Peri-urban vegetable production promising for young people in Africa

Training urban youth to grow and market vegetables will produce employment, income, and a more nutritious food supply

More than half of the world’s population now lives in urban areas. As cities increasingly absorb population growth while at the same time drawing in people from rural areas, the question arises: who will produce food to sustain those city dwellers?

The answer is the urban dwellers themselves.

‘Improving Income and Nutrition in Eastern and Southern Africa by Enhancing Vegetable-based Farming and Food Systems in Peri-urban Corridors,’ a new project from AVRDC – The World Vegetable Center and partners supported by the Australian Centre for International Agricultural Research (ACIAR) through its...
Australian International Food Security Centre (AIFSC), aims to develop peri-urban vegetable production in Ethiopia, Malawi, Mozambique and Tanzania. The project seeks to address societal shifts due to rapidly changing demographics, increasing demand from urban consumers, and an urgent need for a more nutritious food supply, while at the same time increasing income opportunities.

Populations in the four target countries are young, and expanding. Young people in search of stable employment migrate to Dar es Salaam, Addis Ababa, Lilongwe, Maputo and smaller cities throughout the region, but often are disappointed by the lack of job opportunities. These youth constitute labor that can be mobilized for agricultural production in and around the cities where they now live, particularly since the smaller and aging proportion of the population remaining in rural areas cannot feed fast growing urban populations. To reduce youth migration and increase opportunities for gainful self-employment, governments in the target countries are interested in developing nearby production basins or corridors to supply their cities with food.

“Peri-urban” refers to a transition zone around cities where urban and rural activities occur together in a landscape that’s often subject to rapid human modification. Land in peri-urban corridors with an adequate supply of water as well as good transport connections that allow produce to reach cities within 2-3 hours has potential for the production of fresh vegetables.

“Producing vegetables for cities is often a lucrative endeavor for farmers because of the quick return on investment and the high prices fresh produce can fetch,” said Victor Afari-Sefa, project leader.

In addition to providing employment for youth and improving incomes, labor-intensive peri-urban vegetable production can lead to greater diversity in diets—an urgent and vital need in the target countries, where micronutrient malnutrition is widespread. Local diets based on cassava, maize and other cereals are high in carbohydrates, but low in micronutrients and vitamins. Increasing the amount and variety of nutrient-dense vegetables in diets can sustainably alleviate micronutrient deficiencies.

Currently people in the target countries consume only about 200 grams of fruit and vegetables per person per day—about half the amount recommended for good health—and many consumers remain unaware of the health benefits of vegetable consumption.

Knowledge is the key input for successful vegetable production, and the lack of it is felt in a myriad...
of ways across the region. Outdated production methods and marketing systems curtail supply; weak channels for dissemination and adoption of agricultural research and improved technologies further hinder progress. The vegetable value chain stagnates when research cannot inform practice.

The project’s Best Practice Hubs are designed to fill these knowledge gaps. The hubs—centers for crop trials and experimentation that also serve as educational interventions—will draw young producers into communities of practice, where they can learn, evaluate, and adapt vegetable production and postharvest technologies to support income-generating activities, attract the attention and custom of traders, and begin to build strong market demand among consumers for fresh produce and processed vegetable products. The hubs will serve as best practice demonstration sites for the farming communities surrounding them.

National partners selected the vegetable production corridors for their hubs, keeping in mind local land tenure systems (to ensure that trained youth have access to land), gender relationships (to ensure equity and maximum returns to households) and community engagement (to ensure scalability).

Hub participants will identify and grow the most productive and nutritious cultivars of traditional African vegetables such as Ethiopian kale and amaranth, and introduced vegetable crops like tomato and peppers. With improved production skills, it’s expected the peri-urban farmers will be able to boost their profitability while providing more healthy and safe choices at the market for consumers.

The project seeks to train 480 vegetable business professionals in 120 communities. About 6000 vegetable farming families are expected to benefit from the extension of successful technologies and management models developed in the hubs.

“We also intend to closely examine the integration of research into the vegetable value chain,” said Afari-Sefa. “For instance, we want to know if the hubs will strengthen the capacity of national research partners in delivering improved technologies and practices, and if the research interventions can promote collaborative relationships for postharvest storage, value addition and processing.”

Project partners were chosen from their proven track records in agricultural development. In Ethiopia, partners are the Ethiopian Institute of Agricultural Research (EIAR) and International Development Enterprises (iDE); for Malawi, Africare Malawi and the Department of Agricultural Research Services (DARS)/Bvumbwe Agricultural Research Station; for Mozambique, Instituto de Investigação Agrária de Moçambique (IIAM) and the International Potato Center (CIP); and for Tanzania, the Horticultural Research and Training Institute, Tengeru (HORTI-Tengeru) and AVRDC. The project will also draw on the experience of the Australian Applied Horticultural Research (AHR) in integrated crop management.
The Center in the news

AVRDC was highlighted as one of 15 organizations involved in conserving seed for current and future use in a feature article published by Food Tank (http://foodtank.org/) the think tank about food. The article was picked up by several other websites, helping to introduce the Center’s vegetable germplasm conservation effort to new audiences worldwide.

Robert Holmer, Regional Director, AVRDC East and Southeast Asia, was among the experts interviewed for an article by Flora Bagenal in the Christian Science Monitor on assessing Bangkok’s suitability for producing more fresh produce inside the city limits.

Christian Science Monitor

TAKE A TASTE: The Center’s Genetic Resources and Seed staff hosted consumer acceptance evaluations for amaranth, mungbean and soybean sprouts on 26 July (top, left and right), and microgreens of four mustard (Brassica juncea) varieties on 8 August (bottom). Participants rated the samples for taste, texture, aroma, appearance and other qualities.
Sanjitha Baanu, undergraduate intern from Tamilnadu Agricultural University, Coimbatore, India presented a talk on “The Bemisia tabaci species complex: comparing populations from South and Southeast Asia” at AVRDC headquarters on 29 July 2013. With more than 600 host plants including tomato, eggplant, beans, cucurbits and peppers, B. tabaci is a vector for more than 110 viruses and is known as the world’s worst invasive pest. The species has 11 genetic groups; Sanjitha used molecular methods to identify the genetic variation and species classification. Determining how genes are expressed at different developmental stages in an insect’s life cycle can lead to improved pest control methods.

World Food Prize intern Shireen Bhatia shared her impressions of her time at AVRDC with headquarters staff on 7 August 2013. During her two-month stay, Shireen, a high school student from Ohio, USA, conducted observations on 12 sets of hot pepper accessions inoculated with two viruses: Pepper vienal mottle virus (PVMV) and Pepper mottle virus (PepMoV), and had the opportunity to try various laboratory techniques including gel electrophoresis, polymerase chain reaction (PCR), and enzyme-linked immunosorbent assay (ELISA) testing. Shireen said the exposure to intensive hands-on lab work was both exciting and challenging. She also enjoyed life in Taiwan, where she had many new cultural experiences—such as sampling (and liking) “stinky tofu,” a local favorite visitors often find daunting at first bite.

VEGGIE ART: Rachel Pimm, a master of arts candidate at Goldsmith College, London, recently exhibited her interpretation of a “Garden City” as part of her final degree show. Rachel is the daughter of Christian Borgemeister, Director General, International Centre of Insect Physiology and Ecology (icipe). She clearly followed a good IPM strategy, as no problematic insects were seen in the exhibit.
Visitors

Grisana Linwattana, Payanoot Naka, and Supattra Lertwatanakiat from Thailand’s Department of Agriculture, and Hiu-Lung Chiu, Taiwan Agricultural Research Institute, visited AVRDC headquarters on 25 July 2013. AVRDC Director General Dyno Keatinge, Jackie Hughes, Deputy Director General – Research, Yin-fu Chang, Deputy Director General – Administration & Services, and I.R. Nagaraj, Director of Human Resources, met with the Thai scientists to discuss vegetable value chains and other agricultural issues in Thailand, where Dr. Linwattana coordinates a government program on vegetable production. The visitors toured the Genebank and Demonstration Garden with Garden Manager Willie Chen.

A delegation of seven scientists from Vietnam’s Agricultural Genetic Institute learned more about the Center’s R&D activities during a tour of headquarters on 7 August 2013. The visitors met with Yin-fu Chang and Andreas Ebert, Genebank Manager.

Eight senators of the “Blue Continent” from Guam, Northern Mariana Islands, Federated States of Micronesia, and Hawaii stopped by AVRDC headquarters on 8 August 2013 to discuss the challenging issues related to vegetable production on tropical islands with Yin-Fu Chang, I.R. Nagaraj, and Dirk Overweg, Director of Finance. They were accompanied by Robert Lo of Taiwan’s Ministry of Foreign Affairs.

A delegation of youth scholars from Missouri State University USA led by Kevin M. Pybas, Associate Professor, Political Science, and accompanied by Kuan-Ting Lo, Taiwan Ministry of Foreign Affairs, visited the Center on 9 August 2013. After a briefing, the group peppered Yin-Fu Chang, I.R. Nagaraj, and Dirk Overweg with many insightful questions about the operations of an international organization in Taiwan, and then toured the genebank.
Asian Plant Breeding Academy completes session in Thailand

The University of California Davis Asian Plant Breeding Academy (APBA) recently completed a session in Pathum Thani, Thailand, hosted by the Thailand National Science and Technology Development Agency (NSTDA). The core instructors included Wallace Cowling (University of Western Australia), Idy van Leeuwen (BreedWise, The Netherlands), and Rale Gjuric (UC Davis). The program was enriched with interaction and lectures by scientists from NSTDA and the Center for Agricultural Biotechnology at Kasetsart University, Kamphaeng Saen, Thailand.

Contributing guest lecturers included Theerayut Toojinda, Sithichoke Tangphatsornruang (NSTDA Biotec), Julapark Chunwongse, Orarat Mongkolporn, Hugo Volkaert (Kasetsart University), Sirikul Wasee (Thailand Vegetable Research Center) and Narinder Dhillon (AVRDC – The World Vegetable Center).

The UC Davis Plant Breeding Academy is a premium professional certificate program offered in the USA, Europe, Asia—and starting in December 2013, Africa. To date, 114 industry breeders have attended the academy, making it the most significant program of its kind. Applications are still being accepted for a few remaining spots for the European Plant Breeding Academy Class 3, which will begin in October 2013. For more information contact Joy Patterson at jpatterson@ucdavis.edu or visit pba.ucdavis.edu.

Planning with partners

During a recent visit to Germany, Robert Holmer, Regional Director East and Southeast Asia, met with Rüdiger Glaser, Head of the Physical Geography Department and Axel Drescher, leader of the Development Geography working group, both at Albert-Ludwigs University, Freiburg to discuss project results and final updates for the Gesellschaft für Internationale Zusammenarbeit (GIZ)-funded project “Understanding urban and peri-urban vegetable production and marketing systems through GIS-based Community Food Mapping in Greater Bangkok, Thailand (vegGIS),” which is coming to a close in September 2013. Under the coordination of Rüdiger and Axel, the university is also a partner in “Vegetables Go to School: Improving Nutrition by Agricultural Diversification” a project supported by the Swiss Agency for Development and Cooperation (SDC).

While in Freiburg, Robert had the opportunity to greet Takemore Chagomoka, former AVRDC Seed Marketing Specialist, who is now pursuing a Ph.D. under the GlobE-Urban FoodPlus Project in Freiburg. Takemore extended his warmest regards to his former colleagues. We miss you, too, Takemore!
Nutrition research the main activity at MRI

“Research for healthy and tasty diets” is the motto of the Max Rubner-Institut (MRI), the German Federal Research Institute of Nutrition and Food. On 29 July 2013, Robert Holmer, Regional Director East and Southeast Asia, paid a visit to MRI’s headquarters in Karlsruhe, Southwest Germany, where he met with Gerhard Reckemmer, President, Sabine E. Kulling, Head, Department of Safety and Quality of Fruit and Vegetables, Bernhard Trierweiler, Biologist and Sara Kranz, Research Associate, to discuss details of a joint research proposal “Vegetable cucurbits for nutrition-sensitive home and school gardens in Southeast Asia,” which was recently submitted for funding to the Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH (GIZ).

One of the federal research institutes under the remit of the Federal Ministry of Food, Agriculture and Consumer Protection (BMELV), the MRI is responsible for drawing up scientific criteria to facilitate policy decisions in the fields of food, agriculture, and consumer protection. It supports 200 scientists who conduct research on consumer health protection in the nutrition sector. Four of MRI’s eight departments as well as the MRI Analysis Division use a cross-product approach, focusing their research on investigating the quality rating of food in terms of nutritional physiology and health, food safety and bioprocess engineering. This approach traces the active chain of nutrition from the level of molecules and cells to the entire organism. One particularly important area is the study of nutritional behavior. Results of MRI’s cross-product research are incorporated in recommendations for healthy nutrition.

Read more
Max Rubner-Institut
http://www.mri.bund.de/en

Utrecht University College visits Regional Center for Africa

First degree students from Utrecht University College, The Netherlands, visited AVRDC’s Regional Center for Africa on 19 June 2013. Representing various departments and disciplines, the 28 students were interested in getting exposure to the entire vegetable value chain.

Vegetable Breeder Fekadu F. Dinssa briefed the students on the global activities of AVRDC in vegetable research and development, with a special focus on the Center’s work in sub-Saharan Africa. He discussed germplasm conservation activities, technology generation and dissemination, seed systems, postharvest handling, capacity building, marketing and consumption issues. The group then toured field trials, nurseries, seed increase and demonstration plots and the Postharvest Training and Services Center. The students were excited by the various activities of AVRDC across the vegetable value chain, and several expressed an interest in returning as interns and postdocs.
Farmers flocked to the fields at AVRDC’s Regional Center for Africa (RCA) in Arusha, Tanzania on 21 June 2013 to consider prospects for “Traditional African Vegetables for Nutritional Diversity, Income Generation and Food Security.” The field day, supported by the BecA-CSIRO Amaranth project (Biosciences eastern and central Africa [BecA], Commonwealth Scientific and Industrial Research Organisation) and the HortCRSP - African Indigenous Vegetables project, was part of the technology promotion activities of the two projects planned for 2013.

A total of 149 farmers participated from six villages around Arusha and Arumeru areas. Six organizations—Meru District Agricultural and Livestock Development Office, Horti-Tengeru, Thomas Watson Foundation, and Alpha, East Africa and East West Seed companies— took part. ITV-Tanzania Television Media recorded the program.

The field day was opened by Victor Afari-Sefa, Acting Center Director, and closed by invited Guest of Honor Silvester Samali, Director, Horti-Tengeru. The program included tours of on-station trials and nurseries, demonstration plots, and seed increase plots of various traditional and exotic vegetables. Visitors also got a look at the Postharvest Training and Services Center, a one-stop shop located on the RCA campus that serves farmers’ needs for harvesting equipment and advice. The participants were excited by the performance of released varieties in seed increase plots and discussed the importance of Good Agricultural Practices (GAP) for improved productivity, production and quality. The field tour was followed by general discussions, in which farmers interacted with other participants and researchers.
Sweet end to a bitter week in the field

Bitter Gourd Field Week was celebrated from 25 July – 2 August 2013 at AVRDC’s Research and Training Station in Kamphaeng Saen, Thailand. Twenty-six researchers from eleven seed companies visited the Center’s bitter gourd trials, which comprised twenty-seven advanced breeding lines of different market segments planted in three replications along with seven check cultivars from seed companies and national agricultural research centers, including the Bangladesh Agricultural Research Institute (BARI).

Plots also contained lines derived from AVRDC genebank accessions. These breeding lines have improved horticultural traits such as early enhanced fruit yield, uniform fruit color, high fruit quality, and resistance to foliar fungal diseases like powdery mildew and leaf spot; most are suitable for long duration harvest and transport. The visitors showed keen interest in AVRDC’s bitter gourd breeding lines and selected the ones suitable for their breeding programs.

During the field week 11 trainees and two scientists from the Asian Plant Breeding Academy received an introduction to the features of AVRDC’s bitter gourd breeding program from Vegetable Breeder Narinder Dhillon. He explained the constraints of bitter gourd production in Asia, objectives of line development, selection of breeding methods, population structure in segregating generations, selection criterion, and seed production processes. Narinder also outlined the next phase of AVRDC’s bitter gourd breeding program. The week-long field activity prompted several positive comments, including this one:

“Many thanks for the fruitful visit we had. You conducted your experiments very well and it was really informative to see the trial layout, so we could observe your material clearly and evaluate it logically. You have developed good material and we would like to collaborate with you and other colleagues in the seed industry on trait development in cucurbits. Hats off to you and AVRDC for developing such good bitter gourd material.”

Dr. Arvind Kapur, CEO Vegetable Seed Division Rasi Seeds (P) Ltd. Haryana, India

(left) Lines 12THBG1-03A6-13 (top) and 12THBG4-11A6-3. (above) Narinder Dhillon explains his bitter gourd breeding strategy to visitors. (right) Field day visitors get a closer look at the vines and fruit in the field.
Addressing malnutrition in Mali demands a multi-sector approach

Malnutrition continues to affect many segments of Mali’s population, particularly children; rates of malnutrition among children have increased from the critical threshold (10%) to the emergency threshold (15%). To ensure Mali can address some of the pressing issues related to the diet and health of its citizens, more than 250 participants met in Bamako in June 2013 to develop the country’s five-year Nutrition Action Plan (2013-2017).

In January 2013, the government of Mali adopted a national nutrition policy. The policy highlighted the importance of a multi-sectoral approach involving several ministries, technical and financial partners, civil society and the private sector, noting that improvements in household food security and nutrition must also include access to clean drinking water, hygiene and sanitation, and basic services in health and education. The June planning session sought to begin putting the policy recommendations into action.

In working groups, the participants defined priorities for action under four strategic axes. Interventions and key activities were discussed, and targets, indicators, roles, responsibilities, and timelines were established for various activities.

Key points focused on finding ways to integrate nutrition into national programs and ensure it is a priority in Mali. For many participants, the planning workshop served as an introduction to the multi-sector nature of nutrition issues.

In July 2013, the Ministry of Health invited representatives from ministries (rural development, education, water and sanitation, social development, women’s promotion, children and family, economics, finance and budget, foreign affairs and international cooperation, higher education and scientific research, and labor), the public commissioner of food safety, technical and financial partners, civil society, national and international nongovernmental organizations, research centers such as AVRDC, and the private sector to further elaborate the comprehensive and inclusive action plan for nutrition. The meeting was one milestone among many to come for recognizing the importance of nutrition and taking action to ensure it is a priority for Mali now and in the future.
The Capsicum Connection: AVRDC formally added sweet and hot pepper to its list of principal crops in 1986. The attributes of the crop—rich in both vitamins A and C, suited to large-scale or small-scale growers, and with good prospects for processing—prompted AVRDC scientists to begin tackling the problems of producing peppers in the hot, humid tropics. Today the Center’s genebank holds the world’s largest public sector collection of pepper germplasm (8,165 accessions), and 51 open-pollinated and hybrid varieties for commercial cultivation based on AVRDC lines have been released around the world since 2005. From Ethiopia and Ghana to Indonesia and India, these high yielding peppers with improved pest and disease resistance are adding a spicy accent to dishes, improving nutrition, and generating income for farmers.

Delegation from Guatemala at headquarters

H.E. Sr. Arturo Duarte, Ambassador of the Republic of Guatemala to the Republic of China and a delegation led by Excmo. Lic. Elmer Alberto López Rodríguez, Minister of Agriculture and Animal Husbandry, Republic of Guatemala visited the Center on 1 August 2013. The minister was joined by Excmo. Sra. María Magdalena de León de López, his spouse; Sr. Oscar Hernández Vela, Office Manager; Sr. Mario Méndez, Agribusiness Consultant; Sr. Rualdo Leal, Chief Adviser; Sr. Rolando Corado, Representative of Pastoral Ministry in the Central Agricultural School; and Victor Chu from Department of Latin American and Caribbean Affairs, Taiwan Ministry of Foreign Affairs. The Center’s management team greeted the guests, and Director General Dyno Keatinge briefed them on the Center’s current research activities. Genebank Manager Andreas Ebert introduced the delegation to the AVRDC genebank. Minister López Rodríguez and Mrs. López planted a Madagascar almond tree along AVRDC’s Green Drive.