

fresh



News from AVRDC – The World Vegetable Center

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Agrobase software package introduced to AVRDC researchers

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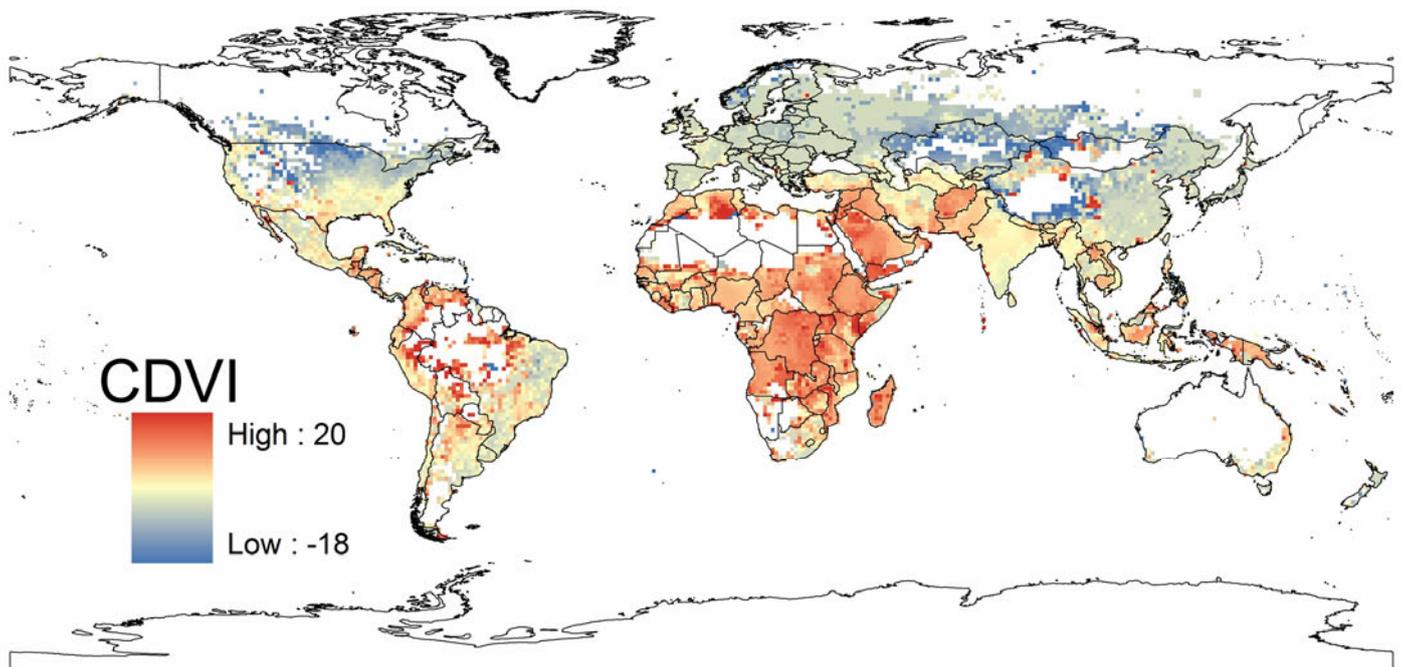
Thailand's Rong Nam vegetable farming system

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A map of vulnerability

Combining weather and human census data reveals a troubling scenario



Global climate-demography vulnerability index (CDVI) showing local vulnerability of human populations to climate change based on ecological and demographic models. The regions in red are expected to be most negatively impacted by climate change. White regions correspond to human density values of zero in the global population database.

A new study from **McGill University's Department of Natural Resource Sciences** indicates that people living in low

latitude tropical regions will be the most affected by climate uncertainty. The research team combined **climate change data**

with censuses covering close to 97% of the world's population to forecast potential changes in local populations for 2050.



If populations continue to increase at the expected rates, countries likely to be the most vulnerable will be in central South America, the Arabian Peninsula and much of Africa.

In these areas, a relatively small increase in temperature will have serious consequences on a region's ability to sustain a growing population. "It makes sense that the low latitude tropical regions should be more vulnerable because the people there already experience extremely hot conditions which make agriculture challenging," said Jason Samson, the PhD candidate who led the McGill research team. "An increase in temperature over the next few decades will only make their lives more difficult in a variety of ways."

Climate uncertainty challenges plant breeders worldwide to develop crops capable of withstanding extremes: high heat, drought, heavy rainstorms, flooding, high winds.

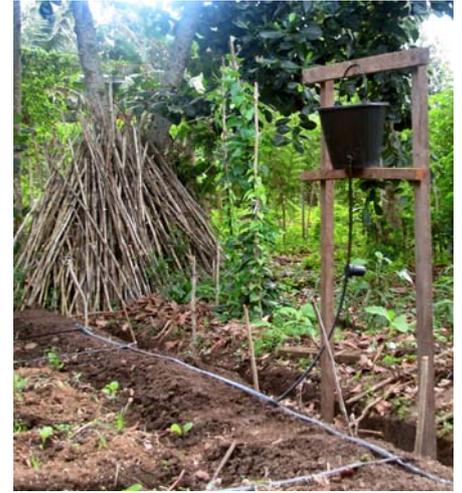
The world's 15 or so staple crops have long cropping cycles and tend to be vulnerable to climate threats. In contrast, **vegetable crops**—

types of which number in the thousands—have shorter cropping cycles and are faster growing than most staples, offering those most affected by climate change a means to improve their diets and incomes.

With such botanical variety, a vegetable can be found to suit almost any agroecological niche. Researchers at AVRDC – **The World Vegetable Center** have developed heat- and drought-tolerant tomato, short-duration, high yielding mungbean, and other vegetables for increasingly extreme climate conditions. **Indigenous**



vegetables—species from specific locations that are typically consumed as part of traditional diets—are often hardy and highly nutritious. Although these underutilized species largely have been overlooked by donors and international agricultural research initiatives, AVRDC is committed to collecting germplasm, improving seed, researching production methods, and promoting consumption of these valuable, well-adapted species. The Center's **mature production technologies**, such as grafting and low-cost drip irrigation, also can help farmers gain a measure of control over their growing conditions in an increasingly uncertain climate.



In short, versatile vegetables can help farmers spread the risk.

The McGill study also points to clear inequities in the causes and consequences of climate change: the countries that have contributed the least to climate change, based on their average per-capita carbon dioxide emissions, are nevertheless predicted to be the most vulnerable to its impacts.

Read more

Samson J, Berteaux D, McGill BJ, Humphries MM. 2011. Geographic disparities and moral hazards in the predicted impacts of climate change on human populations. *Global Ecology and Biogeography*, no. doi: 10.1111/j.1466-8238.2010.00632.x

<http://onlinelibrary.wiley.com/doi/10.1111/j.1466-8238.2010.00632.x/abstract>

Agrobase II: A better way to deal with data



Front row (l to r): Paul Gniffke, Plant Breeder (Pepper/Allium); Roland Schafleitner, Head of Molecular Genetics; Ramakrishnan Nair, Vegetable Breeder-Legume, Regional Center for South Asia; Dieter Mulitze, President, Agronomix Software, Inc.; Peter Hanson, Plant Breeder; and Narinder Dhillon, Vegetable Breeder-Cucurbits, AVRDC East and Southeast Asia.

Back row (l to r): Chei-yin Lee, Hsin-yi Chang, researchers from Known-you Seed Company; Chee-Wee Tan, Principal Research Assistant, Tomato; Chung-cheng Lin, Principal Research Assistant, Cucurbit; Shu-fen Lu, Research Assistant, Tomato; Miao-rong Yan, Principal Research Assistant, Genetic Resources and Seed Unit; Jin Shieh, Assistant Specialist, Pepper; Susan Lin, Principal Research Assistant, Pepper; Vicky Cherng, Assistant Specialist, Bulb Allium; Ruby Hsiao, Assistant Specialist, Indigenous Vegetables; Supunsa Phethin, Research Assistant Breeding, AVRDC East and Southeast Asia; and Jen-fong Kuo, Senior Research Aide, Indigenous Vegetables

Seventeen Center scientists received training in how to use **Agrobase**, a comprehensive database management software package for plant breeders and researchers, from 7-9 March 2011 at headquarters. **Dieter Mulitze**, Agronomix Software, Inc. president, led the training. By linking data types, including variety names, experiment names, field names, soil conditions, weather, and much more, Agrobase can help breeders prepare plot plans for replicated trials and extract meaningful information from the thousands of data points generated by extensive variety evaluation programs.

Farewell



Right: Unpacking the gift – a digital photo frame presented by the Center.
Left: Sylvia Hsu (l), Manager, Food and Dormitory Services and Edwin Javier

Edwin Javier, International Variety Development Coordinator, completed his contract with AVRDC on 9 March 2011. During his tenure Edwin developed global contacts to gather data about the use of the Center's vegetable lines and guided the creation of an online seed catalog to promote and disseminate improved varieties. He was instrumental in establishing the Center's linkages with donors and partners in Oceania, helping to build a strong foundation for future endeavors in the region. Colleagues greatly appreciated Edwin's effort to streamline the seed ordering process and welcomed his insightful commentary on scientific papers. He will return to the Philippines, and after a brief holiday, consider several career options. Edwin's warm smile and gentle demeanor will be missed by all. Best to you, Edwin – stay in touch!



The Center in the news



AVRDC – The World Vegetable Center’s effort to promote healthier, more diverse diets through increased vegetable consumption claimed the front page of *Palawija News*, the newsletter of the **United Nations Economic and Social Commission for Asia and the Pacific/Centre for Alleviation of Poverty through Sustainable Agriculture (ESCAP/CAPSA)**. “The Way Ahead for Diversified Diets and Sustainable Food Systems in Asia and the Pacific” co-authored by CAPSA Director **Katinka Weinberger** (a former AVRDC socioeconomist) and AVRDC Scientist **Warwick Easdown**, Nutritionist **Ray-yu Yang**, and Director General **Dyno Keatinge** outlines fundamental changes in policies, science, and agricultural practices to expand the current narrow food base, and emphasizes the need for nutritional as well as food security.

Taiwan’s *Organic Lifestyle* magazine recently published an article about the Center’s efforts to achieve the **Millennium Development Goals** by increasing the availability of micronutrients in diets for pregnant women and children through increased vegetable consumption, improving vegetable lines, and improving livelihoods in developing countries. The Center’s low input agricultural practices to maintain soil fertility and new disease resistant varieties were noted for their contribution to a sustainable environment.



Improved varieties make news over the years, especially when they have a significant impact on agriculture and health in developing countries. ‘**Maash-2008**’ and ‘**Mai-2008**’—two varieties of AVRDC’s short-duration, high yielding improved **mungbean**—were released in Afghanistan in 2009. The International Center for Agricultural Research in the Dry Areas (ICARDA), a partner in mungbean research, noted the release in a recent newsletter.

“Improving food security in sub-Saharan Africa through increased utilization of Indigenous Vegetables: Studies on seed production and agronomy of major African vegetables”—a project led by the Center and the **Natural Resources Institute (NRI)** from 1998-2001— was highlighted on the Research for Development website hosted by the UK **Department for International Development**. The project aimed to explore appropriate production techniques for target species and to fully exploit their nutritional value.



Welcome



Jian-Cheng (Jan) Chang begins his appointment as a Postdoctoral Fellow – Molecular Entomology under the GIZ-funded *Maruca vitrata* project on 16 March 2011. He will be based at headquarters and report to Srinivasan Ramasamy, Entomologist. Jan is a PhD candidate in Biomedical Engineering and Biotechnology at the University of Massachusetts, Boston and will be defending his dissertation this summer.

Email: jan.chang@worldveg.org; phone extension: 420.

India: Training trainers in integrated pest management



IPM training session participants

cowpea, bottle gourd, and garden pea. AVRDC - The World Vegetable Center entomologist **R. Srinivasan**, project coordinator **Satish K. Sain**, site coordinator **M. Ravishankar**, and scientific officer **Bharat Bhushan** led the training, emphasizing integrated pest management strategies and safer use of pesticides. Participants were keen to learn from and interact with the Center's resource team.

The **Regional Center for South Asia** and **Sir Ratan Tata Trust** project partners **Nav Bharat Jagriti Kendra (NBJK)** and **Professional Assistance for Development Action (PRADAN)** hosted a training session and

workshop on "Insect pests and diseases: identification and IPM" in Ranchi, Jharkhand, India on 8-9 February 2011. Twenty-five trainers from partner NGOs reviewed methods to identify insect pests and diseases of tomato, eggplant, okra,



Left: Getting participants involved in the classroom.



Right: Training trainers ensures useful farming strategies will be widely disseminated through many channels.



The ultimate in water use efficiency: Thailand's *Rong Nam* vegetable farming system

Photos: Madhusudan Bhattarai

Socioeconomist **Madhusudan Bhattarai**, who has a special interest in **water use**, recently took note of some unusual vegetable production practices in Thailand when an AVRDC vegetable-legume project team visited the area for a baseline survey in February 2011. In Khot Cha San village, Pathum Thaini province, about 100 km north of Bangkok, vegetables are irrigated using a pump mounted on a boat. Farmers also use boats to harvest yard-long bean and sponge gourd.

This traditional farming system, known as *Rong Nam*, can be found in Thai lowlands with high water tables. Vegetables are planted on ridges, and water flows through wide furrows spanned by trellises. The furrow water irrigates plants and provides rapid transport lanes for farmers, who float down the furrows in their boats to harvest produce from their fields. Small fish that thrive in the furrow water are caught and sold for supplementary income.



Above: Sponge gourd, (*Luffa aegyptiaca*) a popular crop in *Rong Nam* cultivation.

Bottom left: Irrigating plants with a boat-mounted pump.

Bottom right: Vines grow over the furrows on bamboo trellises. Farmers easily harvest gourds, beans and other produce hanging down from the vines as they float by in boats.



Cucurbit breeding activities in Southeast Asia capture attention of seed company representatives



Left (l to r): Visiting a TVRC research field, **D.A.A. Deshpande**, JK Agri Genetics Ltd., **Narinder Dhillon**, Vegetable Breeder, AVRDC East and Southeast Asia, **Krung Sritatane**, vice director of TVRC, **M.K. Pande**, JK Agri Genetics Ltd.

Center left: Visiting a bitter gourd plot.

Center right: Visiting a pumpkin research field.

Bottom left: Robert Holmer, Director, AVRDC East and Southeast Asia, hands a souvenir to D.A.A. Deshpande.

Bottom right: Robert Holmer presents a souvenir to M.K. Pande.



D.A.A. Deshpande and **M.K. Pande** of JK Agri Genetics Ltd., a member of the Asia Pacific Seed Association (APSA), visited AVRDC's **Regional Office for East and Southeast Asia** on 23 February 2011 to discuss opportunities for research collaboration. The visitors were particularly impressed with AVRDC's pumpkin and bitter gourd breeding activities, led by cucurbit breeder **Narinder Dhillon**. Drs. Deshpande and Pande also toured Kasetsart University's (KU) tomato



and chili fields together with **Krung Sitadthani**, a vegetable breeder from KU's Tropical Vegetable Research Center (TVRC).

