LTRA-5:
Agroforestry and Sustainable Vegetable Production in Southeast Asian Watersheds
Dr. Manuel R. Reyes, PI-North Carolina Agricultural and Technical State University (A&T)

I. Executive Summary of overall progress for the past six months

TMPEGS had several promising studies and activities. From several vegetable tree system studies it was apparent that there are vegetable-tree combinations which can increase yield of vegetables even when vegetables are planted beside and partially shaded by trees. One result showed increased vegetable yield by 5% to 30%. Net complimentary indices, which measure the benefit of vegetable agroforestry, have been developed for some vegetable-tree combinations. Responses of vegetables to varying light intensities showed that some vegetables grow best in full, medium, and low sunlight with one study finding that when pruning, removing more than 40% of tree canopy reduces vegetable yield. Another study concluded that tree-vegetable competition is non-existent during the early tree establishment stage. Several indigenous vegetables, with many more nutritious than traditional vegetables were evaluated. Many were well adapted growing alongside trees. Farmers were surprised that Malunggay, an indigenous tree vegetable, grew well in acid soils at high elevations. On the other hand trees benefited from vegetables as well. It was found that planting vegetables in between cashew trees increased cashew yield. Experiments on the 'International Development Enterprise' low-cost drip irrigation (IDE-drip) with a chili-tree system indicated that drip minimizes vegetable tree moisture competition. It was also found that IDE-drip in home vegetable gardens had more yield and substantial labor savings when compared with traditional hand irrigation. To enhance design of IDE-drip, an extensive evaluation of the water application uniformity coefficient of IDE-drip as a function of operating head and slope was conducted which resulted in IDE-drip design guidelines for steep slopes. Tree root pruning and putting a plastic barrier between pruned roots and vegetables grown beside them, showed a 75% increase in chili yield. Several trials to assess beneficial impacts of *Arachis pintoi* are underway. A no-till drill prototype was designed, fabricated, and tested and was able to cleanly cut *A. pintoi* bed. A prototype seeder, fertilizer applicator and dibbler were also designed, and tested. Other studies showed that vermicost was an excellent media for chili transplant, and vetiver grass can prevent termites from destroying young cacao seedlings.

It was found that market value chain have several weak links. Solutions are underway to strengthen these links. In one site, 30 women and men farmers visited a nearby village who are experienced in growing, handling and marketing high demand indigenous vegetables, Kucai and Katuk. Farmers saw that Katuk and Kucai can be grown and marketed successfully, and are enthusiastic in growing Kucai and Katuk in their farms. The project will provide 100 kg of Kucai's seed and 60,000 stem cuttings of Katuk to facilitate in the development of commercial plots by participating farmers. Policy environments for vegetable agroforestry are supportive in two sites. However, vegetable agroforestry policies tended to benefit rich farmers than poor farmers. Hence, there is a need to alert government policy makers to revise vegetable agroforestry policies to address this bias. It was recommended that incentives for good environmental practices are best negotiated in local rather than national levels. An extensive paper on the policy environment of vegetable-agroforestry systems was completed. Soil erosion caused by traditional vegetable production practices was alarming. Computer simulations of soil erosion in vegetable areas have 157 times more soil loss than forested areas. It was encouraging though because in this site many vegetable farmers are practicing soil conservation methods

which can be traced to SANREM influence. A trend study from this site found that share from agricultural employment has consistently declined with agricultural wage lower than non-agricultural wage; and sadly use of chemicals especially in vegetable production intensified. Another study showed that out of 6 vegetables, chili is the only vegetable that is profitable in an agroforestry system. A sociological study concluded that a participatory approach is likely more applicable with indigenous people and the modern approach is pertinent with migrants. Gender studies are in various stages. On-going conversations with women and men showed that they organize their farm lives as partners. All sites agreed on a cross-cutting study on gendered networks and livelihood alternatives. Scaling up highlighted the launching of the TMPEGS website. Also SANREM- SWAT-SEA international conference is being organized in Thailand, January 5-8, 2009.

II. Research progress by objective

1. Progress towards completing critical Annual Work Plan tasks. (see Appendix)
2. Changes in research design or methods, obstacles encountered, and actions taken

- Some tasks were added and some were aborted
- Some delay in release of funds and was solved when funds were released

3. Significant research findings (bulleted form preferred)

- There are vegetable-tree combinations which can increase yield of vegetables even when vegetables are planted beside and partially shaded by trees
- Net complementary indices, which is a measure of the benefit of vegetable-agroforestry systems, have been developed for some vegetable-tree combinations
- Responses of vegetables to varying sunlight intensities showed that some vegetables grow best in full sunlight, some in medium sunlight, and some in low sunlight
- When pruning, removing more than 40% of tree canopy reduces yield of some vegetables
- *Another study concluded that tree-vegetable competition is non-existent during the early tree establishment stage*
- Many indigenous vegetables tested grew very well beside trees
- Farmers were surprised, that Malunggay, an indigenous vegetable tree, grew well in acid high elevation soils
- Planting vegetables in between cashew trees increased cashew yield
- Drip irrigation minimized moisture competition in a chili-tree system
- Drip irrigation in home gardens had more yield and significantly less labor than tradition hand irrigation
- Water application uniformity coefficients of the International Development Enterprise drip irrigation kits were determined at various operating heads and slopes
- Tree root pruning and putting a plastic barrier between the pruned roots and the chili grown beside them, showed a 75% increase in chili yield
- Test of a prototype dibbler delivered 10 seeds per minute
- Vermicost was an excellent transplant media for chili pepper
- Vetiver grass can prevent termites from destroying cacao seedlings
- Market value chain have several weak links like low use of technology, weak extension activities, inadequate supply of production inputs, poor marketing infrastructure, and inadequate post harvest handling

- Policy environments for vegetable agroforestry is supportive in Vietnam and the Philippines, however they tended to benefit rich farmers than poor farmers
- From computer simulation, it was found that soil erosion caused by traditional vegetable production practices was alarming
- Years of SANREM influence has changed the soil conservation practices of many farmers
- Shares from agricultural employment has consistently declined with agricultural wage lower than non-agricultural wage
- Use of chemicals in vegetable production has intensified endangering people's health and polluting natural resources
- Out of six vegetables studied, chili is the only profitable vegetable to include in an agroforestry system
- Participatory approach is likely more applicable with indigenous people and the modern approach is pertinent with migrants

III. Significant training, capacity building, and networking activities

1. Update degree training students supported (See Form 16)
2. Update short-term training events conducted (See Form 17)
3. Update publications list with proper bibliographic citations and enter into SKB* (See Form 18)
4. List any special events or networking activities

- SWAT-SEA first international conference (http://www2.mcc.cmu.ac.th/swat/detail.php?data=organizer) is a network of 23 institutions from all over the world, many of which are new connections
- ICRAF-scientist Iwan Kurniawan led a team of 19 male and 5 female farmers to network and learned from farmers who are experts in growing Katuc and Kucai. This cross-visit provided excellent connectivity between farming communities and will be encouraged to prosper and continue
- ICRAF-Indonesia developed collaboration with BPPT (Agency for Assessment and Replication) to use their land as production plot trial.
- ICRAF-Indonesia established linkage between a trader and local farmers to market Katuk, Kucai and cassava.
- Bogor Agricultural University scientist Mahmud Raimadoya networked with JAXA an earth observation agency to get medium resolution imagery for free of the SANREM site in Indonesia
- ICRAF scientist Dr. Agustin Mercado reported that partnership with Australian Centre for International Agricultural Research and SANREM facilitated cross visits of farmers from different municipalities and provinces in Mindanao including those areas controlled by the Moro Islamic Liberation Front (MILF)
- Rector and two other top administrators of SANREM-TMPEGS partner Nong Lam University visited NCA&T. They were also brought to University of North Carolina-Greensboro, and North Carolina State University
- Dr. Jean Saludadez from SANREM-TMPEGS partner UP-Open University, visited NCA&T and Virginia Tech

- Juang Kartika, a researcher from SANREM-TMPEGS partner Bogor Agricultural University was sponsored by the Indonesian embassy for three months soil quality training at NCA&T. She also wrote an excellent review of literature paper on *Arachis pintoi*
- ICRAF-scientist Dr. Delia Catacutan visited Nong Lam University and introduced the Knowledge to Action concepts research method and also the policy review in the Philippines
- AVRDC-scientists Drs. Greg Luther, Manuel Palada and Wong Jong-Guy visited Nong Lam University and Nghia Trung village to conduct a participatory research appraisal
- External evaluation panel reviewer Dr. Edwin Price visited with TMPEGS-Indonesia

IV. Research strategy and development objectives.

Many farmers are now aware of the benefits of vegetable agroforestry systems because of the successful results of vegetable tree studies. Farmers started producing indigenous vegetables, and because of the success in indigenous vegetable tree 'Malunggay' testing, farmers clamored for Malunggay planting material because it was not enough for all farmers in the community. Malunggay is very nutritious. Benefits of vegetable home gardens are being seen by farmers.

SANREM participating farmers are enthusiastic in growing the high demand vegetable Katuk and Kucai. Katuk was found to grow well under trees and SANREM will provide 100 kg of Kucai seed and 60,000 stem cuttings of Katuk. Since it was found that good environmental policies are best addressed in local rather than national levels, local government units are being influenced by SANREM researchers to practice vegetable agroforestry.

An good example of TMPEGS impact is this quote from SANREM researcher Agustin Mercado: *"Through the Australian Centre for International Agricultural Research Landcare Project, drip irrigation is now widely promoted at the municipal level in which the local government units provide funds for the purchase of drip irrigation kits to vegetable farmers thus allowing more farmers to benefit from the technology promoted by the SANREM project. This project also facilitated cross visits of farmers from different municipalities and provinces in Mindanao including those areas controlled by the Moro Islamic Liberation Front (MILF)."*

Appendix

LTRA-5 Operational Work Plan

Agroforestry and Sustainable Vegetable Production in Southeast Asian Watersheds

Dr. Manuel R. Reyes, PI-North Carolina Agricultural and Technical State University (A&T)

Objective 1 (Technology): Develop economically viable and ecologically-sound vegetable-agroforestry systems

Co-coordinators: Vegetables: Manuel Palada, AVRDC-The World Vegetable Center; and Agroforestry: Agustin Mercado, ICRAF-The World Agroforestry Center

Task	Description	SANREM Landscape System	Expected Output Result or Impact	Status	Responsible Party	
					US/IARCS/ CQU	Host Country[1]
1.A	Vegetable screening to assess vegetable-tree (VT) complementarity Work Plan Element: T-1-1	Field	Recommendation of vegetables that could be grown for vegetable and tree (VT) complementarity	In progress	AVRDC: Palada's team ICRAF: Mercado's and Manurung's teams. CQU: Midmore, UC-Berkeley: Marsh, A&T: Reyes	V: Du and Ha's team, NLU I: Anas' and Purwoko's teams, BAU P: Mercado's team, ICRAF & Penaso's team, CMU
1.B	Effect of Sunlight Intensity on vegetables and on VT complementarity Work Plan Element: T-1-2	Field	Recommendation of vegetables that could be grown on shade, partial shade and no-shade	In progress	AVRDC: Palada's team ICRAF: Mercado's and Manurung's teams- CQU: Midmore, UC-Berkeley: Marsh,	V: Du and Ha's team, NLU I: Anas' and Purwoko's teams, BAU P: Mercado's team, ICRAF & Penaso's team, CMU

[1]V = Vietnam; I = Indonesia; and P = Philippines

Task	Description	SANREM Landscape System	Expected Output Result or Impact	Status	Responsible Party	
					US/IARCS/ CQU	Host Country[1]
					A&T: Reyes	
1.C	Soil Moisture and VT complementarity: Effect of drip irrigation on vegetable agroforestry Work Plan Element: T-1-3-1	Field	Some knowledge of whether irrigation can significantly reduce soil moisture competition from trees	In progress	ICRAF: Mercado's UC-Berkeley: Marsh, A&T: Reyes	P: Ella, UPLB, Mercado's, ICRAF and Penaso's teams, CMU
1.D	Soil Moisture and VT complementarity: Drip Irrigation: Will it increase yield and income in traditional vegetable production Work Plan Element: T-1-3-1-1	Field	• Benefit/Cost or Profit/Loss if drip irrigation for vegetable production is adopted • Find out about impact of drip irrigation in vegetable growth and yield	In progress	AVRDC: Palada's team ICRAF: Mercado's and Budidarsono's teams- CQU: Midmore, UC-Berkeley: Marsh, A&T: Reyes	V: Du and Ha's team, NLU I: Anas' and Purwoko's teams, BAU P: Ella, UPLB, Mercado's, ICRAF & Penaso's teams, CMU
1.E	Soil Moisture and VT complementarity: Effect of hydraulic head and slope on water distribution uniformity of the International Development Enterprise drip irrigation system Work Plan Element: T-1-3-1-2	Field	Recommendations on minimum hydraulic heads at certain irrigation uniformity coefficients	In progress	Reyes – A&T Yoder – International Development Enterprise	P: Ella's team, UPLB
1.F	Soil Moisture and VT complementarity: Effect of tree root pruning on VT complementarity Work Plan Element: T-1-3-2	Field	Find out if tree root pruning benefit vegetable production	In progress	ICRAF: Mercado's A&T: Reyes	P: Mercado's, ICRAF Ella's, UPLB, and Penaso's

Task	Description	SANREM Landscape System	Expected Output Result or Impact	Status	Responsible Party	
					US/IARCS/ CQU	Host Country[1]
						teams, CMU
1.G	Nutrient and VT complementarity: Tree roots act as safety nets Work Plan Element: T-1-4-1	Field	Find out if trees take up fertilizers leached from vegetable farms and if trees increase fertilizer use efficiency	Removed from task list	ICRAF: Mercado AVRDC-Palada A&T: Reyes	P: ICRAF: Mercado' team
1.H	Nutrient and VT complementarity: Tree roots act as nutrient pumps Work Plan Element: T-1-4-2	Field	Find out if trees take up nutrients from lower soil layers	Removed from task list.	ICRAF: Mercado AVRDC-Palada A&T: Reyes	P: ICRAF: Mercado' team
1.I	Nutrient and VT complementarity: Calibration study of phosphorus on yard long bean in Nanggung watershed Work Plan Element:T-1-4-3-1	Field	Find out phosphorus fertilizer requirements of yard long bean	In progress	AVRDC-Palada A&T: Reyes	I: Susila's team, BAU
1.J	Nutrient and VT complementarity: Optimization of N, P, and K fertilizer for vegetables in Nanggung watershed Work Plan Element:T-1-4-3-2	Field	Find out N, P, and K fertilizer requirements for yard long bean and kang-kong	In progress	AVRDC-Palada A&T: Reyes	I: Susila's team, BAU
1.K	Soil cover for erosion control: Perennial peanut as soil cover for vegetable production Work Plan Element: T-1-5-1	Field	Find out if soil erosion will be minimized due to soil cover by perennial peanut	In progress	AVRDC: Palada's team ICRAF: Mercado's and Budidarsono's teams- CQU: Midmore, UC-Berkeley: Marsh,	V: My and Ha's team, NLU I: Anas' and Purwoko's teams, BAU P: Mercado's team, ICRAF & Penaso's team, CMU

Task	Description	SANREM Landscape System	Expected Output Result or Impact	Status	Responsible Party	
					US/IARCS/ CQU	Host Country[1]
					A&T: Reyes	
1.L	Soil cover for erosion control: Effects of perennial peanut and a botanical herbicide on aphids and their natural enemies on yard long bean Work Plan Element: T-1-5-1-1	Field	Find out if perennial peanut and a botanical herbicide promote natural enemies that attack aphids	In progress	AVRDC: Luther's team A&T: Reyes	I: Rauf's team, BAU
1.M	Developing no-tillage planting aids Work Plan Element:T-1-5-2	Field	Prototype of animal drawn and motorized no-tillage drill and seeder	In progress	VT: Ronald Morse A&T: Reyes ICRAF: Mercado AVRDC: Palada	I: Susila, BAU P: Catalan's team, DBTC
1.N	Cacao under cashew canopy Work Element: T-2-1	Field	Find out what cacao cultivars yield well with cashew trees	In progress	A&T: Reyes	V: Phuoc and Ha's team, NLU
1.O	Natural termite control in young cacao under cashew canopy Work Plan Element:T-2-1-1	Field	Find out if vetiver grass can control termites in young cacao	In progress	AVRDC: Luther A&T: Reyes	V: Truc and Ha's team, NLU
1.P	Effect of drip irrigation in cacao under cashew canopy Work Plan Element:T-2-1-2	Field	• Find out if drip irrigation increase yields of cacao and cashew • Benefit/Cost or Profit/Loss if drip irrigation for cacao-cashew production is adopted	In progress	A&T: Reyes	V: Phuoc and Ha's team, NLU
1.Q	Domestication of indigenous tree vegetables and medicinal trees Work Plan Element: T-2-2	Field	Find out if vegetable and medicinal trees will provide farmers with continuous supply of vegetables and medicines for common	In progress	AVRDC: Engle & Faustino ICRAF: Mercado and Duque	ICRAF: Mercado and Duque

Task	Description	SANREM Landscape System	Expected Output Result or Impact	Status	Responsible Party	
					US/IARCS/ CQU	Host Country[1]
			ailments		A&T: Reyes	
1.R	Effects of weed management methods in cashew production Work Plan Element: T-2-3-1	Field	Find out if soil loss will be reduced and soil quality improved if bare soil management under cashew trees is replaced with no weeding or weeding with residue left on surface	In progress	A&T: Reyes	V: Du and Ha's team, NLU
1.S	Vegetable strips under cashew trees for soil erosion control Work Plan Element: T-2-3-2	Field	Find out if vegetative strips will significantly minimize soil erosion under cashew trees	In progress	A&T: Reyes	V: Du and Ha's team, NLU

Objective 2 (Marketing): Develop a market value chain at the local, regional, and national levels that builds upon existing marketing strategies. Coordinator: Miriam Nguyen, University of the Philippines at Los Baños

Task	Description	SANREM Landscape System	Expected Output Result or Impact	Status	Responsible Party	
					US or IARC	Host Country
2.A	Assessing market constraints and potential for indigenous vegetable from vegetable agroforestry systems Work Plan Element: M-1	Policy/ market	• Have estimate of demands of indigenous vegetables • Have knowledge of consumer preference on local vegetables	In progress	Marsh – UC-Berkeley	V: Loan & Ha, NLU
2.B	Farmer's workshop on disseminating vegetable agroforestry baseline survey and technology & recommendation to improve the quality and quantity of products from vegetable agroforestry systems Work Plan Element: M-2-1	Farm household/ enterprise	Increase farmer knowledge: on vegetable agroforestry and improvement of products produced in vegetable-agroforestry systems	In progress	Marsh – UC-Berkeley	I: Kurniawan and Roshetko's team, ICRAF

Task	Description	SANREM Landscape System	Expected Output Result or Impact	Status	Responsible Party	
					US or IARC	Host Country
2.C	Farmers comparison study trip to good practice of vegetable agroforestry management site Work Plan Element: M-2-2	Farm household/enterprise	Improved farmers' knowledge on vegetable agroforestry	Completed	Marsh – UC-Berkeley	I: Kurniawan and Roshetko's team, ICRAF
2.D	Post harvest training on vegetable agroforestry products and promotion of indigenous vegetable species	Farm household/ enterprise	Training on vegetable post-harvest handling	Not yet initiated	Marsh – UC-Berkeley	I: Kurniawan and Roshetko's team, ICRAF
2.E	Market action plan for TMPEGS-Philippines Work Plan Element: M-3	Policy/ market	• Disseminate market findings with farmer & market stakeholders • Consolidate participatory planning with women marketers to elicit prioritized courses of action	In progress	Marsh – UC-Berkeley	P: Javier's team

Objective 3 (Policy): Identify policy options and institutional frameworks that promote sustainability of vegetable-agroforestry production and reward environmental services. Coordinator: Delia Catacutan, ICRAF

Task	Description	SANREM Landscape System	Expected Output Result or Impact	Status	Responsible Party	
					US or IARC	Host Country
3.A	Developing policy options that stimulate investments in vegetable agroforestry systems by small holders in Southeast Asian watersheds Work Plan Element: P	Policy market	• Recommendations on policy options and institutional frameworks that promote sustainability of VAF production among small farmers • Policy brief on incentive based policy	In progress	Catacutan-ICRAF	V: Ha's team, NLU I: Not applicable P: Catacutan's team, ICRAF

Objective 4 (Environmental and Socio-Economic Impact): Assess the short and long-term environmental and socio-economic impacts for farm families adopting integrated vegetable-agroforestry systems. Co-Coordinators Environmental Impact: Victor Ella, University of the Philippines at Los Baños, and Socio-Economic Impact: Robin Marsh, University of California-Berkeley

Task	Description	SANREM Landscape System	Expected Output Result or Impact	Status	Responsible Party	
					US or IARC	Host Country
4.A	Assessment of the hydrologic impacts of vegetable agroforestry systems in Southeast Asia Work Plan Element: E-1	Community/ Watershed	Simulation of runoff, nutrient and sediment loss at current watershed land use and management conditions	In progress	Reyes – A&T Srinivasan – Texas A&M Heatwole - VT	V: Loi's team, NLU I: Raimadoya's team, BAU P: Ella's team, UPLB
4.B	Pesticide use and farmer's health cost in cashew production Work Plan Element: E-2-1-1	Farm household/enterprise	Pesticide use in cashew production and associated health cost	In progress	Marsh – UC-Berkeley	V: Ha's team, NLU
4.C	Benefit cost analysis of alternative soil erosion control practices in cashew-based vegetable agroforestry system Work Plan Element: E-2-1-2	Farm household/enterprise	Benefit cost analysis of soil erosion practices	In progress	Marsh – UC-Berkeley	V: Ha's team, NLU
4.D	• Identify vegetable cultivation technologies and practices within agroforestry systems that are socially acceptable, affordable and economically profitable • Provide information on adoption of recommended vegetable cultivation technologies and practices by small scale farmers both women and men Work Plan Element: E-2-2	Farm household/enterprise	• Identification of vegetable production technologies in vegetable agroforestry system • Information on adoption of recommended vegetable cultivation technologies and practices small scale farmers both women and men	In progress	Marsh – UC-Berkeley	I: Suseno's team, ICRAF
4.E	• Determine the adoption behavior among small scale farmers both women and men	Farm household/ enterprise	• Report on vegetable agroforestry technology adoption behavior, income	In progress	Marsh – UC-Berkeley	P: Penaso's team, CMU

	• Establish feedback mechanisms between farmers and technologies Work Plan Element: E-2-3		assessment, influence of VAF on women, men and youth, and identification of problems met in technology adoption			

Objective 5 (Gender): Provide mechanisms to ensure women's involvement in decision-making and sustainable production and marketing practices to improve their socioeconomic wellbeing within the vegetable-agroforestry system,

Coordinator: Ma. Elena Chiong-Javier, De La Salle University

Task	Description	SANREM Landscape System	Expected Output Result or Impact	Status	Responsible Party	
					US or IARC	Host Country
5.A	• Impacts of vegetable agroforestry systems and technologies on women labor • Role of women organizations in supporting women farmers Work Plan Element: G	Field, Farm, Policy/ Governance	•Case studies of impacts of vegetable agroforestry systems on women labor •Recommendations for strengthening the role of women organizations in supporting women farmers	Not yet initiated	Marsh – UC-Berkeley	V: Trang's team, NLU
5.B	Gender Awareness Work Plan Element: G	Field, Farm, Policy/ Governance	•Workshop on gender awareness (I) •Manual for gender awareness training (I)	Not yet initiated	Marsh – UC-Berkeley	I: Tri's team, BAU
5.C	• Identification of women farmers involved in vegetable agroforestry technologies • Document women's perception on involvement in vegetable agroforestry and conversion to farm practices • Workshop on research findings to women farmers Work Plan Element: G	Field, Farm, Policy/ Governance	•Process documentation research report •Proposed gender-sensitive mechanism for technology adoption and transfer •Link findings with Technology, Policy, and Scaling up objectives	In progress	Marsh – UC-Berkeley	P: Javier's team, DLSU
5.D	• Accounts and emerging frames of women farmers on vegetable agroforestry system technologies		•Transcript of accounts, emerging frames, re-framed meaning system/interpretative frame and initial write-up of meaning system frame of	In progress	Marsh – UC-Berkeley	P: Saludadez's team, UPOU

	Work Plan Element: G		Songco women			

Objective 6 (Scaling-up): Build host country capacity to manage and disseminate integrated vegetable-agroforestry system
Coordinator: Ma. Victoria Espaldon, University of the Philippines at Los Baños

Task	Description	SANREM Landscape System	Expected Output Result or Impact	Status	Responsible Party	
					US or IARC	Host Country
6.A	• Conduct training needs assessment • Assess scaling-up strategies for vegetable agroforestry systems Work Plan Element: S	Field, Farm household/ enterprise, Policy/market	•Trained farmers and other stakeholders on vegetable agroforestry technologies •Research reports and papers on assessment of scaling-up strategies for VAF technologies	In progress	Marsh – UC-Berkeley Reyes – A&T	V: Hong's team, NLU I: Susila's team, BAU & ICRAF P: Espaldon's team, UPLB