TRIP REPORT

CAMBODIA

UC Davis | February 10 – 26, 2017

Traveler Names:
Jim Hill
Karen LeGrand
David Miller
Cary Trexler
Glenn Young

Sites Visited: Royal University of Agriculture, University of Battambang, Center of Excellence on Sustainable Agricultural Intensification and Nutrition (CE-SAIN) Technology Park at RUA, CE-SAIN technology park in Battambang, Psa Nat Market, Beung Chhouk Market, Angkor Green, Phou Pouy Market, Non input supply shop, Tasey Village, Anlong Run Village, Balang Leu Village, Krous Village, Kampong Pouy, Natural Garden

Key Contacts Made: Professor Kong Thong, Royal University of Agriculture; Dr. Borarin Buntong, RUA, H.E. Sieng Emtotim, University of Battambang; Dr. Nguon Samnang, UBB; Mr. Chheum Vichhera, Provincial Department of Agriculture; Dr. Kim Hian Seng, IPM Innovation Lab project; Mr. Mao Manel, CE-SAIN; Mr. Kong Chantha, CE-SAIN
,

Activities and Observations: Initial project planning stakeholder partnering workshop and training in Battambang, capacity building at RUA

THE ATTACHED PARTNERING WORKSHOP REPORT WAS PREPARED BY THE CAMBODIAN TEAM FROM THE ROYAL UNIVERSITY OF AGRICULTURE TO REFLECT THE PERSPECTIVE OF THESE LOCAL PARTNERS. TRAINING, GUIDANCE AND MENTORING WAS PROVIDED BY THE UC DAVIS TEAM THROUGHOUT THIS TRIP TO BUILD LOCAL CAPACITY FOR INDEPENDENT RESEARCH AND OUTREACH. THE CONTENT OF THE ATTACHED REPORT WAS EDITED TO REFLECT THE OVERALL INTENTION OF THE WORKSHOP.

Photo 1: Training and mentoring Royal University of Agriculture partners about experimental design, data collection and analysis as well as project planning and implementation strategies; UC Davis Investigator, Karen LeGrand (left)

Photo 2: Working as partners to identify information technology and best practices for field work and outreach to small-holder farmers. UC Davis Investigator, Glenn Young (standing)

Photo 3: Mentoring about how to conduct a SWOT analysis with the whole group of value chain actors at the Partnering Workshop; UC Davis investigator, Cary Trexler (sitting) and Royal University of Agriculture Investigator, Borarin Buntong (standing)

Photo 4: Outcomes and feedback about the training and research were discussed among team members after the Partnering Workshop; UC Davis Investigators, Glenn Young (left) and David Miller (right) and Royal University of Agriculture Investigator, Borarin Buntong (middle)

Photo 5: Mentoring in-country partners and training farmers about good agronomic practices; UC Davis Investigator, Jim Hill (left), former UC Davis Humphrey's Fellow, Sam Oreun Ke (right)

Photo 6: UC Davis Professor Glenn Young leads a career building discussion as part of the Center of Excellence for Sustainable Agricultural Intensification and Nutrition (CE SAID) seminar series. Title: *Building careers in Cambodia to promote agricultural sustainability and food security --- an open conversation with students of Royal University of Agriculture*

Photo 7: Active engagement in a "round-table" discussion - 32 students from the Royal University of Agriculture discuss careers in agriculture with UC Davis Professor Glenn Young (second from right) and UC Davis Postdoc Karen LeGrand (taking photo).

PARTNERING WORKSHOP REPORT

INNOVATIONS TO BUILD AND SCALE SAFE VEGETABLE VALUE CHAINS IN CAMBODIA

BATTAMBANG 12-17 FEBRUARY 2017

SUPPORTED BY

USAID FROM THE AMERICAN PEOPLE

HORTICULTURE INNOVATION LAB

UCDAVIS UNIVERSITY OF CALIFORNIA

DETAILED AND FULL REPORT OF PARTENERING WORKSHOP INCLUDING FOCUS GROUP DISCUSSIONS AND SWOT ANALYSIS-CAMBODIA

USAID-INNOVATIONS TO BUILD AND SCALE SAFE VEGETABLE VALUE CHAINS IN CAMBODIA

Partnership With:
University of California (UC Davis)
Royal University of Agriculture (RUA)
University of Battambang (UBB)
Cambodia,
12-17 February 2017

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Table of Contents

Section I: **Introduction**
Section II: **Organizers, participants and program agenda**
Section III: **Meeting Minutes and Methodology of Focus Group Discussions (FGD) and SWOT (Strengths, Weaknesses, Opportunities, Threats) Analysis.**
Section IV: **Summary of interactions between participant groups**
Section V: **Analysis of FGD**
5.1 FGD analysis organized by question
5.2 FGD analysis organized by topic
Section VI: **SWOT analysis grouped by topic**
Section VII: **Photographs of workshop**
Appendix A: **Questionnaire used for FGD/SWOT analysis (English and Khmer)**
Appendix B: **Direct translation from Khmer to English of Respondent Answers to FGD and SWOT analysis question (raw data/results)**

I. Introduction

Safe vegetables are vegetables that promote health and are free/limited of chemical and microbiological hazards. Safe vegetable value chains (SVVCs) include all of the linked actors extending from input providers to local farmers to marketers selling to consumers who seek for safe vegetables as part of their routine diet. The SVVC also needs to function within the landscape of local and national policies. There are certainly dynamic elements to these value chain linkages that can be enhanced through the introduction of hard technologies that, when properly used, result in improved safe vegetable production and postharvest practices through distribution of products to consumers. Safe vegetable production and postharvest practices include technologies and practices comply with Good Agricultural Practices (GAP) and Good Manufacturing Practices (GMP) thereby setting the stage for robust Hazard Analysis Critical Control Point (HACCP) policies.

The participatory events of this partnering workshop produced volumes of useful information that detail the foundation, focus, and rationale for the current SVVC. Particularly, this workshop gathered information about the situation, challenges and possible solutions through interaction between all participants who are current actors in the vegetable value chain. It also included farmer-to-farmer training modules for farmers from different regions in Cambodia to learn about successful practices from each other and to discuss ideas about how to improve the safety and quality of vegetables.

The team from Royal University of Agriculture (RUA), University of Battambang (UBB) and University of California at Davis (UC Davis) will be implementing the USAID project funded by Horticulture Innovation Lab entitled: "Innovations to build and scale safe vegetable value chains in Cambodia" in Battambang province, Cambodia from 2016-2019. This project is an applied research and outreach program with broad impact on family food security in ways that have potential for scaling. The project will incorporate methodologies based on the adaptation of the conventional Participatory Action Research paradigm to define problems and then work together with local Safe Vegetable Value Chain (SVVC) actors, the IPM Innovation Lab, other research teams and development organizations to seek solutions that function in Cambodia. The main objectives of the project are to:

- Pilot test various horticulture and postharvest technologies with potential to improve the safe vegetable value chain
- Field test promising technologies and market linkages with potential to improve the safe vegetable value chain
- Research approaches that promote innovation and adoption of technologies and strengthen market linkages in support of the local SVVC
- Build human capacity, particularly of farmers and other value chain actors, to participate in a sustainable domestic SVVC

1.1 Workshop Objectives:

The main objectives of the workshop are:

- To review the project's objectives and the implementation approaches with stakeholders
- To establish the network among the implementation team and relevant stakeholders, especially the actors in the vegetable value chain in Cambodia
- To identify the strengths and weaknesses of the vegetable value chain
- To conduct farmer-to-farmer trainings and identify opportunities to improve and strengthen the vegetable value chain
- To update the existing work plan according to stakeholder needs

1.2 This workshop covered:

- Introduction about the project including objectives of the workshop and field tours
- Activities and farmer-led trainings to make interaction between all stake holders in value chain including: producers/farmers; input suppliers; collector/marketers; supporters (ie, representatives of the Department of Agriculture and non-governmental training and extension organizations-NGO's)
- Gathering information to identify the priorities and challenges for actors in the vegetable value chain and crop production
- Methodology of FGD, SWOT analysis, and farmer-to-farmer training
- Preliminary review of results and way forward

1.3 This report provides an overview of the facilitated sessions held in Cambodia:

- It is intended hope that the information/data and results from this workshop would be the useful for concrete ideas to design the activity plans toward implementing the project.
- The concepts are from all stake holder/actors of the whole value chain related to safe vegetable production.

II. Organizers and program agenda

2.1 Organizing committee:

There are three groups including: UC Davis team; RUA team; UBB team.

UC Davis Team

1. **Professor Glenn Young**, Vice Chair for International Programs Department of Food Science and Technology.
2. **Dr. Karen LeGrand,** UC Davis Chancellor's Postdoctoral Scholar, International Programs Office, College of Agriculture and Environmental Sciences
3. **Professor Cary Trexler,** School of Education
4. **G. David Miller,** Academic Coordinator and Lecturer, Director of Research and Innovation Fellowship for Agriculture Program, International Programs Office
5. **Dr. James Hill,** Associate Dean Emeritus, International Programs Office, College of Agriculture and Environmental Sciences

Royal University of Agriculture Team

1. **Assistant Professor Kong Thong**, Dean of Faculty of Agro-Industry, Royal University of Agriculture, Phnom Penh
2. **Dr. Buntong Borarin**, Director of Division Research and Extension, Royal University of Agriculture, Phnom Penh
3. **Mr. Bou Bunthi,** Project Field Staff
4. **Mr. Da Gnean Nak**, Administration and Human resources, Royal University of Agriculture
5. **Ms. Chhe Chinda**, Research Assistant, Royal University of Agriculture
6. **Ms. Yim Sophorlkun**, Student Intern, Royal University of Agriculture
7. **Mr. Long Chantha**, Farm manager of Center of Excellence on Sustainable Agricultural Intensification and Nutrition (CE SAIN) in Battambang Province
8. **Mr. Tong Socheath**, Consultant.

University of Battambang Team

1. **H.E. Sieng Emtotim**, Rector of University of Battambang, Battambang province
2. **Dr. Nguon Samnang**, Project partner, Faculty of Agriculture and Food Processing, University of Battambang, Battambang province
3. **Dr. Srean Pao**, Acting Vice Dean of Fac. of Agriculture and Food Processing
4. **Mr. Touch Bunna**, UBB farm manager
5. **Mr. Lim Seiha**, Head of Laboratory and Practice
6. **Mr. Seav Sovanna**, Head of Research Office
7. **Dr. Chea Ratha**, Head of International Relation Office

2.2. Participants were selected from all stake holders in value chain including:

1. Farmers/producers
   - There were two groups of producers/farmers from different locations in Battambang Province where different situations, challenges and priorities exist
     - Thmor Koul district
     - Bannon District
   - Also, farmers/producers from Sa Ang district, Kandal province, attended to contribute their experience and success in using the safe net-house vegetable model. They also were invited to join the workshop to exchange experiences and key success with target farmers in Battambang province.

2. Supporters (Support group):
    - Included individuals from organizations such as Non-Governmental Organizations (NGOs), Ministry offices, and private enterprises offering support services to farmers

3. Team from Value Chain including collector, marketers and input suppliers such as:
    a. Green Fresh Shop (Phnom Penh): Vegetable Retailer
    b. Natural Agriculture Shop (Phnom Penh): Vegetable Wholesale and Retailer
    c. Green Garden (Phnom Penh): Vegetable Wholesale and Retailer
    d. ICCO (Phnom Penh): Vegetable Wholesale and Retailer, Training
    e. Angkor Green (Battambang): Supplier of fertilizer, pesticide, tools, materials and training

4. Invited participants:
    a. 66 out of 73 invited guests participated in the workshop
    b. Invited participants came from the project implementing team, partners and relevant stakeholders especially the actors in the vegetable value chain in Cambodia.

No.	Invited Participant	Title or Affiliation
University of California at Davis		
1	Prof. Glenn Young	Professor and Vice Chair for International Programs Department of Food Science and Technology
2	Prof. Cary Trexler	Professor College of Agriculture and Environmental Science
3	Prof. David Miller	Academic Coordinator and Lecturer, Director of Research and Innovation Fellowship for Agriculture Program
4	Prof. James Hill	Associate Dean, Emeritus International Programs Office College of Agriculture and Environmental Science
5	Dr. Karen LeGrand	UC Davis Chancellor's Postdoctoral Scholar International Programs Office
Royal University of Agriculture		
6	Prof. Thong Kong	Dean, Faculty of Agro-Industry Royal University of Agriculture, Phnom Penh, Cambodia
7	Dr. Buntong Borarin	Vice-Dean, Faculty of Agro-Industry Royal University of Agriculture, Phnom Penh, Cambodia
8	Mr. Davuth	Project Field Staff
9	Mr. Bou Bunthi	Project Field Staff
10	Mr. Da Gnean Nak	Project Assistant
11	Ms. Chhe Chinda	Project assistant
12	Ms. Yim Sophorlkun	Student Intern
13	Mr. Tong Socheath	Consultant

No.	Invited Participant	Title or Affiliation (continued)
		University of Battambang
14	H.E Sieng Emtotim	Rector of University of Battambang
15	Dr. Nguon Samnang	Project partner, Faculty of Agriculture and Food processing
16	Dr. Srean Pao	Dean of Faculty of Agriculture and Food Processing
17	Mr. Touch Bunna	UBB and Center of Excellence on Sustainable Agricultural Intensification and Nutrition (CE SAIN) farm manager
18	Mr. Lim Seiha	Head of Laboratory and Practice
19	Mr. Seav Sovanna	Head of Research Office
20	Dr. Chea Ratha	Head of International Relation Office
21	Mr. Hean	Student Intern
		Provincial Department of Agriculture, Forestry and Fisheries (PDAFF)
22	Mr. Chheum Vichhera	Director of Battambang Provincial Department of Agriculture, Forestery and Fisheries (PDAFF)
23	Chon Non	Battambang Provincial Department of Agriculture, Forestery and Fisheries (PDAFF)
24	Mr. Set Vinit	Office of Agro-Industry, Provincial Department of Agriculture, Forestry and Fisheries (PDAFF)
25	TBD	Office of Extension of Provincial Department of Agriculture, Forestry and Fisheries (PDAFF)
		IPM Innovation Lab / iDE
26	Dr. Kim Hian SENG	Project Coordinator, IPM and Agronomy Adviser Vegetable IPM Innovation Lab, iDE Cambodia
27	Ms. Lors Thmey	iDE Staff
28	Ms. Millie Smith	Virginia Tech University Volunteer student
		Center of Excellence on Sustainable Agricultural Intensification and Nutrition (CE SAIN)
29	Dr. Hok Lyda	Center of Excellence on Sustainable Agricultural Intensification and Nutrition (CE SAIN)
30	Mr. Mao Manel	Program Manager of Center of Excellence on Sustainable Agricultural Intensification and Nutrition (CE SAIN)
31	Mr. Reach Syden	Development Manager of Center of Excellence on Sustainable Agricultural Intensification and Nutrition (CE SAIN)
32	Mr. Kong Chantha	Farm manager of Center of Excellence on Sustainable Agricultural Intensification and Nutrition (CE SAIN) in Battambang Province
		Additional Team from Support Group (NGOs and other offices)
33	Mr. Sam Oeurn Ke	SNV Netherlands Development Organization's Consultant
34	Stewart Brown	The World Vegetable Center (AVRDC)

No.	Invited Participant	Title or Affiliation (continued)
35	Mr. Prum Raksmey	Staff from ICCO international
36	Mr. Chan Sopheak	Angkor Green Co. Ltd, input suppliers company
37	Ms. Lim Porty	Natural Agricultural Village
38	Ms. Lep Asy	Green Garden Store
39	Ms. Phork Hoeurng	Golden YEM co.Ltd
40	Ms. Mert Dany	Project Officer
41	Ms Ngang Channaty	Project Officer
Team from Value Chain (marketers, food processors, input suppliers)		
42	Mr. Lang SengHorng	Program officer, Cambodia, ICCO Cooperation (Interchurch Coordination Committee on Development)
43	Mr. Hean Pheap	General Manager, ASA Co. Ltd
44	Mr. Chan Sopheak	Angkor Green Co. Ltd, Input suppliers company
45	Ms. Phork Heung	Vegetable Processor
46	Ms. Bun Sieng	Natural Agricultural Village
47	Mr. Rung Rim	Collector from Tasey Leu Village, Ta Meun Commune, Thmor Koul District
Farmers from Battambang		
48	Mr. Nob Non, Lead Farmer	Tasey Village, Ta Meun Commune, Thmor Koul District
49	Mr. Kheum Bun Hean	Tasey Village, Ta Meun Commune, Thmor Koul District
50	Mr. Seng Sarun	Tasey Leu Village, Ta Meun Commune, Thmor Koul District
51	Mr. Soam Chantha	Tasey Leu Village, Ta Meun Commune, Thmor Koul District
52	Mr. Heun Ra	Tasey Village, Ta Meun Commune, Thmor Koul District
53	Mr. Chin PhorlLey	Tasey Village, Ta Meun Commune, Thmor Koul District
54	Mr. Cheang Sopheap	Tasey Village, Ta Meun Commune, Thmor Koul District
55	Mr. Khorn Samourn	Tasey Village, Ta Meun Commune, Thmor Koul District
56	Mr. Run Sokun	Tasey Village, Ta Meun Commune, Thmor Koul District
57	Mr. Sa	Tmey Village, Ta Meun Commune, Thmor Koul District
58	Mr. Puth Pun	Tmey Village, Ta Meun Commune, Thmor Koul District
59	Mr. Sam Ath	Anlong Run Village, O' taki Commune, Thmor Koul District
60	Mr. San	Balang Leu Village, Khnach Romeas Commune, Bovel district
61	Mr. Tet Saren	Farmer from Battambang
62	Ms. Tet Roub	Farmer from Battambang
63	Ms. Ham Herng	Farmer from Battambang
64	Ms. Port Sokpos	Farmer from Battambang
65	Ms. Chhom Chherb	Farmer from Battambang

No.	Invited Participant	Title or Affiliation (continued)
Farmers from Sa Ang District, Kandal Province		
66	Mr. Keo, Lead Farmer	Baren Leu Village, Svay Proteal Commune, Sa Ang district, Kandal Province
67	Mr. Peth	Farmer from Sa Ang district
68	Ms. Om Mech, Lead Farmer	Farmer from Sa Ang district
69	Mr. Ke Chheng Meng	Farmer from Sa Ang district
70	Mr. Soun Chem	Farmer from Sa Ang district
71	Ms. Lorn Sokpha	Farmer from Sa Ang district
72	Ms. Theng Sreykhour	Farmer from Sa Ang district
73	Ms. Chheng Pov	Farmer from Sa Ang district

2.3. Venue and Program:

This workshop with all participants was held on February 14th, at University of Battambang, Battambang province. The workshop was cooperation among RUA, UBB and UC Davis teams.

Date/time	Activities
12 Feb 2017	Organizing team meeting (UC Davis, RUA, UBB)
13 Feb 2017	Organizing team visit to Center of Excellence on Sustainable Agricultural Intensification and Nutrition (CE-SAIN) Technology Park in Battambang
14 Feb 2017	Workshop—Venue: University of Battambang (Hall H2)
8:00-8:30	Registration
8:30-8:35	Welcome message for the project and the workshop— by RUA Team
8:35-8:40	Welcome Remark from University of Battambang—Dr. Nguon Samnang
8:40-8:55	Welcome and Opening speech –H.E Rector of University of Battambang
8:55-9:00	Welcome remark for the project and workshop—by UCD team
9:00-9:15	Participants Introductions (Game)
9:15-9:30	Coffee break--Networking activities—Get to know each other
9:30-11:00	Break out into focus groups for different Group Discussions to identify the priorities and challenges for actors in the vegetable value chain: Groups: Crop production Collecting / Marketing Support Group / Input supply
11:00-12:00	Presentation of focus group discussions
12:00-13:00	Lunch Break
13:00-15:00	SWOT Analysis on Vegetable Value Chain
15:00-15:30	Coffee break—Networking activities

Date/time	Activities
15:30-16:00	Review of focus group discussions and SWOT analysis for reflection and the way forward of the project—research activities, trials and outreach program
16:00-16:30	Closing
15 Feb 2017	Field trip (For Invited Participants and Registered Guests)
8:00-9:00	Visit wet market, Psa Nat, located in front the International Hotel to observe many retail shops for local and imported fruit that can be found and also observe different types of local food products
9:00-10:00	Visit Beung Chhouk Market to observe different varieties of fruits and vegetables and seasonality especially the imports from Thailand and also to talk with collectors and wholesalers
10:00-10:30	Visit Angkor Green, supplier of fertilizer, pesticide, tools, materials and training
10:30-11:30	Visit new wholesale distribution market in Battambang, Phou Pouy Market
11:30-12:00	Visit Non input supply shop, supplier of seeds, fertilizers, irrigation systems and other farming materials
12:00-1:00	Lunch in Tasey Village
1:00-2:00	Farmer-to-farmer training at combination horticulture / aquaculture farm of project lead farmer in Tasey Village, Thmor Koul District
2:00-3:00	Farmer-to-farmer training at pepper farm recently converted from rice field in Anlong Run Village, Thmor Koul District
3:00-4:00	Postharvest training at leafy vegetable farm in Thmor Koul District
4:00-5:00	Farmer-to-farmer training at leafy vegetable and cucumber farm in Balang Leu Village, Bovel Disitrict
16 Feb 2017	Field trip (For Invited Participants and Registered Guests)
9:00-11:00	Travel to Krous Village
11:00-12:00	Farmer-to-farmer training about organic fertilizer production and application at a at vegetable farm in Krous Village
12:00-1:00	UC Davis and RUA team lunch in Kamping Pouy, Kandal team depart for Phnom Penh
1:00-2:00	Visit vegetable farm in Kamping Pouy
2:00- 3:30	Reflection from the field trip to identify the way forward
17 Feb 2017	UC Davis team and RUA team
8:00-3:00	Travel to Phnom Penh (lunch in Pursat)
3:00-4:00	Visit Natural Garden (and other Natural Vegetable Store in Phnom Penh as time permits)

III. Meeting Minutes and Methodology of FGD and SWOT

In order to seek input from a variety of participants in Cambodia, University of Battambang (UBB), hosted in collaboration with RUA and UC Davis a workshop in Battambang province, Cambodia on 13-17 February 2017. The following was outlined according to the agenda:

3.1 Welcome remark of Dr. Borarin Buntong, the country project coordinator, in which the project outline was highlighted.

3.2 Welcome remark for the project and workshop by UCD team, Professor Glenn explained the important objectives of the project, representative of the donor, so that the participants trust and willing to get involved in the project.

3.3 Welcome remark of H.E Seng Emtotim of UBB indicated strong cooperation.

3.4 Participants were self-introduction to make interaction between all stake holders in value chain. They shared experiences and willingness/share/work together.

3.5 Presentation from successful model farmers: the workshop agenda spent long period of time for the presentation about successful story by farmers group from Sa ang district who got success in applying nethouse safe vegetable. The presentation was a driver for the farmers in Battambang province to become involved in the project effectively.

3.6 Focus group discussions (FGD) were divided into four groups in the whole value chain, and each group was coordinated by organizers who have long time experience and skill in the safe vegetable value chain:

- Marketing group, coordinated by Assistant Professor Kong Thong, Dean of Faculty of Agro-industry. Participants:
  - Green Fresh Shop (Phnom Penh): Retailer
  - Natural Agriculture Shop (Phnom Penh): Whole and Retailer
  - Green Garden (Phnom Penh): Whole and Retailer
  - ICCO (Phnom Penh): Whole and Retailer, Training
  - Angkor Green (Battambang): Suppliers, fertilizer, pesticide, tools, materials and training
- Supporting group, coordinated by Mr. Sam Oeurn Ke, from SNV, consultant. Participants:
  - Team from Provincial Department of Agriculture, Forestry and Fisheries (PDAFF)
  - Team from IDE-IPM Innovation Lab
  - Team from SNV
- Producers group from Bannon district coordinated by Mr. Tong Socheath, Head of Postharvest technology department, faculty of agro-industry
- Producers group from Thmor koul district, coordinated by Dr. Borarin Buntong, Director of Division Research and Extension, Royal University of Agriculture

3.7 Model questionnaires were used as brainstorming topics for each FGD:

1. Icebreaker question (responses not recorded).
2. What are the benefits of safe vegetable production through marketing?
3. What are the disadvantages of safe vegetable production through marketing?
4. What are your current problems related to vegetable production as a way of making money (Production, health, marketing, postharvest credit and etc.)?
5. What activities/service can this project do with you that will help you address your difficulties/problems related to vegetable production as a way of making money?

6. Are the government supported farmer groups forming saving and leadership groups and receiving additional loans from the government to individual farmer or the groups?
7. Are the farmer groups choosing their leaders and making decisions to gather about how to build enterprises?
8. Do the farmer groups do joint process of vegetables and joint marketing?

3.8 SWOT

- SWOT (Strengths, Weaknesses, Opportunities, Threats) analysis is a strategy commonly used in strategic program planning. It provides a simple framework for an entity to scan both the internal and external environment.
- The SWOT analysis provides information that is helpful in matching the entity's resources and capabilities to the environment in which it operates. It also acts as a filter to reduce the information generated through the exercise to a manageable number of key issues.
- As the name implies, a SWOT analysis consists of four categories: strengths, weaknesses, opportunities, and threats. These categories can further be defined as either internal or external factors. Strengths and weaknesses are often internal to an entity. Opportunities and threats tend to be external factors, often beyond the control of the entity/organization, but that impact and/or influence operations. The following matrix presents the components of the SWOT analysis.
- A number of questions guides the SWOT analysis. Participants were asked to consider the following question as they worked through the focus group discussion.

SWOT Matrix	Competitive Advantages	Institutional Challenges
Internal Factors	Strengths	Weaknesses
External Factors	Opportunities	Threats

Strengths:

- What are the farmers experts in?
- Which vegetables are they good growing?
- What many things cannot do well?

Weaknesses:

- What is it the farmers cannot do?
- Which are vegetables they cannot grow? Why?
- What are things they cannot do well?

Opportunities:

- What areas can make farmers become stronger?
- Which sectors can provide improved techniques to farmers?

Threats:

- What things effect the ability of farmers to to growing vegetables?
- What are the main problems for farmers?

- For the SWOT exercise, each participant received notes cards, three for each SWOT category. The participants were instructed to work individually and write down three strengths, three weaknesses, three opportunities and three threats, one on the each paper. Participants posted their answers on the wall for everyone to review.
- The facilitators at two sessions reminded the participants that the purpose of the exercise was to generate ideas and feedback, not come to consensus on any particular item or issue. Rather, it was entirely conceivable that an issue could be identified in multiple categories (i.e., be both a strength and a weakness). As such, all ideas posted on the walls were documented and are included in the results section.
- Our team collected all the papers to assemble and translate into English to analyze all strengths, weaknesses, opportunities and threats to know how many participants have the same ideas and identify common themes among the answers.

IV. Summary of interactions between participant groups

- Collectors expect to consume the safe vegetable
- Farmers expect to sell out their products
- Supports group is willing to get involved and help the farmers and marketers to promote safe vegetable production
- Issues were highlighted by each group
- Challenges and priority problem were identified
- Farmers in Battambang province learn a lot about the success cases from farmers in attendance from Sa Ang District, Kandal Province

V. Analysis of Focus Group Discussions (FGD)

5.1 FGD analysis organized by question

- Answers given by each of the four participant groups are listed below the respective question (FGD Q1-FGDQ8).
- Following each question are the answers collected from all groups
- Preceding each answer is/are letter(s) that indicate which group(s) provided the respective answer

Note: Letters indicating which group(s) provided each answer:
M = Marketing Group
S = Supporting Group
B = Bannan District Group
T = Thmor Koul District Group

FGD Q1: Icebreaker question

FGD Q2: What are the benefits of safe vegetable production through marketing?

M	Price of vegetables on market is better
M	Both producers and consumers can get better quality vegetables
M	Build confidence for consumers on quality of vegetables
M	Reducing of production cost
S	Has high market demand and can be competed
ST	Healthy consumption
S	No environmental pollution
S	Tourism attraction
B	No affect on health for producers
T	Health for producers
T	Income for producers

FGD Q3: What are the disadvantages of safe vegetable production through marketing?

M	Appearance quality of vegetables is still be limited in attracting the consumers/buyers
M	pay much time in taking care after planting
M	Require higher labors and production cost
M	Growing calendar not yet follow the plan properly
S	Growing season dependence (water, insect/disease and climate change)
MT	Price of vegetables is more expensive than common market
MSBT	Yield is lower compared with conventional growing
MS	Require a higher techniques (growing, transporting and storage) knowledge and skill of producers
MA	Supplies do not reply the demand yet
S	Can be applied mostly for only small farmers, cannot be applied for medium and large farmers
SB	Lack of management and no policy support from Government
S	Lack of market/price information and confidence from the consumers
T	No certification body then price is lower comparable to conventional growing vegetables
T	Price of vegetable without using chemical is similar with price of importing

FGD Q4: What are your current problems related to vegetable production as a way of making money (Production, health, marketing, postharvest credit and etc.)?

M	Lack of information for planning growing
M	Growing calendar not yet properly implemented
M	Destroying factors such as insects, diseases
M	Climate changes
M	Producers grow the kinds of vegetables follow each others
M	Supplies are higher than demand then price is lower
MS	Limitation of growing, harvesting, transport, storage techniques
ST	Lack of Management of insect/pest/disease
S	Low quality of seed
S	Health problems due to using lots of artificial agriculture chemicals
S	No big market, more flow of import and then market low demand
S	Cheap price
S	No trust each other between the producer and buyers
S	No contract buy/sell
S	No have institutes to give advising on growing techniques
B	No enough facilities and equipment to practice the safe growing
B	Longer growing duration
B	Need net that we have no money to buy
B	No cow manure, and rice straw
B	Need money from growing as soon as, where as safe growing take longer time more than conventional growing
T	High price of agriculture inputs where as low price of vegetable sold
T	Narrow market

FGD Q5: What activities/service can this project do with you that will help you address your difficulties/problems related to vegetable production as a way of making money?

- M Set the price of vegetable for stable price, avoiding fluctuation
- M Prepare the growing plan together in the producing groups
- M Training on logistics
- M Build up the confidence of consumers on quality through techniques of growing, harvesting, transport and storage
- M Promoting the marketing based on source of vegetables growing place
- B 1st Their vegetable nowadays are cheaper compared with safe/organic vegetables
- B 2nd Healthy problem due to pollute environment, breath with pesticide
- B 3rd capital shortage
- B 4th growing and taking care techniques are limited
- B 5th not enough facilities, equipment, water, and seeds
- T Price of inputs should be comparable to neighboring countries
- T Market price of vegetables should be higher/reasonable
- T New techniques and new experiences
- T Help developing the farmers' groups/corporation

FGD Q6: Are the government supported farmer groups forming saving and leadership groups and receiving additional loans from the government to individual farmer or the groups?

- M Didn't answer (marketing group)
- S These days there are some support from Government but still be limited
- S Communities of producers can sumit the proposal for fund but through the line such as from PDA (Provincal Department of Agriculture) to MAFF
- BT No loan from Government
- B No saving group establish supported by Government
- B No any leadership training from Government
- T Government established the saving group

FGD Q7: Are the farmer groups choosing their leaders and making decisions to gather about how to build enterprises?

- M No answer (marketing group)
- S Selection of Team Leader: Producers group select by themself through election
- SB Generally leaders are the one who voluntary implement any activities
- T Farmers already selected the leader

FGD Q8: Do the farmer groups do joint process of vegetables and joint marketing?

- SBT There has not yet been a group of joint processing and joint marketing
- BT Farmers not yet have enough knowledge/skill in processing their produces
- B But farmers are looking for market to sell their fresh vegetables
- T Not many buyers once plenty vegetables are harvesting
- T Collectors product in cheap price
- T Collectors look to buy any vegetables, which cannot be grown in that season.

5.2 FGD analysis organized by topic

- The topic for each category is indicated in **Bold**
- The letter(s) preceding each answer indicates which group(s) responded with the respective answer (note: in several cases, different groups indicated the same answer)

Note: Letters indicating which group(s) provided each answer:
M = Marketing Group
S = Supporting Group
B = Bannan Group
T = Thmor Koul Distict

➢ FGD issues relating to **Market:**

MSB	Price of vegetable on market is better
M	Build confidence for consumers on quality of vegetables
S	Tourism attraction
S	Has high market demand and can be competed
M	Appearance quality of vegetables is still be limited in attracting the consumers/buyers
MT	Price of vegetables is more expensive than common market
M	Supplies do not reply the demand yet
S	Can be applied mostly for only small farmers, cannot be applied for medium and large farmers
S	Lack of market/price information and confidence from the consumers
T	Price of vegetable without using chemical is similar with price of importing
M	Producers grow the kinds of vegetables follow each others
M	Supplies are higher than demand then price is lower
S	No big market, more flow of import and then market low demand
S	Cheap price
S	No trust each other between the producer and buyers
S	No contract buy/sell
T	High price of agriculture inputs where as low price of vegetable sold
T	Narrow market
M	Set the price of vegetable for stable price, avoiding fluctuation
M	Build up the confidence of consumers on quality through techniques of growing, harvesting, transport and storage
M	Promoting the marketing based on source of vegetables growing place
M	1st Their vegetable nowadays are cheaper compared with safe/organic vegetables
T	Price of inputs should be comparable to neighboring countries
T	Market price of vegetables should be higher/reasonable
B	But farmers are looking for market to sell their fresh vegetables
T	Not many buyers once plenty vegetables are harvesting
T	Collectors product in cheap price
T	Collectors look to buy any vegetables, which cannot be grown in that season.
SBT	There has not yet been a group of joint processing and joint marketing

- FGD issues related to **Appearance/Quality/Postharvest Techniques:**
  - MS Both producers and consumers can get better quality vegetables
  - M Appearance quality of vegetables is still be limited in attracting the consumers/buyers
  - MS Limitation of growing, having, transport, storage techniques

- FGD issues relating to **Production Techniques:**
  - M Require a higher techniques (growing, transporting and storage) knowledge and skill of producers
  - MS Limitation of growing, harvesting, transport, storage techniques
  - ST Lack of management of insect/pest/disease
  - B No enough facilities and equipment to practice the safe growing
  - B Longer growing duration
  - M Prepare the growing plan together in the producing groups
  - B 4th growing and taking care techniques are limited
  - T New techniques and new experiences

- FGD issues relating to **Calendar and Seasonal growing:**
  - M Growing calendar not yet follow the plan properly
  - S Growing season dependence (water, insect/disease and climate change)
  - M Growing calendar not yet properly implemented
  - B Longer growing duration
  - M Prepare the growing plan together in the producing groups
  - M Producers grow the kinds of vegetable follow each others

- FGD issues related to **Environment, health and safety:**
  - S No environmental pollution
  - B No affect on health for producers
  - T Health for producers
  - M Destroying factors such as insects, diseases
  - M Climate changes
  - ST Lack of management of insect/pest/disease
  - S Health problem due to pollute environment, breath with pesticide
  - ST Healthy consumption

- FGD issues related to **Income, Loans and support:**
  - S Lack of management and no policy support from government
  - S Lack of market/price information and confidence from the consumers
  - T No certification body then price is lower comparable to conventional growing vegetables
  - M Lack of information for planning growing
  - S No contract buy/sell
  - S No has institutes to give advising on growing techniques
  - B Need net that we have no money to buy
  - B Need money from growing as soon as, where as safe growing take longer time more than conventional growing
  - M Training on logistics
  - B 3rd capital shortage
  - T Help developing the farmers groups/corporation
  - S These days there are some support from government but still be limited from PDA (Provincial Department of Agriculture) to MAFF

- FGD issues relating to **Production Costs and Business Management:**
  - M Reducing of production cost
  - MT Pay much time in taking care after planting
  - MST Require higher labors and production cost
  - MSBT Yield is lower compared with conventional growing
  - B Training on logistics

- FGD issues relating to **Input Supplies:**
  - S Low quality of seed
  - B No enough facilities and equipment to practice the safe growing
  - B Need net that we have no money to buy
  - B No cow manure, and rice straw
  - B 5th not enough facilities, equipment, water and seeds

- **Other Issues from FGD:**
  - S Selection of Team Leader: Producers group select by themself through election
  - SB Generally leaders are the one who voluntary implement any activities
  - T Farmers already selected the leader
  - SBT There has not yet been a group of joint processing and joint marketing
  - BT Farmers not yet have enough knowledge/skill in processing their produces

VI. SWOT (Strengths, Weaknesses, Opportunities, Threats) Analysis

- All participant answers to SWOT analysis are grouped by topic (indicated in the heading in **bold**)

Colors represent answers in the indicated SWOT categories:

Strengths S = Green
Weaknesses W = Blue
Opportunities O = Red
Threats T = Orange

- SWOT issues relating to **Market**:
  - S Built up confidence for consumers on quality of vegetables
  - S Safety vegetables into market, provide healthy for consumers and producers and profit
  - O High price of organic/safe vegetable
  - O Consumers can access good and healthy quality
  - O Quality of produces can be competed with international market
  - O There are high market demand
  - O High price of vegetable due to the consumers consider high value for safe vegetable
  - O There are companies waiting to buy vegetables
  - O There are companies waiting to buy vegetables
  - O Demand is increasing
  - O Supports of consuming organic and safe vegetables
  - O Information of safe vegetable is becoming more widely well
  - O Appropriate price
  - O There are much more interests of this safe vegetables growing
  - T No market access
  - T Lack of information on techniques and market demand

T Difficult in to compete with produces imported
T Not stable prices, some time up and sometime down
T Price of fresh produces become lower
T There are lots of imports then local produces price are lower

- SWOT issues related to **Appearance/Quality/Postharvest Technique:**
  - W There should training on producing technique, postharvest, packaging
  - O Ensure the quality for consumers

- SWOT issues relating to **Production Techniques:**
  - S With technical growing
  - S Soil preparation
  - S Soil preparation and applying lime stone
  - S Know the techniques of growing
  - S Good skill in taking care vegetables after growing
  - S Help in seeds producing techniques
  - S Good at seed selection
  - S Chinese cabbage
  - S Tomato
  - S Can growing much pumpkin not by safe vegetable
  - S Can grow pumpkin and SAAM well
  - W Much consumptions of time, labors, such as growing, take care after growing, postharvest packaging
  - W No self-confident in producing/growing
  - W Not good result of tomato growing
  - W Not know well on insecticide making
  - W Not know how to do seedling
  - W Not know how to apply the pesticides/insecticide
  - W Not techniques in taking care
  - W Not techniques in soil preparation
  - W Lack of knowledge on how to grow
  - W There should training on producing technique, postharvest, packaging
  - W Growing dependent on calendar/plan
  - O Help producers with growing techniques
  - T There are no protection measures for vegetables in rainy season (soft rot diseases)
  - T Several times of destroying by insects
  - T Lack of improvement/reform and irrigation system

- SWOT issues related to **Environment, Health and Safety:**
  - S No bad effects on health of producers
  - S Safety vegetables into market, provide healthy for consumers and producers; and profit
  - S No pollution on environment since no use chemicals
  - S The produces are safe
  - W Not know well on insecticide making
  - W Not know how to apply the pesticides/insecticide
  - O Consumers can access good and healthy quality
  - O No environmental pollution (such water, air, soil) by agriculture chemicals

- O High price of vegetable due to the consumers consider high value for safe vegetable
- O Ensure the quality for consumers
- T Several times of destroying by insects
- T Storm flood, not rain and fire

- SWOT issues related to **Income, Loans and Support:**
  - S Safety vegetables into market, provide healthy for consumers and producers and profit
  - O There are supports from NGOs and Government
  - O Government is focusing on safe vegetable
  - O Contract with farmers in growing cucumbers
  - T Provide information on selection of seeds
  - T Lack of information on techniques and market demand
  - T Lack to management and policy supported from government

- SWOT issues relating to **Production Costs and Business Management:**
  - S Reduce the production cost
  - S Records on sells
  - S Enlarge the production
  - W Much Consumptions of time, labors, such as growing, take care after growing, postharvest and packaging
  - W Producing areas are small
  - W Lack facilities/equipment
  - W There should be a common price limitation

- SWOT issues relating to **Input supplies:**
  - S There are gathering of material for compost such as from animal manure
  - S There are producing of compost
  - S Can producing natural fertilizers by them self
  - S Practicing of producing composts
  - W Limitation natural fertilizers making
  - W Poor fertilized soil
  - O Access to seeds, pesticides fertilizer (more on market)
  - O Know the company supplied seed, fertilizer and pesticide/insecticide
  - T Supplies doesn't meet the requirement
  - T Inputs supplies price are high

- **Other SWOT Issues:**
  - S High commitment
  - S Sharing of experiences among producers
  - W Lack water resources for irrigation
  - O There are water and soil for growing
  - O Lots of water sources
  - O Enough infrastructure
  - O There is production of safe vegetables growing
  - T There are water and soil for growing

Section VII: Photos of Partnering Workshop Activities

Photo 1: UC Davis and RUA team visiting the Center of Excellence on Sustainable Agricultural Intensification and Nutrition (CE SAIN) technology park in Battambang Province. University of Battambang farm manager, Mr. Kong Chantha (standing), presenting overview of the plans and progress towards the vision for the technology park.

Photo 2: From multiple provinces throughout Cambodia, vegetable value chain actors (ie. farmers, collectors, food processors, marketers, input suppliers) and other agriculture sector stakeholders (ie. Ministry of Agriculture Forestries and Fisheries, Non-Governmental Organizations, university researchers) gathered and are registering to attend the Partnering Workshop at the University of Battambang.

Photo 3: Glenn Young (left) and Karen LeGrand (right), mentoring Royal of University of Agriculture faculty, Mr. Tong Socheath (center), on how to conduct the focus group discussions later in the day. This is one example of the UC Davis team's strategic plan to build capacity of local counterparts to conduct research and training after the USAID Safe Vegetable Value Chain project is completed.

Photo 4: Rector of University of Battambang, H.E. Sieng Emtotim (seated at the head of the table), officially opening the Partnering Workshop, describing the three-way partnership between the University of Battambang, UC Davis and the Royal University of Agriculture and encouraging participants to use the time at the workshop to develop partnerships that can improve the safety and quality of vegetables in Cambodia.

Photo 5: Dr. Borarin Buntong, Director of Research and Extension at the Royal University of Agriculture (standing), giving a project overview of the "Innovations to build and scale safe vegetable value chains in Cambodia" project to participants of partnering workshop and encouraging their ongoing participation for the next two and one half years.

Photo 6: Professor Glenn Young from UC Davis (standing) giving welcome remarks and introducing the UC Davis team to participants of the Partnering Workshop.

Photo 7: Professor Kong Thong, Dean of the Faculty of Agro-Industry at the Royal University of Agriculture (standing) discussing the research and extension activities of the Royal University of Agriculture as well as the partnership with UC Davis and University of Battambang.

Photo 8: University of Battambang faculty sharing with workshop participants the research, academic programs and partnerships of the university.

Photo 9: Ms. Lep Asy (standing), a safe vegetable marketer within the value chain, is introducing herself and her business to participants of the partnering workshop and expressing interest in developing new partnerships that can diversify her business.

Photo 10: Mr. Keo (standing), a farmer from Sa'ang District who has participated with the UC Davis-RUA Research Team since 2011 to build a safe vegetable value chain in Kandal province, is introducing himself and describing his experience with the research team and in the emerging safe vegetable value chain.

Photo 11: Mr. Set Vinit from the Battambang Provincial Department of Agriculture, Forestries and Fisheries is introducing himself, describing the role of the Provincial Department of Agriculture in this project, discussing his role in the vegetable value chain and expressing thanks to the project team for bringing this idea into Battambang province.

Photo 12: Mr. Nob Non (standing), one of the lead farmers in the project from Thama Koul District in Battambang province, is introducing himself, his role in the project and inviting partnership with other farmers throughout Cambodia.

Photo 13: Dr. Seng Kim Hian (in red shawl) from the Integrated Pest Management (IPM) Innovation Lab is describing the partnership between the Horticulture Innovation Lab and the IPM Innovation Lab and her role in partnering with the UC Davis, RUA and UBB research team to advance IPM techniques in Battambang Province.

Photo 14: Focus group discussion of a supporting group of value chain actors that includes participants from IPM Innovation Lab, NGO's and Provincial Department of Agriculture. Mr. Sam Oeurn Ke (standing), former UC Davis Humphrey's Fellow, leading discussion about how the organizations represented by this group can work with farmers in Battambang Province to improve the safety and quality of vegetables and increase farmer income.

Photo 15: Research team from Royal University of Agriculture, Dr. Borarin Buntong and Ms. Yim Sophorlkun (left), leading a focus group discussion with farmers from Thama Koul District in Battambang Province about the benefits and challenges of producing safe vegetables.

Photo 16: Focus group discussion among food processors, collectors and marketers (sitting in circle) being led by Professor Kong Thong (sitting center), Dean of the Faculty of Agro-industry at Royal University of Agriculture. Ideas about how safe vegetables can be better produced, transported and marketed are being recorded on the white board by Ms. Chhe Chinda (standing), Research Assistant at Royal University of Agriculture.

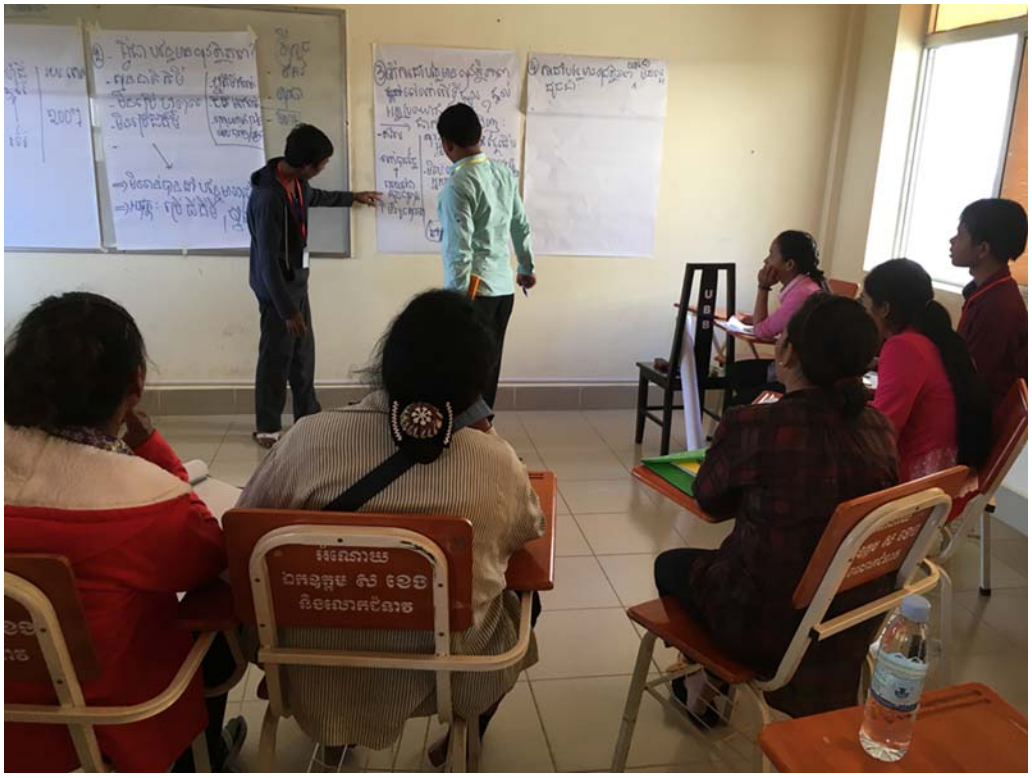

Photo 17: Focus group discussion among farmers of Bannon District, Battambang Province (sitting in circle) being led by lead farmer from Kandal Province, Mr. Keo (standing left), and Mr. Tong Socheath (standing right), Royal University of Agriculture, to identify the benefits and challenges of producing safe vegetables in this district.

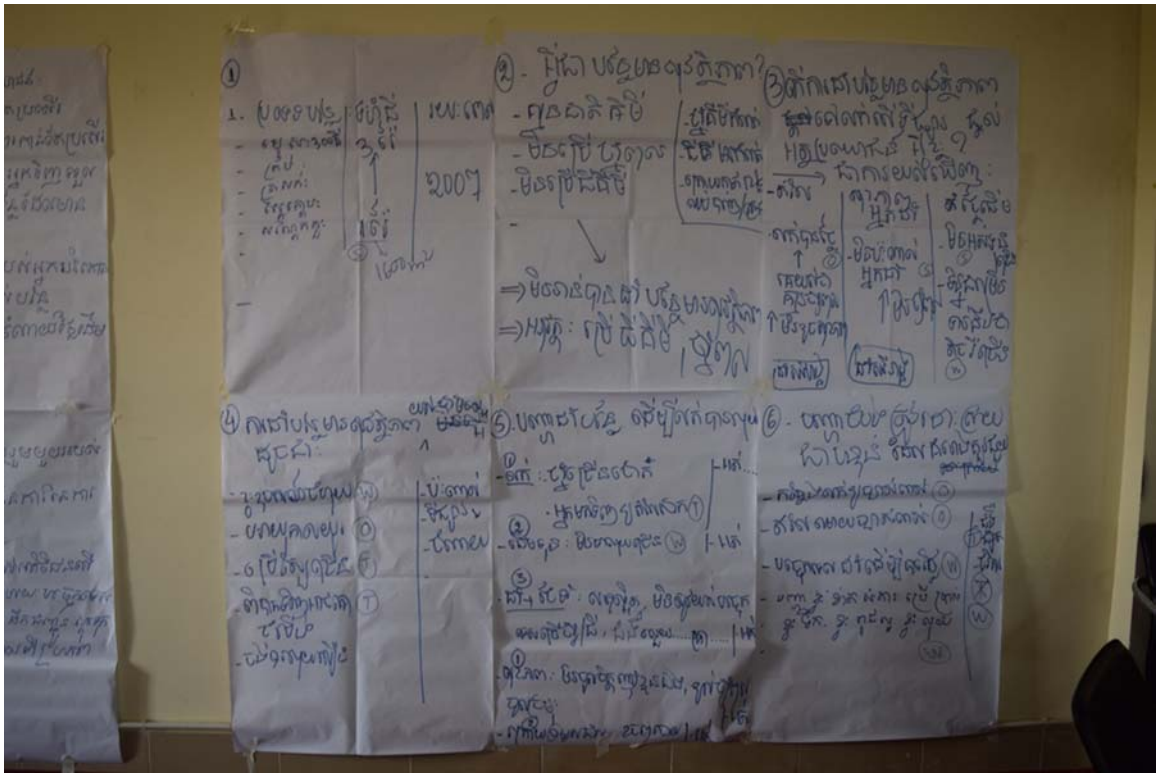

Photo 18: Results of focus group discussions posted on the wall for review and discussion among all participants of the partnering workshop.

Photo 19: Nethouse technology is being introduced as a way for Cambodian farmers to control insect pests.

Photo 20: Food processor, Ms. Phork Heung (right), who is looking to expand her business is showing project staff (left) the types of products her business already makes and discussing ideas for a new supply chain of products that can be made from the raw materials made by farmers participating in the workshop.

Photo 21: Another example of the UC Davis team's capacity building that occurred throughout the workshop. UC Davis investigator, Cary Trexler (sitting), is mentoring Royal University of Agriculture Investigator, Borarin Buntong (standing), about how to conduct a SWOT analysis with the whole group of value chain actors.

Photo 22: Project team describing to participants how they will participate in the SWOT (Strengths, Weaknesses, Opportunities, Threats) analysis by writing their ideas for each category on different colored sheets of paper, then posting their ideas under the appropriate category on the wall in the front of the conference room.

Photo 23: Participants writing about their individual perceptions of the Strengths, Weaknesses, Opportunities and Threats that exist in the current vegetable value chain while looking forward towards developing a safe vegetable value chain in Battambang province.

Photo 24: Participants adding their SWOT ideas to the board and comparing their ideas about Strengths, Weaknesses, Opportunities and Threats within the value chain to the ideas of other participants.

Photo 25: The project team actively pursues ways to foster gender equity in mixed gender settings. In response to the facilitator's question, women farmers are actively participating in group discussion about the results of the focus group discussions and SWOT analysis by raising their hands to share their ideas.

Photo 26: In-country project leaders Dr. Borarin Buntong (left) and Dr. Kim Hian Seng (right) discuss ways the results from the workshop activities can be incorporated into the collaboration between the Horticulture Innovation Lab and the IPM Innovation Lab.

Photo 27: UC Davis Team members Dr. Karen LeGrand, Dr. Glenn Young, Dr. Cary Trexler and G. David Miller discussing workshop outcomes and the way forward for the project to impact the safe vegetable value chain in Battambang Province.

Photo 28: Workshop participants from the entire Cambodian value chain on their way to Beung Chhouk Market to see varieties of fruits and vegetables and discuss the vegetable value chain with sellers and collectors at this market. Many products at this market are imported from Thailand, so there is potential for local products to displace the large quantities of imported vegetables.

Photo 29: Market survey conducted by workshop participants at Beung Chhouk Market who are making observations, discussing with sellers and taking notes about the types, origin, quality, price, etc. of fruits and vegetables found within this market.

Photo 30: Photo documenting his market research to share with other farmers in Kandal Province, Lead farmer Mr. Keo uses his smartphone to photograph fruit and vegetable displays at Beung Chhouk Market in Battambang Province.

Photo 31: Workshop participants on a tour and being introduced to locally available products at an agriculture input shop, Angkor Green.

Photo 32: Workshop participants discussing the benefits and drawbacks of agricultural products available at Angkor Green.

Photo 33: Observations about the types and quality of products available and discussions with collectors and sellers about the price, origin, destination and postharvest practices being conducted by workshop participants on a tour at Phou Pouy Market, a new wholesale distribution center in Battambang.

Photo 34: Conducting an economic analysis of the value chain, UC Davis researchers Cary Trexler and David Miller discuss with University of Battambang researcher Hay Chanthol information gathered from wholesale marketers at Phou Pouy Market.

Photo 35: Farmer-to-farmer training about safe vegetable cultivation, participation in the safe vegetable value chain and combined horticulture/aquaculture systems being led by project lead farmer Mr. Nob Non (grey shirt in foreground).

Photo 36: Postharvest training being conducted by Ms. Chhe Chinda (bottom right) and Dr. Glenn Young (orange shirt) with farmers harvesting leafy greens in Thama Koul District, Battambang Province.

Photo 37: Field visit to pepper farm that was recently converted from a rice field based on favorable economic analysis of market demand.

Photo 38: Lead farmer, Mr. Nob Non, conducting farmer-to-farmer training about leafy green vegetable and cucumber cultivation in Balang Leu Village, Bovel District.

Photo 39: Mr. San showing to the workshop participants his high quality leafy greens that are ready for the market.

Photo 40: Farmer-to-farmer training by lead farmer in Krous Village. Farmers from other villages and provinces throughout Cambodia are watching a demonstration and taking detailed notes about organic fertilizer production.

Photo 41: Elements of a cold-chain in Cambodia are budding as Horticulture Innovation Lab technology, CoolBot (small black box with red digits under the air conditioning unit), is being used in a safe vegetable shop in Phnom Penh to override the thermostat and cool vegetables below normal air conditioned temperatures to extend the shelf life of vegetables.

APPENDIX TO DETAILED AND FULL REPORT OF PARTENERING WORKSHOP INCLUDING FORCUS GROUP DISCUSSIONS AND SWOT ANALYSIS-CAMBODIA

USAID-INNOVATIONS TO BUILD AND SCALE SAFE VEGETABLE VALUE CHAINS IN CAMBODIA

Partnership With:
Royal University of Agriculture (RUA)
University of California (UC Davis)
University of Battambang (UBB)
Cambodia
12-17 February 2017

Appendix A: Focus group discussion questionnaire (English and Khmer)

Q1: Please tell us your names, the vegetables you grow and how many years farming?
សំនួរទី១៖ សូមអោយកសិករប្រាប់ឈ្មោះ, ដំណាំអ្វីខ្លះដែលគាត់ដាំ និងបានដាំដុះបានប៉ុន្មានឆ្នាំហើយ?

Q2: What are the benefits of safe vegetable production through marketing?
សំនួរទ២៖ តើការដាំដុះដំនាំបន្លែទៅលក់លើទីផ្សារផ្តល់នូវភាពចំណេញ
និងគុណប្រយោជន៍អ្វីខ្លះដល់អ្នក?

Q3: What are the disadvantages of safe vegetable productions through marketing?
សំនួរទី៣៖ តើការដាំដុះដំណាំបន្លែសុវត្ថិភាពទៅលក់លើទីផ្សារផ្តល់នូវគុណវិបត្តិអ្វីខ្លះដល់អ្នក?

Q4: What are your current problems related to vegetable production as a way of marking money (Production, health, marketing, postharvest, credit)?
សំនួរទី៤៖ តើមានបញ្ហាអ្វីខ្លះដែលអ្នកជួបប្រទះក្នុងការដាំដុះដំណាំបន្លែដើម្បីលក់យកប្រាក់កំរៃ?

Q5: What activities/service can this project do with you that will help you address your difficulties/problem realated to vegetables producion as a way of making money?
សំនួរទី៥៖ តើអ្នកចង់មានសកម្មភាព (សំណូមពរ) អ្វីខ្លះ ដែលអាចជួយដោះស្រាយបញ្ហាក្នុងការដាំដុះដំណាំបន្លែ
របស់អ្នកក្នុងការលក់លើទីផ្សារ? (សូមអោយកសិករធ្វើចំណាត់ថ្នាក់ពីសកម្មភាពដែលចាំបាច់ជាងគេ)

Q6: Are the government support farmer groups forming saving and leadership groups and receiving additional loans from the government to individual farmer or the groups?
សំនួរទី៦៖ តើរដ្ឋាភិបាលមានបានជួយក្នុងការជ្រុំជ្រេញបង្កើតនៅក្រុមសន្សំ
ឬជួយជ្រើសរើសប្រធានក្រុមដែរទេ? មួយទៀតរដ្ឋាភិបាលមានបានផ្តល់ជាប្រាក់កម្ចីដល់កសិករ
ឬក្រុមកសិករដែរឬទេ?

Q7: Are the farmer groups choosing their leaders and making decisions to gather about how to build enterprises?
សំនួរទី៧៖ តើក្រុមកសិករមានបានធ្វើការជ្រើសរើសមេដឹកនាំ
ដើម្បីធ្វើការសម្រេចចិត្តអំពីការបង្កើរសហគ្រាសដែរ
ឬទេ?

Q8: Do the farmer groups do joint process of vegetables and joint marketing?
សំនួរទី៨៖ តើកសិករមានបានបង្កើតក្រុមក្នុងការកែច្នៃផលិតផលបន្លែ
និងចូលរួមក្នុងការស្វែងរកទីផ្សារដែរទេ?

Appendix B: Direct translation from Khmer to English of respondents' answers to FGD and SWOT Analysis question (raw data/results)

B.1 Focus group discussion (FGD) answers recorded

For each group as indicated

- Marketing group (Section B.1.1)
- Supporters group (Section B.1.2)
- Producers from Bannon district (Section B.1.3)
- Producers from Thmor Koul district (Section B.1.4)

B.1.1 *FGD Marketing group answers*

Q2*:* The benefit of the safe vegetable production through marketing:

- Better quality of vegetables
- Price of vegetables on market is better
- Both producers and consumers can get better quality vegetables
- Build confidence for consumers on quality of vegetables
- Reducing of production cost

Q3: The disadvantages of safe vegetable production through marketing:

- Appearance quality of vegetables is still be limited in attracting the consumers/buyers
- Spend much time and labor in taking care
- Growing calendar not yet follow the plan properly
- Price of vegetables is more expensive than common market
- Yield is lower compared with common growing
- Require higher level of techniques (growing, transporting, storage)
- Supplies do not reply the demand yet

Q5: The project can help them to address the problems related to vegetables production:

- There is fix determination of price as common price of vegetables
- Prepare the growing plan together
- Training logistics
- Build up the confidence of consumers on quality through techniques of growing, harvesting transport and storage
- Promoting the marketing based on source of vegetables

B.1.2 FGD Supporters group answers

Q1: The vegetables: mustard, Chinese kale, onion leaf, salad, cabbage

- Fruit vegetables: cucumber, egg plant, yard long bean, bitter gourd, tomato, chili, pumpkin

Q2: The benefit of the safe vegetable production through marketing:

- Has high market demand and can be competed
- Healthy consumption
- High price
- No environmental pollution
- Tourism attraction

Q3: The disadvantages of safe vegetable production through marketing:

- Require higher technology
- Yield is lower compared with common practices
- Higher production cost
- Growing season dependence (water, insect/disease, climate change)

Appendix B: (continued)

- Can be applied mostly for only small farmers, cannot be applied for medium and large farmers
- Lack of management and no policy support from Government
- Limitation of knowledge and skill of producers
- Lack of market/price information and confidence from the consumers
- Require higher labors

Q4: The current problems about vegetable production they are facing:
- Production: management of insect/pest/disease; cannot be storage longer time;
- Low quality of seed;
- Limitation of knowledge and skills in growing
- Heath problems due to using lots of artificial agriculture chemicals
- Marketing: no big market, cheap price, no trust each other between the producer and buyers, no contract buy/sell,
- No institutes to give advising on growing techniques
- More flow of import and market low demand

Q5: The project can help them to address the problems related to vegetables production:
Priority issues to be solved:
- 1st Market
- 2nd Capital
- 3rd Techniques
- 4th Labor
- 5th Processing

Q6: Support from Government:
- These days there are some support from Government but still be limited
- Communities of producers can summit the proposal for fund but through the line such as from PDA (Provincial Department of Agriculture) to MAFF
- Through development partners

Q7: The farmer groups have chosen leaders, but not yet build the enterprises. Selection of Team Leaders: were made by the
- Producers group themselves through election.
- Generally leaders are those who voluntarily implement activities.

Q8: The farmers have only done a small amount of vegetable processing because:
- Processing techniques is still be limited, at family level low processing skill,
- Not enough processing facilities
- There has not yet been groups focused on processing

Requests from this group:
- Lower the tax of imported agricultural inputs
- Reduce the importing of vegetables
- Certification of standard of vegetable (safety, GMP, ...) without charging
- Promote research and development related to vegetable production (compost, breeding crops)
  - Networking the information of market for the actors such as producers, collector, retailers, ... Especially by ICT?

Appendix B: (continued)

B.1.3 FGD Producers from Bannon district answers

Q1: The vegetables typically grown include:

- Chili; Egg plan; Cucumber; Cabbage; Yardlong bean
- Farmers have planted these products since 2007 till present
- Farm size from 1to 3 Rai (RAI = 40m x 40m

Q2: The Benefits of safe vegetable production:

- No chemicals
- No pesticide/insecticide
- No chemical fertilizers
- Our group did not practice the safe vegetable growing yet
- These days, we use chemicals as usual practicing without limitation

Q3: The disadvantages of safe vegetable production through marketing:

The farmers did not do safe vegetable yet, the answers bellows are just our understanding only:

- Higher price because consumer think no harmful for their health
- No affect on health for producers
- Production is lower
- Yield not sure higher or lower compared with usually growing

Q4: The current problems related to safe vegetable production:

- No enough facilities and equipment to practice the safe growing
- Longer growing duration
- Need net that we have no money to buy
- No cow manure, and rice straw
- Need money from growing as soon as, where as safe growing take longer time more than conventional growing

Q5: The current problems about vegetable production they are facing:

- 1st Their vegetable nowadays are cheaper compared with safe/organic vegetables
- 2nd Healthy problem due to pollute environment, breath with pesticide
- 3rd capital shortage
- 4th growing and taking care techniques are limited
- 5th not enough facilities, equipment, water, and seeds

Q6: The government assists farmers:

- No loan from government
- No saving group establish supported by government
- No any leadership training from government

Q7: The farmer groups chosen leader will be:

- Generally leaders are the one who voluntary implement any activities

Q8: The farmers do joint processing of vegetables because:

They do

- Not yet have skill
- They are looking for market to sell their fresh vegetables

Appendix B: (continued)

B.1.4 FGD Producers from Thmor Koul district

Q1: The vegetable typically grown include:
- Chinese cabbage; Bo Choy; Salad; Cabbage; Chinese Kale; Radish; Cucumber; Waxgourd; Luffa gourd; Biter Gourd; Chili; Egg plant (round small); Tomato; Pumpkin
- Farmers have planted these products longer than 5 to 20 years till present

Q2: The benefit of the safe vegetable production through marketing
- Health for consumers
- Health for producers
- Increase income for producers

Q3: The disadvantages of safe vegetable production through marketing:
- No certification body than price is lower comparable to conventional growing vegetables
- Yield is decreased
- Lower price
- Cost inputs is higher than revenue (compared with conventional growing)
- Price of vegetable without using chemical is similar with price of importing vegetable

Q4: The current problems about vegetable production they are facing:
- High price of agriculture inputs where as low price of vegetable sold
- Narrow market
- Insect
- Not many buyers once plenty vegetables are harvesting
- Buyers buy product in cheap price
- Buyers look to buy some vegetables which are not available to grow

Q5: The project can help them to address the problems related to vegetables production:
- Price of inputs should be comparable to neighboring countries
- Market price of vegetables should be higher/reasonable
- Need new techniques and experiences in constructing the nethouse to increase production with higher yield, no health affects and more income
- Help developing the farmers groups/corporation
- Need net
- Reduce importing vegetable
- Need the techniques to prevent insect problem

Q6: The government assists farmers:
- Government Established the saving group, but not yet give loan to farmers

Q7: The farmer group chose leader:
- Through to the member election
- The process of election provide by PDAFF but they supported only advise

Q8: The farmers didn't do joint processing of vegetables because:
- Farmers not yet have enough knowledge/skill in processing their products

Appendix B: (continued)

B.2 SWOT (Strengths, Weakness, Opportunity, Threats)

B.2.1 Strengths

- High price of vegetable
- Producers and consumers/customers can access to good and healthy quality
- Build up confidence for consumers on quality of vegetables
- Reduce the production cost
- Quality of produces and be competed with international market
- No bad effects on health of producers
- No environmental pollutions (such water, air, soil) by agriculture chemicals
- Safety vegetables into market, provide healthy for consumers and producers; and profit
- With technical growing
- I know how to access to market by myself
- There are supports from NGOs and Government
- There are gathering of material for compost such as from animal manure
- There are producing of compost
- Soil preparation
- Soil preparation and applying lime stone
- Chinese cabbage
- Tomato
- There are high market demand
- Contract with farmers in growing cucumbers
- Know the techniques of growing
- There are water and soil for growing
- Can producing natural fertilizers by them self
- Ensure the quality for consumers
- Appropriate price and help producers with growing techniques
- High price of vegetable due to the consumers consider high value for safe vegetables
- No pollution on environment since no use chemicals
- Access to seeds, pesticides Fertilizer (more on market)
- There are much more interests of this safe vegetables growing
- There are production of safe vegetable
- Good skill in taking care vegetables after growing
- Records on sells
- Help in seeds producing techniques
- Provide information on selection of seeds
- Can growing much pumpkin not by safe vegetable
- Can grow pumpkin and SAAM well
- Good at seed selection
- High commitment

B.2.2 Weaknesses

- No market access
- Growing not depend on calendar/plan
- Much consumptions of time, labors, such as growing, take care after growing, postharvest and packaging
- Supplies doesn't meet the requirement
- Lack information on techniques and market demand
- No self confident in producing/growing
- Lack to management and policy supported from government

Appendix B: (continued)

- Not good result of tomato growing
- Not know well on insecticide making
- Not know how do seedling
- There is now protection measures for vegetables in rainy season (soft rot diseases)
- Several times of destroying by insects
- Difficult in to compete with produces imported
- Not stable prices, sometimes up sometimes down
- Producing areas are small
- Not know how to make the compost
- Not know how to apply the pesticides/insecticide
- Lack facilities/equipment
- Not techniques in taking care
- Not techniques in soil preparation
- Lack water resources for irrigation
- Limitation natural fertilizers making
- Lack of improvement/reform and irrigation system
- Poor fertilized soil

B.2.3 Opportunities

- Lack skill of insecticides destroying
- High commitment and trying
- There are companies waiting to buy vegetables
- Demand is increasing
- Supports of consuming vegetables
- Enlarge the production
- The produces are safe
- Government is focusing on safe vegetable
- Lots of water sources
- Information of safe vegetable is becoming more widely well known
- Practicing of producing composts
- Sharing of experiences among producers
- Know the company supplied seed, fertilizer, and pesticide/insecticides
- Enough infrastructure

B.2.4 Threats

- Storm, flood, not rain, fire
- Price of fresh produces become lower
- There are lots of imports then local produces price are lower
- Lack of knowledge on how to grow
- Inputs supplies prices are high
- There should be a common price limitation
- There should training on producing technique, postharvest, packaging

B.2.4 Requests of participant's

- Inputs price is high similar to inputs in other countries
- There should be determining the range of price
- Together prepare the growing calendar
- Need new techniques
- Government had help in promoting new experiences and new techniques
- Government had help in creating the saving but did not provide the loan
- Producers groups are low knowledge in processing of fresh produces