



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

**Report on 10th AARNET Expert Consultation on “Climate Change
Mitigation and Adaptation Strategies for Vegetables in Southeast Asia”
(26 March 2015, at Pakse City, Champasak Province, Lao PDR) and
subsequent Vegetable Germplasm Training Course for ASEAN Countries
(18-29 May 2015, AVRDC Headquarter)**

Summary

Ensuring safe and nutritious food is available, accessible and affordable year round is one of the most pressing concerns facing the ASEAN region and risks are exacerbated by both gradual and drastic changes in climate change. A report from the Asian Development Bank (2009) warned that Southeast Asian countries, were particularly vulnerable to losses in food security due to observed and predicted climate changes combined with rapidly growing populations. The AVRDC- ASEAN Regional Network for Vegetable Research and Development (AARNET) tackled some of the most prominent issues at an expert consultation on “Climate Change Mitigation and Adaptation Strategies for Vegetables in Southeast Asia”, on 26 March 2015, at Pakse City, Champasak Province, Lao PDR (Annex 1 – agenda). This consultation succeeded the 10th AARNET Steering Committee meeting which was held on 24-25 March and therefore benefited from the participation of ASEAN country representatives in addition to invited experts. In total there were more than 30 delegates who were welcomed by **Bounthong Bouhom**, Director General of National Agriculture and Forestry Research Institute (NAFRI), Ministry of Agriculture and Forestry who expressed his appreciation to AARNET for selecting Lao PDR as the venue to discuss the critical climatic challenges threatening sustainable vegetable value chains in the region. **Fen Beed**, Regional Director for East and South East Asia for AVRDC – The World Vegetable Center, set the scene by highlighting the structure and objectives of the workshop; to share and develop practical strategies to address climate change related issues. Background presentations included a keynote from **Jacqueline d'Arros Hughes**, AVRDC's Deputy Director General for Research “On minimizing climatic change in vegetable production” who emphasized the need for the efficient utilization of resources such as land, water, nutrients and genetic resources to ensure more productive and resilient vegetable production. **Grisana Linwattana**, Senior Agriculture Scientist of Horticulture Research Institute of the Department of Agriculture, Thailand presented the “Lessons learned by Thailand in research and development for vegetable based mitigation and adaptation to climate change”. **Andreas Ebert**, Theme leader-Germplasm; **Narinder Dhillon**, global cucurbit breeder and **Sopana Yule**, Entomologist and Biological Control Specialist presented AVRDC research findings on how germplasm, breeding and production practices, respectively, can be used to mitigate and adapt to climate change. All of these presentations are available.

AARNET members from 10 ASEAN countries (Brunei Darussalam, Cambodia, Indonesia, Lao PDR, Malaysia, Myanmar, Philippines, Singapore, Thailand, and Vietnam) shared their respective countries' policy frameworks, research and development programs and strategies to mitigate and adapt to climate change and their relevance to vegetable value chains. All of these fascinating presentations are available.

Working groups were then established to prioritise risks and opportunities 1> to mitigate gradual climate changes, 2> to adapt to gradual climate changes, 3> to mitigate drastic climate changes, and 4> to adapt to drastic climate changes.

Summary of group reports:

Members of AARNET Steering Committee were grouped to discuss priority approaches in addressing issues on climate change.

Group 1: Approaches to mitigate gradual changes

- Capacity building, especially on control measures for vegetable growing conditions
- Inventory of available information (on projects, initiatives, innovations, etc) and design platform to share information to member ASEAN countries - Research
- Project to tackle on technologies addressing soil problems

Group 2: Approaches to adapt to gradual changes

- Infrastructure development – protective agriculture and appropriate/sustainable irrigation systems
- Germplasm – conservation of indigenous genetic materials
- Promotion of sustainable agriculture
- Information analysis – evaluation of climate change impacts on vegetables. Identification of knowledge gaps

Group 3 and 4: Approaches to mitigate and adapt to drastic changes

- Gene bank
 - Facilitate the collection and conservation of local / existing varieties to prevent biodiversity loss in event of drastic climate changes
 - National priorities to screen line for biotic diseases and abiotic stresses, involved breeders in developing lines
 - Share promising lines and share with ASEAN countries to enrich and benefit.
- Technology
 - Developing of crop system (Organic farming)
 - Cultural Practices that conserve water and protect crop
 - Crop diversification, Adjust timing of crop production, reduce tillage, mulching – plastic mulch)
 - Disease Management (Grafting for salinity, flooding, soil borne disease)
 - Shading and Rain Shelter
 - Fertiliser management
- Capacity Building
 - Information sharing
 - Standardised protocol for screening line starting from AVRDC

As there are several approaches discussed as priority areas, each member country was requested to highlight their top most priority. These were:

Country	Priority
Lao PDR	Germplasm conservation, screening, characterization
Brunei	Training on methodology – approaches that are tested by other countries and institutions
Cambodia	Capacity building on germplasm conservation
Indonesia	Capacity building on germplasm conservation
Malaysia	Capacity building on germplasm conservation
Myanmar	Capacity building on germplasm conservation
Philippines	Capacity building on germplasm conservation
Singapore	Information gathering and analysis through hiring of a consultant
Thailand	Capacity building on germplasm conservation
Vietnam	Capacity building on germplasm conservation

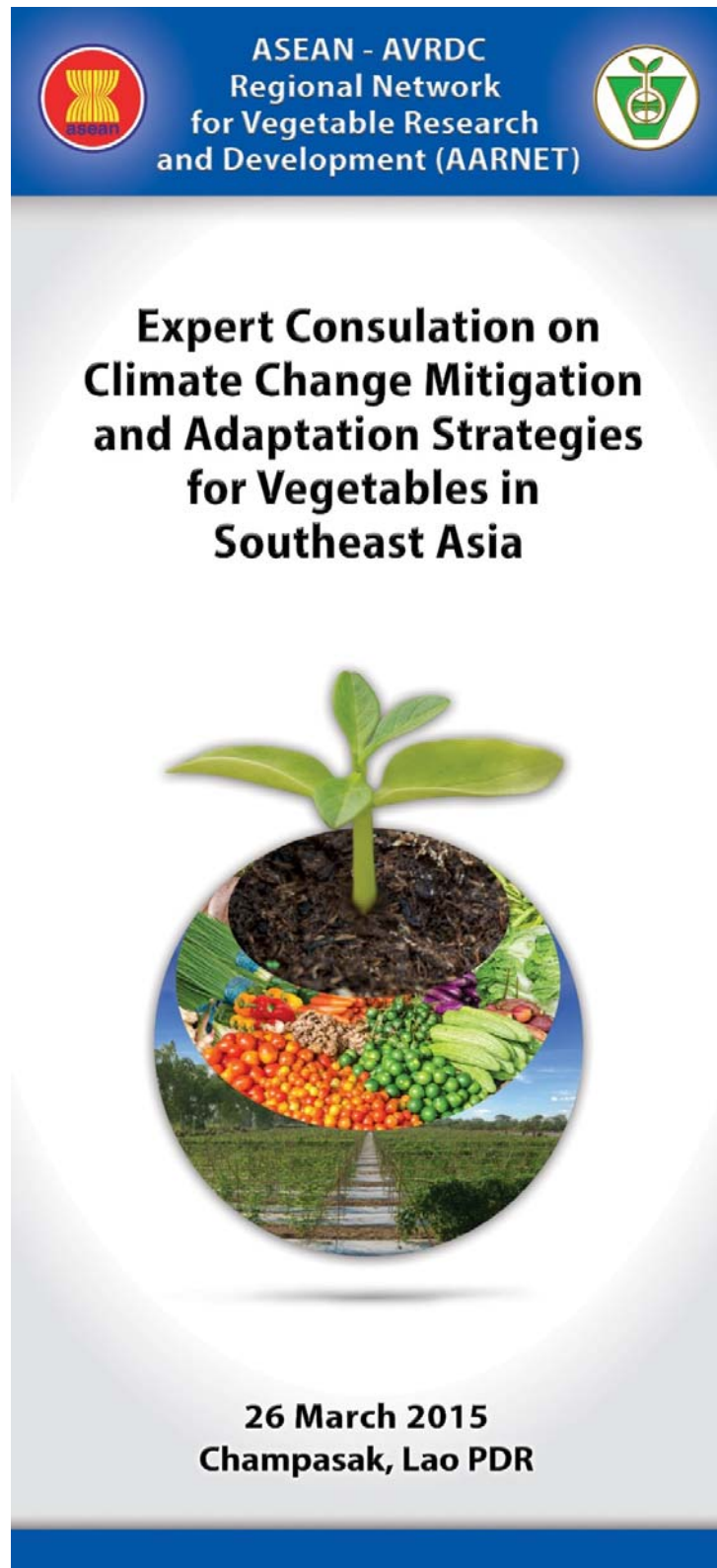
Following plenary presentations and questions and answer sessions the AARNET Steering Committee group then identified common challenges and approaches that were pertinent to all ASEAN countries. After an animated discussion and voting process, capacity building on how to harness the diversity of vegetable genetic resources was identified as the collective critical priority.

This training was designed to encapsulate germplasm collection, characterization, conservation, and screening for resistance to abiotic and biotic stresses, as well as the sharing of standard protocols for wider use and adoption by ASEAN countries.

Annex 2 shows the agenda and Annex 3 the Participant list for the training at AVRDC HQ

Viengxai Siphaphone, Director of Provincial Agriculture and Forestry Office, Champasak province, officially closed the expert consultation meeting and concluded “that this has been a truly unique meeting as the quality of information provided was illuminating and the participatory discussions frank and productive and that it was a privilege for Lao PDR to host this AARNET meeting, and welcomed participants to return”.

Annex 1. Agenda for expert consultation meeting for 10th AARNET



Agenda for 26th March

Time	Activity	Person-in-Charge
07:30-08:30	Registration	Sheila de Lima Vongvilay Vongkhamsoo
Opening Program		Chair: Andreas Ebert
08.30 – 09:30	Welcome Address	Bounthong Bouahom DG of National Agriculture and Forestry Research Institute (NAFRI) Ministry of Agriculture and Forestry Vientiane Lao PDR
	Opening Address	Jacqueline d'Arros Hughes Deputy Director General - Research AVRDC - The World Vegetable Center Tainan, Taiwan
	Workshop Overview	Fenton D. Beed Regional Director, East and Southeast Asia AVRDC – The World Vegetable Center Bangkok, Thailand
	Group Photograph	
09.30 - 10.00	Coffee / tea break	
Background session		Chair: Fen Beed
10.00 – 10.30	Keynote Address: <i>Minimizing climatic change risks in vegetable production</i>	Jacqueline d'Arros Hughes Deputy Director General - Research AVRDC - The World Vegetable Center Tainan, Taiwan
10.30 – 10.50	<i>R&D proposal, results and capacity building in Thailand for vegetable based mitigation/adaptation to climate change</i>	Grisana Linwattana Senior Agriculture Scientist Horticulture Research Institute Department of Agriculture Chatuchak, Bangkok 10900, Thailand
10.50 – 11.20	<i>How can germplasm be used to mitigate and adapt to climate change?</i>	Andreas Ebert Theme Leader – Germplasm, AVRDC - The World Vegetable Center Tainan, Taiwan
11.20 – 11.40	<i>How can breeding be used to mitigate and adapt to climate change?</i>	Narinder Dhillon Global Cucurbit Breeder AVRDC – The World Vegetable Center Bangkok, Thailand

11.40 – 12.00	<i>How can production practices be used to mitigate and adapt to climate change?</i>	Sopana Yule Biological control specialist AVRDC – The World Vegetable Center Bangkok, Thailand
12.00 – 13.00	Lunch	
Country presentations by AARNET Steering Committee Members		Chair: Jacqueline Hughes
13.00 – 13.10	Lao PDR	Thongkhoun Sisaphaithong Horticulture Research Center National Agriculture and Forestry Research Institute (NAFRI) Ministry of Agriculture and Forestry Vientiane Lao PDR
13.10 – 13.20	Brunei Darussalam	Normah Binti Tuah Horticulturist, Vegetable Development Unit Department of Agriculture and Agrifood Ministry of Industry and Primary Resources Kilanas BG1121 Brunei Darussalam
13.20 - 13.30	Cambodia	Ho Puthea Director of Horticulture and Subsidiary Crop Directorate of Agriculture, MAFF 54B, 656 St., Sangkat Toek Laak III, Khan Tuol Kork, Phnom Penh, Cambodia
13.30 - 13.40	Indonesia	Ahsol Hasyim Senior Research Scientist Indonesian Vegetables Research Institute (IVegRI) Indonesian Agency for Agricultural Research and Development Ministry of Agriculture Jalan Tangkuban Perahu No.517 Lembang Bandung 40391, Indonesia
13.40 – 13.50	Malaysia	Pauziah Muda Deputy Director, Postharvest Handling Programme Horticulture Research Centre Malaysian Agricultural Research and Development Institute (MARDI) Persiaran MARDIUPM 43400 Serdang, Selangor, Malaysia
13.50– 14.00	Myanmar	Thant Lwin Oo Director Department of Agricultural Research Ministry of Agriculture and Irrigation Nay Pyi Taw

		Myanmar
14.00 - 14.10	Philippines	Jesus R. Aspuria Agricultural Center Chief IV Bureau of Plant Industry Baguio National Crop Research, Development and Production Support Center Baguio City, Philippines
14.10 – 14.20	Singapore	Poh Bee Ling Director, Horticulture Technology Department Sembawang Research Station Lorong Chencharu, 17 km Sembawang Road Singapore 769194
14.20 - 14.30	Thailand	Grisana Linwattana Senior Agriculture Scientist Horticulture Research Institute Department of Agriculture Chatuchak, Bangkok 10900, Thailand
14.30 – 14.40	Vietnam	Nguyen Quoc Hung Director General Fruit and Vegetable Research Institute Trau Quy, Gia Lam, Ha Noi, Viet Nam
14.40 – 15.00	Coffee / tea break	
15.00 - 16.00	Working Group 1: Prioritization of approaches to mitigate gradual changes in climate in ASEAN countries	Chair: Grisana Linwattana Rapporteur Presenter
	Working Group 2: Prioritization of approaches to adapt to gradual changes in climate in ASEAN countries	Chair: Nguyen Quoc Hung Rapporteur Presenter
	Working Group 3: Prioritization of approaches to drastic changes in climate in ASEAN countries	Chair: Ahsol Hasyim Rapporteur Presenter
	Working Group 4: Prioritization of approaches to adapt to drastic changes in climate in ASEAN countries	Chair: Bounneuang Douangboupha Rapporteur Presenter
16.00 – 16.10	Plenary report from working Group 1	Chair: Ling Ling Tan / Poh Bee Ling
16.10 – 16.20	Plenary report from working Group 2	
16.20 – 16.30	Plenary report from working Group 3	

16.30 - 16.40	Plenary report from working Group 4	
16.40 – 17.00	Coffee / tea break	
16.40 – 16.55	Summary discussion and consensus on way forward	Chair: Fen Beed Jacqueline d'Arros Hughes DDG-R, AVRDC - The World Vegetable Center, Taiwan
16.55 – 17.00	Closing Remarks	Viengxai Siphaphone Provincial Agriculture and Forestry Office (PAFO), Champasack Province, Lao PDR

**Annex 2. Vegetable Germplasm Training Course For ASEAN Countries
AVRDC headquarters, 18-29 May 2015**



AARNET
**ASEAN – AVRDC Regional Network on
 Vegetable Research and Development**

Time	Activity	Person in-charge
17 May (Sunday) – Arrival of participants		
	Arrival at KHH Airport – to be met by AVRDC driver	
18 May (Monday)		
08:30 - 09:20	Registration, brief tour of AVRDC Campus and photo taking	Letty Lin
09:30 - 10:00	AVRDC overview presentation (Conference room)	Maureen Meccozzi
10:00 - 10:25	Coffee break and interaction with AVRDC scientists & group photo taking	Andreas Ebert & Amy Chen
10:30 - 11:45	The role of germplasm for adaptation to climate change (GRSU meeting room)	Andreas Ebert
11:45 - 13:00	Lunch break	
13:00 - 14:00	Collecting and handling seed in the field (GRSU meeting room)	Andreas Ebert & Yung-kuang Huang
14:00 - 16:30	Collecting and handling seed in the field (GRSU fields)	Yung-kuang Huang et al.
19 May (Tuesday)		
08:00 - 10:00	Vegetable seed regeneration and quality preservation (GRSU meeting room)	Andreas Ebert
10:00 - 10:30	Coffee break	
10:30 - 11:00	Tour of genebank	Yung-kuang Huang
11:00 - 11:45	Tour of demonstration garden	Yi-chin Wu
11:45 - 13:00	Lunch break	

13:00 16:30	-	Practical on seed extraction, seed moisture germination and setting up of germination test (GRSU main laboratory)	Yung-kuang Huang et al.
20 May (Wednesday)			
08:00 11:30	-	Lecture and practical on screening for resistance to insect pests	Srinivasan Ramasamy & team
11:45 13:00	-	Lunch break	
13:00 16:30	-	Lecture and practical on screening for resistance to insect pests	Srinivasan Ramasamy & team
21 May (Thursday)			
08:00 17:00	-	Technical tour to Endemic Species Research Institute in Jiji, Nantou County	Andreas Ebert & Yung-kuang Huang
22 May (Friday)			
08:00 11:30	-	APSA Multiple TY trial	Peter Hanson
11:45 13:00	-	Lunch break	
13:00 16:30	-	Screening for viruses	Lawrence Kenyon
23 May (Saturday)			
09:00 17:00	-	Excursion	Andreas Ebert
24 May (Sunday)			
		Free	
25 May (Monday)			
08:00 11:45	-	Screening rootstocks for tolerance to abiotic and resistance to biotic stresses including grafting practical	Willie Chen and Carla Amongero
11:45 13:00	-	Lunch break	
13:00 16:30	-	Screening for salinity tolerance	Willie Chen and Carla Amongero
26 May (Tuesday)			
08:00 11:30	-	Lecture and practical on screening for resistance to fungal diseases	Jaw-Fen Wang et al.
11:45 13:00	-	Lunch break	
13:00 16:30	-	Lecture and practical on screening for resistance to bacterial diseases	Jaw-Fen Wang et al.

27 May (Wednesday)		
08:00 - 09:30	Domestication and evolution of <i>Capsicum</i> and screening for heat tolerance in sweet pepper	Sanjeet Kumar
09:40 - 11:45	Morphological characterization of vegetable germplasm – <i>Capsicum</i> and tomato (theory and practice)	Sophie Chou & Sam Yen
11:45 - 13:00	Lunch break	
13:00 - 14:45	Characterization of legume crops - theory and practice	Jessica Chang and Miao-rong Yan
15:00 - 16:40	Characterization of eggplant, okra and indigenous vegetables - theory and practice	David Wu and Sam Yen
28 May (Thursday)		
08:00 - 11:30	Screening for heat tolerance	Roland Schafleitner
11:45 - 13:00	Lunch break	
13:00 - 15:00	In situ conservation: nature reserves, on-farm, home and school gardens, community seed banks	Andreas Ebert
15:00 - 16:00	Follow-up on practical on grafting and germination testing	Willie Chen, Carla Amongero, Yung-kuang Huang
16:00 - 16:30	Certificate presentation	Andreas Ebert
18:00	Time leaving in front of cafeteria for Farewell Dinner	All participants & Lecturers
29 May (Friday)		
08:00 - 12:00	Technical tour to Fengshan Tropical Horticultural Experiment Branch , TARI, Kaohsiung; and Dr. Cecilia Koo Botanic Conservation and Environmental Protection Foundation / Conservation Center, Gaoshu Township, Pingtung County, Taiwan	Andreas Ebert, Willie Chen, Yung-kuang Huang
13:00 - 17:00		
30 May (Saturday) – Departure of participants		
04:45	Time depart for Kaohsiung Airport to catch flight #VN-587 (0745 hr)	Ms. Hong Thi Tran, Vietnam
08:25	Time depart for Kaohsiung Airport to catch flight #CX-5433 (1125 hr)	Ms. Nor Hazlina Mat Sa'at, Malaysia
10:35	Time depart for Kaohsiung Airport to catch flight #CI-757 (1335 hr)	Mr. Cliff An Ting Tham, Singapore

11:55	Time depart for Kaohsiung Airport to catch flight #CI-839 (1455 hr)	Name of participants: <ul style="list-style-type: none"> - Mr. On Vannak On-Vannak, Cambodia - Ms. Suwarni Tri Rahayu, Indonesia - Ms. Tounglien Vilayphone, Lao PDR - Mr. Satja Prasongsap, Thailand
04:30 (31 May)	Time depart for Kaohsiung Airport to catch flight #CI-711 (0730 hr)	Ms. Juanita Guevarra Calibo, Philippines

Annex 3. Participants Vegetable germplasm training course for ASEAN countries, AVRDC Headquarters, 18-29 May 2015



AARNET

ASEAN – AVRDC Regional Network on Vegetable Research and Development

Name	Institute	Country
Mr. On Vannak On-Vannak (ornvannak@yahoo.com)	General Directorate of Agriculture, MAFF	Cambodia
Ms. Suwarni Tri Rahayu (swarnit@yahoo.com)	Indonesian Vegetables Research Institute	Indonesia
Ms. Tounglien Vilayphone (tounglien@gmail.com)	National Agriculture and forestry Research Institute	Lao PDR
Ms. Nor Hazlina Mat Sa'at (nor@mardi.gov.my)	Malaysian Agricultural Research and Development Institute (MARDI)	Malaysia
Ms. Juanita Guevarra Calibo (calibojuanita@gmail.com)	BPI-Los Baños National Crop Research Developmnet & Production Support Center	Philippines
Mr. Cliff An Ting Tham (cliff_tham@ava.gov.sg)	Agri-Food & Veterinary Authority of Singapore	Singapore
Mr. Satja Prasongsap (herbdoa@gmail.com)	Department of Agriculture (DOA)	Thailand
Ms. Hong Thi Tran (tranhongvra@gmail.com)	Fruit and Vegetable Research Institute (FAVRI)	Vietnam
Mr. Chun Ming Chen (forestaray@gmail.com)	Dr. Cecilia Koo Botanic Conservation Center and Environmental Protection Foundation	Taiwan
Ms. Ya-Lan Chang (muchlan@gmail.com)	Dr. Cecilia Koo Botanic Conservation Center and Environmental Protection Foundation	Taiwan