECARD), he decided to participate.

“Some of the introduced varieties are not new to us,” he said. “However, we lost them as result of poor management. The introduced varieties yield better than our local ones. Therefore, we must not repeat our past mistake by leaving their multiplication to chance.”

With the knowledge he gained from project-sponsored training in seed multiplication, he is determined to keep multiplying and supplying quality seed to other farmers. “I shall continue to improve upon the storage and packaging of my seed to make my business attractive,” he added.

Mr. Rahman’s goal is to become a local seed distributor for traditional African vegetables in and around Tamale. He recently produced 2 kg of amaranth and 2 kg of roselle seed—a modest but very important milestone in his quest to be a commercial seed producer.

Apart from seed production, Mr. Rahman is also concentrating on production of traditional vegetables instead of staple crops. “Vegetables are more productive per unit area compared to cereals,” he said. “Cultivating amaranth ‘Madiira II’ enables me to harvest 3 times the usual harvest from the local varieties. It has larger, more attractive leaves, bringing me a higher value per unit area of my land.”

With the income generated from vegetables during the dry season, he can purchase cereals for the household for the whole year. “Last season, I was able to purchase a motorbike, which has improved the efficiency of my farm operations,” he said.