ASEAN-AVRDC Regional Network for Vegetable Research and Development (AARNET)

Expert Consultation on Vegetable Research and Development Priorities in Southeast Asia

21 March 2013, Kasetsart University, Bangkok, Thailand

Summary Report

Introduction

More than 50 participants attended the Expert Consultation on Vegetable Research and Development Priorities in Southeast Asia on 21 March 2013 at Kasetsart University, Bangkok, organized by the ASEAN-AVRDC Regional Network for Vegetable Research and Development (AARNET) with support from the Ministry of Foreign Affairs (MOFA), Taiwan. AARNET Steering Committee members from the 10 ASEAN member states presented their needs for vegetable research and development to scientists from AVRDC – The World Vegetable Center, Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ; Germany), the Food and Agriculture Organization of the United Nations (FAO), Kasetsart University (Thailand), Mahidol University (Thailand), the Taitung District Agricultural Research and Extension Station (Taiwan), and the University of Freiburg (Germany) to identify and prioritize common concerns, research gaps and required development efforts. The detailed program as well as the list of participants are attached as an Annex.

List of priority areas for vegetable research and development

During two working group sessions the following priority areas for vegetable research and development were discussed and identified:

Working group 1 (Germplasm conservation, gene-mining and plant breeding):

1. To promote conservation and sustainable utilization of underutilized vegetables
    - Involvement of farmers and NGOs in on-farm and in-situ preservation:
        - benefits and incentives to farmers to be considered by national and local governments, NGOs, etc. (payment for environmental services, recognition and benefits for farmers conserving biodiversity)
    - Documentation of indigenous knowledge
        - capturing, documenting and preserving local knowledge and sharing with the general public
    - Collection of indigenous/traditional vegetables in highly threatened environments
        - genetic erosion is often caused by the lack of awareness by farmers and communities, often due to economic needs and subsequent over-exploitation of native species
    - National genebank establishments:
        - each country should have at least a (low cost) genebank to preserve valuable plant genetic resources for the medium-term to be used for breeding and research purposes. Safety duplication should also be considered such as sending and conserving duplicates at other locations within the country or in other countries or collaborating institutions, such as AVRDC
    - Capacity building on genebank and germplasm management

        - capacity building should focus on collection, safe management, and medium- to long-term preservation of genetic resources.
    - Need for more information on what genetic resources are available for plant breeders
        - sharing of information within the national and regional institutions, national and regional networks
        - sharing of information and protocols on regeneration and characterization of indigenous/traditional vegetables
    - Collecting of indigenous/traditional vegetables in relation to sustainable horticulture and climate change adaptation for use by current and future generations
        - link between in-situ and ex-situ conservation
        - need to sensitize national governments on the wealth of genetic resources in indigenous/traditional vegetables that can help adapt crops to the challenge of climate change
    - Enhance the utilization of genetic resources conserved in genebanks through full characterization and screening with subsequent documentation and sharing of results among institutions within each country
        - survey of genebanks in ASEAN members states and identifying the capacity needs/ gaps of each country (Gap Analysis)
        - policy and infrastructure support for the medium and long term conservation of germplasms
        - collection of wild relatives of major vegetable crops for breeding and conservation purposes
        - Provision of information and exchange of germplasm with the needed characteristics between partner countries
2. To promote breeding activities for vegetable crops
    - Vegetable crops which should receive focused attention for breeding activities in the region as proposed by each country:
        - Brunei – could not be decided by participants, for referral to vegetable breeders in Brunei
        - Cambodia – could not be decided by participants, for referral to vegetable breeders in Cambodia
        - Indonesia – chili pepper, indigenous vegetable crops
        - Lao PDR– cucumber, pumpkin, tomato
        - Myanmar – tomato, watermelon
        - Philippines – tomato, eggplant and legumes (mungbean)
        - Singapore – chili pepper (resistance to anthracnose and thrips)
        - Thailand – chili, tomato, leafy vegetables, papaya (adaptation to climate change – heat tolerant crops)
        - Vietnam– could not be decided by participants, for referral to vegetable breeders in Vietnam
    - Tomato and chili pepper were identified as crops of common interest in all ASEAN member countries. Breeding activities should particularly focus on adaptation to climate change (i.e. heat

tolerance), resistance and tolerance to prevalent diseases (anthracnose, virus diseases, bacterial wilt) as well as extended shelf life

- Capacity building activities for vegetable breeding are needed in most ASEAN member states. This should include testing of nationally and regionally available varieties and improved lines from AVRDC to identify best locally adapted lines (climate, market)
- The importance of the availability of high quality open-pollinated lines for vegetable growers in ASEAN member states was emphasized.
- The cost of developing hybrids could be reduced by promoting public and private partnerships.
- Indigenous/traditional vegetables are important in most ASEAN member states. Scientists should identify high priority indigenous/traditional vegetables in each country for possible crop improvement and encourage the public and private sectors to invest into corresponding trait specific breeding activities.

3. To test panels of promising vegetable lines from AVRDC in different members states
    - The cost of seeds and shipment will be borne by AVRDC, while member states will bear the cost of conducting the trials
    - At the time of preparing this report, Cambodia, Lao PDR, the Philippines, Singapore and Vietnam agreed to test the following advanced vegetable lines from AVRDC:
        - Cambodia: tomato, chili pepper, eggplant, pumpkin, bittergourd, vegetable soybean, mungbean, yardlong bean
        - Lao PDR: pumpkin
        - Philippines: bittergourd, vegetable soybean, mungbean
        - Singapore: Chinese kale, Chinese cabbage
        - Vietnam: tomato, chili pepper, pumpkin, bittergourd, vegetable soybean, yardlong bean

Working group 2 (Crop management, postharvest, marketing and nutrition):

1. To promote safer vegetable production practices to reduce the use of pesticides and fertilizer, particularly on the major crops such as tomato, pepper, eggplant, yardlong bean, and brassica etc.
    - Overuse and misuse of chemical pesticides and fertilizers is a common phenomenon under intensive vegetable production systems. As a result, consumers tend to associate vegetables with high pesticide residues and as cause of environmental pollution.
    - Biocontrol agents and sustainable crop management practices should be advanced and promoted. AARNET should establish a close linkage with the "*ASEAN Bio-control for sustainable agri-food system*" project, which promotes the use, trade and registration of sustainable agricultural inputs by harmonizing the regulatory framework for bio-control agents in the region.
    - ASEAN Good Agricultural Practice (GAP) for fresh fruit and vegetables was adopted in 2006. It provides standards for the production, harvesting and post-harvest handling of fruits and vegetables to ensure the produce is safe and of good quality for consumers, and the fruit and vegetables are produced and handled in a manner that will not harm the environment, health, safety and welfare of workers in agriculture and food sectors. Several constraints limit the adoption of GAP, such as poor understanding of farmers of related information, poor institutional capacity, and undifferentiating prices of GAP and non-GAP produce etc.

Institutional capacity enhancement and effective extension and dissemination of GAP should be addressed by AARNET.

2. To increase vegetable productivity during off-season to ensure year-round supply of nutritious and health promoting vegetables
    - Abiotic and biotic stresses, such as high temperature, flooding, drought, and outbreaks of insect pests and diseases reduce vegetable yields dramatically. This results in seasonal supply and fluctuating prices of vegetables in the markets and thus may discourage regular consumption of vegetables as part of a balanced diet.
    - Improved, innovative and climate-smart technologies should be developed to increase vegetable yield during off-season. The range of technologies includes improved varieties, water-saving irrigation scheme, input-saving fertilization schemes, improved seedling production; use of stress tolerant rootstocks, protective structures etc.
    - Indigenous/traditional vegetables tend to be more tolerant to stresses. Underutilized stress-tolerant vegetable crops should be identified and production packages developed to promote their cultivation. Multidisciplinary collaboration on development of new technologies should be encouraged, such as participation of engineers to design vertical production systems.
    - When vegetable supply is low, homestead production could provide the very much needed nutrition to the household and community. Thus, home, school and community gardens should be promoted to enhance resilience during lean season. Economic profitability and nutrition contribution of such gardens should be documented.
3. To develop and adopt proper post-harvest and processing technologies that retain vegetable quality and nutritional value, and ensure food safety
    - Vegetables in general have poor shelf life, particularly leafy vegetables. The practices from harvesting, handling, storage, processing, packaging, transportation and marketing determine the degree of post-harvest loss. Descriptions of post-harvest losses generally focus on quantity and overlook the quality traits such as nutritional value and food safety. There is a need to develop interventions through research, particularly focusing on quality traits. Collaboration among stakeholders along the value chain is necessary. Engagement of service providers, such as farmer organizations, credit providers, processors, etc. would enhance the adoption of improved post-harvest practices.
    - Vegetables produced during the main production seasons could be processed and stored to meet the supply gaps during off-season. Interventions on proper processing, which retain or enhance nutritional values of vegetables should be developed and promoted.
4. To develop marketing strategies to promote safe, nutritious and health-promoting vegetables, especially nutrient-dense indigenous/traditional vegetables
    - Price seems to be the main concern of consumers when they purchase vegetables. How to increase their appreciation for the efforts that GAP farmers spend producing vegetables in an environmentally friendly manner? How to help them understand the nutritional values of different vegetables to make health-conscious food choices? Marketing strategies, such as branding and labeling etc., should be developed to enhance market value of vegetables. Many indigenous/traditional vegetables are dense contain more nutrients than the global vegetables. Rural communities tend to have better knowledge about them and may grow them in their

home gardens. Strategies should be developed to link rural producers to markets and to promote nutrient-dense indigenous/traditional vegetables.

5. To promote vegetable consumption for all age groups and to identify supply gaps for guiding vegetable research and development priorities
    - Healthy citizens are the most important resources for any country. The contribution of vegetables to alleviate micronutrient deficiency and improve health should be further promoted. Collaboration should be strengthened between the agriculture, health and education sectors to develop promotion strategies for different age groups and population subgroups. Supplies of vegetables should be mapped and planned to ensure rural as well as urban populations would be able to obtain the vegetables at affordable prices, and thus to consume the minimum intake of vegetables recommended by the World Health Organization. Studies on the contribution of various supply sources (home/school/community gardens, rural informal markets, supermarkets etc.) to provide household vegetable needs should be conducted. Gaps on overall supply and the need for specific nutrients should be identified and strategies should be developed to fill the gaps. Vegetable research and development strategies should be prioritized according to the gaps in supply as well as the optimization of nutritional content.

Annex

Program

Time	Activity	Person-in-Charge
21 March, Thursday		
08.00	Registration *Venue:* *Kamphol Adulavidhaya Room* *2nd Floor Golden Jubilee Building,* *Kasetsart University*	Ms. Ratchada Thongkrailad Finance Officer AVRDC – The World Vegetable Center East and Southeast Asia
08.30	Welcome Address	Dr. Poonpipope Kasemsap Vice President for International Affairs of Kasetsart University (KU) Bangkok, Thailand
	Opening Remarks	Assoc. Prof. Dr. Linkham Douangsavanh Deputy Director General National Agriculture and Forestry Research Institute Ministry of Agriculture and Forestry Vientiane, Lao PDR
	Introduction of Participants and Guests	Ms Sheila de Lima Administrative and Training Officer AVRDC – The World Vegetable Center East and Southeast Asia Bangkok, Thailand
	Workshop Overview	Dr. Robert J. Holmer Regional Director, East and Southeast Asia AVRDC – The World Vegetable Center Bangkok, Thailand
09.00 - 09.20	AVRDC – The World Vegetable Center	Dr. Jacqueline Hughes Deputy Director General - Research AVRDC – The World Vegetable Center Shanhua, Taiwan
09.20 - 09.35	Integrating Nutrition into ASEAN Integrated Food Security Framework and its Strategic Plan of Action for Food Security	Ms Nomindelger Bayasgalanbat Technical Officer (Nutrition) Regional Office for Asia and the Pacific Food and Agriculture Organization of the United Nations (FAO) Bangkok, Thailand
09.35 - 09.45	Question and Answers	
Country Presentations on Vegetable Research & Development Priorities by AARNET Steering Committee Members		
09.45 – 09.55	Brunei Darussalam	Ms. Normah Binti Tuah Head, Vegetable Development Unit Department of Agriculture and Agrifood

		Ministry of Industry and Primary Resources Brunei Darussalam
09.55– 10.05	Cambodia	Ms. Sitha Mam Technical Officer General Directorate of Agriculture Ministry of Agriculture, Forestry and Fisheries Phnom Penh, Cambodia
10.05 – 10:15	Question and Answers	
10.15 – 10.30	*Coffee Break*	
10.30 – 10.40	Indonesia	Dr. Liferdi Lukman Director Indonesian Vegetables Research Institute (IVegRI), Indonesian Agency for Agricultural Research and Development, Ministry of Agriculture, Bandung
10.40 – 10.50	Lao PDR	Dr Bounnueng Douangboupha Director, Hatdokeo Horticulture Research Station, National Agriculture and Forestry Research Institute (NAFRI), Ministry of Agriculture and Forestry (MAF) Vientiane
10.50 -11.00	Malaysia	Dr. Pauziah Muda Deputy Director, Postharvest Handling Programme Horticulture Research Centre, Malaysian Agricultural Research and Development Institute (MARDI), Serdang, Selangor
11.00 – 11:10	*Question and Answers*	
11.10 - 11.20	Myanmar	Mr. U Kyaw Win (tbc) Director General Myanmar Agriculture Service Ministry of Agriculture and Irrigation Naypyitaw
11.20 – 11.30	Philippines	Ms. Flora A. Jarilla Senior Agriculturist Bureau of Plant Industry Los Baños National Crop Research and Development Center Timugan, Los Baños, Laguna
11.40 – 11.50	Singapore	Ms Poh Bee Ling Director, Horticulture Technology Department, Sembawang Research Station Agri-Food and Veterinary Authority (AVA) of Singapore
11.50 - 12.00	Question and Answers	
12:00	Group Picture	Sorawit Limsiriwat

		IT&C Assistant AVRDC – The World Vegetable Center East and Southeast Asia
12.00 – 13.00	*Lunch break*	
13.00 - 13.10	Thailand	Dr. Grisana Linwattana Deputy Director, Horticulture Technology Department of Agriculture, Horticulture Research Institute, Chatuchak, Bangkok
13.10 - 13.20	Vietnam	Dr. To Thi Thu Ha Head, Vegetable and Spicy Crop Division Fruits and Vegetables Research Institute Vietnam Academy of Agricultural Sciences Ministry of Agriculture and Rural Development of Viet Nam, Trau Quy, Gia Lam, Hanoi
13.20 – 13:30	Question and Answers	
13.30 – 15.15	**Working Group Discussions**	
13.30 - 13.45	Introduction to Working Groups	Ms. Sheila de Lima Administrative and Training Officer AVRDC – The World Vegetable Center East and Southeast Asia Bangkok, Thailand
13.45 - 15.15	Working Group 1: Germplasm conservation, gene-mining and plant breeding	Dr. Andreas Ebert Global Theme Leader – Germplasm AVRDC – The World Vegetable Center Shanhua, Taiwan
13.30 - 15.15	Working Group 2: Crop management, postharvest, marketing and nutrition	Dr. Jaw-fen Wang Global Theme Leader – Production AVRDC – The World Vegetable Center Shanhua, Taiwan
15.15 – 15.45	*Coffee break*	
15.45 – 16.00	Presentation Working Group 1	
16.00 – 16.15	Presentation Working Group 2	
16.15 – 16.45	Discussion	
16.45 – 17.00	Feedback from Taiwan's Perspective	Dr. Hsueh-Shih Lin Director of Taitung District Agricultural Research and Extension Station (COA) Taitung, Taiwan
Closing		
17 .00 – 17.15	Summary of Discussion and Way Forward	Dr. Robert J. Holmer
17.15 - 17.30	Closing Remarks	Dr. Philip Chew Hong AARNET Chairman Group Director, Technology & Industry Development Group, Agri-Food and Veterinary Authority (AVA) of Singapore

List of Participants

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Presentation by representative of Malaysia

Presentation by representative of Thailand

Discussion of working group 1

Discussion of working group 2