

fresh

News from AVRDC – The World Vegetable Center



May 20, 2011

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Farmers meet to plan new demonstration site

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New vegetable varieties draw crowds in Mali

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Sharing knowledge, building relationships

A trio of workshops strengthens the Center's links with partners in health, breeding, and seeds

In recent weeks the halls of AVRDC – The World Vegetable Center's headquarters in Taiwan buzzed with conversation, as people gathered to propose ideas, explore collaborations, and extend their knowledge in three different workshops. In addition to fostering many fruitful exchanges of information, the sessions highlighted the Center's role as a connector bringing together a diversity of disciplines and sectors to benefit small-scale farmers and consumers in the developing world.

Focus on the seed sector



Seed company owners, managers, and scientists convened on 11-12 May 2011 for the fifth annual **APSA-AVRDC workshop** at AVRDC headquarters. The **Asia Pacific Seed Association** is a vital link to the private seed sector in Asia; its members offer valuable perspective on issues related to





APSA-AVRDC Workshop 2011

AVRDC Headquarters, Shanhua, Tainan, Taiwan
11-12 May 2011



seed production and marketing across the continent. Thirty-four APSA members attended, along with 26 AVRDC researchers and staff. The event also provides APSA representatives and AVRDC management with an opportunity to discuss potential areas for future collaboration.

AVRDC Deputy Director General – Research **Jackie Hughes** and APSA's **Anthony Tse**, Managing Director of Clover Seed Co., Hong Kong, gave the opening remarks. Among the 12 presentations by AVRDC researchers, Tomato Breeder **Peter Hanson** and Virologist **Wen-shi Tsai** updated APSA members on the Center's tomato breeding work for resistance to diseases caused by *Tomato yellow leaf curl virus*; Socioeconomist **Madhu Bhattarai** presented an analysis of chili production and marketing in Central Java, Indonesia; Molecular Biotechnologist **Roland Schafleitner** discussed advances in marker-assisted selection; Nutritionist **Ray-yu Yang** briefed the group on bioactive compounds

in bitter melon and germplasm evaluation; Genebank Manager **Andreas Ebert** explored patents and plant genetic resources; Pepper Breeder **Paul Gniffke** discussed progress toward breeding heat-tolerant sweet peppers; Plant Pathologist **Jaw-fen Wang** reviewed resistance markers for bacterial wilt in tomato; Virologist **Lawrence Kenyon** looked at the prospects for finding *Capsicum* species resistant to common and emerging viral diseases in Asia; and Entomologist **Srinivasan Ramasamy** reviewed progress in the development of insect resistant vegetable varieties.

Justin Rakotoarisaona, Secretary General of the African Seed Trade Association (AFSTA), shared his perspective on private-public partnerships for seed sector development in Africa, noting a new trend in involving the private sector at the beginning of seed policy development, and the desire to forge linkages with Asia's seed sector.

The **field tour** is always a highlight of the APSA-AVRDC workshop. On

12 May, participants guided by **Wen-shi Tsai, Peter Hanson, Paul Gniffke, Chung-cheng Lin** and **Deng-lin Wu** saw a preliminary yield trial of multiple TY tomato lines, the International Sweet Pepper and Chili Pepper Nurseries, a bitter melon trial, an advanced generation selection of cucumber, and the AVRDC Demonstration Garden.

A better bitter gourd: planning for success



A three-day planning workshop for the MOCHI project— *Momordica charantia* for Health and Income— also known as “A better bitter gourd: Exploiting bitter gourd (*Momordica charantia* L.) to increase incomes, manage type 2 diabetes, and promote health in developing countries” was held at AVRDC headquarters from 3-6 May 2011.

The three-year project funded by the Federal Ministry for Economic Cooperation and Development, Germany (BMZ) aims to create a link between agriculture, socioeconomics, medicine and nutrition by exploring the potential of bitter gourd in diabetes management. The holistic project design encompasses germplasm selection to field trials, laboratory

compound analysis to animal and human trials, and finally the development of agricultural and nutritional strategies. Project study sites are located in Coimbatore and Ludhiana (India), Moshi and Arusha (Tanzania), Giessen (Germany), and Taipei and Tainan (Taiwan).

Project manager **Ray-yu Yang**,



Momordica charantia for Health and Income Project Planning Workshop
3~6 May 2011, Tainan, Taiwan

AVRDC- The World Vegetable Center



AVRDC – The World Vegetable Center Nutritionist, welcomed a group of international researchers from AVRDC headquarters and regional centers (South India, East and Southeast Asia, and Africa), Justus-Liebig University (Germany), Punjab Agricultural University (India), Avinashilingam Deemed University for Women (India), Kilimanjaro Christian

Medical Centre (Tanzania), and National Taiwan University (Taiwan) to the workshop. **Dyno Keatinge**, AVRDC Director General and **Jackie Hughes**, Deputy Director General for Research opened the workshop sessions with remarks on the contribution of interdisciplinary vegetable research to health.

The project collaborators discussed details and responsibilities, and developed standardized protocols for field trials, the preparation of bitter melon samples for analysis, and socioeconomic surveys. Presentations and vigorous discussions paved the way for future successful project implementation.

A few testimonials from the workshop:

“The workshop again proved that what we thought was a big world has been reduced to a village.” -- Dr. Mark Swai, Kilimanjaro Christian Medical Centre

“It is the first time I have participated in a project where a specific crop is tied to a specific public health problem.” -- Chris Ojiewo, AVRDC Regional Center for Africa

“This has been an enriching experience, to be able to interact in this multinational project. Thank you for including us in the project. It was a memorable workshop.” -- Dr. Premakumari, Avinashilingam Deemed University for Women

“The scope of the project is breathtaking. This project has the potential to answer important scientific questions and alleviate a health problem.” -- Peter Hanson, AVRDC – The World Vegetable Center

A website for the project is currently under construction and will be available in early June. For more information on the MOCHI project, please contact Jen Wen Luoh.

-- Jen Wen Luoh, Assistant Specialist in Nutrition
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Molecular breeding for crop improvement



With financial support from the Taiwan Ministry of Foreign Affairs, AVRDC – The World Vegetable Center hosted a **Molecular Breeding Workshop** at AVRDC headquarters from 19-21 April 2011. Twelve researchers from Taiwan Council of Agriculture institutions and several research assistants from AVRDC participated in the workshop. **IR Nagaraj**, AVRDC Human Resources Director, welcomed the delegates. On the first day, the participants gave presentations introducing their research institutes and their work. Over the next two days AVRDC Head of Molecular Breeding **Roland Schafleitner** and researchers **Vivian Wang**, **Jean Lin**, **Shu-mei Huang** and **Joyce Yen** discussed marker development, genotyping, genetic mapping, quantitative trait loci analysis and association genetics



Molecular Breeding Workshop, 19~21 April 2011

AVRDC – The World Vegetable Center, Shanhua, Tainan, Taiwan



analysis in presentations and practical exercises. **Mandy Lin**, Global Technology Dissemination, guided workshop participants through the AVRDC Demonstration Garden, and researcher **Vivian Wang** gave a tour of the biotechnology facilities. Participants enjoyed a delicious welcome dinner and a barbecue party on the second day of the workshop prepared by **Sylvia Hsu** and the staff of **Food and Dormitory Services**.

On the afternoon of April 21, IR Nagaraj delivered the concluding remarks and handed over a workshop certificate and souvenir to every participant. Feedback received from participants was generally positive, and indicated the workshop successfully presented the uses of molecular breeding in crop improvement.

-- Roland Schafleitner
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40 years of service to tropical agriculture



Four decades ago, a research and development institute dedicated to alleviating poverty and malnutrition in Asia by increasing the supply and quality of vegetables was established in Taiwan. Today, AVRDC – The World Vegetable Center operates on a global scale across Asia, Africa, and Oceania. Future issues of Fresh will track the Center’s history and progress through photos.



An idea becomes a reality

In 1962, **Frank D. Parker** of the United States Agency for International Development advocated the creation of a vegetable research center in Asia to colleagues in the international development community. Nine years later, a Memorandum of Understanding creating the **Asian Vegetable Research and Development Center** was signed in Taipei, on **22 May 1971**. The official signers were S.C. Hsieh, Director, Project Department, **Asian**

Development Bank; Osamu Itagaki, Ambassador of **Japan**; Kae-Won Kim, Ambassador of **Korea**; Pelayo F. Lamas, Ambassador of the **Philippines**; Sanong Nisalak, Ambassador of **Thailand**; Walter P. McConaughy, **United States** Ambassador; Nguyen Van Kieu, Charge d’Affairs, **Vietnam**; and Chow Shu-Kai, Minister of Foreign Affairs, **Taiwan**.



The Center in the news



Danielle Nierenberg of the **Worldwatch Institute** mentioned the Center's efforts to improve indigenous crops and make them available to farmers in a recent editorial published on the **ChinaDailyUSA** website. The Institute continues to be a strong promoter of indigenous vegetables, which have been neglected by agricultural researchers and investors despite their widespread consumption.

http://www.chinadaily.com.cn/opinion/2011-05/13/content_12502242.htm

Narinder Dhillon, cucurbit breeder in East and Southeast Asia, shared two recent news items, one from his hometown of Chandigarh, India and the other from his alma mater, Punjab Agricultural University. The **Hindustan Times Chandigarh** reported on 15 farmers in the Doaba region of Punjab that have formed the **Global Healthy Vegetable and Fruit Marketing Cooperative Society**. The cooperative aims to diversify wheat and paddy production with high value vegetables such as tomato and peppers grown in net houses. The fresh vegetables, produced without pesticides, will be delivered directly to consumers. More than 1000 small-scale farmers will also participate in the scheme.



"Putting a veg into wheat-paddy cycle," Hindustan Times, 14 May 2011 <http://tinyurl.com/6favcfd>



The Center's seminal role in developing and promoting improved **mungbean cultivars** to diversify crop rotations, increase farmer incomes, and improve nutrition in northern India was recognized by **Punjab Agricultural University**, one of the partners in the ongoing effort to popularize "summer moong" cultivation in the region. Under the Seed Village Program, seed of mungbean 'SML 668' was distributed free of cost to farmers. PAU scientists monitored the farmers' plots to ensure good crops and the seed produced was distributed from farmer to farmer, which led to rapid dissemination of the improved variety.

"PAU's role in promoting summer moong lauded by ICAR ADG," Punjab Agricultural University

<http://tinyurl.com/6f2nr9k>

Visitors



(l to r): Andreas Ebert briefs Yin-Fu Chang, Masoud Al-Marri, Faleh Al-Thani, and Dyno Keatinge on current operations in the AVRDC genebank. Qatar's domestic vegetable production currently meets about a quarter of the demand. With protected agriculture, vegetable growers could supply 80-90% of the country's fresh produce.

Masoud Al-Marri, Director of Qatar's Biotechnology Center, and **Faleh Al-Thani**, Assistant Deputy Minister of Qatar's Ministry of the Environment toured the Center on 13 May 2011. The visitors met with AVRDC Director General Dyno Keatinge, Deputy Director General for Administration and Services Yin-fu Chang, and researchers Peter Hanson, Paul Gniffke, Roland Schafleitner, Andreas Ebert, Greg Luther, and Deng-lin

Wu to discuss potential areas of collaboration and molecular breeding technologies. On 16 May, Yungkuang Huang, specialist in Genetic Resources and Seed, accompanied the visitors on a trip to the Taiwan Agricultural Research Institute in Taichung, where they were briefed at the National Plant Genetic Resources Center.



Michael Sutherland, Deputy Speaker of the Western Australia Legislative Assembly, assembly members **John McGrath**, **Antonio Krsticevic**, and **Michael Nahan**, accompanied by **Mrs. Nahan**, met with Dyno Keatinge and Yin-fu Chang on 11 May 2011 to discuss issues of vegetable production in the state, including the potential role of mungbean in Australian agriculture.

(top left, l to r) AVRDC's Greg Luther with Michael Sutherland and John McGrath. (below) Michael Nahan.



RCA visits ESEA



Abdou Tenkouano, (2nd from left) visits TVRC's Indigenous Vegetable Garden with East and Southeast Asia staff: (l to r) **Supunsa Phethin**, **Pishayapa Thongmalai**, **Robert Holmer** and **Sopana Yule**.

On his flight back from Taiwan, where he attended AVRDC's Institutional Management and the Board of Directors Meeting, **Abdou Tenkouano**, AVRDC Regional Director for Africa (RCA), made a stopover in Bangkok to interact with his colleagues in the East and Southeast Asia Regional Office (ESEA) and meet with representatives of Kasetsart University (KU) to explore opportunities to further strengthen the collaboration between the two regions.

On 19 April, Abdou went to Kamphaeng Saen to see the renovation work at ESEA's

Research and Training Station, which is being carried out with the financial support of the Ministry of Foreign Affairs, Taiwan. Together with **Robert Holmer**, ESEA Regional Director, and several staff, he enjoyed a stroll through the indigenous vegetable garden of Kasetsart University's Tropical Vegetable Research Center (TVRC), where he got acquainted with rice paddy herb (*Limnophila aromatica*) and Vietnamese coriander (*Polygonum odoratum*), two Southeast Asian indigenous vegetables not commonly known in Africa. Robert introduced Abdou to several KU representatives, including **Anamai Damnet**,



(Top - l to r): **Robert Holmer** introduces **Sirikul Wasee**, Director of KU's Tropical Vegetable Research Center to **Abdou Tenkouano**.

Assistant to the KU President for Education and International Affairs; **Sirikul Wasee**, Director, TVRC; **Piyanath Phagamas** and **Jutamas Romkaew**, Seed Technology experts in the Department of Horticulture and Agronomy, respectively; **Anyamanee Auvuchanon**, Vegetable Breeder, Department of Horticulture; and **Naroon Waramit**, Forage and Biomass Crop Production, Department of Agronomy. **Kanokwan Laoaroon** from the International Affairs Office facilitated a guided tour for Abdou of KU's famous insect dome and museum.



Transitions

Robert Holmer (r), Regional Director, East and Southeast Asia, and **Victor Afari-Sefa**, new Global Theme Leader – Consumption, met in Bangkok on 29 April 2011 to discuss the handover of the Theme Consumption leadership. Robert has served as the theme leader since June 2010.

AVRDC inaugurates office, research & training station in East and Southeast Asia



(Left): AVRDC Director General **Dyno Keatinge** and East and Southeast Asia Director **Robert Holmer** cut the ribbon at the inauguration of AVRDC Bangkok office, Bangkok.

(Right - l to r): **Sombat Chinawong**, **Dyno Keatinge**, **Michael Yiin**, **Robert Holmer** and **Sirikul Wasee** after the unveiling ceremony

AVRDC – The World Vegetable Center’s East and Southeast Asia (ESEA) Regional Office based in Thailand, inaugurated newly renovated offices at Kasetsart University’s (KU), Bangkok campus in Bangkok and the Research and Training Station at KU’s Kamphaeng Saen campus in Nakhon Pathom province. The ceremonies were held on May 18 and 19, 2011, respectively.

The renovation of the administrative and research facilities of ESEA was made possible through the generous support of the Ministry of Foreign Affairs (MOFA) of Taiwan.

In Bangkok, the ribbon-cutting was led by **Dyno Keatinge**, AVRDC Director General, assisted by **Robert J. Holmer**, ESEA

Regional Director. **Grisana Linwattana** from the Horticultural Research Institute of Thailand’s Department of Agriculture and **Somsakdi Tabtinthong**, KU’s Director of International Affairs under the Office of the President of KU, participated in the event.

At ESEA’s Research and Training Station, **Michael S. Yiin**, advisor under the Political Division Taipei Economic and Cultural Office (TECO) in Thailand, **Sombat Chinawong**, Vice President, Kasetsart University Kamphaeng Saen campus, **Dyno Keatinge**, **Sirikul Wasee**, Director of the KU Tropical Vegetable Research Center and **Robert Holmer** cut the ribbon and unveiled a plaque recognizing Taiwan’s support of AVRDC. A tour of the facilities, laboratories

and demonstration sites of ESEA’s Research and Training Station followed the ceremony.

On both occasions, **Dyno Keatinge** expressed his gratitude to the Taiwan Ministry of Foreign Affairs for supporting AVRDC. **Michael Yiin** recognized AVRDC’s efforts in the region and urged the continuing partnerships and cooperation with Taiwan and Thailand.

10,000 vegetable seed kits for Thailand



(l to r): Sombat Chinawong, Dyno Keatinge, Michael S. Yiin and Robert Holmer during the turnover of vegetable seed kits to KU at AVRDC's Research and Training Station.



(Top - l to r): Dyno Keatinge, Suwit Chaikittiyos, Col. Samat Potisa, Robert Holmer, Grisana Linwattana and Piyanuch Naka during the turnover of vegetable seed kits at Horticultural Research Institute, KU, Bangkhen, Bangkok.

AVRDC – The World Vegetable Center East and Southeast Asia (ESEA) presented 10,000 packs of vegetable seed kits to the Royal Thai Army and Kasetsart University (KU) on May 18 and 19, 2011 at the office of the Director of Horticultural Research Institute, Bangkok and at ESEA's Research and Training Station in KU Kamphaeng Saen campus, respectively. **Dyno Keatinge**, AVRDC Director General and **Robert Holmer**, ESEA Regional Director, led the ceremonies.

The kits, each containing seed of mungbean (32 grams), okra (4 grams), and kangkong (62 grams), were produced through the generous support of the Ministry of Foreign Affairs (MOFA) of Taiwan for distribution to communities affected by natural disasters.

Col. Samat Potisa received 5,000 seed kits on behalf of the Royal

Thai Army and expressed his gratitude to AVRDC for the support. The seed kits will be distributed primarily to communities affected by severe flooding in Thailand's Nan Province. **Suwit Chaikittiyos**, Director of the Horticultural Research Institute (HRI) in Bangkok, and **Grisana Linwattana** and **Piyanuch Naka**, both of HRI, also attended.

The other 5,000 kits were received by **Sombat Chinawong**, Vice President of KU Kamphaeng Saen campus. He thanked AVRDC for the seeds, which will later be distributed to communities affected by floods and landslides in Krabi Province. He acknowledged the significant contribution of AVRDC in alleviating poverty and decreasing malnutrition in the developing world, thanked the government of Taiwan for its

financial support, and vowed to support AVRDC and its activities in the future.

Dyno Keatinge noted the importance of producing and consuming health-promoting vegetables. He thanked the Taiwan Ministry of Foreign Affairs for its support in scaling up the Center's activities aimed to address nutritional crises and the rehabilitation of vegetable production in disaster-affected farming communities in the region.

Planning in practice

Head of Global Technology Dissemination **Greg Luther** and Coordinator of the Center's Solomon Islands Smallholder Garden Project, **Suz Neave**, met with members of the **Areatakiki Farmers Group** in Honiara, Guadalcanal on 15-21 April 2011 to

plan a demonstration site and discuss the marketing contract the group has with a local hotel, which commits the group to supply vegetables to the hotel on a scheduled basis. Group members conducted a SWOT (strengths, weaknesses, opportunities and

threats) analysis for the proposed demonstration site, and discussed options for training, pest control, seed production, and financial planning.

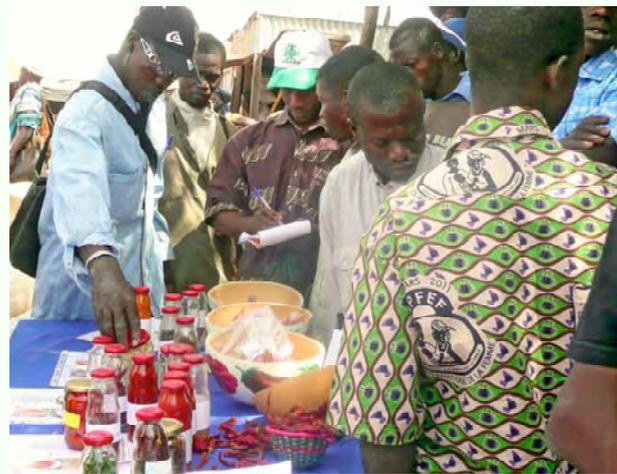


Top: (l) The Areatakiki Farmers Group met to plan for future endeavors, including a demonstration site. **(r)** Drawing a "mind map" of pest control issues. Mind mapping helps participants visualize the links between different aspects of an issue.

Center: Farmers vote to prioritize strengths, weaknesses, opportunities and threats.

Bottom: (l) Presenting the necessary inputs required for vegetable trials and general costs for the demonstration site. **(r)** Presenting sources of income to pay for the demonstration site costs.

Mali's marketplace



Visitors gather at the AVRDC stall to view a vegetable processing demonstration.

The weekly market in **Bandiagara, Mali** is the major venue for fresh produce commerce in the area. Men transport shallots and millet by foot, by scooter, or by local transportation. Women bring small quantities of *soumbala* (a local condiment made from seed pods of the Nere tree) peanuts, roselle, peanut butter, and mangoes to sell.

Staff from AVRDC – The World Vegetable Center's **Mali office** set up a stall at the market to promote new vegetable varieties and other aspects of the Center's work. Five vegetable producer groups helped the AVRDC team share information with farmers who were not familiar with the new varieties.

Onions 'Violet de Galmi' and 'FB 01' produced by local farmers were on sale at the stall. Staff also informed visitors about 'Prema,' an onion tested in Kirina (in southern Mali) and adapted to the rainy season. Visitors were interested in the new onions and requested seed to carry out trials on their own farms.

In March 2011, Mali's National Variety Release Office prepared a catalogue of new vegetable varieties that have been released to expand

market options for farmers. AVRDC staff discussed the new varieties with farmers who stopped by the stall, and also explained how tomatoes, onions and other new vegetable varieties can be processed to extend market sales.

Farmers noted the following points about new vegetable varieties sold in the Bandiagara market:

Okra: Despite its late start in fruiting, the producers liked 'Torigan,' a variety with fruit larger and smoother than the local variety. Producers felt that if the okra crop had been established in July, results would have been better than what was achieved.

Eggplant: Variety 'Keur M'bira N'Dao' was appreciated for its resistance to disease and size of fruit. Variety 'N. 24' was favored for taste and texture—consumers noted that the fruit is softer compared with the local variety. Eggplant was sold at 25 FCFA per piece for large fruit and 3 to 50 FCFA for small fruit.

Golden Tomato: At Bandiagara market, the first crop sold out quickly, at 50 FCFA per kg. The second harvest sold for 350 FCFA per kg.

Chili: 'Nisondia' had larger fruit than the local variety and was less pungent. The entire harvest was sold.

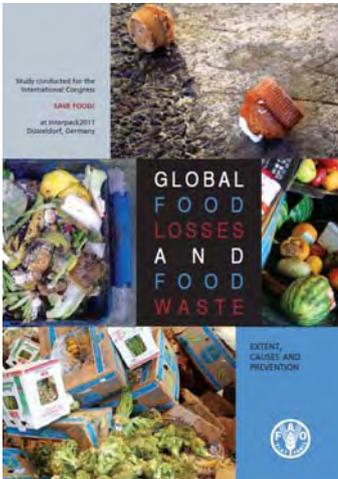
Onion: About 10% of production was consumed in salads, sauces, and gravies. 'Violet de Galmi' was sold at 300 FCFA-350 FCFA per kg, 'FB 01' at 300 FCFA.

Roselle: Most families grew their own roselle for consumption. Many visitors to the stall did not know the leaves of roselle are edible.

At the AVRDC stall, visitors sampled food prepared with the onion variety 'Violet de Galmi.' In evaluations visitors said the taste of the onion met their expectations, and that the price was acceptable.

-- Theresa Endres
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inside insight



Cutting food waste to feed the world

About one-third of the food produced for human consumption every year—approximately 1.3 billion tonnes—is lost or wasted. Global Food Losses and Food Waste, a report published by the UN Food and Agriculture Organization, notes that reducing losses could have an "immediate and significant" impact on livelihoods and food security.

Key findings

- Industrialized and developing countries waste roughly the same quantities of food — respectively 670 and 630 million tonnes.
- Consumers in rich countries waste almost as much food (222 million tonnes) as the entire net food production of sub-Saharan Africa (230 million tonnes).
- Fruits and vegetables have the highest wastage rates of any food.
- The amount of food lost or wasted every year is equivalent to more than half of the world's annual cereals crop (2.3 billion tonnes in 2009/2010).

Losses and waste

The report distinguishes between food loss and food waste. Food *losses*—occurring at the production, harvest, postharvest and processing phases—are most important in developing countries, due to poor

infrastructure, low levels of technology and low investment in food production systems.

Food *waste* is more of a problem in industrialized countries, most often caused by both retailers and consumers throwing perfectly edible foodstuffs into the trash. Per capita waste by consumers is between 95-115 kg a year in Europe and North America, while consumers in sub-Saharan Africa and South and Southeast Asia each throw away 6-11 kg a year.

Total per capita food production for human consumption is about 900 kg a year in rich countries, almost twice the 460 kg a year produced in the poorest regions. In developing countries 40 percent of losses occur at postharvest and processing levels, while in industrialized countries more than 40 percent of losses happen at retail and consumer levels.

Food losses during harvest and in storage translate into lost income for small farmers and into higher prices for poor consumers.

Squandering resources

Food loss and waste squander resources, including water, land, energy, labor, and capital, and needlessly produce greenhouse gas emissions, contributing to global warming and climate change.

In developing countries the problem is chiefly one of inadequate harvest techniques, poor postharvest management and logistics, lack of suitable infrastructure, processing and packaging, and lack of marketing information, which would allow production to better match demand. Strengthening the food supply chain by assisting small farmers to link directly to buyers is one solution. The private and public sectors should also invest more in infrastructure, transportation and in processing and packaging.

In middle- and high-income countries food losses and waste stem largely from consumer behavior and lack of communication between different actors in the supply chain.

inside insight

Changing consumer attitudes

Consumers in rich countries are generally encouraged to buy more food than they need. "Buy three, pay two" promotions are one example, while oversized ready-to-eat meals produced by the food industry are another. Restaurants frequently offer fixed-price buffets that spur customers to heap their plates.

Generally speaking, consumers fail to plan their food purchases properly, the report found. That means they often throw food away

when "best-before" dates expire.

Education in schools and political initiatives are possible starting points to changing consumer attitudes. Consumers should be taught that throwing food away needlessly is unacceptable, given the limited availability of natural resources. It is more effective to reduce food losses than increase food production to feed a growing world population.

Read more:

Global Food Losses and Food Waste: Extent, Causes, and Prevention

[http://www.fao.org/ag/ags/ags-division/publications/publication/en/?dyna_feffuid\]=74045](http://www.fao.org/ag/ags/ags-division/publications/publication/en/?dyna_feffuid]=74045)

Errata

M.L. Chadha, former Regional Director for South Asia, worked for the Center for 20 years, not 17 years as stated in the May 3 issue of FRESH ("Transitions"). Dr. Chadha, our apologies for the error!

They look good enough to eat...



These beautiful **vegetable soaps** made from pure natural ingredients are handcrafted for AVRDC - The World Vegetable Center by Huang Mao-Chai of Chaiyi, Taiwan. Mr. Huang produced the soap molds with vegetables harvested from the AVRDC Research Fields and Demonstration Garden. Each set includes three bars carefully selected to represent the world's most popular and nutritious vegetables. Although these soaps may look good enough to eat, we suggest seeking out the real thing for your next meal: For good health, eat five to nine servings of vegetables a day.



The 2011 soap selection:

*African eggplant
Sweet pepper
Pumpkin
Eggplant
Tomato*



Handmade soap set: 3 bars/set. NTS\$550.0, US\$19.23

To **order** this unique gift, contact Kathy Chen, kathy.chen@worldveg.org