ASEAN Young Professionals Volunteer Corps (AYPVC)

Agricultural Team Report

PCambodia: Samrong Tong and Lvea Aem

Prepared by
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Table of Contents

1 Summary

The team spent 2 weeks in Cambodia, one week each in Samrong Tong and Lvea Aem respectively where we were constantly placed in situations beyond comfort zones where learning opportunities were abundant.

In the period of time when the team was in Cambodia, it coincided with the rainy season that Cambodia usually sees, explaining the lush green farming lands (June to November).

Week 1 was spent in Samrong Tong, Kampong Speu province that harvested mainly rice in the wet season as rice cultivation is a water intensive crop. We visited 3 groups of villagers in the district to understand the local farming scene, as well as their problems better.

Week 2, on the other hand, was a different experience altogether spent at Lvea Aem, Kandal province in Cambodia. It built on what we learnt during the previous week to further our agricultural techniques and share what we knew with the local villagers. We served and interacted with 4 different families in the 5 days we spent there.

2 About the Programme

2.1 Objective

Objective: Improvement in agricultural practices of the farmers around the area and relevance of the crop introduced

Community Needs: Agricultural development

Country: Cambodia (Samrong Tong District & Lvea Aem District)

Date: 24th August to 8th September 2013

Duration: 15days

Theme: ***"Spirit of One ASEAN through Volunteerism"***

Host NGO: Organisation for Building Community Resources (OBCR)

2.2 About the Volunteers

2.2.1 The ASEAN Volunteers

ASEAN Young Professionals Volunteer Corps (AYPVC) Agricultural team consists of young professionals of different nationalities:

1. Ei Ei Tun, Myanmar
2. Fanny Widadie, Indonesia
3. Lilik Triyanto, Indonesia
4. Mohamad Fadhilullah Tudun Hj Hassan, Brunei
5. Nguyen Minh Quang, Vietnam
6. Sovatha Korng, Cambodia
7. Tew Tjin Fern Amanda, Singapore
8. Zah Kung Tu Mai, Myanmar

2.2.2 The NGO facilitators

2.2.2.1 Samrong Tong

Vannary Nou <left>
Sambath <right>

2.2.2.2 Lvea Aem

Amerr Jeffry from education team	Bonthorng	Sun Soeun
		

3 Our Work in Samrong Tong

3.1 Our Focuses

3.1.1 Rice transplanting & introducing System of Rice Intensification (SRI) method

The village we visited in Samrong Tong cultivated mainly rice and is flanked by garment industries in some areas. SRI is a technique widely practiced in neighboring countries like Myanmar and also Vietnam. It was found out that other international NGOs such as World Vision has introduced this technique to the farmers in Samrong Tong, yet a dismal rate of uptake was observed. The team pushed to encourage farmers to give this technique a try.

The SRI is a method aimed at increasing the yield of rice produced through farming. SRI is a new and promising resource-saving method to grow rice under irrigated or rain-fed conditions. Studies in a number of countries have shown a significant increase in rice yield, with substansial saving of seeds, water and cost compared to conventional methods.

Through the SRI method, it is estimated that with a 5% increase in the amount of water fed into the system, there is a potential doubling of the yield of rice.

Among practices in SRI are:
(1) transplanting very young seedlings, raised in an un-flooded nursery;
(2) transplanting them carefully and at a suitable depted;
(3) transplant single seedlings and at regular intervals than the current randomized ways;
(4) apply a minimum amount of water – no continuous flooding;
(5) reliance on as much organic matter as possible for purposes of soil fertilization.

For more information about the technique: http://irri.org/

The concept of SRI have been introduced to rice farmers in Samrong Tong through the workshop the team has conducted.

3.1.2 Introducing methods of planting to improve yield

We introduced new methods of building structures to facilitate a healthy growth of cucumbers through two methods that have not been used by the farmers we visited.

The ways of growing cucumbers in Samrong Tong have been done the traditional way and the maximum yield has yet to be achieved. We introduced a technique that is unfamiliar to them: the trailer method

Previously, many growing plants collapsed under the weight of gravity as well as the natural forces which made their way of farming relatively unproductive. The function of using the sticks we introduced was to enforce the structure for the plants to grow on, to support the growing weight of the fruits, to optimize sunlight exposure to the plant as well as to convenience their need to weed and perform pest control.

We introduced two different configurations of the Trailer Method: the triangular and vertical systems.

Triangular system entails having four sticks in a complete structure stretched across a length of the land, with two on each end and positioned in a criss-cross position. A wick is tied across the both ends such that plant could grow along them.

The vertical configuration is one where sticks are secured into the ground at the four different corners of the land, with a wick strung across them. This structure makes it more convenient for farmers to practice pruning as well as weeding.

3.1.3 Pest Control in the Cucumber Fields

Pest infestation is a common problem that farmers see. Worms, insects and rats are one of the common few pests that visit the crops that farmers are troubled by. To tackle the problems of flying insects feeding on the cucumber crops, we introduced the placing of pesticides on plastic stickers that resembled the color of the flower petals. We also experimented with different heights and sizes of the plastic stickers to see which position as well as the size would be the most ideal.

3.1.4 Provision of farming tools to the 3 groups of villagers

We decided to donate seeds as well as farming tools (rakes, hoes, watering cans, and other materials) we thought would be useful to the villagers in question. Our group made sure we had an approach of demonstrating any new techniques with actions and experiments so that the farmers themselves understood the rationale as well as methods we undertook.

3.1.5 Building a nursery for one of the 3 groups of villagers

We built a nursery while demonstrating the right way to install nursery nets to the family. We also helped with the selection of seeds and planting of the seedlings.

3.1.6 Systemic Crop Intensification

Sothea, a non-AYPVC volunteer and FAO officer, showed the farmer in question a systematic intensification method applied to crops, which in this case was the bitter gourd. Instead of the usual method of planting as many plants as possible in an area that results in competition and overcrowding. One of the plants was chosen based on its health, while the rest of the plants are discarded. The chosen plant's stem was then coiled on the ground and covered in compost. The idea and rationale behind this is that the stem when covered underground would turn into roots, and the nutrients within the ground would be channelled to one plant, so that the plant would bear more flowers and fruits, thereby increase the yield.

3.2 Our Main Challenges

3.2.1 Language barriers and miscommunication

As Sovatha was the only Cambodian in the group, he had to be the translator for the group at all times in our interviews with the local farmers. This meant that conversations often droned on beyond a certain time and miscommunication was potentially a problem. However, we ensured that our questions were understood and answered through multiple questions that built on one after another.

3.2.2 Lack of agricultural field experiences in the team

Ei Ei, Fanny and Sovatha had related knowledge on agriculture – much technical leadership was often lacking due to the big gaps that exist between the strictly cerebral and field experience. This also resulted in the team having more questions than answers for farmers..

3.3 Water samples testing

We obtained two different samples from the first family that plants rice for a living. One of the sample is from the pond that stores rainwater and the other sample was taken from the water in which the planted paddy is submerged in.

The water were subsequently stored in plastic bottles and kept away from the sun.

More detailed will be given in the later section of the report.

Schedule, Challenges by Farmers and Recommendations Made

Refer to Appendix I.

4 Our Work in Lvea Aem

4.1 Our Focuses

4.1.1 Learning how to build nurseries

4.1.2 Introducing new farming techniques with plastic mulch

The rationale behind introducing plastic mulch that are spread over the soil was such that its dark colour could absorb heat from sun to increase its rate of evaporation and water circulation within the closed system, yet slowing down overall rates of water losses to outside of the system.. It also serves to prevent overcrowding and competition of nutrients by the growing crops.

4.1.3 Learning how to plough with tractors

4.1.4 Stick Installation Technique for Cucumber – Trailer Methods

4.2 Our Main Challenges

4.2.1 Perceived feasibility of plastic mulch

Plastic mulch do not seem to be economically feasible for the farmers as they do not see it as a worthwhile investment. Even though the yield would likely increase, the high initial cost remains a deterrent.

We decided to give a bale of mulch to the villagers in bid to convince them of the productivity. We practiced this technique for 2 of the familes we visited and donated to each a bale of plastic.

4.2.2 Existing Advanced Techniques

Villagers were already advanced in their cultivation techniques, relative to the ones in Samrong Tong.

We observed that the recommendations we provided to the first village was already in practice in some of the families at Lvea Aem. When asked, it turns out that despite the rural and remote conditions of the location, villagers were all learning from one another to increase their yield with these new techniques. Farmers we interviewed did not know the source of knowledge, but only knew they did so because their neighbors were doing it.

4.3 Water Samples Testing and Results

Two water samples were collected as with the case in Samrong Tong. One was from the filtered water that came from a ceramic water pot a household living by the river had, and the other was the river water itself.

The presence of a ceramic water pot that is a well received point-of-use water treatment technique especialliy in

developing countries. However it certainly was a surprise to have seen one in a relatively isolated Lvea Aem as farmers interviewed spoke no mention of any forms of external organizations coming into the area for aid. Hence, this immediately drew the interest of the team as one of the members in the team asked in greater details about the pot.

The ceramic water filter has been around for 6 months and was introduced by an organization where the filters were distributed by the village chief.

There were a total of four samples collected – 2 each from the 2 different villages. However, due to limited resources, only 2 samples could be tested with the National University of Singapore. The tests were ran with an Inductively Coupled Plasma Mass Spectrometry (ICP-MS) machine.

The two samples that were selected were the rain-fed pond water from Samrong Tong as well as the filtered water collected at Lvea Aem, as these were the samples that could provide more conclusive results given the limited resources and circumstances.

The results that returned showed positive on levels of arsenic, which is of course the main concern in these water tests. Biological activity was high however expected. Turbidty and solids suspension were significant despite the clarity of the filtered water.

Figure 1 Samrong Tong's (L) and Lvea Aem's (R) samples

	SRT: rain-fed pond	LA: filtered water	Remarks
Turbidity	High	High despite the clarity of filtrate	Many smaller solids invisible to the naked eye exist. Clarity of filtrate does not signal cleanliness of drinking water
Biological content	Unable to be tested	Unable to be tested	Samples have 'expired' beyond the typical microorganisms' lifespans for an accurate test
Arsenic levels	-	0.09ppm	Safety levels of arsenic by the WHO is at 0.01ppm

Arsenic presence for the sample collected at SRT was unable to be tested due to the sensitivity of the machine (ICP-MS) being unable to withstand the turbidity of the sample. Also, after multiple rounds of filtration, there was insufficient amounts of sample left for testings. Hence, a conclusive result on the presence of arsenic is unable to be determined.

However, the results for the sample collected at LA showed startlingly dangerous levels of arsenic that could potentially account for the sicknesses experienced by the villagers that the Healthcare team had noticed. Kandal Province, according to many literatures available, is known to be susceptible to unsafe levels of arsenic contamination in Cambodia.

Also, it was noticed that there was a chemical fertilizer factory (Five Stars International Fertilizers) on the other bank of the river flanking the strip of land where the water sample was collected that may be a cause of concern for the community there.

Also due to the limitations of the equipment used for these testings, the arsenic levels is highly likely with confidence to be higher than what the results reflected due to the different forms of arsenic that could exist in the sample (positive, neutral and negative forms). One limitation of the machine is that it can only test for negatively charged ions, which in this case is arsenic.

Taking it forward, arsenic contamination and poisoning is a pressing issue that many in the developing countries face today while no cost effective methods have been known to treat this problem effectively.

It is interesting to note that the crops are irrigated by mainly river water, which means that high levels of arsenic may already be present in both the water they drink as well as the food they eat.

The way forward may be a hard one, however it all stems from awareness. One method that has gained recognition in arsenic removal will be using rusted nails to do so – though much more research and attention needs to be placed in this respect.

One recommedation for future AYPVC projects would be to be water-focussed and with greater supports for more comprehensive testings to ensure participants develop a fuller understanding of the problems that exist with the community.

Schedule, Challenges by Farmers and Recommendations Made
Refer to Appendix II.

5 Suggestions and recommendations

Considerations for future improvements.

5.1 Team dynamics

It is recommended that the team consists of practicing or research agriculturist, entrepreneurs. It is also very important to have one or two members who speak the local language. It was very crucial to have locals in the area to be appointed as a guide.

5.2 Project dynamics

It is very important to have an idea of the current status of the farms and the people living there, especially if this trip was the only one that was made. It would help the member formulate an optimum strategy. In our case the general events were as follows:

1. Research and survey the area or people to be assisted. This could be done in the respect of the current situation, the problems most commonly faced, and the causes behind these problems. We were fortunate that the organizer had basic information of the farms and farmers, and that the local guide knew the right people to be assisted. Interviewing of the farmers prior to assistance is crucial.
2. Develop an action plan that is feasible based on the skills, knowledge and background of the members. Include the beneficiary in the plan for their approval.
3. Implement the action plan within time constraints. Get feedback from beneficiary.
4. Share the activities with other farmers. Follow-up can and should be be done through keeping in contact with the local guides.

5.3 Communication

The participants may have done the research or briefed through e-mail by the organizer. The volunteer participants could be briefed by the host NGO or guides about what to expect from the host country. Including a quick lesson on the common conversations or greetings, Do's and Don'ts etc.

6 Conclusions

The team managed to overcome language differences at many times though communication was often a problem. Due to the technical nature of volunteering work that we were engaged in, communication gaps often surfaced between tasks delegation within the group. This was however overcome in the last few days where rationales of actions were communicated more clearly.

Both Samrong Tong as well as Lvea Aem have very different yet similar agricultural scenes that we all learnt a lot from. As this volunteering experience was the first hands on experience for everyone in the group, the Agricultural team is proud to say that the knowledge and experiences gained are long lasting.

7 Appendix

7.1 Appendix I – Week 1 in Samrong Tong

Day 1: 26th August

Schedule

No	Time	Activity	Project Description
1	0800	Arrival at the village	• Briefing on our duties by the villagers • Retrieving and picking the rice plants, getting ready for transplanting
2	0845	Rice transplanting	• Got introduced to Systematic Rice Intensification (SRI) technique of planting • Practiced rice transplanting for half the field
3	1000	Discussion and reflections I	• Planned about the workshop that is to come on Friday, and also our expectations and what we plan to cover (with references to Ei Ei's experiences in Myanmar) • Revised budget
4	1130	Left for lunch	
5	1400	Returned to the village and resumed with transplanting in the other half of the land	• Finished with the other half of the land
6	1445	Discussion and reflections II	• Discussed about the content of Focus Group Discussions that are to be held on the next day
7	1600	Market shopping, returning to OBCR for final debrief	• Preparation for the discussion with farmers the next day with a list of questions we think are pertinent to establishing better understanding**

Schedule

No	Time	Activity	Activity Description
1	0830-1030	KII with farme <refer to appendix>**	• Informal interview with farmers to find out the challenges that the village face
2	1400-1500	Going to the market for purchase of materials	• Learning to choose and identification of seeds • Buying of tools for farmers
3	1500-1630	Visiting the monkey temples	• Cultural immersion

Time: 0830-1030

7.1.1 **Key Informant Interview (KII):

- Nature of event is such that we will conduct an informal interview with the farmers in question to further understand the nature of problems that exist
- Interview with **Sai Sokong (67)**
    - Has been farming for 50 years, since his teens
- Questions:
    - What do you usually grow?
        - Rice (only 1 time per year in the rainy season), mix of vegetables (leafy ones, long bean, gourds, pumpkin), climbing palm for sugar production.
        - In the dry season, they climb the palm trees for income
        - He doesn't do anything with the land during the dry season
        - Per harvest: 2 tonnes of rice, 2.5 hectares, 500USD
        - 1kg for 1000 riel - to the middle man in the Poey market
    - What are the key challenges?
        - Pests are not the biggest concern
        - Sometimes seed do not have water **
        - No water – only rainwater
    - Why do you not practice double cropping?
        - No habit for cambodian
        - Intercropping varies with location – some provinces will do it, some will not
        - He will not mind doing it next year but wishes to harvest rice for this season
        - Rice and corn (3 months to cultivate the crops) in the rainy season, in the dry season, just plant corn. There are paddies that can grow in the dry season (hybrid seeds)
        - Soy beans, carrots can regenerate the soil's fertility after the soil has been stripped of its nutrients and fertility

Suggestions
    - Dry season: corn + bean (nitrogen fixation)
    - Wet season: Rice
        - Better to use for only 1 crop in the wet season
- Who helps with growing?
    - All the members in the family
- What are your inputs? (seeds, fertilizers, labor etc)
    - Rice seeds: they keep the better and collect it from older seasons and generations (productivity decreases with every cycle)
    - Do not use the new seeds because old seeds have productivity
    - If they change to new seeds, then they need to approach the seeds market to explore and compare productivities of seeds
    - Importance does not lie in the seeds but whether enough due care is given
    - He hears only about the higher productivity but sees nothing about the harvest
    - Ministry of Agriculture encourages using new seeds to be friendlier for export
    - "New" seeds have been used from 5-6 years ago
    - Team: maximum of 3 years for each seed
    - SS will keep the better seeds from each harvest
    - District for Agriculture has seeds for the rice planting in the dry season (Government)
    - SS needs about only 30kg of seeds
    - 'educated' farmers will be aware of the choosing of seeds and SS will join these programmes
    - Laws are put in place to regulate GMO yield
    - There is an organization (GADI) that dedicates itself to planting seeds – farmers can sell their seeds to the organization too
        - Research is available and extensive in the Department of Agriculture
- Horticulture:
    - In Indonesia: in dry seasons, farmers plant less water-intensive crops
- What is your main crop?
    - Rice (wet season), palm trees (dry season)
- What are your cultivation methods?
- What is your normal yield?
    - 2 tonnes of rice for 2.5 hectares
- How do you store the products?
    - Small hut for storage of seeds to prevent birds from coming
- How does the government support your crops?
    - Dept of Agriculture to the village
        - Training
    - Thailand: insurance and subsidies available for farmers
- Are there any organizations that support you?
    - Some will help to provide seeds
    - NGOs will help provide monetary incentives
    - Microfinancing is catching on in Cambodia but SS does not borrow

        - Village Loan Savings Model in some villages to encourage saving but it is not in Cambodians to want to save
        - Microfinancing is from World Vision
    - What prevents you from trying out new techniques?
    - How many kgs do you expect from this crop? (SRI)
    - What prevents you from applying new techniques?
    - Why don't your village have community support groups?
    - How do you cope with drought?
        - They don't have any measure but to wait for the rain to come
        - Deep well is required for freshwater
        - 5 to 6 years ago: they experienced a 3 years long drought
        - Oct-Dec in other years: production started late
        - Only in 2013: rain started falling earlier
        - If droughts are longer than 15 days, everything will be destroyed
        - Canal nearby is for water management purposes
        - Climate change and deforestation as possible reasons for seasonal drought
        - No tropical forests nearby
        - It is common to face a short drought in every wet season
        - SS knows that the drought happens due to a lack of forests cover
        - SS knows to encourage reforestation/afforestation
            - There are no plans to plant trees
        - Only a few families have ponds to cope with the lack of water
        - During the dry season, the water ponds run out of water
        - He has seen the presence of ponds and that's why he knows (1975-1979)
    - What was the way with the rope that we used to plant?
        - Mix of SRI and traditional farming
        - But SRI will need exact land levelling and measurements
    - What does SS want to plant?
        - Uplands for vegetable planting
        - If there is climbing palms to harvest, he would rather do it.
        - In rainy season, he would prefer upland cultivations.
        - As he is aging, he wishes to wean off climbing palms and move towards lower land cultivations
    - SS's concerns
        - Any suggestions for crops to plant in the dry season after paddy harvesting?
        - They cannot do short term harvesting on rice in the dry season as the other families do not grow it – insects will be particularly attracted to his crops, resulting in infestation (grasshoppers and many other types of insects)
        - At night: rats infestation
        - In the day: birds
    - Any methods he employs to prevent pest infestation?
        - Pesticides for mice and rats
        - Electric fence (dangerous)
        - Unable to control as there is resistance from rats(many many)
        - Rat community prevalent in the dry season
    - Corn:

        - Market price: 600 riel per corn
        - Middle man: 300~ riel per corn
        - Market accessibility is not a problem
    - Concerns:
        - SRI technique was taught by World Vision
            - Lesser water required for the technique
        - There was no water then
        - SRI was not practised last year as the rain fell too late
        - He does not have any plan to do SRI
            - They required water but there is a lack of rain
            - Money is required for SRI – fertilizers, labour, need to prepare land multiple times, SS does not have enough economic means to practise, and climate
        - SRI only friendly for smaller pieces of land because it is really laborious
    - Others:
        - No one practises SRI
        - In the community, there are about 70 families
        - Collects firewood from trees – may cut from his own plots of land or in the region
    - SS's dream
        - He hopes that in 5 years time, he will be able to increase his yield on rice.

Conclusion and recommendations:

- To practise planting crops in the dry season as well
- He doesn't need us to help with anything but instead give him suggestions on improvements
- Collect water samples for water testing

Time: 1400-1500
Market visit

- To purchase new seeds and tools for farming in the next two days

Time: 1500-1630
Visiting the Temple of Monkeys and shaking bridge

- Aggressive stealing monkeys
- Shaking bridge to the cultural village

Day 3 August 28th

Activities:

- Picking cow manure at the cucumber farm
  - Composting fertilizers
  - Finding out the problems:
    - Pests, leaves from worms, old seeds
    - Old seeds will lose its productivity over time
- Conducting KII with the farmers in the cucumber plantation
- Grandmother's house
  - Ploughing and levelling the land at the grandmother's
  - Building a nursery for the grandmother
    - Gave materials to the grandmother (seeds, watering cans)
    - Introduced a new method of planting eggplant
  - Grandmother has never been a farmer in her life and recently moved in only two years ago
  - Market price is not possible to the grandmother as she lacks the seeds as well as does not have enough volume for sales in the market

Day 4, August 29th

Time: 0800-1130

With the cucumber farm:

- Introducing pest control
- Introducing planting methods
- Giving materials to the farmer
  - Seeds, watering cans and tools

Time: 1400-1700
With the Department of Forestry

- Went to collect the 50 trees that were donated in kind by the Department of Forestry for the following day

Back at OBCR:

- Sharing session with the Education and Healthcare teams

Giving a recap of what we have been doing for the past four days as well as the challenges that we face

Day 5, August 30

Workshop Day

Introduction

Profile of participants:

- Different durations of farming / varied experiences with farming
  - Some for a few months, some for many years
  - Mostly plant rice and fruits, some vegetables

Problems:

- Long waiting time to set up, making the farmers wait
  - Think of games or activities to distract them from the long waiting time
- Lack of personal knowledge
- Lack of translators
- Introduction:
  - Other farmers were spacing out with the introductions
  - Sovatha does not translate back to English sometimes which leaves the team lost
- Sharing session:
  - Should explain the rationale of doing what we do, instead of instructing them on what to do

Sharing session

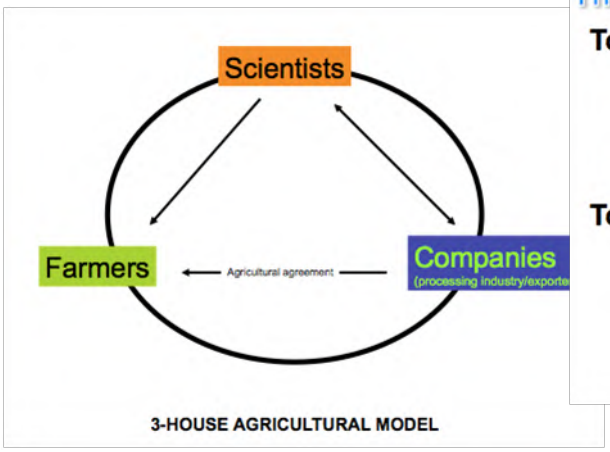
Team	**Strengths** What they already know how to do and are doing well	**Weaknesses** What problems they face What they need solutions for	**Solutions to their problems** Other participants offer solutions from their own experience.
1	- Already practicing SRI	- Lack of technical knowledge in planting fruits, vegetables, SRI method, raising animals and fish - Land problems - Insufficient market for their produce - Droughts (water management problems) - Seeds, do not know how to plant hybrid seeds	- Choose the best and latest rice seeds - Cut the plant after it is mature - SRI: transplant with natural fertilizers
2	- Farming rice in the dry season - Ploughing land - How to raise the pigs - Growing vegetables - Cultivating rice in the rainy season	- Pest control - Making compost - Cue animals - Maintain vegetables - Storing seeds - food production to last	- Raising pigs has 4 steps: 1 choose the place to rear them 2 choose the breed of pigs 3 look after them with due care 4 have a plan to raise them
3	- How to plough the land - Rice transplanting - Field experiment	- Raising pig and fishes - Raise chicken farming - Choosing the best seeds	- SRI: 1 Plow the land 2 to 3 times prior to planting

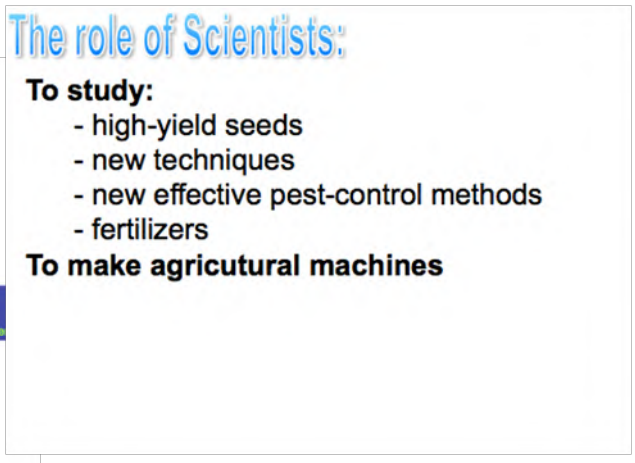
	- Planting fruit trees (banana, coconut and papaya etc)	- Land exhuasted - Marketing	2 Spread the seeds one by one, do not broadcast 3 Prepare the natural fertilizers 4 Transplant a distance of 15-20cm for each rice plant

Recommendations:
-To meet regularly and foster effective communications with one another

SRI by the Cambodian farmer
- Only 5 farmers out of 24 have ponds in their homes for water storage and contingency purposes in the dry season
- SRI is too water intensive a process to do, farmers are not confident of its benefits

3 Houses Model by Quang
*Refer to slides





Questions by the farmer:

- Why are the farmers in Vietnam in a better position to do farming, receiving better and more favourable income from farming
    - Many factors, Vietnam has a long history on agriculture
    - Vietnam is receptive to trying new techniques, and are very collaborative with one another in terms of crop choice (specialization)
- In Vietnam, do the farmers use new or hybruud seeds?
    - Seeds in Vietnam has a 3 years lifespan
    - Stable market conditions
- If the companies and farmers want to practice contract farming, will the companies ever not buy the produce?
    - The companies will lose out if they choose not to get the produce
    - Explains the 3 houses model again and the tripartite relationship
- Fertilizers in Vietnam?
    - Chemical fertilizers in nature because Vietnam has a long history in agriculture and does not have sufficient natural fertilizers

<u>Recommendations by Fanny</u>

- How to increase the yield
    - Apply new cultivation methods: SRI method
    - Using new seeds, hybrid seeds, and do not reuse the seeds for too long a period of time. A small step would be to change the mindset
    - In dry season, use the field for crops that do not require too much water such as corn, bean and build drought resilient facilities such as a pond
    - Marketing: form a stronger group of farmers within one another. This can also help you to help one another, to increase the volume and use it to leverage against the middle man

7.2 Appendix II – Week 2 in Lvea Aem

Day 0 (Over the weekends)

In preparation for Lvea Aem

- Bought
    - Watering cans
    - Seeds
    - Pesticide cans
    - Hoes and rakes
    - Rope
    - Bamboo
    - Plastic Mulch
- Conducted a site visit to Lvea Aem and also went to the first farmer's house to recce the site that we would work on the following day
    - Interview with the farmer
        - Farmer plants and harvests 2 times a year every rainy season
            - Bitter gourd, corn, long beans, cucumber, papayas, turnips
        - Land is 20 acres huge
        - There are 27 families on the island
        - Land ownership is based on division since post-Polpot regime, and dependent on the number of people in the family.
        - He has been experiencing floods for every year since farming but not in the past two years
        - They turn to fishing when it floods, and uses the fishing nets to do so
        - Land is used only for farming during the rainy season
        - Land in the island is not used to plant rice as they are not large enough
        - Problems:
            - Floods
            - Rats
                - But when there are floods there won't be any rats
                - Killed through electricity and rat traps
    - Farmer was noticed to be practicing the new techniques and he learnt it from the neighbors → source of knowledge is unknown
    - No exising organization has ever come in here to help
        - Sells his crops to the middle man
    - Help farmer requires:
        - To make nursery and also practise new techniques

Day 1, 2nd September

Activities for the day:

- Building a nursery
- Ploughing the land with the tractor

Day 2, 3rd September

Activities for the day:

- Ploughing the land (2 rows)
- Placing plastic over the ploughed land
- Transplanting the leafy vegetables

Day 3, 4th September

Activities for the day:

- Building the trailer for cucumber planting
    - Plough, rake, plastic placing the plastic, burning holes in the plastic, placing the rods and tying the ropes

Day 4, 5th September

Activities for the day:

- Building a nursery
- Discussion for workshop

Workshop day

Demographic of farmers:

- Better and more even mix of females and males
- Many years of farming experience
- Concerns
    - New experiences for farming
    - How to grow corn
    - How to improve on human resource management

Schedule

Time	Activitiy	Action by
0800–0830	Introduction	Bobby
0830–0900	Recaps for the week	Tu Mai
0900- 0945	Strengths, Weaknesses, and Solutions I	Bobby
0945 – 1000	Refreshments	
1000 – 1030	Strengths, Weaknesses, and Solutions II	Bobby
1030 - 1045	3-House Model	Quang
1045-1100	Recommendations and wrap up	Fanny

Strengths, Weaknesses and Solutions:

Team	Strengths	Weaknesses	Solutions to their problems
1	- Good at growing vegetables and rice - Raising cows and hens - Looking after the land	- Pests - Growing certain crops of vegetables and land management - Animals and birds that cause sickness	**- Money and equipment** - Selling crops and animals - Borrowing money from the bank - Materials come from selling the crops and animals that they rear
2	- Have sufficient materials for farming - Have sufficient money - Good at materials utilization - Good at raking land and looking after the land	- Inexperienced and lacking the suitable techniques - Insufficient money and materials	**- Pest control** - Have an understanding of the pests that are responsible for destroying the crops to find the most suitable way of killing it - Spray poison to kill the caterpillars - Look after the crops with due diligence to prevent extensive crop damage from pests
3	- Good at using the land and drawing water - Using materials - Using fertilizers, seeds and poison - Using land in a way efficient for the climate - Good for growing chili and eggplant - Looking after the land	- Not enough money - Pests control problems - Lacking materials and money - Insufficient farming techniques - Fertilizers and poison usage	**- Techniques for farming vegetables** - Ploughing the land 2 to 3 times prior to planting - Make rows and cut the grass - Use natural fertilizers - Irrigate every day and protect against the pests

Sharing by Quang: 3 Houses Model

Feedback from farmers:

- Vietnam has companies that will provide the seeds but not in Cambodia
    - Vietnamese companies provide only the necessary capital while farmers need to plant

Recommendations by Fanny:

- To increase the yield, use plastic mulches and the trailer method. The benefit of plastic mulches are to maintain soil moisture, reduce soil temperature fluctuations, suppress the growth of weeds and ants that can disturb crop cultivation and prevent fruits from directly touching the ground as doing so will cause the fruit to rot.
- Land needs to be free from grass and must be well-managed at all times. Cutting the wildly growing branches, leaving only one or two branches per stem is recommended. This practice will speed up the process of fertilization in plants.
- Can employ the use of natural fertilizers after ploughing the land, followed by the usage of chemical fertilizers after the first round of transplanting
- Make nursery with the nursery nets. It will shade the growing plants from sun and rain.
- Set up a farmer group to increase collaborative partnerships and communications.
- Use new seeds or hybrid seeds whenever possible