Participatory appraisal of stakeholders’ needs conducted in Bali and East Java

A participatory appraisal (PA) was conducted on 23 May – 3 June 2011 to determine the needs of farmers and other stakeholders at project sites in East Java and Bali. The PA was the initial large-scale field activity for the project, “Mobilizing vegetable genetic resources and technologies to enhance household nutrition, income and livelihoods in Indonesia,” which is scheduled for 2011-2014. Project activities will focus on the districts of Kediri and Blitar in East Java, and Tabanan and Bangli in Bali. The sites were selected because they are important vegetable production areas but crop yields are still far below their potential.

The PA team conducted semi-structured interviews with farmers regarding seed issues, vegetable varieties planted, crop management practices, pest problems and how the farmers cope with them, soil fertility issues, postharvest practices, vegetable consumption, and more. The team also directly observed the farmers’ vegetable fields to gain further information. Soil samples were taken to determine pH and soil texture. The team visited vegetable markets and interviewed marketers to gain insight into marketing opportunities and constraints.

Overall, chili pepper and tomato emerged as the most important crops in the project areas; however, other
Diseases of angled luffa (left) and tomato (right) cause serious crop losses for farmers in Menang village of Pagu, Kediri, East Java.

Anthracnose (top middle) and virus (bottom middle) infestations were prevalent on peppers in many locations in East Java and Bali.

Participatory appraisal team interviewing different farmer groups from the districts of Kediri (top left), Blitar (top right) in East Java, and Tabanan (bottom left) and Bangli (bottom right) in Bali.

vegetables such as cabbage, shallot and carrot are important in certain locales. Virus and anthracnose infestations were prevalent on peppers in many locations, and fruit fly damage was heavy on peppers in Bangli, Bali. Farmers in Menang village of Pagu, Kediri have almost given up trying to grow tomatoes, due to serious crop losses from diseases. The main vegetable market in Kediri receives tomatoes from over 300 km away (Banyuwangi, East Java), so the Menang farmers, who are less than 20 km from this market, have a potential opportunity to supply tomatoes to the market with far lower transportation costs than Banyuwangi growers.
Difficulties with obtaining quality vegetable seed and wide price fluctuations when selling produce were common complaints by farmers in many locations. Soil pH levels were shown to be relatively suitable for vegetable production in all project localities. Farmers are growing vegetables in sandy soils along the edge of Lake Batur in Bali, which is polluting the lake with chemical and nutrient runoff. Postharvest handling practices are minimal in villages and markets that the PA team surveyed.
Shallot is a major crop in Abang Batudinding village of Bangli District, Bali. Farmers harvest the shallots (top left), and keep them on the shelves under a roof for drying (top right), and clean and remove the dried leaves before sale (bottom right).

The main outputs from the PA and planning workshops were better defined and refined plans and priorities for all project activities so that they address the needs of stakeholders in East Java and Bali. The PA teams in each province used a voting process to prioritize areas for research and development (R&D) activities on this project. After some consolidation of topics, the following issues were prioritized for designing future R&D activities:

**East Java**

- Chili pepper diseases and resistant varieties
- Tomato production problems: diseases, resistant varieties, grafting
- Seed supply, production and quality
- Marketing, price fluctuation, value added issues, processing, postharvest
- Soil fertility, erosion, acidity and management
- Vegetable production issues: reducing pesticide use, grafting, netting for nursery, water supply

**Bali**

- Chili pepper diseases and resistant varieties
- Soil and water
- Marketing and price fluctuation
- Reduction of chemical pesticide and fertilizer use
- Seed supply, production and quality

The R&D activities on the above issues are presently being designed by working groups. This project is led by AVRDC–The World Vegetable Center, and project partners include the Indonesian Vegetable Research Institute, Udayana University, Assessment Institute for Agricultural Technology, Agricultural Extension Service, and FIELD Indonesia Foundation (Farmers’ Initiatives for Ecological Livelihoods and Democracy). The project is funded by the United States Agency for International Development (USAID).

**Participatory Appraisal Team**

**East Java and Bali:**

- AVRDC: Greg Luther, Joko Mariyono, Victor Afari-Sefa, Paul Gniffke, Mandy Lin
- Indonesian Vegetable Research Institute: Rakhmat Sutarya, Wiwin Setiawati, Asma Sembiring
- FIELD: Nugroho Wienarto, Arief Lukman Hakim, Endang Sutarya

**East Java:**

- Assessment Institute for Agricultural Technology – East Java: Kuntoro Boga Andri, Sudarmadi Purnomo, Evy Latifah, Hanik Anggraeni Dewi, Putu Bagus Daroini
- Agricultural Extension Service – East Java: Agus Pratomo (Surabaya), Suryo, Yusuf Wibisono (Kediri), Yotti Hadiana, Wawan Dianto (Blitar)

**Bali:**

- Udayana University: Made Supartha Utama, IGP Ganda Putra, Ketut Sumsiarta, Gede Ardha
- Assessment Institute for Agricultural Technology – Bali: Ketut Kariada, Agung Kamandalu, Sagung Nyoman Ariyani, Abiyadun, Sutami, Mahaputra, Made Agus, Ida Bagus Suryawan, Tri Nova Aliati, Yennita Sihombing, Fawzan Sigma Aurum
- Agricultural Extension Service – Bali: Adiyasa, Gedhe Rasa, Karsa, Bagus Sativa
- USAID: Sanath K. Reddy

**Source:** The Participatory Appraisal Team

**Photos:** Greg Luther and Mandy Lin, Global Technology Dissemination; Paul Gniffke, Pepper Breeding, AVRDC-The World Vegetable Center
Home manufacturing of biological agents in Kediri District, East Java

In Menang village, about 10 km northeast of Kediri City in East Java, a small scale ‘bioreactor’ business is making biological pest control available to Indonesian vegetable farmers. Mr. Susanto, a leading member of the local farmers’ association, has established a small business producing several biological plant protection products, including *Verticillium lecanii, Trichoderma*, and a formulation of plant growth-promoting rhizobacteria (PGPR). He distributes these products among local farmers.

Agriculture in Menang is dominated by staple crops (rice and maize) and vegetables (chili, angled luffa, tomato, and eggplant). Farmers grow rice in the rainy season and plant secondary crops and vegetables after harvesting rice.

Susanto obtained initial training and pure cultures in test tube ‘slants’ from the Bogor Agricultural Institute (*Institut Pertanian Bogor, IPB*) and incubated the cultures in sterilized potato broth. The homemade ‘bioreactor’ was a simple assembly of 20-liter plastic bottles, agitated with air supplied from plastic tubing and filters made from commercial water filtration cartridges.

Production of the fungi takes about 10 days, while bacteria are somewhat faster. About 60 liters of finished product can be generated from each slant, and Susanto sells it all locally. The cost of the original isolate from IPB is about US$2.40, and he sells a 1-liter bottle of his product to local farmers for about US$3.

More than 100 farmers have used the bio-agents. They usually purchase the agents from Susanto through a cooperative and apply them weekly to several vegetable crops including chili, eggplant, angled luffa and rape, as foliar sprays. These biological agents can serve to deter diseases, and accelerate crop growth and development. The *Verticillium* fungus can suppress whiteflies, which are the principal vector of ‘virus kuning’ or the yellow virus (pepper leaf curl virus, a geminivirus) which is an increasingly severe problem for chili pepper production in Indonesia.

Members of the farmers’ association vouched for Susanto’s ‘Quality Source’ bio-agents. “I have used the agents since a very long time ago when the agents were first promoted” said Mr. Soetomo, a member of the farmers’ group. “I observed that my vegetable crops (angled luffa and chili) look better because the level of diseases can be controlled. The use of chemical fungicides were reduced.” Another farmer, Mr. Sutarjo, said the reason he applies bio-agents is to protect natural enemies. A third farmer, Mr. H. Soewardi added, “After I noticed my neighboring farmers who applied bio-agents were successfully controlling the pests and diseases, I started to apply too. I applied the agents to maize and sometimes rice. Now my farm is better than the time I was applying a lot of chemical pesticides.”

**Source:**
Paul Gniffke, Pepper Breeding, AVRDC-The World Vegetable Center; Joko Mariyono, Site Coordinator, Vegetable for Indonesia project, AVRDC-The World Vegetable Center; Sarjuli, Pest and Disease Observer, Dinas Pertanian Kabupaten Kediri, Jawa Timur (Agricultural Service of Kediri District, East Java)

**Photos:**
Paul Gniffke; Mandy Lin, Global Technology Dissemination, AVRDC-The World Vegetable Center
AVRDC-distributed pepper lines benefit farmers and processors in Armenia

Hot pepper variety ‘Zspanak’ - prolonged, heavily plicate spiral fruit with intermediate pungency, green when young, turning red at maturity, ideal for canning and culinary design.

Hot pepper variety ‘Kon’ - conical fruit shape with intermediate pungency, light yellow when young, turning to red at maturity.

Tomato and pepper are highly profitable crops for farmers and are consumed by most of the population in Armenia. By providing novel and profitable varieties and hybrids with good adaptation to the local agroclimatic conditions, and disease and pest resistance, local requirements of processing factories and fresh markets can be met.

A Farmer’s Day was organized by the Scientific Center of Vegetable-Melon and Industrial Crops (SCVIC) in September 2010 to promote the selected novel varieties that were introduced from AVRDC-The World Vegetable Center, including hot pepper ‘Zspanak’ (C02408) and ‘Kon’ (C05670); sweet pepper ‘Natali’ (0137-7025); and tomato ‘Armine’ (L01448) and ‘Zeytyn’ (CH154). Many representatives from various departments of the Ministry, specialists, farmers, processing factories, managers of international projects and media outlets participated. The event was reported by the TV channel Kentron and the program delivered information to numerous people.

Mr. Sargis Yeralyan, one of the farmers from the Vosketap community, Ararat Marz, attended the Farmer’s Day and planted two released hot pepper varieties ‘Zspanak’ and ‘Kon’ after the event. He arranged to supply five tons of hot pepper to the Aygi processing plant for canning. Sargis sold his produce at double the average market price. The deal was profitable for the processing plant as well, as the canned peppers sold out quickly. SCVIC plans to expand the production of good quality seeds to meet the high market demand.

Source and photos:
Gayane Martirosyan, Scientific Center of Vegetable-Melon and Industrial Crops