PAD Guide Book
(Revised edition)

June 2020
Savan PAD

Contents list

V Improve farm management

VI Improve water use efficiency

VII New site selection

VIII Monitoring & Evaluation

Attachments

Contact person

I Overview of PAD

Mr.KeoOudone SOULYYA (Director of Planning & Finance section, PAFO)

II Market oriented production

Ms.Chalernphone (Deputy Head of Trade & Product Promotion section, DOIC)
Ms.Phonekeo VANGNA (Technical staff of Extension and Cooperative Section, PAFO)

III Increase productivity (Rice)

Mr.Chanlakhon XAYYALATH (Technical staff of Extension and Cooperative Section, PAFO)
Mr.Phonesack VILAIKHAM (Technical staff of Agriculture section, PAFO)

IV Sales promotion

Ms.Chalernphone (Deputy Head of Trade & Product Promotion section, DOIC)
Ms.Phonekeo VANGNA (Technical staff of Extension and Cooperative Section, PAFO)

V Improve farm management

Ms.Chalernphone (Deputy Head of Trade & Product Promotion section, DOIC)
Ms.Phonekeo VANGNA (Technical staff of Extension and Cooperative Section, PAFO)

VI Improve water use efficiency

Mr.Vanlakhone PHANGTHAVONG (O&M unit leader of Irrigation section, PAFO)

VII New site selection

Ms.Phonethip Xayyachack (Technical staff of Planning & Finance section, PAFO)
Ms.Ledi SAYASEN (Technical staff of International Cooperation section, DPI)

VIII Monitoring & Evaluation

Mr.Hommala PHOMMASENGTHONG (Team leader, Irrigation section, PAFO)
Mr.Ladda LASAPON (Technical staff of International Cooperation section, DPI)

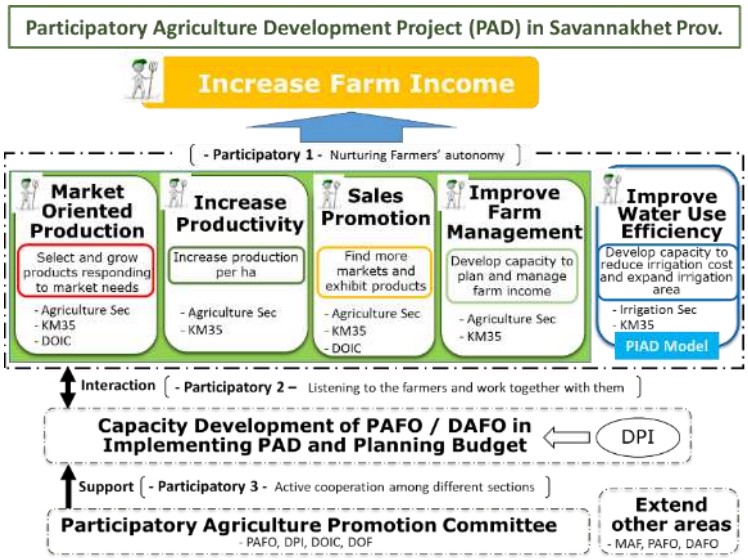
1 PAD model overview

1) PAD (Participatory Agriculture Development) model is,
   - Farmers aim to increase farm income by 5 approaches; Market oriented production, Increase productivity, Sales promotion, Improve farm management and Improve water use efficiency.
   - Government staffs support these activities with farmers training, technical conduction, field observation and others.
2) Participatory means,
   - Farmers participate their decision making (i.e. meeting).
   - Government staffs participate farmers' activities to support.

(Implementer: Government staffs, Farmers)

(Explanation)

1) PAD (Participatory Agriculture Development) model is summarized activities which Government staffs and farmers implement to increase farm income. This model composes of 5 approaches implemented by farmers and Government staffs support.



PAD model figure

- Market oriented production
  Farmers cultivated vegetables without considering market demand before. PAD model changes the farming style from "Grow and sell" to "Grow for sell" and aims that farmers select and grow crops based on market needs in order to increase profit.

- Increase productivity
  PAD model extends to many farmers appropriate cultivation techniques of rice for increase product.

- Sales promotion
  Government staffs find more markets (i.e. restaurants, shops) to sell vegetables which are cultivated based on market demands.

- Improve farm management
  These above 3 approaches make large the sales amount. But it is important for farmers to consider P/L (Profit and Loss) in order to increase profit. PAD model aims to strengthen farmers to farm management ability (i.e. book keeping, cultivation plan making).

- Improve water use efficiency
  In dry season, farmers use irrigation water for rice and vegetables. Many farmers would like to extend cultivation area in dry season and reduce irrigation fee.
  PAD model aims that Government staffs conduct WUO and give them technical support regarding improve water management in order to irrigation area extension and irrigation fee reduction.

2) “Participatory” has many meanings. PAD model defines the “Participatory” as below,

- Farmers participate their decision making (i.e. meeting) regarding PAD activities.
  PAD model doesn’t make farmers implement activities by government staffs. Because this model focuses on increase farm income, therefore, farmers should select by themselves whether they join activities or not. Government staffs respect their opinions.
- Government staffs participate farmers’ activities to support.
  On the other hand, when farmers implement the activities, Government staffs need to participate them to give useful advices and provide necessary budget.)

2 Baseline survey

1) DAFO staffs implement Baseline survey in order to grasp actual condition in project site.
2) Baseline survey is that DAFO staffs visit to project site and interview to farmers using questionnaire sheet and implement irrigation measurement.

(Implementer: PAFO, DAFO)

(Explanation)

DAFO staffs need to grasp actual condition in project site and be familiar with farmers. Thus, they implement Baseline survey as below,

<Baseline survey outline>

1) Purpose: - To grasp actual condition in project site (i.e. land area, cultivation crop, economic condition, WUO condition and others).
- To trigger DAFO staffs make relationship with farmers.

2) Key survey areas: This survey is aimed at identifying the current situations regarding the following areas
- Farming practice
- Sales of agriculture procedure
- Water User Organization's capacity
- Irrigation facilities and water management

3) Survey target:
(a) Sampling survey: 30% households* of project site
* To select many varieties of households;
- WUO's board member
- Active farmers who participate WUO's activities and training executed by PAFO, DAFO and other donors
- Other farmers (Land area 0.5ha or more and 2.0ha or less)

4) Surveyors:
(a) Sampling survey: DAFO staffs (Agriculture, Marketing and Irrigation)
(b) Irrigation measurement: DAFO staffs (Irrigation)

5) Survey period:
(a) Sampling survey (interview to farmers): 10-20days for first 2 months
(b) Irrigation measurement: First dry season (from Dec. to Mar)

6) Survey method:
There are two different survey method prepared as below;
(a) Sampling Survey by Questioner (Attachment I-1) interviewed by DAFO staffs
(Survey contents)
- Farming practice
(i.e. Land area, production, crop types, inputs, etc.)
- Sales
(i.e. Sales amount, market, price setting, transport, etc.)
- General household survey
(family members, work force, assets, etc.)
- WUO and irrigation practice
(information sharing, decision making, etc.)
- Gender
(participation and decision making in the household)

(b) Irrigation measurement (Water velocity, Water depth, Pump working hours, Electric use and irrigated area)

a) Measurement of water velocity and depth
Place; Beginning point of main canal
Interval; once a day

b) Pump working hours and electric amount
Record the pump working hours and electric amount in everyday by pump operator of WUO.

c) Irrigated area
After irrigation started, WUO measure the all irrigated area.

PAFO staffs implement Baseline survey workshop to DAFO staffs in order to strengthen their interview skills

<Workshop outline>

1) Purpose: To explain Baseline survey outline and practice questionnaire.
2) Venue: PAFO
3) Date: 1day
4) Target:
DAFO staffs (Agriculture, Marketing and Irrigation)
5) Instructor: PAFO staffs
6) Workshop program:
- Baseline Survey outline
- Understanding survey questionnaire
- Practice questionnaire
- Review of practice, Q&A

Practice questionnaire

(Attachment I-1: Questionnaire sheet)

Participatory Agriculture Development Project
in
Savannakhet Province

Baseline Survey Questionnaire

Respondent Information:

Name:	
Village:	
District:	
Gender:	
Age:	
Marital status:	
Contact number:	

Name of Enumerator:_____

Interviewed Date: _____

(Attachment I-1: Questionnaire sheet)

Introduction and Informed Consent

Please read this out to the respondent and introduce yourself and explain about the survey;

My name is ----------, and I am from Champhone / Xaibouly district agriculture office. I am working with Savannakhet Provincial Agriculture Office. The object of the survey is to identify the current situation of the farmers and their farming activities in the target area, and utilize the information for effective project implementation.
We would very much appreciate your participation in this survey. The outcome of this survey will help improve agriculture development in this province as well as this country.

INFORMED CONSENT

Participation is voluntary and whatever information you provide will be kept strictly confidential and will not be shared with anyone other than member of our survey team. I do, however, hope that you will participate fully in the survey since your views are important for the project. The survey usually takes about 30 - 40minutes.
At this time, I would like to ask if you are going to participate in this survey.

CIRCLE THE APPROPRIATE NUMBER

RESPONDENT AGREES TO BE INTERVIEWED	**1**
RESPONDENT DOES NOT AGREES TO BE INTERVIEWED	**2**

(Attachment I-1: Questionnaire sheet)

SAVAN PAD Base line Survey Questioner

#	Question	Answers				
A. Farming						
1	How much is your total land area ?					Ha
2	Agriculture land area	Owned			Rent	
	Paddy field	㎡				㎡
	Upland cultivation area	㎡				㎡
	Grazing field	㎡				㎡
	Pond area	㎡				㎡
	Others (specify)	㎡				㎡
3-1	What did you grow and sell?	* Please use attached sheet				
3-2	Did you consult anyone to decide the crops you grew?	1	Yes	2	No	
	If yes, who?	1 neighbours	2 DAFO	3 trainings	4 village excutives	5 others
3-3	What are your priorities in selecting crops or varieties ?	1	I did not think much			
	(Multiple answers)	2	Less work to grow			
		3	Easy to take care / resistance to pests			
		4	Seed price			
		5	Sales price after harvest			
		6	Someone gave me the seed			
		7	Someone told me to do so			
		8	I follow my tradition			
		9	Market demand was high			
		10	Others (specify)			
3-4	**How many people are engaged in farming?**	**1**	**2**	**3**	**4**	**5**
		more than 5				
3-5	Did you employ labours? **(Dry seasons/2017/18, Rice)**	1	Yes	2	No	
	If yes, how many labours?			labours		
	how many days?			days		
	what kind of work you asked them to do?	transplanting	weeding	harvest	others	
	how much did you pay per day per person?			kips		
	how much did you pay total amount ?			kips		

(Attachment I-1: Questionnaire sheet)

	Did you employ labours? **(Rainy seasons2018, Rice)**	1	Yes	2	No		
	If yes, how many labours?			labours			
	how many days?			days			
	what kind of work you asked them to do?	transplanting	weeding	harvest	others		
	how much did you pay per day per person?			kips			
	how much did you pay total amount ?			kips			

3-6	How much did you spend for inputs for rice production in **2017/18DS**?				
	Dry season Rice from production to harvest	Cost		Where did you get?	
	seeds		kips		
	fertilizer		kips		
	Fuel		kips		
	Labour		kips		
	Others (specify)		kips		
	Total cost		kips		
	Did you keep the record in writing? (observation)	1. Yes with book	2. Yes w/o book		3. No
	How much did you spend for inputs for rice production in **2018RS**?				
	Dry season Rice from production to harvest	Cost		Where did you get?	
	seeds		kips		
	fertilizer		kips		
	Fuel		kips		
	Labour		kips		
	Others (specify)		kips		
	Total cost		kips		
	Did you keep the record in writing? (observation)	1. Yes with book	2. Yes w/o book		3. No

3-7	How much did you spend for inputs for other crops production in **2017DS - 2018RS**				
	Vegatbles from production to harvest	**Name of crops**			
		Cost		Where did you get?	
	seeds		kips		
	fertilizer		kips		
	Fuel		kips		
	Labour		kips		
	Others (specify)		kips		
	Total cost		kips		
	Did you keep the record in writing?	1. Yes with book	2. Yes w/o book		3. No

3-8	How much sales did you make from farming in 2017/18DS - 2018RS					
	Total sales ?					Kips
	Did you keep the record in writing?	1. Yes with book		2. Yes w/o book		3. No

(Attachment I-1: Questionnaire sheet)

4	Have you tried any measures to sell at higher price?			1	YES	2	NO
		If Yes, what did you do?					
		If yes, where did you get that knowledge?	1 neighbours	2 DAFO	3 trainings	4 village excutives	5 others
B. Marketing							
1	Do you grow any crops in the dry season?		1	YES	2	NO	
	Where do you get water from?		1. irrigation	2. river	3. well	4. pond	5.others
2	How did you find the buyers or markets (place to sell)?						
		(Multiple answers)	1	Middle men came to the village			
			2	I looked for the market by myself			
			3	Government officer introduced			
			4	Others			
3	Where do you sell your agriculture products ?						
		(Multiple answers)	1	Market in the village			
			2	Middle man comes to the village			
			3	Regional markets (market fares)			
			4	District trading centre			
			5	Seno market			
			6	Savanakhet market			
		specify the name	7	Outside Savanakhet (Domestic)			
		specify the name	8	Outside Savanakhet (International)			
		How long did it take to get there?	1) on farm	2) 30min	3) 1hr	4) 2hrs	5) >3hrs
		What means of transport used?	1) on farm	2) motorbike	3) truck/tractor	4) bus	5) foot
		What is the cost spent for the transport per delivery?			kips		
4	Who decided the price of your products? (multiple answers)		1	I decided			
			2	buyer decided, the buyer told the price			
			3	I negotiated with the buyer (negotiation)			
			4	Group decided and set the price in the aera			
			5	Used the governement rate			
			6	others			

(Attachment I-1: Questionnaire sheet)

5	Did you ask or use any information to decide the price?		1	Used last year price			
	(Multiple answers)		2	Asked the buyer			
	before the project		3	Checked the market			
			4	Others			
6	What did you use the sales money for? (multiple answer)						
			1	Purchase agricultural inputs for next season			
			2	School fees			
			3	House			
			4	Daily consumption			
			5	Savings			
			6	Others			
8	Are you going to plant the same vegetables from last year again?		1	Yes	2	No	
	If so, what are they?						
9	Are there any crops you are interested in growing this year?		1	Yes	2	No	
	If so, what are they?						
C. Household Survey							
1	Is farmer your major job or part time job?		1 Major		2 Part		
	If part time, what is your another job?						
2	What is total number of your household members ?		Total:		Male:		Female:
			Female	Male	Total		
	Adult (over 16 years old)						
	Children (under 15 years old)						
	Number of children going to school		Female	Male	total		
	Primary school						
	Secondary School						
	college and above						
	studying outside Savannakhet						

(Attachment I-1: Questionnaire sheet)

3	How do you get electricity						
			1	Electricity installed in house			
			2	solar panel			
			3	generator			
			4	no electricity			
4	How many people in your household engaged in paid work?			Person(s)			
		What do they do?	1	Government officer			
			2	Running own business			
			3	Mining			
			4	others (specify)			
5	Is there any one in your house working abroad ?			1	Yes	2	No
				No. of people:			
		If yes, where do they work? (Write No.)	1	Thailand			
			2	Vietnam			
			3	China			
			4	Others			
6	Please put the number of household assets if you have		Qty				
		Water bufferlo					
		Ox					
		Pigs					
		Goats					
		Chicken					
		TV					
		Radio					
		Mobile phones					
		Computers					
		Motorbike					
		Car					
		Others					
7	Does anyone in your household have bank accounts?		1	Yes	2	No	

(Attachment I-1: Questionnaire sheet)

8	Do you have a loan **for farming**?			1	Yes	2	No		
		When did you get loan?							
		From where?							
		For what purpose?							
9	What is the major source of income of your household?								
				1	farming				
				2	working overseas				
				3	running				
				4	Others				
D. Farmers' Organization and Irrigation Management									
1	How much was your water fee for the Dry season **2017/2018**? (water bill)							Kips	
		Did you manage to pay the bill?		1 Full amount		2 Part payment		3 Not yet	
2	Did you use irrigation water in the Dry season **2017-2018** ?			1	Yes	2	No		
	If yes, did WUO board distribute the water as requested volume ?			1	Yes	2	No		
	If no, did you apply the irrigation request to WUO board ?			1	Yes	2	No		
3	Do you know how the board members were selected?			1	Yes	2	No		
4	Do you know WUO held any meeting for the past 1 year?			1	Yes	2	No		
	Did you participate any of those meetings held by WUO?			1	Yes	2	No		
		If yes, what was the meeting about?							
	How did you find out about the meeting?			1) Letter	2) Phone call	3) Directly talked	4) didn't here anything	5) others	
	Who delivered the message to you?			1) WUO board members	2) Canal group leader	3) Neighbours	4) Random person	5) No one	
3	Do you know if your WUO made any changes in by-laws in the past			1	Yes	2	No		
4	Do you know what WUO board members did during the irrigation			1	Yes	2	No		
		If yes, what did they do?							
5	What was the benefit you obtained from being a member of WUO								

(Attachment I-1: Questionnaire sheet)

6	Did your WUO implement what they decided during the meeting?		1	Yes	2	No			
		If yes, what did your WUO do?							
<Maintenance of irrigation facilities>									
7	Did you see irrigation water management plan ?		1 Yes, I saw it before						
			2 Yes but I have never seen it before						
			3 No						
8	Did you discuss about your irrigation problems with WUO?		1	Yes	2	No			
		If yes, did WUO respond to your problems?	1	Yes	2	No			
9	Do you understand and agree with how the water fee is set?		1	Understand & agree	2	Understand, not agree			
			3	Don't understand					
10	Were you informed about water fees?		1	Yes	2	No			
		Which month?							
		How were you informed?	1) Letter	2) Phone call	3) Directly talked	4) didn't here anything	5) others		
		From who did you get information?	1) WUO board members	2) Canal group leader	3) Neighbours	4) Random person	5) No one		
<Transparency and accountability>									
11	Do you understand and agree with how the group money has been used?			1	Understand & agree	2	Understand, not agree		
				3	Don't understand				
12	Do you know how much money the group has?		1	Yes	2	No			
		How were you informed?	1) Letter	2) Phone call	3) Directly talked	4) didn't here anything	5) others		
		From who did you get information?	1) WUO board members	2) Canal group leader	3) Neighbours	4) Random person	5) No one		
13	Do you know that the WUO has the accounting record?		1	Yes	2	No			
		Have you seen it before?	1	Yes	2	No			
14	Did you attend the meeting to discuss WUO budget?		1	Yes	2	No			
		If yes, when did you attend?	Date						

(Attachment I-1: Questionnaire sheet)

E. Fertilizer application								
1	Practice of fertilizer application for Rice **(2017/18DS)**							
	Timing of the application							
	Activities / Name of fertilizer		Month	Early	Mid	Late	Amount	
	1	Sowing nursery bed						
	2	Transplanting						
	3	After trans…….day						
	4							
	5							
	6	Harvest						
	Type of fertilizer		Amount bought		Cost	Amount used		
			Bags	Kg	Kips	Bags	Kg	
	Chemical fertilizer fomular:							
	Chemical fertilizer fomular:							
	Chemical fertilizer fomular:							
	Manure							
	Others (Specify)							
	Practice of fertilizer application for Rice **(2018RS)**							
	Timing of the application							
	Activities / Name of fertilizer		Month	Early	Mid	Late	Amount	
	1	Sowing nursery bed						
	2	Transplanting						
	3	After trans…….day						
	4							
	5							
	6	Harvest						
	Type of fertilizer		Amount bought		Cost	Amount used		
			Bags	Kg	Kips	Bags	Kg	
	Chemical fertilizer fomular:							
	Chemical fertilizer fomular:							
	Chemical fertilizer fomular:							
	Manure							
	Others (Specify)							

SAVAN PAD Base line Survey Questioner **Farming Practice - Prodcution and Sales**

*** For vegetables: Harvest period between Dry season(Nov 2017 and Apr 2018).**

No.	Crop Name	Farming area (m2)	Yield / Volume*	Crop amount sold*	Unit Price /kg	**Total sales**	Buyer/Where sold	**Expenditure (Kips)**	Seed Variety	Seed generations	Source
1	Consumption rice										
2	Rice seed										
3											
4											
5											
6											
7											
8											
9											
10											

*1 In case the weight of vegetables (i.e) leaf vegetables are hard to be measured, packing type can be recorded. For example, length, number of leaves, volume etc.

(Attachment I-1: Questionnaire sheet)

SAVAN PAD Base line Survey Questioner **Farming Practice - Prodcution and Sales**

*** For vegetables: Harvest period between Rainy season(btw May 2018 and Oct 2018).**

No.	Crop Name	Farming area (m2)	Yield / Volume*	Crop amount sold*	Unit Price /kg	**Total sales**	Buyer/Where sold	**Expenditure (Kips)**	Seed Variety	Seed generations	Source
1	Consumption rice										
2	Rice seed										
3											
4											
5											
6											
7											
8											
9											
10											

*1 In case the weight of vegetables (i.e) leaf vegetables are hard to be measured, packing type can be recorded. For example, length, number of leaves, volume etc.

II Market oriented production

1 Building ownership and stimulating motivations

(1) Entry Point: Know yourself

1) PAFO and DAFO discuss with farmers about their farming activities
2) PAFO and DAFO help farmers to calculate their farming income and production to find out current profit from their farming activities.

(Implementer: PAFO, DAFO, DOIC)

(Explanation)

1) Discuss with farmers about their farming activities and their livelihood

1-1) PAFO and DAFO organize a meeting with farmers. Let any farmers come to the meeting, not only village authority and board members.

1-2) Introduce each other. Self introduction.

1-3) Ask farmers about their farming activities and livelihood. Facilitate them to talk.

1-4) Ask Farmers how much money they used for livings and farming activities in the past 3 or 6 months and how did they pay these expenses. To what extent did farming activities contribute to their living expenses?

✧ Prepare your questions before the meeting.

Question list for entry point

1. Did you buy anything today or yesterday?
2: What did you buy? And how much did it cost?
3: Do you remember what you bought for the past 7 days and how much you spent?
4: What was the biggest spending for the past three months? What did you buy and how much did you pay?
5: Where did you get money to pay these expenses? Who brought money home?
6: How much did you make from farming activities like rice cultivation?
7: Compare the farming income and expenditure. Which one is more?

1-5) Explain about the project. After these questions above, we can explain about the project more in details.

Key message: “This project is to think agriculture as business. How can we increase our farming income? Does anyone here want to increase your farming income?

You can also explain about project objective and what project can do and cannot do. i.e. The project do not provide donations. The project works together to think and improve technical skills. “we don’t give you fish but think together how to fish.”

2) Profit and Loss calculation

2-1) Ask farmers how much income and profit they are making from their faming activities. If they know, ask how much profit they made. Based on some answers from farmers above, you can talk to farmers like this;

"if you want to increase your farming income, do you know how much you are making now? Are you making profit or Loss? If you don't know how much you make, how will you know your income increase or decrease?"

- Explain the meaning of profit clearly by using examples of project model farmers.

2-2) Let farmers find out their profit together

- Introduce "Profit and Loss calculation sheet" and help farmers to calculate their profit from the previous dry season and rainy season farming activities.
- Demonstrate how to do in front of all the farmers by taking an example of one farmer.
- After that, PAFO and DAFO divide farmers into some groups to calculate and write on the sheet.

✧ **Use P/L calculation sheet (attachment II-1)**

✧ **See the attached P/L calculation sheet example (attachment II-2)**

Question for profit calculation (Example)
1. What did you grow last dry / rainy season?
2: What did you buy to grow these crops? How much did you spend? (ask for more details such as: seed, petrol, labor, water and electricity fee and labour, etc.)
3. How many Kgs/bags did you harvest?
4. After you harvest did you sell? If so, how many bags did you sell? How much money did you make?

2-3) Share the result of P/L calculation among the farmers, and see what they say. If they start saying they need more money, then ask them how much more?

- Ask farmers are there anyone who they want to share this information with?
- Conclude the meeting by asking farmers to share this information with their families and discuss how much they want more.

In the next meeting, farmers will share their target and think together how we can achieve our target.

✧**Homework for farmers to share P/L sheet information with their families and talk about the sales target.**

(Attachment II-1: P/L calculation sheet)

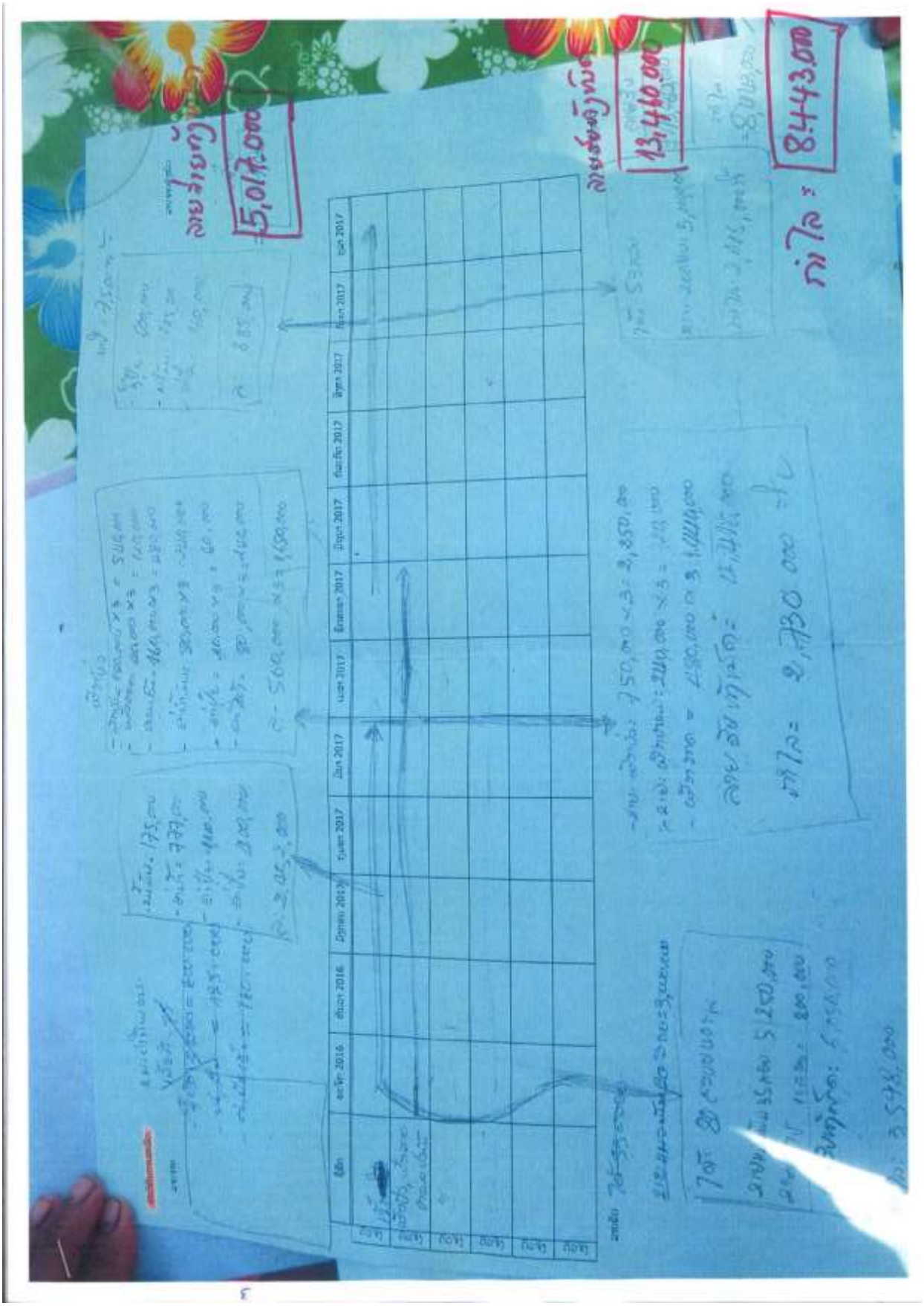
Production cost: Total production cost: Profit:

ປະຕິທິນການແຊື່:
ລາຍຈ່າຍ

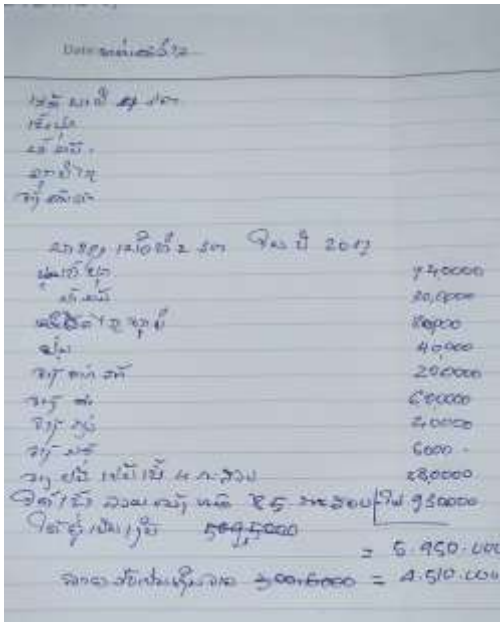
	ຊື່ພືດ	ເດືອນ10	ເດືອນ11	ເດືອນ12	ເດືອນ1	ເດືອນ2	ເດືອນ3	ເດືອນ4	ເດືອນ5	ເດືອນ6	ເດືອນ7	ເດືອນ8	ເດືອນ9

Income: Total sales:

(Attachment II-2: P/L calculation sheet example)



P/L calculating by farmer



P/L calculation result

P/L calculation result

Important Note

- PAFO and DAFO should NOT tell farmers that they have to participate the project.
- PAFO and DAFO should NOT do all the calculations for farmers. If government officers do all, farmers will not think this activity is for themselves. Government officers should support farmers to do, this is their learning process.
- PAFO should explain DAFO about the meeting and their roles.
  For example, government officers can talk to farmers like the following. “We do not give you money or machines. This project, we think together what we can do and work together to improve your skills in order to increase your income. To start with this, we would like to know about your farming activities”

(2) Image what you want to become

1) Farmers who are interested in making income from vegetable cultivation will set a target and think how to achieve the target.
2) Visit advanced farmers to learn what and how they grown and sell
3) PAFO and DAFO facilitate farmers to link "income increase" with "soil

(Implementer: PAFO, DAFO, DOIC)

(Explanation)

1) Set a tentative income target

1-1) PAFO and DAFO organize a meeting with farmers who attended the first meeting.

1-2) Ask farmers whether they talked with their families about the result of the first meeting (Farming income and expenditure) and what their family members said.

1-3) Share some of their target and let all discuss how to achieve the target by thinking of what to grow, land area, number of labors based on their experience and their current situations.

- ✧ **Let farmers talk about their current and past farm income. If they think it is low, what made it low? Diseases, insects, market availability, cultivation technique or soil?**
- ✧ **If time and budget allows, take these farmers who are interested in agribusiness to Phonsim OA groups or neighbouring advanced farmers.**

2) Study tour to Phonsim OA group (1day or 2day trip)

Goal of this study trip is to facilitate farmers to image what they want to become, what kind of agribusiness they want to do.

2-1) Prepare study tour

PAFO and DAFO discuss with farmers what they need to learn from Phonsim group and make a program.

[Attachment II-4: Sample program]

(points to be considered)

How they sale their product:

- ➢ Variety of vegetable to sale in market
- ➢ Price of vegetable 1 bundle or 1 kg
- ➢ Quantity of vegetable for sale per day
- ➢ How much income they get per day?
- ➢ How they contact to customer

Basic cultivation technique:

- ➢ How to prepare nursery
- ➢ How to prepare soil and ridge (size of lane and high)
- ➢ How to prevent insects
- ➢ How to control the heat (i.e. Salad cultivation or transplanting)

2-2) Conduct study tour

At the end of tour, PAFO and DAFO discuss with farmers to set a date for the review meeting. It is recommended to arrange within a week.

2-3) Summarize learnings from the study tour and compare.

After coming back from study tour, PAFO and DAFO help farmers to organize a meeting to summarize what farmers

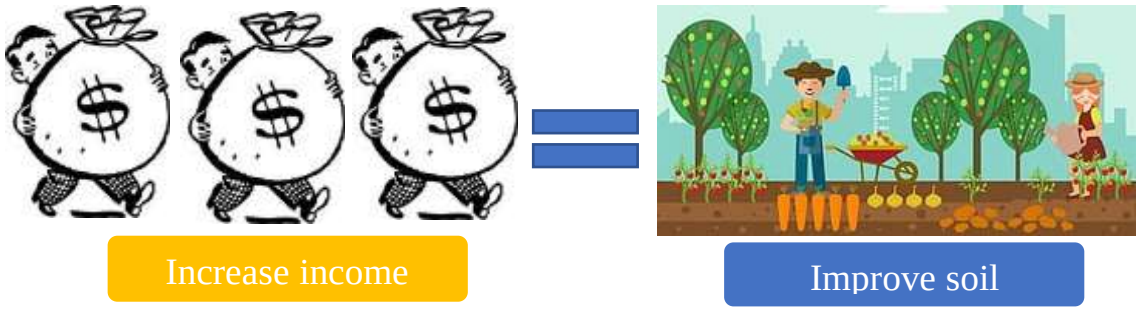
observed and learned from the study trip, and compare with their practice and situations. Write them on A0 paper so that it makes it easier to compare.

- ✧ **<u>If not conducted, PAFO and DAFO can skip to the next step of "Linking income increase with soil improvement" and proceed to basic cultivation technique trainings.</u>**
- ✧ **<u>PAFO can also introduce market potential crops to grow. [See Section IV Sales Promotion]</u>**

3) Linking income increase" with "soil improvement"

3-1) After finding comparisons between Phonsim OA groups and themselves, let farmers think what are the things we can start now in order to increase income.

✧ **<u>This is the focal point to move to the next technical training steps.</u>**



3-2) When farmers say they need to improve their technique, facilitators can ask them what kinds of techniques. Get as many techniques as possible and write them on the paper. Organize them in order of cultivation steps.

✧ **<u>Soil preparation should come first. Then, facilitators can ask whether farmers want to learn how to improve soil from the next session.</u>**

(Attachment II-4: Sample program)

Farmer to Farmer in Phonsim organic vegetable group

Target: to motivate farmers from new project site to grow vegetable for commodity.

Purpose: For farmers to learn about cultivation technic and sale.

Place: 1.PAFO meeting room. 2.Phonsim field.

Date: 25-26/February 2020

Participant: Total farmers 40 + DAFO 6

- Farmer from Phin district 20 + DAFO 02 people
- Farmer from Xaiphouthong district 10 + DAFO 02 people
- Farmer from Songkhon district 10 + DAFO 02 people

Schedule.

Time	Activities
Day 1	PAFO
13:00 – 13:05	Meeting in PAFO before go to Phonsim market.
13:05 – 13:20	Introduce themselves
13:20 – 13:50	Phonsim leader explain briefly about history of group
13:50 – 14:30	Go to visit and see how they sell vegetable in phonsiim market.
14:30 – 16:00	Back to PAFO meeting room to summarise information for the sale. Prepare question for phonsim farm visiting.
16:00 – 17:00	Dinner all together
Day2:	Phonsim farm
08:30 – 9:00	each farmer group to propose a question to Phonsim leader, what do you want to learn with Phonsim group.
09:00-10:00	Explain for cultivation technic. - How to make nursery, soil preparation, how to take care and prevent disease and insect. - Compost making and bio pesticide.
10:00 – 10:30	Explain about income how much their get for 1 cycle of vegetable cultivation in 01 roof.
10:30 – 10:45	Phonsim leader will explain how to calculate for the construction of 01 roof.
10:45 – 11:30	Field observation.
11:30 – 12:30	Summary and closing
12:30 – 13:30	Lunch together

2 Technical Training

(1) Importance of soil improvement and Compost making

1) PAFO and DAFO assist farmers to understand the importance of soil. 2) Conduct compost making training.

(Implementer: PAFO, DAFO, DOIC)

(Explanation)

1) Conduct a workshop for farmers to learn about the soil

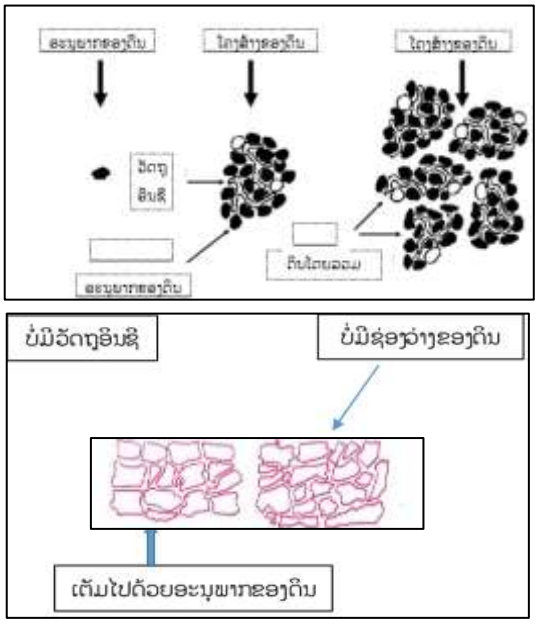
1-1) Ask farmers what is good soil and bad soil? What types of soil do they have? Write them down as they answer.

Criteria	Good soil	Bad soil
Texture Colour Moisture Nutrition	-	-

After this, ask farmers the following questions;

- **<u>Where can you find these good soil?</u>**
  Sample answer: forest,
- **<u>Do you know what soil is made of?</u>**
  Sample answer: Soil particle, plants, air, water, microorganism

1-2) Use drawings to explain soil aggregate structure.



Good soil = Many varieties of Microorganisms

1-3) Ask farmers **how we can increase microorganisms in their soil?**

Explain microorganism is a living creature. To live, what do they need? To eat!

Microorganisms eat ONLY organic matter. They do not eat chemical substance including chemical fertilizer.

We need COMPOST

1-4) Review the learnings and check if farmers understand the points.

Criteria	Good Soil	To Do
Texture	- Soft - Keep enough air - Roots spread deeply - More microorganism	- Need many varieties of microorganisms - Microorganisms eat only organic matter
Moisture	- Keep water well	- Need compost for feeding microorganism.
Nutrition	- Rich in nutrition - Good balance of many kinds of nutrition - No pests and diseases	- Fertilizer is for nutrition for plants and does not improve soil condition.

2) Conduct trainings on compost making

Demonstrate how to make compost by taking the materials. Make sample compost together with farmers.

✧ (attachment II-3) How to make compost

PAFO conclude the meeting with following questions;

- How many kilograms of compost are you going to make?
- How big is your cultivation area?
- Have you decided what you are going to grow?

Wait till they ask PAFO and DAFO what they should grow.

Then, "let's find out together. When do you have time to do market survey?"

Set the date for market survey training and finish the meeting.

(Attachment II-3: How to make compost)

How to make compost 1

1. Ingredient:

- Rice straw 1 hand tractor/ if rice husk 6 bags
- Saw dust 2 bags
- Cow dung (not mix with soil) 8 bags
- Water 100 liter (if not enough can add more)

2. How to make

- Put rice husk(layer1) 2 bags
- Put cow dung(layer2)2,5 bags
- Put saw dust(layer3) haft bag
- Remark: Each layer need to put water, after that cover by plastic sheet. Check 2 time per week, if it dry, we need to put water then covers by plastic sheet.
- Period 3 months it will be ready.

How to make compost 2

1.Ingredient:

- Compost
- Green leaf
- water
- cow dung
- Bowl or cement tank
- Earth worm

2. How to make

- Put compost into bowl or cement tank high 30 cm.
- Put green leaf about 30 cm.
- Put water, we can make more layer
- Put earth worm and put cow dung on top then put water.
- 40 days it will be ready. Then we can expand this compost just only for 02 weeks.
- We use 3 kg/1 square meter.

How to make compost 3

1. Ingredient:

- Cow dung 1 bags
- Rice bran 1 bag
- Rice husk 3 bags
- EM 2 spoon/water 1 watering pot
- Molasses 2 spoon/water 1 watering pot

2. How to make

- Mix all ingredient together then put in a bag and leave for 5-7 days it will be ready, we will see fungus(white colour) it mean compost are ready to use.

How to use compost

1) Plough soil and leave them for 7 to 10 days, then spray bio-pesticide and mix neem leaves with the soil to prevent weeds, insects and diseases under the ground.
2) Mix compost 1 to 2 kg per a square meter of the soil and leave them for 3 to 5 days before sowing or planting.

Important Note

1: Follow up on farmers (Encouragement and Relationship buildings)
It is important to visit farmers to see if they implemented the way you taught them to do. Ideally DAFO should visit farmers every week at the beginning and share information with PAFO. PAFO, if possible, visit two to three times a month to support farmers' cultivation

2: Don't rush
PAFO and DAFO should spend time to make farmers understand why they need to learn compost making before starting compost making demonstration.

3: Demonstrate
PAFO and DAFO should show how to do in practice and let farmers make together.

4: No more "Do you understand?" questions!
Do NOT ask them if they understood or not. Ask them what they learned instead.

5: Prepare well in advance
PAFO should spend enough time for preparation to make visual materials before the trainings.

Farmers feel encouraged and motivated to try when government officers work close with them especially at the beginning before making money. It is important for PAFO and DAFO to DO TOGETHER NOT ONLY TALKING.

(2) Market survey and Crop selection

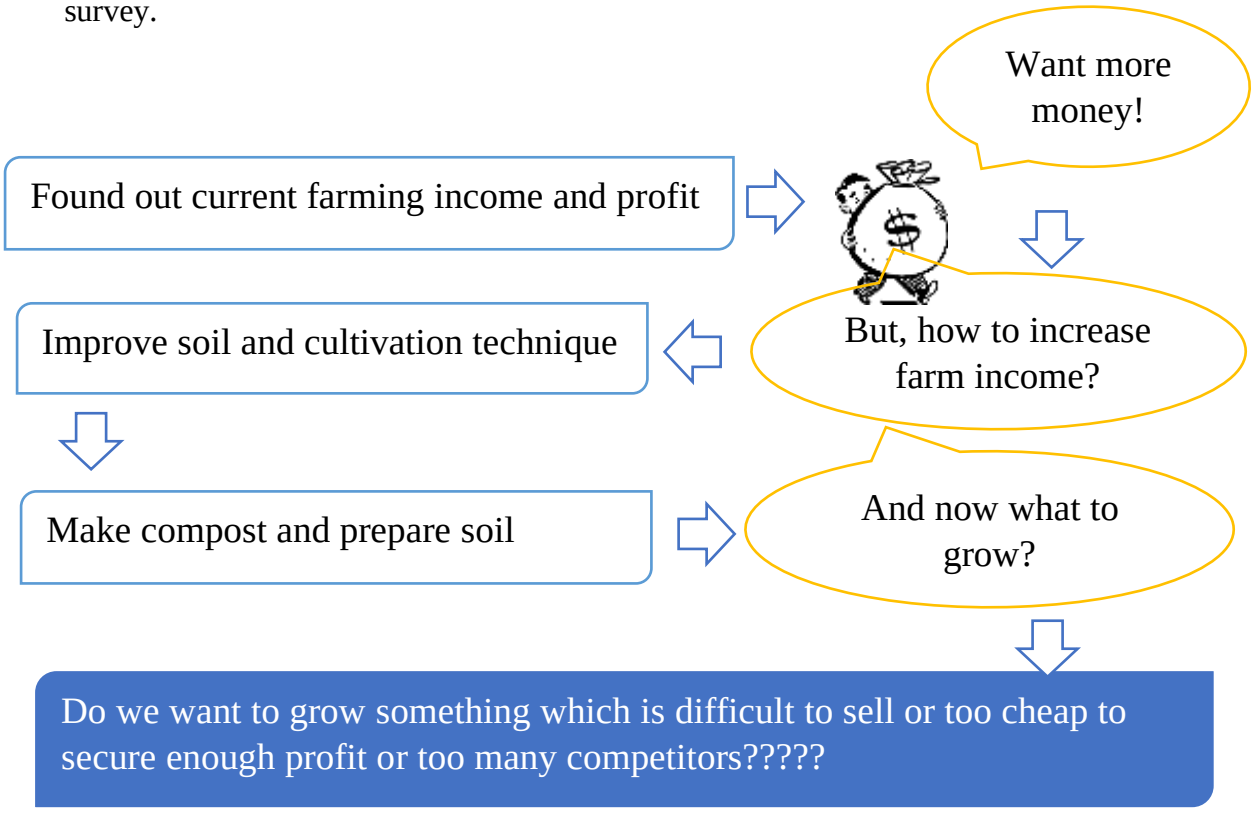
1) Preparation of Market survey 2) Conduct Market Survey 3) Summarize Survey Result and Crop selection

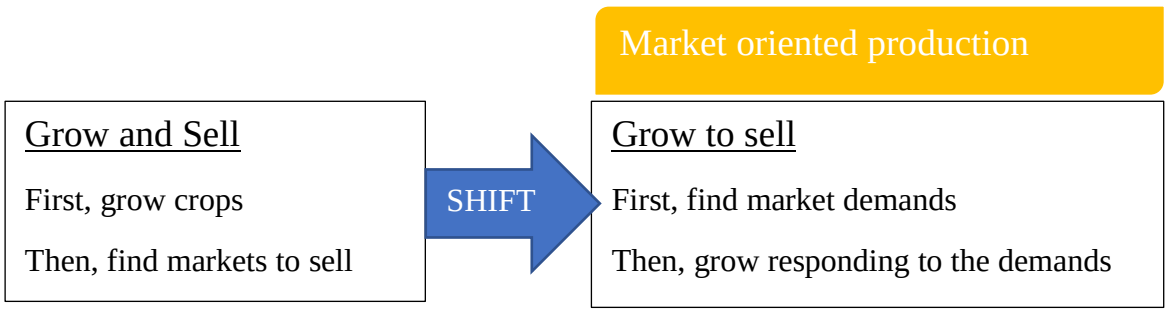
(Implementer: PAFO, DAFO, DOIC)

(Explanation)

1) Preparation of Market Survey (Day 1 –half day)

1-1) PAFO and DAFO organize a meeting with farmers on market survey. Review what has been done up to the previous sessions, and remind them why we are going to do market survey.





(Source: SHEP)

***Farmers grow crops without thinking where or who to sell, and start asking to find markets after harvest. In this case, it would be difficult to help them if the crops are not highly demanded.**

1-2) PAFO and DAFO help farmers to make survey questions. Make sure farmers write these questions by themselves.

[Possible questions]
- Price (sales price and buying price)
- Production place
- Quantity that vendors buy daily or weekly
- Quality required for higher price (Size, Colour, Taste, Texture, etc)
- Seasonal change in price and supply
- Contact person name and number
- What kinds of crops they sold fast so that they need more quantity?

1-3) Let farmers decide who will go to the market to do survey. All the farmers or they select some representatives.
If all farmers go, then divide them into some groups.
* See [attachment II-6] Market survey question sheet example.

2) Conduct Market survey (Day 2)
PAFO and/or DAFO take farmers to the market for implementing survey. Let farmers ask questions to the vendors so that they can communicate directly next time.

3) Summarize information and crop selection (Day 3 –half day)
Use the crop selection sheet to organize the information. (this is an example).

Crop	Price (/kg)	Yield* (kg)	Income	Production Cost*	Profit	Cultivation period	Demand and Buyer

*Yield and Production cost are estimated based on farmers' experience. If farmers have never cultivated before, PAFO and DAFO should help them to provide information on them.

*It is very difficult to estimate yield where farmers have never tried kinds of vegetables they surveyed. In this case, compare the price and cultivation period, and let farmers think whether they want to try cultivation at small scale.

*Do NOT too much worry about filling all the information. Rather, it is important to share any information collected from the market and discuss among the farmers.

Let farmers discuss which crops might have more potential to sell and likely to have higher profit. PAFO can also introduce some recommended trial crops.

Farmers summarizing information after the survey

At the end, ask farmers “How much sales are you targeting?” “When to start?” “Please discuss with your family, and we will make a plan next”

(Attachment II-4: Market survey question sheet example)

Market survey preparation

1: Select the crops – 5 to 6 crops
2: Select the market
3: Think of who we are going to ask questions in that market

Crops	Market	Who to interview
Corns		Vendor, Middlemen
Tomatoes		Vendor, Buyer, Middlemen
Morning glory		Vendor, Buyer,
Chili		Vendor, Buyer,
Water melon		Vendor, Buyer,
Lettuce		Vendor, Buyer,

4: Think of questions we are going to ask

- List down what we want to know?
- Make questions
  i.e.
  Popular Variety
  Quality required to sell at higher price
  Seasonality for selling at higher price
  Price range
  Procurement quantity for one time

5: Make a group of 3 people

6: Write questions on A4 paper

7: Divide the role in the group
Member 1: asking question from the question sheet
Member 2: writing answer to another sheet
Member 3: checking the time and customers

(Source: ideas taken by SHEP)

(Attachment II-4: Market survey question sheet example)

* Sample survey questions

1. What is your name? Telephone number?

2. Could you tell me if the price of _____ is increasing or decreasing?

3. How does the price change depending on the season?
   Peak season price:_____ When:_____
   Off Peak season price:_____ When:_____

4. Size affects the price?
   If yes, what is the ideal size?

5. What are the alterative products when _____ is not available?

6. Where do you procure _____ from?
   If from middlemen, who is s/he? Where are they from? Do you have contact number?

7. What is the quantity you buy at once? _____ bags / kg,
   And how often?
   A: everyday, B: once a week, C: Twice a week, D: Others_____

8. Do you know how many traders like you are here in this market?

9. Do you know who is the largest trader for this product in this market?

10. What is your payment conditions?

11. Are you interested in buying from me?

12. What is the quality you are looking for?

Anything related to the product category

(Attachment II-4: Market survey question sheet example)

2. Production Selection

1: Distribute the crop selection sheet for all the farmers. Or, write on the A0 paper for everyone to see.
2: Everyone fills out the sheet based on the survey information. Also, other information about production cost will be supported by PAFO/DAFO staff.
3: Decide the ranking

* Sample selection sheet follows;

(Source: SHEP)

(Attachment II-6: Market survey question sheet example)

Crop	Ever growth	Produce period	Main issue when produce	Yield average per 1 square meter (Kg)	Average price (kip/kg)	Total sale per 1 square meter	Production cost per 1 square meter	Expectation for profit	Market / buyer	Market condition	Ranked
Corn											
Tomatoes											
Morning glory											
Chili											
Water melon											
Salad											

(Source: SHEP)

(Crop selection sheet example)

Crops comparison for income

#	Chili		Eggplant	Cucumber	Galangal	Salad	Spring onion	Celery	Long bean
	Red	Pi							
Price	10,000	10,000				5,000	10,000	8,000	4,000
	15,000	15,000	6,000	2,000	5000	12,000	17,000	25000	10,000
Yield per $1m^2$	1 kg	1 kg	2-3 kg	3-5 kg	2-5 kg	3 kg	1-2 kg	1 kg	2-3 kg
Yield per $100m^2$	100 kg	100 kg	200-300 kg	300-500 kg	200-500 kg	300 kg	100-200 kg	100 kg	200-300 kg
Income	1,000,000	1,000,000	1,000,000	600,000	1,000,000	1,500,000	1,200,000	800,000	800,000
	1,500,000	1,500,000	1,500,000	1,000,000	2,000,000	3,600,000	1,700,000	2,500,00	3,000,000
Production cost	95,000	95,000	100,000	70,000	100,000	85,000	250,000	150,000	100,000
Profit	905,000	905,000	900,000	530,000	900,000	1,415,000	750,000	650,000	700,000
	1,405,000	1,405,000	1,400,000	930,000	2,400,000	3,515,000	1,450,000	2,350,00	2,900,000
Cultivation period	3-4 months	3-4 months	100 days	45 days	6-12 months	30-35 days	25-30 days	2 month	55-75 days

(3) Make cultivation plan

1) Make cultivation plan 2) Soil preparation progress check

(Implementer: PAFO, DAFO, DOIC)

(Explanation)

1) Make cultivation plan for one season (dry or rainy)

1-1) PAFO and DAFO arrange a meeting with farmers to make a cultivation plan.

1-2) Ask farmers about the previous session. “What kind of crops did you select?” “What did you discuss with your families?”

1-3) Explain how to make cultivation plan by showing examples. [see attachment II-5:Cultivation plan]

- Crops
- Area
- Production cost
- Estimated sales
- Estimated total profit

1-4) After they made the plan, ask farmers the following questions;

- “When are you going to start cultivation?”
- “Do you remember when you need to put compost in the soil?”
- “Do you know how much compost you need for your cultivation plan?”
- “Do you have enough compost?”
- “If not, how much more compost do you need to make and by when?”

(Attachment II-5: Cultivation plan example 1)

(Attachment II-5: Cultivation plan example 2)
*We used this format for rainy season roof cultivation planning

Crop name:	Crop name:
Total harvest:	Total harvest:
Price/Kg	Price/Kg
Total sale:	Total sale:

Crop name:	Crop name:
Total harvest:	Total harvest:
Price/Kg	Price/Kg
Total sale:	Total sale:

Crop name:	Crop name:
Total harvest:	Total harvest:
Price/Kg	Price/Kg
Total sale:	Total sale:

Crop name:	Crop name:
Total harvest:	Total harvest:
Price/Kg	Price/Kg
Total sale:	Total sale:

Total production cost	Total income

Crop name:	Crop name:
Total harvest:	Total harvest:
Price/Kg	Price/Kg
Total sale:	Total sale:

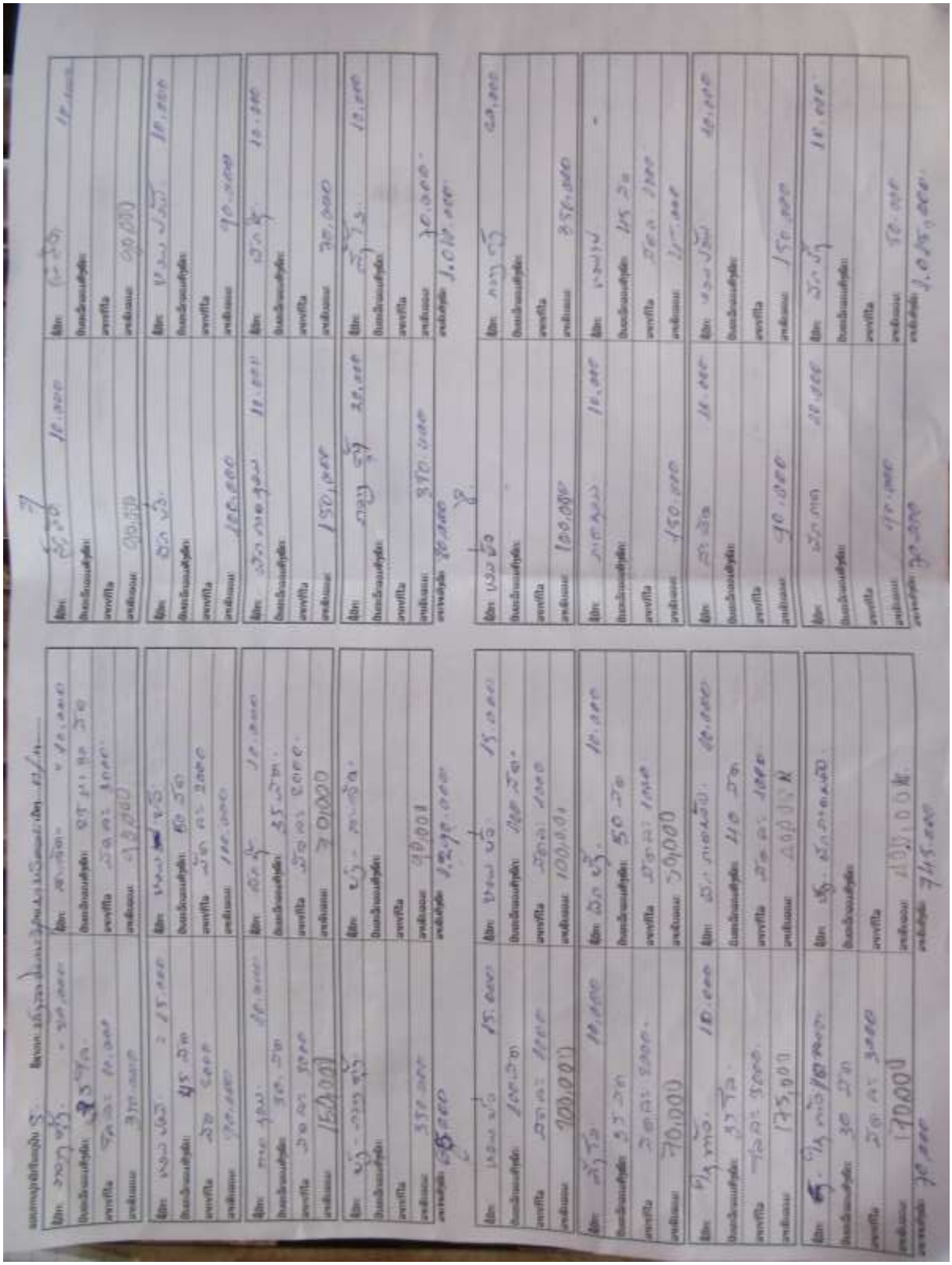
Crop name:	Crop name:
Total harvest:	Total harvest:
Price/Kg	Price/Kg
Total sale:	Total sale:

Crop name:	Crop name:
Total harvest:	Total harvest:
Price/Kg	Price/Kg
Total sale:	Total sale:

Crop name:	Crop name:
Total harvest:	Total harvest:
Price/Kg	Price/Kg
Total sale:	Total sale:

Total production cost	Total income

(Attachment II-5: Cultivation plan example 3)



2) Soil preparation progress check (Monitoring)

2-1) PAFO and DAFO visit each farmer to check the progress of their soil preparation and compost making.

The following questions help;

- "What did you put in compost?"
- "When is this compost ready for use? When made?"
- "How much compost do you need to make?"
- "Did you plough the land? If not, when to do?
- Touch the compost together to check the heat.

During the monitoring visit, it is important to review what farmers learn and encourage them to implement it by asking questions. Do NOT preach farmers what to do but let them think what they need to do and when. Help them to take notes.

✧ **By this time, we will know which farmers are really interested in vegetable cultivation. Believe what they do, not what they say.**

What to check when checking compost?

Criteria	**Details**
Texture	Dry, soft and light
Colour	Black
Fungus	See the white colour inside the bag
Temperature	Less than 60 degree
Smell	Good smells like soil

3 Experience sharing and Building network

(1) Conduct review meetings within the village

1) Conduct midterm review meeting within a village
2) Conduct season end review meeting within a village

(Implementer: PAFO, DAFO, DOIC)

(Explanation)

1) Conduct midterm review meeting within a village

When 2 months passed after the start of cultivation, PAFO and DAFO should organize a meeting with farmers to share experience of vegetable cultivation and sales at village level.

- What they have grown, what was easy and difficult?
- What sold better, where?
- Price and bundle size
- Any cultivation problems and solutions?
- Any sales problems and solutions?
- Who is growing / selling well? How is s/he doing?

Meeting should end with summaries of discussion and way forward.

How can we improve next? Which crops can we try?

Case Study

Midterm meeting helped farmers improve their business

It is very important to do this midterm review in order to take quick measures to some issues arising. Here is an example.

Panomxay farmers were selling vegetable individually and did not communicate much about their sales activities. It seemed all the farmers were selling well until one farmer complained that he was not selling well. DAFO organized a meeting to call all the farmers to share their sales experience. Then we found out that farmers were selling vegetables at different price and bundle size which was also differed double among the farmers.

By sharing information, some farmers found out that their price was too low. They also share the vendor information and decided to go to the market together to promote their vegetables as safe and special.

Since then, the group started receiving orders from more vendors and sold at price they set.

2) Conduct season end review meeting within a village

2-1) When ending the season (either dry or rainy), PAFO and DAFO organize a meeting with farmers to share experience of vegetable cultivation and sales at village level.

Points of review can be similar to the mid-term;

- What was easy and difficult?
- What sold better, where? Price
- Any cultivation problems and solutions?
- Any sales problems and solutions?

Plus, help farmers to calculate

- Total sales, production cost
- Total profit

Farmers are taking sales records, but may not sum up monthly total. PAFO and DAFO help farmers to calculate the total.

2-2) Discussion for the next season

After the review, PAFO and DAFO ask farmers about the next season cultivation.

- Want to continue? If so, what they will grow and when to start?
- Need to check the market again?
- PAFO and DOIC can introduce contract farming trial or market potential crops

Discuss with farmers about the next step depending on their situations and their opinions

⇒ Conduct market survey again? [Market survey and crop selection (p.29)]
⇒ Make cultivation plan and set a target? [Make cultivation plan (p.36)]

Case Study

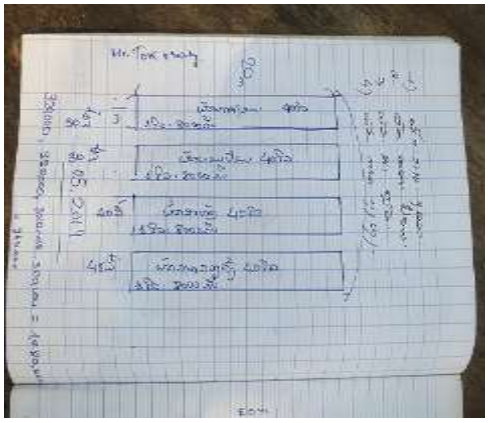
Introduce plastic sheet roof for rainy season cultivation

After the first dry season trial, the project asked farmers whether they want to continue vegetable cultivation during the rainy season. Farmers expressed their interests in trying rainy season cultivation by using plastic sheet roof. The project assisted them at loan basis. Here's the procedure.

PAFO introduce plastic sheet loan. 500,000kips per 20m to be paid after the rainy season.

Farmers make a cultivation plan for rainy season. 1 roof = 20m x 4 lanes

Calculate total profit



PAFO check the plan to see if farmers can make enough profit to pay back

Conduct training on roof construction. Set one sample in each village

Farmers set up structures and after that request for the plastic sheet

PAFO check the structure and provide plastic sheet.

Loan collection and discuss among farmers what to use the money for

This is not revolving fund program. Purpose of loan is to see which farmer is serious about roof cultivation.

(2) [F to F] Conduct exchange session at provincial level (1-2 day)

1) Conduct exchange session for farmers to share their experience
2) Take farmers to advanced farmers group to learn cultivation technique

(Implementer: PAFO, DAFO, DOIC)

(Explanation)

1) Conduct exchange session for farmers to share their experience (0.5 day)
[*Attachment 6: sample program]

1-1) Compare the farm produce

Ask farmers to bring their own vegetables to present.
During the session, farmers show how they make bundle and compare the size, price and quality. Let farmers observe and discuss freely during the comparison. PAFO and DOIC write the information on the comparison chart in order to organize the information.

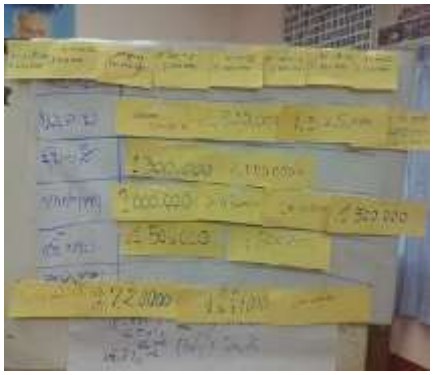
OR

We can divide the farmers into group and let them share within a group. DAFO become facilitator to sort out information on the flipchart.

Village	Price	Weight	Size	Other quality
Thapangthong				
Nonboua luang				
Panomxay				
Phonsim				
Tonhen				

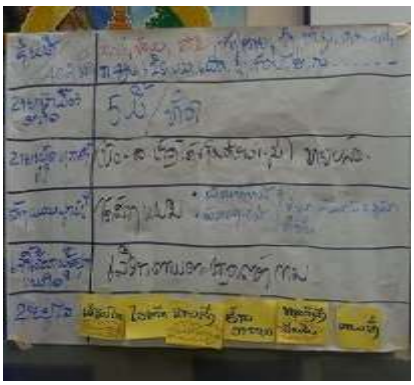
1-2) Compare the sales income

Ask farmers to write the latest monthly vegetable sales on the paper. Put them on the board to compare who has the highest.
Choose the highest earning farmer and ask the following questions. At the same time, let all the farmers compare themselves and the highest one using the chart below.



Items to compare;

Crop varieties	
How many times sold/week	
Did you sell them all?	
Made cultivation plan?	
How to select the crops?	
Where to sell?	
Land area	
Number of labours	
How many hours a day spent	
Production Cost	
What to arrange among the members	



Let farmers find out the comparison between themselves and higher earning farmers. This activity energizes farmers to try more.

DAFO should attend the session together with farmers. Their role is to support farmers to learn and participate the session. Each DAFO sits together with their farmers at the same table.

2) Take farmers to advanced farmers group to learn cultivation technique (0.5day)

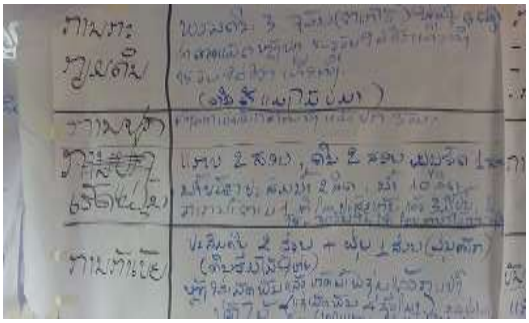
Take farmers to Phonsim OA group farm (or other model group can also be considered) to see their cultivation methods and soil conditions. Encourage learnings between farmers.

First, Phonsim group guide the participants to show their farm and what and how they cultivate. If time allows, we can give farmers free observation time.

After the farm observation, PAFO facilitates farmers to discuss their findings and summarize the learning points

Example items to organize findings;

- Soil preparation
- How soil is different from yours
- Nutrition application, what kinds of nutrition applied
- How they prevent insects
- How they take care plants
- How they water (times, amount, etc)
- What kinds of seeds they use
- How they plan cultivation
- Any particular crop cultivation technique



Good point

Farmers began to change after Farmers' exchange session

Nonboualuang farmers autonomously held a meeting with the members after the exchange session and assigned marketing officers to collect vegetables from members to take them to market.
More farmers started requesting additional plastic sheet to expand cultivation area.
Thapangthong farmers started selling their vegetables more than once a week.

(Attachment II-6: Sample program)

Farmer to Farmer – Mid term Review Meeting

Purpose:
Learn from other farmers in similar situations and improve the cultivation technique, crop selection skills as well as build networks for sales.

Background:
Project farmers started rainy season cultivation and it has been almost 2months Some farmers have managed to grow and sell, and others have some problems and asked for information about other farmers how they are doing. At this occasion, project decided to let farmers exchange their experience about rainy season cultivation and sales and learn from each other.

Date: 1/Aug/2019 – 2/Aug/2019

Participants: Total 32 Farmers + 5 DAFOs

- 6 PLX farmers + DAFO
- 7 XNB farmers + 2 DAFOs
- 9 TPT farmers + DAFO
- 10 Phonsim farmers
- 2 TH farmers + DAFO

Activity Schedule

Time	**Activity**	**Remarks**
Day 1: 01/08/2019		
12:00 – 13:00	Lunch	
13:00 – 13:00	Opening session / Introduction	PAFO mtg room
13:30 – 14:00	Observe Phonsim market	
14:15 – 16:30	Sharing experience and discussion	PAFO mtg room
17:00 -	Dinner	
Day 2: 02/08/2019		
08:00 – 08:30	Move to Phonsim farm	
08:30 – 09:30	Guiding tour of Phonsim farm	
09:30 – 10:15	Free observation time	
10:30 – 11:30	Summary of findings	
11:30 – 12:00	Go back to Savannakhet	
12:00 – 13:00	Lunch	

(Attachment II-6: Sample program)

Day 1 Marketing & Sales:

Session 1: Sharing experience about vegetable sales (1hour)

Objective: Facilitate farmers to realize the value of their products and become more confident in selling their vegetables.

- This will help them negotiate price with the buyers
- This will help them start thinking about what to sell, how to sell, where to sell.

Activities:
Let farmers find the differences in value of vegetables sold at the market by comparing the vegetables farmers sell.

(1) Ask farmers to bring the following farmers.

- Morning glory
- Spring onion
- Coriander
- Salad
- Okra, Zucchini, Chili, Eggplants, etc…

(2) Let farmers compare each district vegetables
example of comparison

Morning glory	Bundle Weight	Vegetable Size	Price	Vegetable Quality	Others
Phonsim					
TPT					
PLX					
TH					
XNB					

(3) After they compare, take the comments and questions from farmers.
Key questions:

- How much difference is there between Phonsim vegetable price and others.
- What about the bundle size difference?
- How to negotiate the price?

(Attachment II-6: Sample program)

Session 2: Sales comparison (1hour)
* Ask farmers to bring their sales record

(1) Write the sales of one month. For example, June sales of vegetablesNo need to put the name.

Put them on A0 paper and compare.

(2) What are the difference between high earning farmer and other farmers? Compare.

Phonsim farmers

Crop varieties	
How many times sold/week	
Did you sell them all?	
Made cultivation plan?	
How to select the crops?	
Where to sell?	
Land area	
Number of labours	
How many hours a day spent	
Production Cost	
What to arrange among the members	

Session 3: Way forward (30mins)
(1) Let farmers think what they can improve to increase their farm income base on what they find from the session 1&2.

(2) Make a brief action plan
- Crop selection?
- Cultivation plan?
- where to sell / how to sell?
- What can you start from tomorrow?

* Session 3 can be a homework, and marketing team will follow up by visiting them.

(Attachment II-6: Sample program)

Day 2 Agriculture Technique:

(1) Guiding tour of Phonsim farm (45mins)

- Phonsim introduces the followings
    - Compost making
    - Vegetable plots (salad, zucchini, radish, long beans, etc)
    - Bio pesticides

(2) Free observation by the farmers (45mins)

Before free observation, ask farmers questions what can help you improve your income.

(3) Summary session (1hour)

Soil preparation	
Nutrition application	
How to prevent insects	
How to take care	
How to water	
Seeds	
Cultivation plan	

III Increase productivity (Rice)

1 Strengthen cultivation techniques by rice seed and fertilizer lending program

(1) Overview

1) PAFO and DAFO lend farmers seeds and fertilizer
2) Farmers who join lending program are to attend 4 times trainings.

(Implementer: PAFO, DAFO)

(Explanation)

1) Implementation procedures:

"Rice seed and fertilizer lending program" is a system to supply rice seeds and fertilizer to farmers in project's sites in order to improve production technique and increase rice yield.

<Lending program system>

Meeting with farmers to announce and explain lending program
(For dry season: September-October, For rainy season: April-May)
Organize Training 1 and also distribute seeds and basal fertilizer
(For dry season: November, For rainy season: June)
Organize Training 2 and also distribute top-dressing
(For dry season: December-January, For rainy season: July-August)
Organize Training 3 and also distribute top-dressing
(For dry season: January-February, For rainy season: August-September)
Organize Training 4 Pre and post-harvest
(For dry season: March, For rainy season: September)
Payment for lending program
(For dry season: May-June, For rainy season: October-November)
*All Training materials are attached the back of this Guide Book

Explanation at village meeting

Explanation at village meeting

< Focal points >
To ensure farmers attending the trainings, DAFO staff is to distribute seeds and fertilizer in each training: Training 1, 2 and 3

(2) Meeting with farmers

1) The village meeting is to explain conditions, ways to apply this program and support to fill in application form.
2) Hand over application forms to village authority because of smooth procedure

(Implementer: PAFO(Agri), DAFO(Agri))

(Explanation)

1) Purpose:
   A. To announce “Seed and Fertilizer Lending Program in RS2020” to village authority and WUO board members. The announcement includes lending price.
   B. To ask the authority to announce to farmers in project site for applying for lending program (Attachment III-1: Application form).
   C. To ask the authority to organize “village meeting” in order to disseminate and assist farmers to fill in application forms and also to collect the filled forms.
2) Meeting organization method
   A. Meeting to explain lending program to committee of village/WUO: PAFO and DAFO have a meeting with village authority in order to explain the details of the lending program.
   B. Village meeting organized by itself: village authority call all villagers to the meeting and explain lending program to them within the observation of DAFO staff.
   C. Application period is about 3 weeks starting after village meeting
3) Things to be considered
   A. We always consider about farmers ‘participation
   B. We utilize experiences from implementing lending program in the last season
   C. ຜູ້ສະໝັກຂໍກູ້ຢືມຕ້ອງໄດ້ເຂົ້າຮ່ວມການຝຶກອົບຕາມໃນແຕ່ລະຄັ້ງທີ່ໂຄງການຈັດຂຶ້ນ
   D. ພວກເຮົາຫຼີກເວັ້ນພື້ນທີ່ໆມີຄວາມສ່ຽງສູງໃນການເກີດນ້ຳຖ້ວມ
   E. Non-applied farmer before need to be selected in a preferential under limited budget.

< Focal point >
- Village meetings with farmers should be organized in convenient conditions for farmers; organize in the village and a convenient time for farmers.
- Request a farmer who joined the program of last season to explain his result

(Attachment III-1: Application form)

Lend-lease contract (Rice seed, Fertilizer)

Date

1 Lender and Borrower

Lender

Name	
Address	
Tel	

Borrower (Farmer)

Name	
Village	
Tel	

2 Lend materials

(1) Rice seed

Seed variety	Amount(kg)	Unit price (kips/kg)	Subtotal price(kips)	Cultivation area (m2,ha,rai)
			(Total price)	

(Attachment III-1: Application form)

(2) Fertilizer

Fertilizer name	Amount(bags)	Unit price (kips/bag)	Subtotal price (kips)
			(Total price)

3 Lease requirements

(1) All farmers who borrow rice seeds and fertilizers need to participate the agriculture training conducted by PAD project and follow the way of lecture.

(2) WUG is responsible for collection and hand over to DAFO after completion of collect all money.

(3) All farmers need to pay to WUG the rice seeds' and fertilizers' charge within one month after harvesting.

(4) After harvesting, if farmers don't pay money back to PAFO, farmers have to pay back **3 times** of the lend amount (kg).

(5) Do not sell and give rice seed and fertilizer to anyone.

The Lender

The Borrower

Witness (Head of Village)

Name:

The collector of payment (Head of WUG)

Name:

❖ Collect application forms and start procurement process

- Lending price is referred to local market price
- PAFO is responsible for transportation cost of the seeds and fertilizer

(Explanation)

1) Lending price (Project site case in DS of 2018-2019, RS of 2019 and DS2019-2020)
In last two season, the lending price of rice seeds, fertilizer (N:P:K=15-15-15) and Urea (46-0-0) is equal or less than local market price 10,000 kip/bag for farmer incentive to apply this strengthen technique program. In RS 2020, PAFO issue the price as follows:

(Seeds)

Lend to farmers	Buy from seed center
7,000kip/kg	7,000kip/kg

The project suggests: R3 seeds, 60kg / ha
Purchasing place: Tasano rice seed center, Nonheo rice seed center

(Fertilizer)

Type	Lend to farmers	Buying price
Formula (15-15-15)	5,000kip/kg	5,000 kip
Urea (46-0-0)	3,800kip/kg	3,800 kip

The project suggests: basal fertilizer: 150kg /ha, top-dressing (Urea) 60kg /ha

2) Transportation cost: PAFO is responsible.
PAFO pays for transportation and PAFO is the one who delivers seeds and fertilizer to villages.

< Focal point >
- Lending price is same as local market price in order to extend rice cultivation techniques and to strengthen sustainability.
- Some farmers who only want (46-0-0) are not accepted due to it doesn't comply the technique suggested by project.

ການຈັດສົ່ງແນວພັນຢູ່ເມືອງໄຊບຸລີ

(3) Training

1) Organize training 1 and distribute seeds & basal fertilizer

1) Topic of the training is "General technique on rice cultivation, from soil preparation till transplanting" 2) The distribution is only rice seeds and basal fertilizer

*All Training materials are attached the back of this Guide Book.

(Implementer: PAFO(Agri), DAFO(Agri))

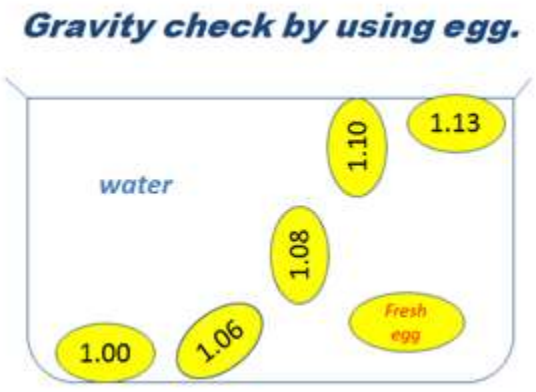
(Explanation)

1) Training 1

The project organize 4 times trainings to farmers who join lending program in order to stably produce rice and get high yield. For the Rainiy season, Training 1 is organized in beginning of June. (In case of dry season: November)

Training contents

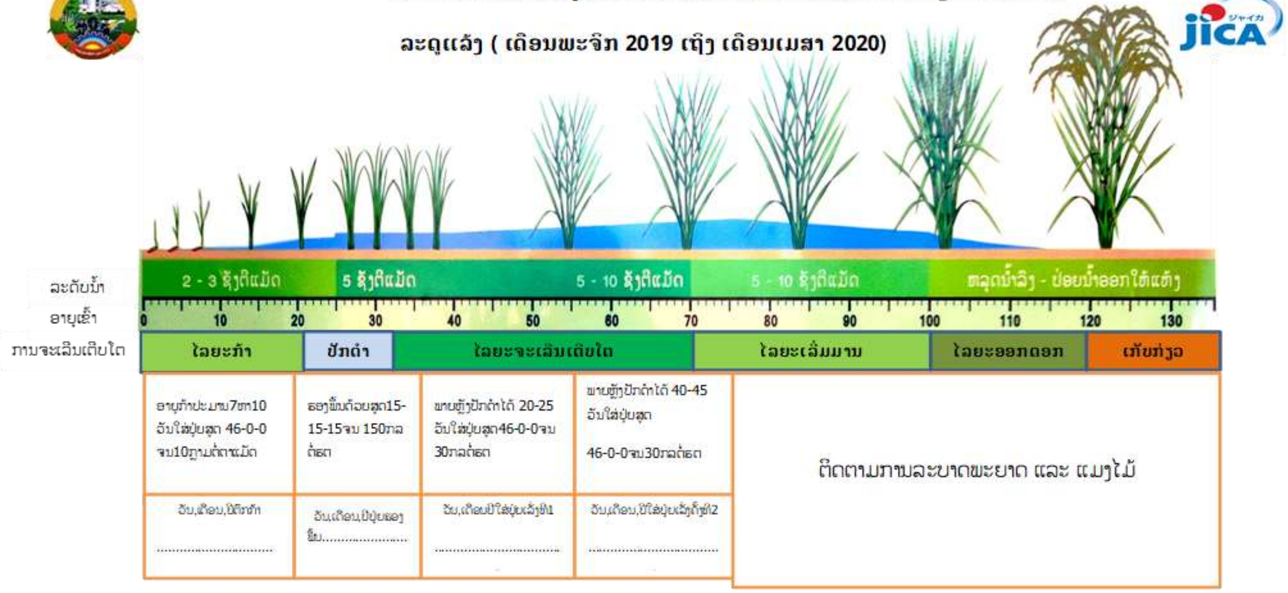
a) Review last DS production
b) General explanation of rice cultivation calendar (See attachment III-2: Cultivation calendar)
c) Seed selection: select with salt water (water density 1.06*), 1 month dormancy.
* Salt water which density is 1.06g/cm3 is heavier than water; 1.0g/cm3. We can select the good quality seeds with dipping them.
d) Soaking and Incubation: soak 24 hours and leave for 36 hours.
e) Nursery setting and taking care of nursery: 20cm ×20cm, 3-4 plants/hill
f) Role of NPK
g)Basal fertilizer calculation: 150kg / ha apply before transplanting
h) Timing and amount of fertilizer application: Apply basal fertilizer before transplanting; Top dressing 1, apply 20-25 days after transplanting; Top dressing 2, apply 55 – 60 days after transplanting.



How to select seed

(Attachment III-2: Cultivation calendar <Transplanting>)
*Original file is distributed at PAD project office.

ປະຕິທິນການປູກເຂົ້ານາດຳທົ່ວໄປສຳລັບເມືອງ ຈຳພອນ



ຄຳແນະນຳ: ການຜະລິດອີງຕາມປະຕິທິນລະດູການ

- ຄັດເລືອກແນວພັນເຂົ້າທີ່ເຫັນວ່າມີຄວາມແທດເໝາະກັບສະພາບດິນນາຂອງຕົນເອງ
- ຜ່ານຂັ້ນຕອນການຄັດເລືອກແນວພັນໂດຍການນຳໃຊ້ນ້ຳເກືອທຸກເທື່ອເພື່ອໃຫ້ໄດ້ແນວພັນທີ່ສົມບູນ
- ເນື້ອທີ່ຕາກ້າປະມານ 600 ມ² ຫຼື ປະມານ (20ມx30ມ) ໃຊ້ແນວພັນເຂົ້າ 1 ເຮັກຕາ: 60 ກລ ,ສຳລັບນາດຳທົ່ວໄປ
- ຕ້ອງໄຖດິນຕາກແດດປະໄວ້ປະມານ 1 ຫາ 2 ອາທິດ ເພື່ອຄວບຄຸມວັດສະພືດ
- ເມື່ອອາຍຸກ້າໄດ້ 20ຫາ25ວັນສາມາດປັກດຳໄດ້ເລີຍ
- ກ່ອນກຽມດິນປັກດຳຄວນໃສ່ຝຸ່ນຄອກໃນອັດຕາ0,5ຫາ1ກລຕໍ່ຕາແມັດຖ້າມີ, ຖ້າບໍ່ມີໃຫ້ໃສ່ຝຸ່ນເຄມີສູດ 16-20-00(ສຳລັບນາດິນຕົມ) ສູດ 15-15-15,16-8-8 (ນາດິນຊາຍ) ຕາມອັດຕາ 150ກລ/ຮຕ)
- ກ່ອນການໃສ່ຝຸ່ນເລັ່ງແຕ່ລະຄັ້ງຄວນກຳຈັດຫຍ້າໃຫ້ໝົດເສຍກ່ອນ
- ເມື່ອເຂົ້າມີອາຍຸໄດ້ 50 ວັນ ຫຼືພາຍຫລັງປັກດຳໄດ້ 20-25 ວັນ,ໃສ່ຝຸ່ນເລັ່ງຄັ້ງທີ່ 1 ຕາມອັດຕາ 30ກລ/ຮຕ ສູດ 46-00-00
- ເມື່ອເຂົ້າມີອາຍຸໄດ້ 70 ວັນ ຫຼືພາຍຫຼັງປັກດຳໄດ້ 40-45 ວັນ,ໃສ່ຝຸ່ນເລັ່ງຄັ້ງທີ່ 2ຕາມອັດຕາ 30ກລ/ຮຕ ສູດ 46-00-00
- ການເກັບກ່ຽວເມື່ອເຂົ້າສຸກປະມານ 80%ສາມາດເກັບໄດ້.

ຫ້ອງການກະສິກຳ ແລະ ປ່າໄມ້ເມືອງ ຈຳພອນ

1. ທ່ານ ວຽງສະຫວັນ ທາດາສະຫວັນ 020 56610956
2. ທ່ານ ຄອນໄລ ສຸວັນນະສີ 030 9984441
3. ທ່ານ ນາງ ພອນທິບ

ພະແນກກະສິກຳ ແລະ ປ່າໄມ້ແຂວງ

1. ທ່ານ ທອມມາລາ ພົມມະແສງທອງ 020 55645466
2. ທ່ານ ຈັນລະຄອນ 020 56745462
3. ທ່ານ ພອນສັກ 020 91171114

ໂຄງການ Savan PAD Project

1. ທ່ານ ໂອກະດະ
2. ທ່ານ ສຸລິຍົງ 020 95003777
3. ທ່ານ ຕົ້ນຕະການ 020 91215123

ປະຕິທິນຈາກເດືອນພະຈິກ 2019 ເຖິງເດືອນເມສາ 2020

ພະຈິກ 11 /2019

ທິດ	ຈັນ	ຄານ	ພຸດ	ພະຫັດ	ສຸກ	ເສົາ
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30

ມັງກອນ 1/2020

ທິດ	ຈັນ	ຄານ	ພຸດ	ພະຫັດ	ສຸກ	ເສົາ
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

ມີນາ 3 /2020

ທິດ	ຈັນ	ຄານ	ພຸດ	ພະຫັດ	ສຸກ	ເສົາ
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

ທັນວາ 12 /2019

ທິດ	ຈັນ	ຄານ	ພຸດ	ພະຫັດ	ສຸກ	ເສົາ
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

ກຸມພາ 2 /2020

ທິດ	ຈັນ	ຄານ	ພຸດ	ພະຫັດ	ສຸກ	ເສົາ
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29

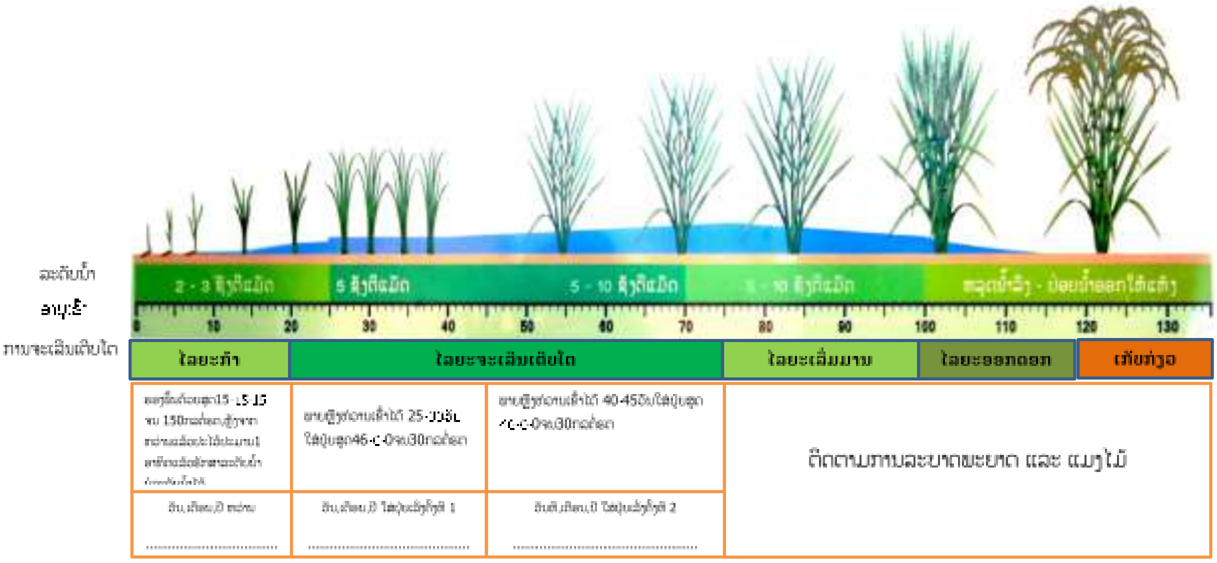
ເມສາ 4 /2020

ທິດ	ຈັນ	ຄານ	ພຸດ	ພະຫັດ	ສຸກ	ເສົາ
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30		

(Attachment III-2: Cultivation calendar <Direct sowing>)
*Original file is distributed at PAD project office.

M\ HJ K@^KM@ApK^X ¥^KWUL i RYCDP YK

U\ G UG (i GYKP \ D@ 2019 i l C i GYKi RW 2020)



Bj K\ K: @^KN\ UGYCH^RM HJ KU\ G@^K

- BGUY@ KVPKi ApJ aXKVRBV^Rj J Gi ^\ @LW P^LGKK^AYGHKi YC
- NKAKHYK@KBGUY@ KVPKKGF@KK EKp@YJ @J Y i PY XeCKVPKJ WRLK
- l EKVPKi Ap1 iZ@H^: 80 @U ,WUL K^XV^K
- HYCl GKH^@ GGM mVM R^K 1 X^ 2 Y^J G i PYBVLBVGW PG
- i RYi ApRBV^RCY@l a ^\ WR@WR^GKmVXV^KnG@^K@ @nRGKHYC XW ; W i ; a
- @YK@nRGKBVKl WKBY@ KYGH^0,5X^1 @UHb^j RGl ^Ra ^L BaXWKi BRWG 16-20-00(WUL K^GKHR) WG 15-15-15,16-8-8 (K^GKEF) H^RYGH^ 150 @UZH)
- @YK@Kl WKi U HL\ BBVK@DGXF Xe GiWF@YK
- i RYi ApRa^FdG 50 VK XF^FXUM@GnG 20-25 VK,l WKi UBD a H^RYGH^ 30@UZH WG 46-00-00
- i RYi ApRa^FdG 70 VK XF^FXM@GnG 40-45 VK,l WKi UBD a H^RYGH^ 30@UZH WG 46-00-00
- l ^RBV^RDMKHYC WKBD a j HHYCUGM UR^KCKUC
- @Ki @L@ i RYi ApW@M R^K 80% WR^G i @L nG

X YC@^K@ W j U\ MnRRYCDP YK

1. J K VhCW XVK J ^GW XVK 020 56610956
2. J K BYKmU WKK\ W 030 9984441
3. J K K^CPYKJ L

P\ j K@@ W j U\ MnR AVC

1. J K XYRR^U^ PRR\ j WJ YC 020 55645462
2. J K DKU\ BYK 02056745462
3. J K PYKW@ 02091171114

kBC@^K Savan PAD Project

1. J K kY@ G\
2. J K WUFC 020 95003777
3. J K HKH\ @K 020 91215123

ປະຕິທິນຈາກເດືອນພະຈິກ 2019 ເຖິງເດືອນເມສາ 2020

ພະຈິກ 11/2019

ອາທິດ	ຈັນ	ອັງຄານ	ພຸດ	ພະຫັດ	ສຸກ	ເສົາ
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30

ມັງກອນ 1/2020

ອາທິດ	ຈັນ	ອັງຄານ	ພຸດ	ພະຫັດ	ສຸກ	ເສົາ
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

ມີນາ 3/2020

ອາທິດ	ຈັນ	ອັງຄານ	ພຸດ	ພະຫັດ	ສຸກ	ເສົາ
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

ທັນວາ 12/2019

ອາທິດ	ຈັນ	ອັງຄານ	ພຸດ	ພະຫັດ	ສຸກ	ເສົາ
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

ກຸມພາ 2/2020

ອາທິດ	ຈັນ	ອັງຄານ	ພຸດ	ພະຫັດ	ສຸກ	ເສົາ
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29

ເມສາ 4/2020

ອາທິດ	ຈັນ	ອັງຄານ	ພຸດ	ພະຫັດ	ສຸກ	ເສົາ
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30		

Distribution of seeds and basal fertilizer

1) We distribute the seed in the 1st training, based on the number of farmers requested.

2) The time to distribute rice seed and fertilizer

Training	Month	Distribution
1st	June.: Before sowing / Preparing the soil	Rice seed and fertilizer (15-15-15) for basal fertilizing
2nd	June.: Before using top - dressing I	fertilizer type (46-0-0) for top - dressing I
3rd	July.: Before using top - dressing II	fertilizer type (46-0-0) for top - dressing II

3) Fertilizer calculation for 1 Ha

ການຄິດໄລ່ຈຳນວນການໃສ່ປຸ໋ຍຕໍ່ໄຮ່ນາ 1 ໄຮ່

ຫ້ອງທີ	1	2	3	4	5	6	7	8	ໝາຍເຫດ
ເນື້ອທີ່ໄຮ່ນາ (m²)	50	100	200	300	400	500	1,000	5,000	
ປຸ໋ຍຮອງພື້ນ (kg)	7,5 (ຂີດ)	1.5	3	4.5	6	7.5	15	75	ອັດຕາ 150kg/ha
ປຸ໋ຍເລັ່ງຄັ້ງທີ 1 (kg)	1.5 ຂີດ	3 ຂີດ	6 ຂີດ	9 ຂີດ	1.2	1.5	3	15	ອັດຕາ 30kg/ha
ປຸ໋ຍເລັ່ງຄັ້ງທີ 2 (kg)	1.5 ຂີດ	3 ຂີດ	6 ຂີດ	9 ຂີດ	1.2	1.5	3	15	ອັດຕາ 30kg/ha

< Focal point >

- For distribution person in charge is needed, village head and WUO, do not distribute seed/fertilizer before training.
- Farmers should know or estimate their plots size of their field.

Fertilizer distribution in Thapangthong and Xaibouly

2) Organize training 2 and distribute 1st top-dressing fertilizer

1) 2nd training instructs techniques of 1st top-dressing, pest and disease control 2) Fertilizer use Urea (46-0-0) 30kg/ha on 20-25 days after transplanting

*All Training contents are attached the back of this Guide Book.

(Implementer: PAFO(Agri), DAFO(Agri))

(Explanation)

1) For the 2nd training course in dry season is organized in the beginning of January. The main topics of the training course are how to apply fertilizer for top dressing 1 and fertilizer distribution (Urea).

Training contents

a) Review of last training course what the farmers did
b) Timing and amount of top dressing 1
Urea (46:0:0) 30 Kg/1ha, apply 20-25 after transplanting
c) Fertilizer calculation
Fertility of soil, how to apply top dressing (In the activity 2-4)
d) Practice of making bio-pesticide
e) According to pest and disease observation in the rice field we saw that Dried leaf disease, Leaf collar blast were found

Top dressing 1 training course

Leaf collar blast

Brown Plant hopper

❖ Additional training: Bio-pesticide

1) How to control diseases and insects with bio-pesticide
2) Explain life circle of the insect to be controlled

1) In the training course, first we have to explain to the farmers about life circle of those kind of pest and disease.
2) Teaching how to make and utilize bio-pesticide
(EX: bio-pesticide of plants hopper control)

- Ingredient:

1) Gliricidia (flower - leaves) = 1 kg
2) Neem = 1 kg
3) Lemongrass = 1 kg
4) Red chilli (wet) = 1 kg
5) molasses = 0,5 L
6) EM = 0,5 L
7) Water = 7 L
8) Bucket size :12 liters

Mash the gliricidia, neem, lemongrass, chili, etc…, leave for 1 day.

How to use:

Mix with water in the same amount of the biopesticide. Spray for the field (40 m x 40 m), around 4 – 5 PM

9) Beauveria Bassiana (fungal pathogens)

< Focal points >
- Easily to find the herb ingredient around you
- Explain the bad point of using pesticide and herbicide to farmers.

ສາທິດການເຮັດນ້ຳໝັກສະໝຸນໄພຂັບໄລ່ແມງໄມ້

3) Organize training 3 and distribute 2nd top-dressing fertilizer

1) It is a training on how to apply top-dressing 2 2) How to control diseases and insects of rice

*All Training contents are attached the back of this Guide Book.

(Implementer: PAFO(Agri), DAFO(Agri))

(Explanation)

1) Training 3

The training course is organized in the from end of June to beginning July (In case of Dry season: January-February). Main topic are 2nd top dressing application and Urea distribution

Training contents

a) Review of last training course what farmers did

b) Explanation of timing and amount of 2nd top dressing:
Urea (46:0:0) 30 Kg/ha, 40-45 after transplanting

c) Fertilizer amount calculation
How to calculate amount of fertilizer (See III-1-(3))

d) Pest and disease control
Interview and discuss with the farmers about Pest/disease which occurred at that moment, also observation and give the guidance to the farmers in the field. The additional training will be organized if necessary.

Top dressing 2 training

Bio-pesticide training

Bio-pesticide spraying

4) Organize training 4 (Additional training)

1) Train on any topic which is useful for increasing rice yield 2) Train on how to protect pre-harvest and post-harvest loss (for last season)

*All Training contents are attached the back of this Guide Book.

(Implementer: PAFO(Agri), DAFO(Agri))

(Explanation)

1) In case of dry season DS2019-2020: The 4th training course was organized in the middle of March . Main purpose of this training course is to increase the quantity and quality of rice after harvesting and they are related to seed renewal, amount and timing of fertilizer application properly.

Training contents

a) Water management when the rice is about maturing
b) Determination of rice maturity
c) Harvesting and drying rice after harvesting
d) Threshing and drying after thresh
e) Keeping to prevent loss of production

Moisture inspection

Check Drying condition

< Focal points >
- Moisture content is less than 14%.
- DAFO staffs need to inspect moisture.

(4) Monitoring and Guidance

1) Select farmers to be monitored 2) Collect data by observing and asking with questionnaire

(Implementer: PAFO(Agri), DAFO(Agri))

(Explanation)

1) It is very necessary to monitor and evaluate the practice of farmers to know the result of the lending program and to improved training courses. On the other hand, It is necessary to discuss with the farmers and give guidance about rice cultivation technic to the target farmers.

2) Monitoring and Guidance

A) After finishing each training, we have to monitor and guidance

B) The number of target farmers: 20% or more of the farmers.

C) PAFO and DAFO (DAFO are main in-charge people) together visit and observation also gives guidance to the farmers; interview farmers by using monitoring form.

(Attachment III-3: Monitoring sheet)

< Focal point>

- Monitoring-evaluation the farmers by interview and give the guidance to the farmers in the field

Monitoring and guidance to farmers

(Attachment III-3: Monitoring sheet)

Monitoring and Guidance Record Sheet
Lending seed and fertilizer program

Farmer No.: Farmer Name: Village name: District name:

Visit date: Visit place: Home, Field, Both, Other ( )

Part I Questionnaire

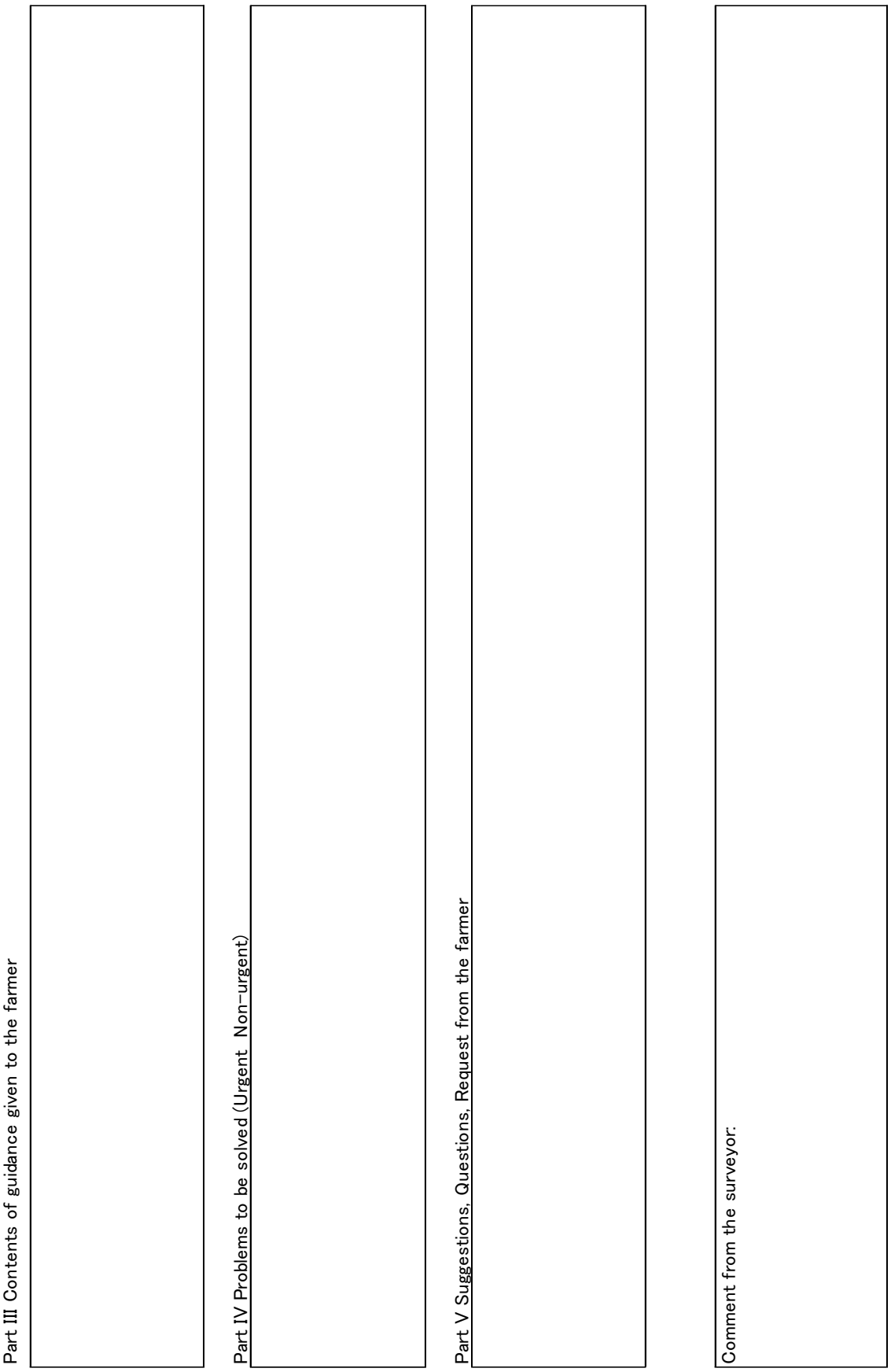
No.	Questions	Present season	Previous seasons
1	Cultivation way	Transplanting (Date:) Direct sowing (Date:)	Transplanting Direct sowing
2-1	Seed selection	Salt water Water No selection	Salt water Water No selection
2-2	Seed amount sown kg/ ha	60 70 80 More	60 70 80 More
3-1	Basal fertilizer amount (kg/ ha)	150 kg More(kg) Less(kg)	150 kg More(kg) Less(kg)
3-2	Basal fertilizer mixed in soil	Yes (Date) No	Yes No
4-1	Top-dressing I: Amount (kg/ ha)	30 kg More(kg) Less(kg)	30 kg More(kg) Less(kg)
4-2	Top-dressing I: Days after transplanting/ sowing	_____ days after transplanting/ sowing (Date:)	_____ days after transplanting/ sowing
5-1	Top-dressing II: Amount (kg/ ha)	30 kg More(kg) Less(kg)	30 kg More(kg) Less(kg)
5-2	Top-dressing II: Days after top-dressing I	_____ days after top-dressing I (Date:)	_____ days after top-dressing I
6	Do you irrigate enough water?	Enough Not enough Too much	Enough Not enough
7	Pest and disease	Name of problem or damage ( ), ( ), ( )	Name of problem or damage ( ), ( ), ( )

(Attachment III-3: Monitoring sheet)

Part II
Observation results

No.	Observation item	Observation result
8	Uniformity, mixture of other variety	
9	Spacing, Number of plants/ hill	
10	Growth and greenness	
11	Weed	
12	Pest and disease	

(Attachment III-3: Monitoring sheet)



(5) Lending money collection

1) DAFO, board member of WUO/village is to collect lending money as soon as possible after harvesting.
2) DAFO transfers the collected money to PAFO in every 1/2 week.

(Implementer: PAFO(Agri), DAFO(Agri))

(Explanation)

1) In the lending contract:
   A) All applicants in the lending seed and fertilizer program must attend the rice cultivation technic training course from the PAD project and follow the technic in the training course.
   B) WUO/Village authority is responsible for collecting money from farmers and hand over to DAFO staff.
   C) After harvesting the farmers have to pay back the money to WUO / village authority by cash, Latest wit in 1 month.
   D) After 1 month of harvesting farmers who don't pay back will be fined 3 times of borrowing amount.
2) How to collect money
   A) DAFO prepare document about the request of payment and receipt, deliver the document to the village by DAFO:
      - List of applicants and amount of money
      - The request of payment (delivery 1 month in advance)
      - Receipt
      - Hand overring money paper between Village and DAFO
      - Monitoring sheet for the yield of farmers (Hearing)
   B) Village collect the money from farmers and hand over money to DAFO once a week it takes 5-6 weeks); DAFO transfer that money to PAFO

< Focal point >
- Not allow WUO or village authority and DAFO staff keep the money too long, its better to hand over or transfer money before weekends
- Every times of payment and receive must have signature.

(5)-1 Observation of yield results

1) Board member of WUO/village is to ask total yield of each farmer

(Implementer: PAFO(Agri), DAFO(Agri),WUO)

(Explanation)

This observation is asking the yield of farmers

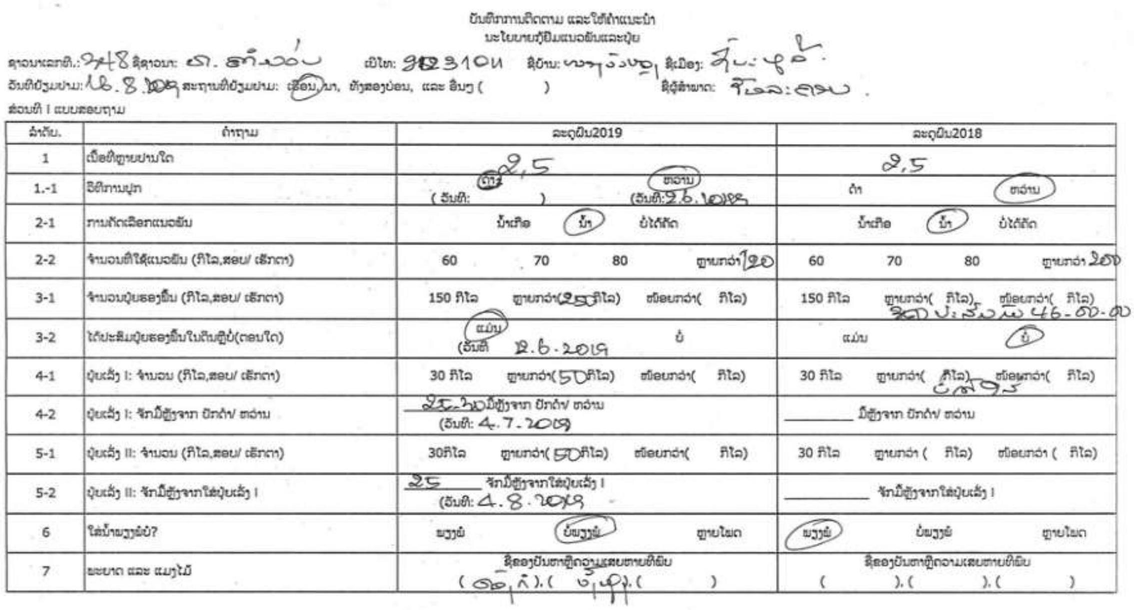
1) Purpose

To know the yield of the farmer before and after the project conduct the activities, to compare the yield of the farmers in each year

2) How to survey

When farmers come to pay back the money to the village head of the village or responsible person ask them how many bags do they get after harvest this year and last year.

3) Monitoring form to ask the yield (see attachment III-3:Monitoring sheet)



ບັນທຶກການຕິດຕາມ ແລະ ໃຫ້ຄຳແນະນຳ
ນະໂຍບາຍກູ້ຢືມແນວພັນແລະປຸ໋ຍ

ສ່ວນທີ I ແບບສອບຖາມ

ລຳດັບ.	ຄຳຖາມ	ລະດູຝົນ2019	ລະດູຝົນ2018
1	ເນື້ອທີ່ຫຼາຍປານໃດ	2,5	2,5
1.-1	ວິທີການປູກ	ດຳ (ວັນທີ:) ຫວ່ານ (ວັນທີ: 26.10.18)	ດຳ ຫວ່ານ
2-1	ການຄັດເລືອກແນວພັນ	ນ້ຳເກືອ ນ້ຳ ບໍ່ໄດ້ຄັດ	ນ້ຳເກືອ ນ້ຳ ບໍ່ໄດ້ຄັດ
2-2	ຈຳນວນທີ່ໃຊ້ແນວພັນ (ກິໂລ,ສອບ/ ເຮັກຕາ)	60 70 80 ຫຼາຍກວ່າ120	60 70 80 ຫຼາຍກວ່າ 200
3-1	ຈຳນວນປຸ໋ຍຮອງພື້ນ (ກິໂລ,ສອບ/ ເຮັກຕາ)	150 ກິໂລ ຫຼາຍກວ່າ(25ກິໂລ) ໜ້ອຍກວ່າ(ກິໂລ)	150 ກິໂລ ຫຼາຍກວ່າ(ກິໂລ) ໜ້ອຍກວ່າ(ກິໂລ) 46-00-00
3-2	ໄດ້ປະສົມປຸ໋ຍຮອງພື້ນໃນດິນຫຼືບໍ່(ຕອນໃດ)	ແມ່ນ (ວັນທີ 12.6.2019) ບໍ່	ແມ່ນ ບໍ່
4-1	ປຸ໋ຍເຄັ່ງ I: ຈຳນວນ (ກິໂລ,ສອບ/ ເຮັກຕາ)	30 ກິໂລ ຫຼາຍກວ່າ(50ກິໂລ) ໜ້ອຍກວ່າ(ກິໂລ)	30 ກິໂລ ຫຼາຍກວ່າ(ກິໂລ) ໜ້ອຍກວ່າ(ກິໂລ)
4-2	ປຸ໋ຍເຄັ່ງ I: ຈັກມື້ຫຼັງຈາກ ປັກດຳ/ ຫວ່ານ	25 ມື້ຫຼັງຈາກ ປັກດຳ/ ຫວ່ານ (ວັນທີ: 4.7.2019)	______ ມື້ຫຼັງຈາກ ປັກດຳ/ ຫວ່ານ
5-1	ປຸ໋ຍເຄັ່ງ II: ຈຳນວນ (ກິໂລ,ສອບ/ ເຮັກຕາ)	30ກິໂລ ຫຼາຍກວ່າ(50ກິໂລ) ໜ້ອຍກວ່າ(ກິໂລ)	30 ກິໂລ ຫຼາຍກວ່າ (ກິໂລ) ໜ້ອຍກວ່າ (ກິໂລ)
5-2	ປຸ໋ຍເຄັ່ງ II: ຈັກມື້ຫຼັງຈາກໃສ່ປຸ໋ຍເຄັ່ງ I	25 ຈັກມື້ຫຼັງຈາກໃສ່ປຸ໋ຍເຄັ່ງ I (ວັນທີ: 4.8.2019)	______ ຈັກມື້ຫຼັງຈາກໃສ່ປຸ໋ຍເຄັ່ງ I
6	ໃສ່ນ້ຳພຽງພໍບໍ່?	ພຽງພໍ ບໍ່ພຽງພໍ ຫຼາຍໂພດ	ພຽງພໍ ບໍ່ພຽງພໍ ຫຼາຍໂພດ
7	ພະຍາດ ແລະ ແມງໄມ້	ຊື່ຂອງບັນຫາຫຼືຄວາມເສຍຫາຍທີ່ພົບ ( ). ( ). ( )	ຊື່ຂອງບັນຫາຫຼືຄວາມເສຍຫາຍທີ່ພົບ ( ). ( ). ( )

Monitoring record example

Monitoring and guidance to farmers

2 Intensive Guidance Field

1) Intensive guidance field (IGF) is to show the result if we use technique taught in the trainings by using field of farmer who join lending program.
2) IGF selection is to be considered about field condition and farmer's motivation.

(Implementer: PAFO, DAFO)

(Explanation)

1) In "lending seed and fertilizer program", the project set "Intensive guidance field" in each project side to improve of seed renewal and usage of fertilizer.
   A) Guidance for basal fertilizer application and the spacing for transplanting
      (a) Rice cultivation calendar explanation.
      (b) Plowing, puddling, spacing for transplanting, Area and amount of fertilizer.
      (c) Calculation of fertilizer apply amount
      (d) Seed selection by salty water
      (e) Soaking and incubation
      (f) Nursery setting and taking
   B) 1st guidance
      (a) Timing and amount of top dressing 1
      (b) Pest and disease observation
   C) 2nd guidance
      (a) Timing and amount of top dressing 1
      (b) Pest and disease observation
   D) 3rd guidance
      (a) pre and post harvesting
      (b) Water management, determining the enjoyment of rice and drying in fields, selecting, drying after harvest, storage including post-harvest losses.

Intensive Guidance Field

Field monitoring

3 Yield Survey

1) When Government staffs need accurate data of rice yield for monitoring project effect, they implement yield survey by themselves.
2) Yield survey is that Government staffs harvest some point on paddy field and measure crop weight.

(Implementer: PAFO, DAFO)

(Explanation)

1) How to collect the sample
(a) Collect 3 points of sample 1 m X 1 m in standard
(b) threshing by hand.
(c) Sample will be hanged and dry, clean and weigh. Keep in the high place to prevent the animals

Three (3) sampling points

Sampling frame: Inside 1mX1m

Made from pipes

Removal of paddy

Plastic net bag

(d) Measure the weight and moisture
A= weight after cleaning(g), B= weight of net (g),
C= moisture (%), D= weight change by the moisture (g/3m^2)

Formulated
$D = (A - B) \times (1 - C \times 0.01) / (1 - 0.14)$

(e) The yield that expected/ha will calculate by this formula.
Yield (t/ha) = (D /1000) kg/3 m^2 X (10,000 m^2 /3 m^2) / 1,000

IV Sales promotion

1 Introduce market potential crops to farmers

(1) Conduct market survey and introduce farmers for selection

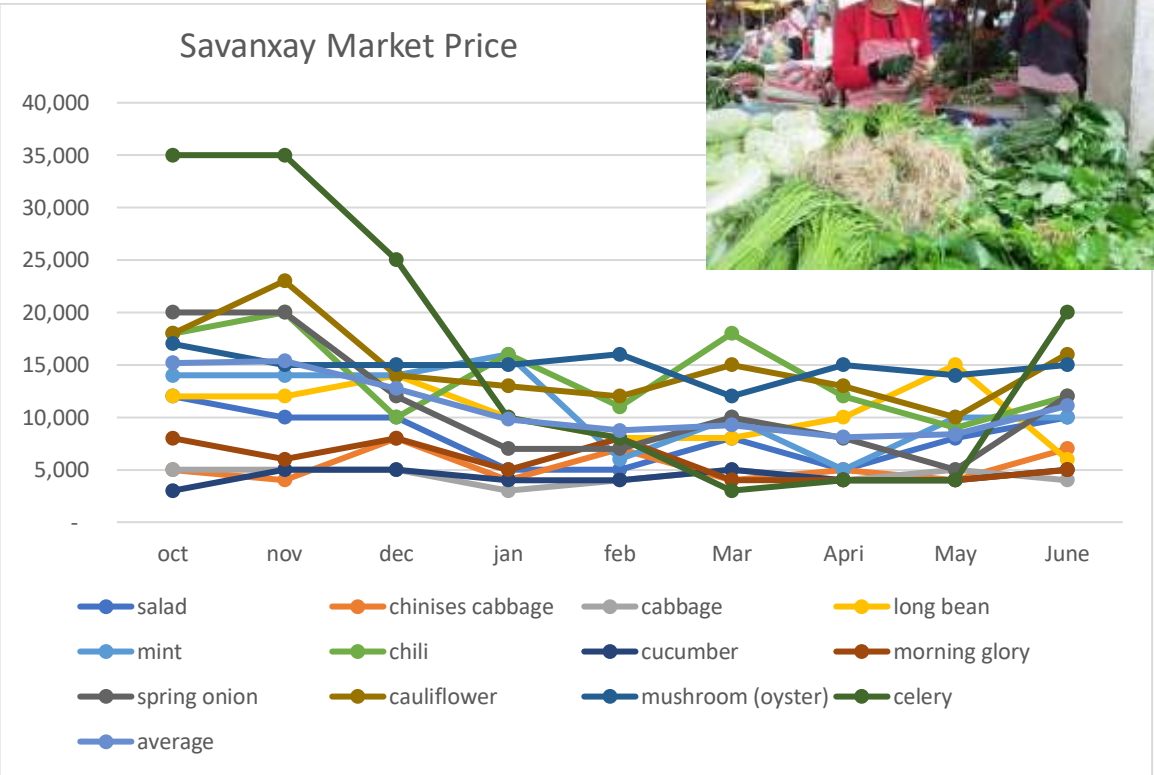
1) Conduct regular market survey 2) Visit potential customers 3) Select potential crops and introduce farmers

(Implementer: PAFO, DOIC)

(Explanation)

1) Conduct regular market survey

PAFO or DOIC assigned officer visit Savanxay market every month to check the vegetable price, varieties and where they are produced. Record them in the list and analyze the price fluctuation and whether possible to produce locally.
[*see attachment for price list]



No.	Vegetable names	12-Aug-19				5-Sep-19				11-Oct-19				12-Nov-19			
		Unit (kg)	Price (kip)	From	Availability	Unit (kg)	Price (kip)	From	Availability	Unit (kg)	Price (kip)	From	Availability	Unit (kg)	Price (kip)	From	Availability
1	Salad lettuce	1	8,000	paksae	many	1	15,000	paksae	many	1	10,000	paksae	many	1	7,000	xvk	many
2	Buttercrunch lettuce (nks)																
3	Frillice lettuce (krru)																
4	Chinese kale	1	8,000	xvk	few	1	10,000	xvk	few	1	10,000	xvk	few	1	8,000	xvk	few
5	Chinese flowering cabbage																
6	Bok Choy (nunyt)																
7	Mustard green																
8	Mustard cabbage																
9	Thai mustard																
10	Chinese cabbage	1	6,000	paksae	many	1	10,000	paksae	many	1	8,000	paksae	many	1	5,000	paksae	many
11	Cabbage	1	5,000	paksae	many	1	4,000	paksae	many	1	6,000	paksae	many	1	5,000	paksae	many
12	Tang Hi lettuce																
13	Pi chili (green)																
14	Pi Chi (mixed)	1	20,000	xbf,paske	many	1	13,000	xbf,paske	many	1	14,000	xbf,paske	many	1	10,000	xbf,paske	many
15	Pi chili (red)																
16	Viet red chili (no head)																
17	Viet red chili (with head)	1	12,000		many	1	20,000		many	1	14,000		many	1	15,000		many
18	Yellow chili(Tomhet)																
19	Mixed-yellow chili(Tomhet)																
20	Khi Noo chili																
21	Dill	1	15,000	xvk	many	1	15,000	xvk	many	1	10,000	xvk	many	1	10,000	xvk	many

2) Visit potential customers

2-1) Make a list of potential customers including restaurants, companies, and shops. Make appointments where necessary OR just walk in to introduce ourselves. Higher possibility to meet and talk is the latter choice of just walking in. Once you make a list, it is faster and more successful to visit one by one without any appointment.

2-2) When visiting the potential customers for the first time, DO NOT BE SHY and introduce yourself with smile. If you are shy introducing about yourself and the project, they think your product is not good. Be confident and visit as many potential customers as possible.

During the meeting, ask the following questions;

- What kinds of vegetables do you use?
- Where do you buy them? How often? How many kg at one time?

Summarize information as you collect.

*See attachment for sample

[What to prepare]

- Brochure (about project)
- Photos of vegetables
- Price list
- Brochure (about benefit of vegetables)

3) Select potential crops to introduce farmers

Discuss within PAFO and DOIC which crops might have more market potential or better deal in case of contract farming.

How to select?

- Find out production cost
- Do profit calculation and
- Analyze pros and cons for each crop

Introduce farmers for them to select

✧ **When introducing crops to farmers, provide enough information about production cost, cultivation period and technique.**

Let farmers decide, do NOT push them to try

(Attachment: Phonsim price list example)

Phonsim Farmers' Group Price List

Contact Number: 030 9067364/ 020 9559 4485 / 020 9129 9264 (Mr.Sengsavang)
020 98892879 (Mrs.Chalernphone)

S/N	Type of vegetable		Price / Kg	Remarks
1	ຜັກຫອມປ້ອມ	Parsley/Corriander	20,000	Available daily
2	ຜັກບົ່ວໃບ	Spring Oinon	15,000	Available daily
3	ຫອມເຂັ່ມ	Peppermint leaves	15,000	Available daily
4	ຜັກຄາວຫອງ	Fishmint leaves	15,000	Available daily
5	ຜັກບົວລະພາ	Cinamon basil	15,000	Available daily
6	ຜັກອີ່ຕູ	Sweet basil	15,000	Available daily
7	ຜັກຫອມປ	Culantro	15,000	Available daily
8	ຜັກຫົ່ມ 20 cm	Chinese amaranth 20 cm	10,000	Available daily
9	ສະຫຼັດກອນ	Lettuce/salad	10,000	Available daily
10	ສະຫຼັດໄຂ	Butter crunch lettuce	15,000	Available daily
11	ຜັກກາດຂ້ອງເຕ້	Chinese-Bok choy	7,000	Available daily
12	ຜັກຫົ່ມ 30-35 cm	Chinese amaranth	7,000	Available daily
13	ຫົວສີໄຄ	Lemon Grass	5,000	Available daily
14	ຫົວຂ່າ	Galangal	8,000	Available daily
15	ໝາກຫຸ່ງດິບ	Papaya(Raw)	4,000	Available daily
16	ຜັກກາດຂາວ	Chinese cabbage	10,000	Available daily
17	ກະຈຽບຂຽວ	Okra	20,000	Available daily
18	ຜັກຕຳນັ່ນ	Ivy gourd leaves	15,000	Available daily
19	ຜັກກາດຊໍ່ຂມ	Chinese flowering cabbage	7,000	Available daily
20	ຍອດມັນຕ່ຳ	Sweet potaoto leave	10,000	Available daily
21	ຍອດມັນຕົ້ນ	casava leave	5,000	Available daily
22	ໝາກຂະໄຫ້ໃຫຍ່	Bitter melon	15,000	Available daily
23	ໄຂ່ໄກ່ພື້ນ	Eggs (from Bounthong farm)	25,000	Available daily
24	ໄຂ່ໄກ່ລາດ	Eggs (Free range)	75,000	1 time a week
25	ໝາກເຂືອ	Eggplant	10,000	Twice a week
26	ໝາກບວບນ້ອຍ	Small sponge qourd/luffa	10,000	Twice a week
27	ຜັກຕົ້ງຝ້າຍ	Celery	30,000	Order in advance
28	ໝາກຖົ່ວຍາວ	Long bean	12,000	Available from 2019
29	ຜັກຫຽມໃບ	Garlic leaves	15,000	Available from 2019
30	ຫົວກາດຂາວ	Whtie raddish	15,000	Available from 2019
31	ຫົວຈາດ ແດງ	Red raddish	15,000	Available from 2019
32	ແຄ້ລອດ	Carrot	15,000	Available from April-2019
33	ຫົວຈາດແດງ(ນ້ອຍ)	Small red raddish	20,000	Not yet
34	ຜັກກະເພົ	Holy basil	15,000	Not much
35	ຜັກບົ້ງ	Morning glory	8,000	Not much
36	ໝາກແຄ້ງ	Small eggplant	8,000	Not much
37	ຜັກສັ່ງຫອງ	Sangthong vegetable	20,000	After 2 weeks
38	ໝາກເດັ່ນ	Tomato	10,000	After 1 month
39	ໝາກເຂືອຍາວຂຽວ	Long green eggplant	10,000	After 2 months
40	ໝາກເຜັດ	Chilii	22,000	After 3 months

(Attachment: Benefit of vegetable example)

(Attachment: vegetable photo example)

Case Study

Project introduced 6 varieties and contract farming trial

Project introduced several crops and contract farming trials to farmers.

No.	Trial crops	Market	Result of trial
1	Black sesame	Export to japan	Can harvest but not much because of weather, during trial
2	Zucchini	Restaurant, general customer, Company	During trial (can growth in small scale because disease damage)
3	Straw mushroom	General market	Can grow but get low yield
4	White radish	Market, Company, Vietnamese and Chinese people	Can produce
5	Bokchoy	Market, Company, Vietnamese and Chinese people	Can produce
6	Okra	Market, Vietnamese people	Can produce
7	Salad	Salad for rainy season	Can produce
8	Pi chili	General market	Can produce
9	Purple eggplant	Market, Company	Can produce
10	Melon	Market, super market	Cannot growth because of insect and disease damage
11	Black ginger	Market, STD	Cannot growth because of insect and disease damage
12	Japanese cucumber	Market, Vientiane market, Company	Cannot growth because of insect and disease damage
13	Carrot	General market	Can harvest some but take a lot of time
14	Small tomatoes	General market for rainy season	Cannot growth because of insect and disease damage
15	Big tomatoes	General market for rainy season	Cannot growth because of insect and disease damage
16	Onion	Company	Difficult to growth, take a lot of time, not good germinate

(2) Provide cultivation training and trial seeds

1) PAFO and DAFO provide cultivation training to farmers. Trial seeds will be given to farmers who participated the trainings afterwards.

(Implementer: PAFO, DAFO)

(Explanation)

1) Conduct cultivation training on trial crops

After farmers decided which crops to try, PAFO prepare the training to teach farmers how to cultivate. You can find some information at

Savanpad.webnode.com

During the training, PAFO should make sure to remind farmers about the production cost and let them calculate the profit again. Explain the price of each materials provided and where they can buy.

After the training, ask farmers about cultivation procedure and write down the date, when to do what". (Make cultivation schedule)

i.e. "When are you going to start?" 10/09 "Which day to transplant?" 25/09
"Which day are you going to put compost?" 05-10/10

Finally, PAFO provide the trial seeds to the farmers only who participated the training.

- **Do NOT provide seeds for those who do not attend the trainings**.

Next

After the training, PAFO and DAFO periodically visit the farmers.

If place is available, PAFO officers are highly recommended to practice their cultivation technique. i.e. KM35 trial plots

- **See attachment, an example for straw mushroom cultivation. PAFO conducted trial and made manual.**

Attachment: Straw mushroom cultivation method example)

Straw mushroom cultivation

1.Straw mushroom cultivation

There are many ways to grow straw mushrooms: grow in the bag, baskets and grow in the roof. But on manual or on the internet, there are so many different ways that it is so confusing and don't understand for readers so now we have a way to recommend for mushroom cultivation.

Grow mushroom in wood box: It is easy method and materials are available in local.

2. Ingredient:

- Plastic sheet 12 m
- Rice straw 12 bags
- Cow dung 1 bag
- Mushroom spawn 4 bags spawn 2 bags can grow for 3 boxes)
- Cultivation size 40 cm x 70 cm. The box makes like trapezoid
- Water 40 liter per / stack of straw 40 cm

3. Preparation

Take out spawn | soak straw 5 minute in water | Place no sun light and not shade

If grow in rainy season cultivation area should be high, the water does not flow through. the size of the cultivation area is 1 x 5 m and 15 cm deep, make high ridge around to prevent spawn wash away. Place no sun light and not under the shade

4. Cultivation method:

Put rice straw 5 cm | put cow dung around | Put spawn around

Put rice straw | watering | Make for 3 layers and top layer put more rice straw to prevent spawn touch with plastic sheet

All process are detailed in tables and photo on above

Put water
top layer put more rice straw to prevent spawn touch with plastic sheet
Make 3 layers
Put water
Put spawn
Put cow dung
Put rice straw thick 5-10 cm

Make for 3 layers and top layer put more rice straw thick about 20-30 cm to prevent spawn touch with plastic sheet after that cover by plastic sheet to protect the air.

5. How to take care: After 3-4 days we need to tear the plastic sheet to let air come inside then we observe for moisture in every day. If we see a lot of white fungi we need to put water (If we didn't see no need to put water)

6. Harvest: We should harvest in the morning or in the evening because cool weather so when we finish for harvest, we need to cover by plastic sheet and rice straw.

2 Advertisement / Sales promotion

(1) Support farmers when they harvest for sales

1) DOIC, PAFO and DAFO support farmers to sell their products, especially visiting buyers together at the first time.

(Implementer: DOIC, PAFO, DAFO)

(Explanation)

1) Support farmers to sell their products.
Farmers are quite shy and not familiar with how to sell. They tend to wait for the vendors to visit their farms to buy their farm produce. It is very important for DOIC, PADO and DAFO officers to assist them to make first contacts with the vendors/customers. **Let's take farmers to the market and restaurants for sales visit.**

When taking farmers for sales visit, the following materials will help.
- Brochure to introduce about the project
- Flyers to introduce farmers' produce (photos of vegetables & farmers, phone number)
- Flyers to explain benefits of new vegetable
- Price list (if available)
- Sample vegetables

  * See attachment for sample

How can we prepare the sales visit???

a. Think about the value of the product

Before making any flyers or sales promotional materials, think what kind of value our potential customers need or want.

Value = Happy = Buy

No Value = Unhappy = Don't buy

Customers do **not buy product** per se, but they buy the **value** that they can get from the products.

In terms of "vegetables", Food safety and Health benefit can be major value.

Food Safety

Health Benefit

Examples;

Crops	Nutrition	Benefit
Okra	Vitamin A,C,K, Protein, Fiber, Calcium	Stabilize cholesterol, Help liver condition, Reduce knee pain, etc
Bok Choy	Vitamin A, Calcium, Magnesium, Potassium	Helps Healthy Cardiovascular System, Promote anti-cancer, etc.
Carrot	Vitamin A, Anti-Oxidant, Carotein	Reduce the risk of cancer, Good for eyes, Help keep beauty

b. Make posters and fliers based on the value found

Based on the information collected regarding the value, make the posters. You can include the following information.

1: Nutrition contained: i.e. Vitamin A, C, K, Iron, Calcium, Protein, etc.
2: Health benefit: i.e. Reduce blood pressure, Lower cholesterol, Help digestion, etc.
3: How to cook/eat: i.e. Easy cooking recipe

DOIC officers together with PAFO and DAFO help farmers to distribute and put the posters.

Fliers to introduce farmers can be as simple as below.

Think catchy phrase to get attentions.

Make sure to put contact number which can be reached all the time.

Use real photos of farmers' produce. Avoid using the ones from the internet.

Case Study

Okra Promotion

Okra was not well known neither popular in Savannakhet. When introduced to customers, they often said "I don't know how to eat this." "I have never eaten this" Okra sold in Savannakhet was brought from Vietnam, thus they did not look fresh.

The project asked farmers if they wanted to try grow okra. Some tried and found out it was easy to grow even during the rainy season, and they can produce continuously.

DOIC and PAFO searched the internet and found that Okra has many health benefits. Some farmers who ate their harvest also commented their knee pain getting better.

DOIC officer made a poster and flyer to promote health benefit and distributed directly to the customers by hands and explained the benefit.

After that, customers started coming back to ask for okra, and this led farmers to expand okra cultivation area.

c. Utilize media tools to attract people

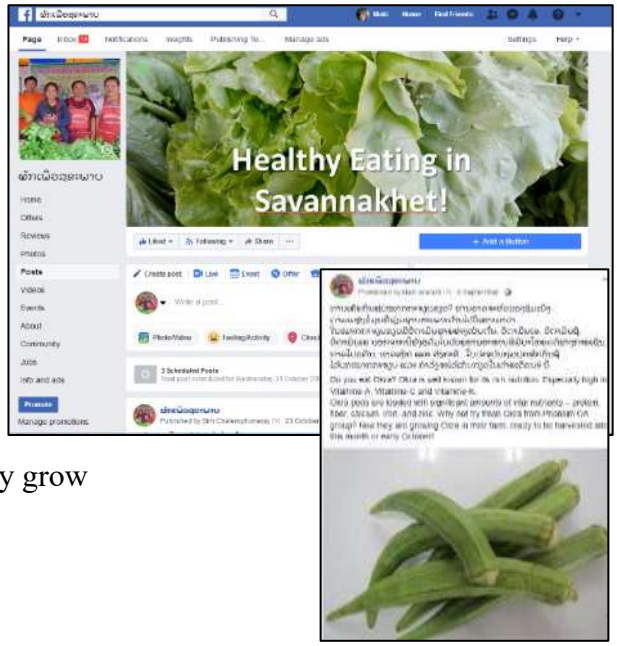
Facebook can be one of the most effective tools the project has tried. DOIC officer together with PAFO update the posts weekly.

When setting up a new Facebook page, discuss the objective of the page you are going to set up and decide the theme.

SavanPAD project Facebook page objective: To promote sales of farmers' safe vegetables. Facebook page theme: To promote healthy eating life from Savanakhet province.

Example of posts:

- Benefit of vegetable series
  - Okra
  - White radish
  - Zucchini
  - Carrot
  - Bokchoy
  - Celery
- What pregnant women should eat
- How our farmers cultivate vegetables in safe manner
- Opening organic market information
- Introducing farmers' farm and what they grow
- Introduce new types of crops for sales



TV commercial is another option, however, it highly depends on which TV channel to be broadcasted. The project tried, however, it could not show any substantial effect.

Case Study

Creating more demands for fresh vegetables

Introducing healthy eating by demonstrating how to eat more vegetables

In order to create an environment where people to buy more vegetables, it is a marketing role to create more demands. The project tried introducing green smoothie to get more people's attentions to buy vegetables. We made a short clip of how to make and uploaded them to Facebook page.

Marketing is to create demands and encourage purchasing actions.

d. Open farmers' market

Upon request of the farmers, opening farmers' market is another sales promotional tool. **Key is to start small**. No need to build a shop to start.

Here's the procedure.

1. Meeting with farmers to set the rule of the group. Registration of the members to sell SAFE vegetables according to the rules. *attachment#2-d-1

2. Group leader or assigned member visit each farm to check the cultivation methods and crop varieties. *attachment#2-d-2

3. Group member make cultivation plan and share within the group. Decide which date is the best to start the market. *attachment#2-d-3

4. DOIC and DAFO together with farmers to consult the local authority where to open the market.

5. Set the price and bundle size among the members

6. DOIC and DAFO together with farmers set up tables and tents to rehearse the market opening.

*Equipment project provided

- folding tables, plastic chairs, banners, baskets, brochures

!Opening Market!

*attachment#2-d-1

Rule

1. Prohibit to use chemical, chemical pesticide, the member who use need to be stop for 1 year, we will take out from the group if any member breaks the rule.
2. Only member can sell in this farmer market (another needs to be register first)
3. Need to be record of produce, keep cleaning (place to sell)
4. Prohibit to contain the product into bucket which use for chemical.
5. Contribute of member within group(income) member need to contribute 20,000 kip per person per month.
6. The money of contribute will use for administration in a group:
    1. Garbage fee
    2. Petrol to go to check member's farm 1 time for 3 month (3 people) and also refill card for mobile phone for leader group 10,000 kip per person per month (3 people).
    3. Maintenance for table, tent.

*attachment#2-d-2

Application check for vegetable Group

Name (Full Name) :

Land area : Contact Tel:

1	Have you ever used chemical pesticide on your land? If yes, when?	Yes		No
2	Are you using chemical pesticide when growing vegetables?	Yes		No
3	Are there anyone using chemical pesticide within 50m of your farms?	Yes		No
4	Are you using chemical fertilizer? If yes, identify the type of fertiliser	Yes		No
5	Have you learned the methods of how to use composts for vegetable growth?	Yes		No
6	Have you started making compost by following the methods learned? (Check the compost)	Yes		No
7	Have you learned how to make and use bio extracts and bio pesticide in safe manner?	Yes		No
8	Have you starteed making bio extracts and bio pesticides according to the methods learned? (C	Yes		No
9	Can you present your recording book for cultivation ans sales? (Check the record book)	Yes		No
10	Do you promise NOT to use chemical inputs for vegetable cultivation and agree to follow the rules set by the Phonsim OA group?	Yes		No

Result of Application + Comments

Applied by Checked by

Farmer's Signature Leader's Signature

Date applied: Date checked:

*attachment#2-d-3

ປະຕິທິນການຂະຊື່: ລາຍຈ່າຍ

ຊື່ພືດ	ເດືອນ10	ເດືອນ11	ເດືອນ12	ເດືອນ1	ເດືອນ2	ເດືອນ3	ເດືອນ4	ເດືອນ5	ເດືອນ6	ເດືອນ7	ເດືອນ8	ເດືອນ9

e. Building supply network

Once some vegetable groups became able to sell their produce and receive orders of more than their capacities, DOIC and PAFO officers should help them connect with other groups across the province in order to meet the quantity requested.

Example of Savanakhet province, DOIC and PAFO officers took farmers responsible of marketing from Phonsim Organic Agriculture group to other districts to meet vegetable farmers to build network between them. Phonsim marketing farmers checked how farmers in other districts grow vegetables and their quality.


Phonsim OA group

Case Study

Zucchini production based on restaurant demands

Grow the crops which has less supply in Savanakhet province

DOIC officers visited restaurants to ask what kinds of vegetables they buy and where they buy from. Zucchini was one of these crops which restaurants procure from Thailand. It is difficult to find zucchini in Savanakhet, so customers have to go across the bridge to buy them. Under this circumstance, farmers tried zucchini cultivation and they managed to harvest and PAFO and DOIC officers helped them to deliver their produce first. Zucchini was sold at 25,000kips/kg and customers said they would buy if farmers could continuously supply.

Project farmers also tried small red radish. At the beginning, people did not know but customers liked the looks and tastes. After that, customers started ordering.

Try something new to test the market!

Case Study

Straw mushroom Trial

No need for sales promotion, crops which can sell by itself

Based on periodical market survey, PAFO officer suggested straw mushroom cultivation trial. PAFO officers first conducted trial cultivation and introduced farmers to try. Once harvester, farmers were selling without any assistance from the project. Straw mushroom had high demand and less supply in the villages, which made farmers very easy to sell the produce. It can be the best to find crops like this.

Farmers once found out that straw mushroom can be sold easily at good price, they started buying the spawns by themselves to continue mushroom cultivation.
While straw mushroom has high demand and good markets for farmers, production cost remains still high and in fact did not bring high profit to farmers. Issue is to increase yield or reduce the production cost.

V Improve farm management

1 Building capacity to make continuous profit

(1) Bookkeeping

1) Conduct training on recording sales income and expenditure
2) Follow up on recording
3) Summarize the record and share information for review

(Implementer: PAFO, DOIC)

(Explanation)

1) Conduct training on recording sales income and expenditure

When farmers start selling their products, provide one notebook to farmers for bookkeeping purpose. Make sure to use the same book all the time. It takes time and patience to see farmers start recording. If difficult for them to record income and expenditure together, let them start with recording sales only first.

Sample 1: Farming activities only

Date	Description / Items	IN	OUT

Sample 2: When the source of virtually all the income comes from vegetable cultivation (i.e. some of Phonsim OA farmers), you can write all the expenditures to show the balance.

Date	Description / Items	In	Out	Balance

Review with farmers to get monthly total and compare among the farmers as well as month and season.

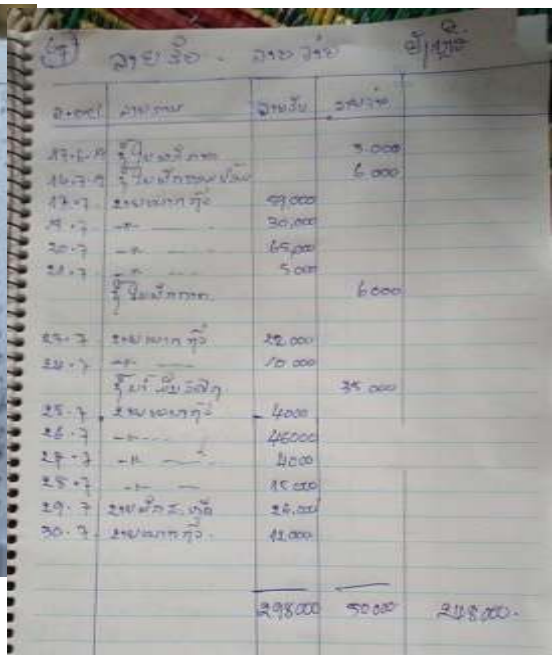
2) Follow up on recording

DOIC, PAFO and DAFO are expected to check their sales records when they visit farmers. Check their notebook to see if the calculation is correct as well as sales progress.
Compare their sales with their production cost for farmers to realize if they are making profit or not.

Thing NOT TO DO

1: Do NOT do all the calculation and writing for farmers. Let farmers do. If they cannot do, teach them how to do step by step.

2: Do NOT give notebook to the farmers each time conducting training. Tell them to bring their notebook once after you provided them. Otherwise, information is not accumulated.



3) Summarize the record and share information for review

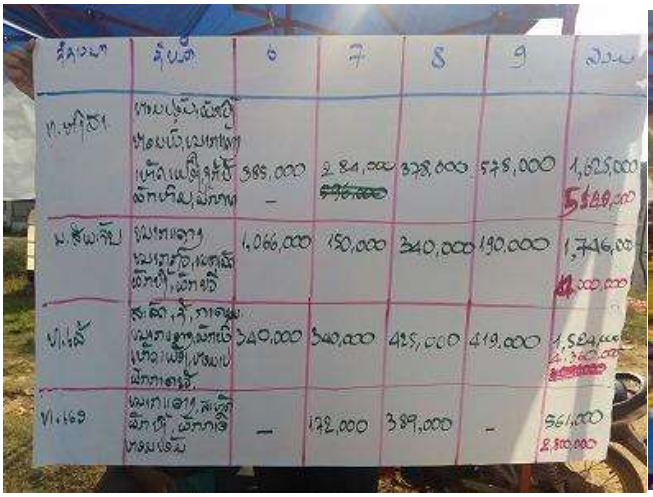
Collect information and make summary of monthly income to compare with the plan they made.(i.e. Four months: fromJune to September).

- PAFO and DAFO organize a meeting to review the sales experience at the end of dry or rainy season. Ask farmers about the experience of rainy season vegetable cultivation and sales. What they succeeded and what kinds of issues they faced.:

DO NOT ASK WHY they could not achieve their target. This will discourage farmers. It is not important to achieve the target at this point. Learning from the experience and small improvement is good enough to encourage farmers to move forward to the next steps.

- Review the figures together and facilitate farmers to discuss about the followings;
    - Who has higher income and what s/he is growing?
    - Which month has higher income and what could be the reasons for that?
    - What are the differences between the higher income earning farmers and the lower ones?
    - Where did they sell vegetables?
    - Are there anything farmers did in order to make more sales? Anything succeeded?
    - Are there any vegetables which was difficult to sell?

- Based on their experience and the review, ask farmers what they can improve in order to increase income more. Try to put their ideas into the plan and follow up on practice.



Case Study

During the review session, farmers pointed out the following factors contributing to their sales results.

- Particular crops got damaed by the insects and diseases more than others. The ones damaeged are zucchini and melon.
- By comparing the total sales among the members, farmers who started rainy season cultivation from April made better sales than the ones started late.
- Price was not set and agreed at the beginning, which made some farmers making less profit compared to others.
- Farmers were not sure if they could really sell their vegetables until they literally did.
- Farmers received calles from the vendors for orders, however could not supply continuously.
- Farmers started thinking to make a plan for continuous supply.

Without the Project told farmers the above points, farmers themselves started bringing the issues to be improved in order to make more money.

Important thing is to have them compare the results and what they did to bring that results whether it is good or bad

(2) Cultivation plan for continuous supply

1) Decide crops required for continuous supply 2) Make cultivation plan as a group

(Implementer: PAFO, DOIC)

(Explanation)

1) Decide crops required for continuous supply

- Assist farmers to discuss which crops are currently in high demands and let them select. It is important to consider their production capacity in terms of quantity and varieties.
  i.e. Phonsim group selected 5 varieties,: Morning glory, amaranth, Chinese cabbage, salad and Vietnamese mustard
  Phalanxai group selected 3 varieties: Spring onion, Corriander, Mint

Divide farmers into groups:

- Make a group of cultivation to grow the same variety at the same schedule, same day of same time to get enough quantity to supply the market requirement.

2) Make a group cultivation plan.

Set the date of planting:

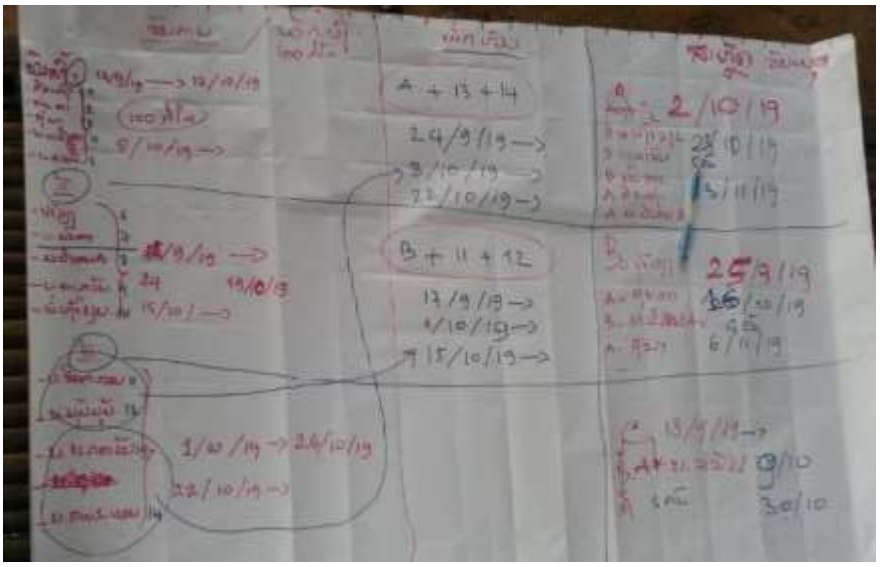
- Need to set the date, and amount for each group

- Write a plan for each group: It is important to know the date of harvests so that marketing officers can respond to the orders easily and check for each members' progress..

Case Study

Case study of making plan for continuous supply by cultivation calendar.

Phonsim has almost 20 members in a group. This time, they divided themselves into 3 groups and each group contains about 5 farmers.
The group selected 5 varieties including Morning glory, amaranth, Chinese cabbage, salad and Vietnamese mustard.
The photo below is an example of making cultivation plan in Phonism OA group.



Phalanxai group made very simple plan since the members are only 6 households and selected 3 varieties which has similar cultivation period.
They selected spring onion, coriander and mint.

Farmers divided themselves into three groups with 2 households each. Every month, group 1 plants on the day of 6th, and the group 2 on the16th and the group 3 on the 26th.

Group1:Keng&Noun

SUN	MON	TUE	WED	THU	FRI	SAT
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28			

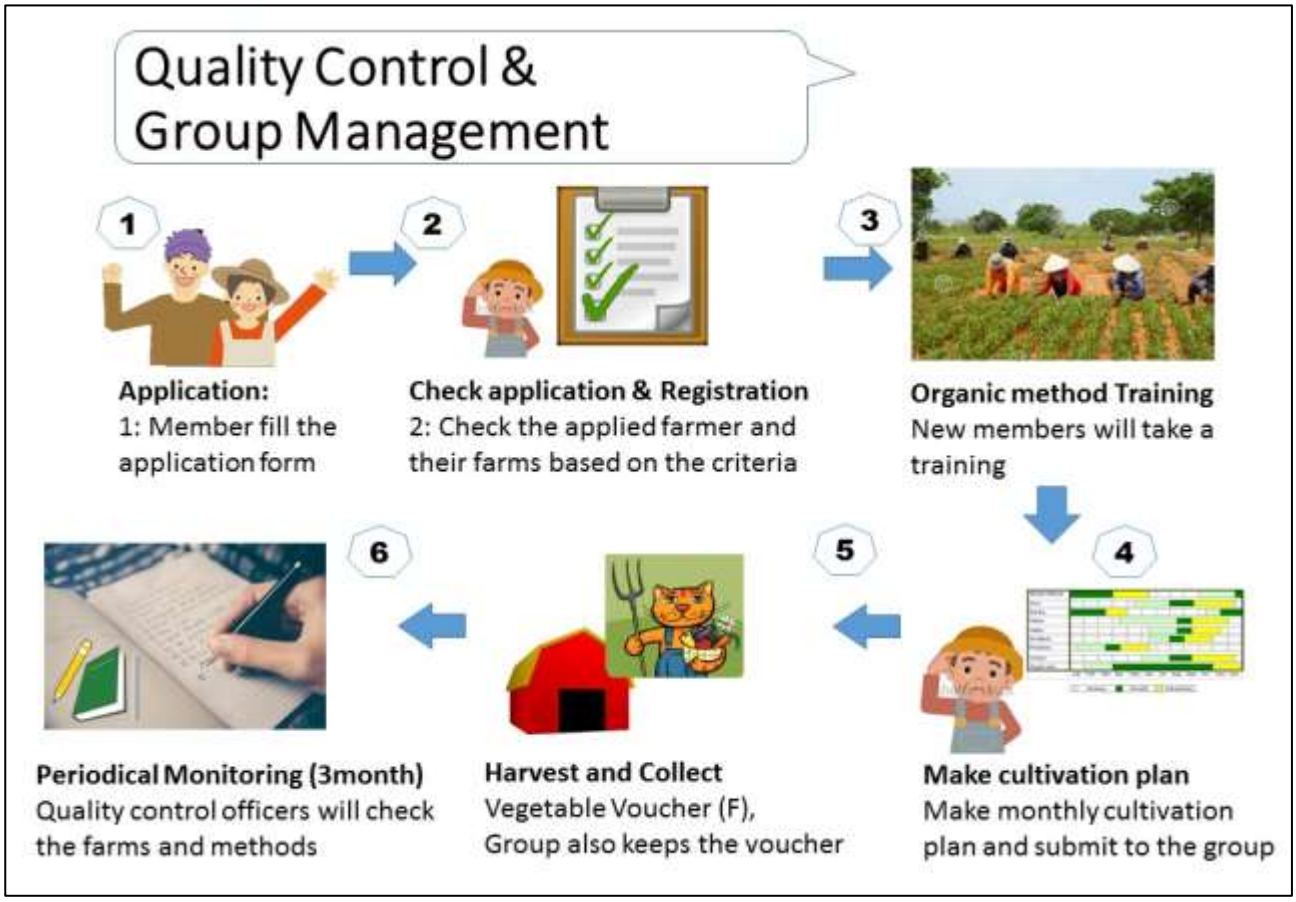
Group2:Khoun&Noy

Group3:Kinoy&Kampuan

(3) Group management for Quality control

1) Decide rules and regulations
2) Member registration and farm check
3) Share cultivation plan
4) Check the vouchers

(Implementer: PAFO, DOIC)



(Explanation)

1) Make the rule and regulation of the group:
   - Facilitate farmers to discuss the rules and regulations of their groups. Ministry of agriculture has determined for type of crop cultivation as below:
     1. Organic
     2. Safe and clean agriculture.
     3. Growth by using chemical

     Farmers can decide what kinds of farming methods they want to apply to their group and make rules accordingly.

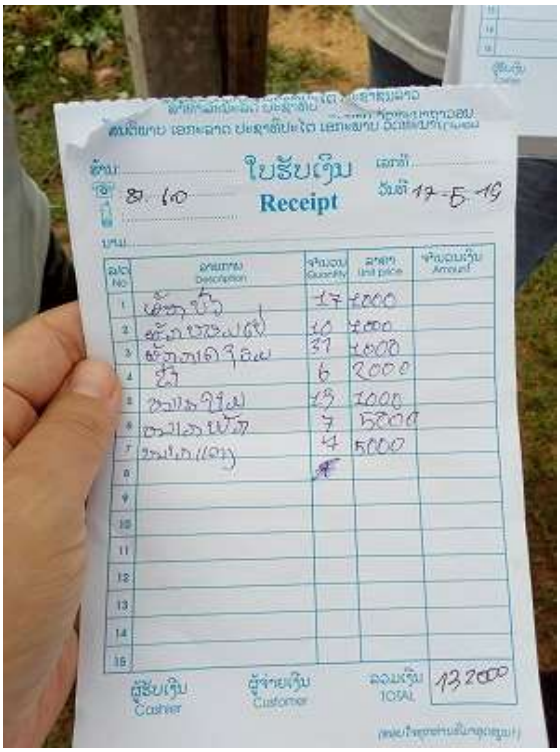
Here's an example of Thapangthong vegetable farmers group rule. First, farmers decided that they want to apply safe method which they defined as **chemical pesticide free. Then,** they made their rules accordingly.

Rule

1. Prohibit to use chemical, chemical pesticide, the member who use need to be stop for 1 year, we will take out from the group if any member breaks the rule.
2. Only member can sell in this farmer market (another needs to be register first)
3. Need to be record of produce, keep cleaning (place to sell)
4. Prohibit to contain the product into bucket which use for chemical.
5. Contribute of member within group(income) member need to contribute 20,000 kip per person per month.
6. The money of contribute will use for administration in a group:
    1. Garbage fee
    2. Petrol to go to check member's farm 1 time for 3 month (3 people) and also refill card for mobile phone for leader group 10,000 kip per person per month (3 people).
    3. Maintenance for table, tent.

2) Registration and farm monitoring member.
- Registration for the member.
- All member needs to be informed the size of the cultivation area.
- All member needs to be agreed to each other to make a rule of the group and all member have to fill the form and get certify by village authority.
- All member needs to have training such as: how to make compost and how-to taking care the crop.
- Assign the committee to check for the producing standard base on the plan every 3-6 month by quality control officers.

3) Quality control officers should check these vouchers periodically together with the farmers' cultivation plan and actual cultivation on site. let each farmer write down into voucher which crop they harvested and take the voucher to leader of quality control within group to check and sign when selling at the market as a group. Marketing officers should check the voucher and actual products and also need to check for signature of group



This voucher helps:
- To control for quality of product in the farm.
- To avoid taking the product from another place.
- To follow the plan in the group.
- To summarise monthly income

Here is a sample of application/registration form.

Application check for Phonsim Organic Agriculture Group

Name (Full Name):				
Land area:		Contact Tel:		

1	Have you ever used chemical pesticide on your land? If yes, when?	Yes	No
2	Are you using chemical pesticide when grow ing vegetables?	Yes	No
3	Are there anyone using chemical pesticide within 50m of your farms?	Yes	No
4	Are you using chemical fertilizer? If yes, identify the type of fertiliser	Yes	No
5	Have you learned the methods of how to use com posts for vegetable growth?	Yes	No
6	Have you started making com post by following the methods learned? (Check the com post)	Yes	No
7	Have you learned how to make and use bio extracts and bio pesticide in safe manner?	Yes	No
8	Have you started making bio extracts and bio pesticides according to the methods learned? (Check the inputs)	Yes	No
9	Can you present your recording book for cultivation ans sales? (Check the record book)	Yes	No
10	Do you promise NOT to use chemical inputs for vegetable cultivation and agree to follow the rules set by the Phonsim OA group?	Yes	No

Result of Application + Comments

Applied by		Checked by	
Farmer's Signature		Leader's Signature	
Date applied:		Date checked:	

Here is a sample of vegetable inspection form

Inspection form

Name and surname: .....

Village: .....District: .....Province: .....

Contact no.:.....

Inspection on D/M/Y: .....

Name and surname of inspector: .....

Checking item	Details
Which crop you use chemical fertilizer	
Which crop you didn't use chemical fertilizer	
Which crop you use bio pesticide and herbicide	
Production factors	☐ Compost ☐ Bio extract ☐ Fertilizer ☐ Chemical pesticide
Seed from where	☐ Project ☐ Market ☐ Own seed
What kind of compost you use	☐ Cow dung ☐ Compost ☐ Green manual ☐ Bio extract
Do you use chemical	☐ Use ☐ Not use
What kind of chemical you use	Type.....
When do you use	D/M/Y ..... How long: .....
What do you use to kill the insect	
What kind of insect	

Inspector:

Here is a sample of cultivation plan.

Table of cultivation plan of member in group period: 7-8-9/2016 (cultivation plan of each crops)

Group name: Phonsim organic vegetable District: Kaisornphomvihan Province: Savannakhet

Name of farmer: Mrs. SisaNga Keovongkot Member code: PS001

No.	Crop variety	Area m2/plot	Date of soil preparation	Date of nursery making	Date of planting	Date of first harvest	Date of last harvest	Expect yeild for planting area														Remarks
								July				Aug				Sept						
								1	2	3	4	1	2	3	4	1	2	3	4			
			2016	2016	2016	2016	2016															
1	Salad	60	2016	24-Jun	9-Jul	8-Aug	23-Aug				60			60								12
2	Shallot	40	2016		24-Jun	22-Jul	6-Aug			40		40										12
3	Cucumber	20	6-Jul		8-Jul	21-Sep	10-Sep							25			25					8
4	Salad	80	6-Jul		8-Jul	6-Aug	20-Sep						80					80				12
5	Shallot	40	18-Jul		20-Jul	20-Aug	25-Sep						40					40				12
6	Celery	20	20-Jul	22-Jul	22-Aug	25-Sep	25-Oct												30			5
7	Tomato	20	4-Jun	11-Jun	16-Jul	25-Aug	25-Sep								30				30			12
8																						
9																						
10																						
11																						
12																						
13																						
14																						
15																						

VI Improve water use efficiency

1 Maintain of irrigation facilities

(1) The way to repair canal with limited cost

1) Repairing canal with limited budget is using group fund to buy necessary materials and contributing labor from WUO, all member and DAFO staffs give suggestion and provide techniques.

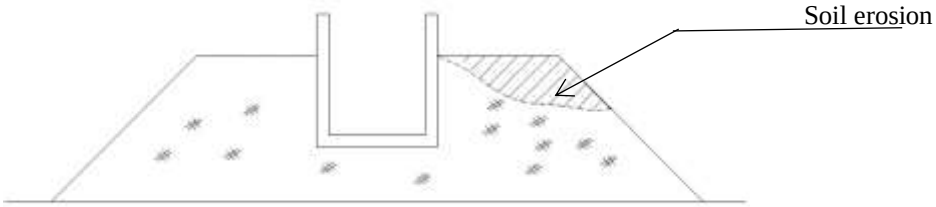
(Implementer: WUO)

(Explanation)

(Phanomxay village, Phalanxay district, Savannakhet province)

Case study 01: Water flood out of the canal and make the soil erosion

- Hold the meeting with Water User Organization include village authority to make an appointment for repairing day, make a plan for use and nominate person to be responsible for each work.
- Find the soil to cover the erosion part. Asking the land owner for agreement.
- Clean the repaired area (cutting grass and tree)
- Cover the soil and step on tightly by using compact machine
- Put the sandbags around the ridge of the leaching canal.



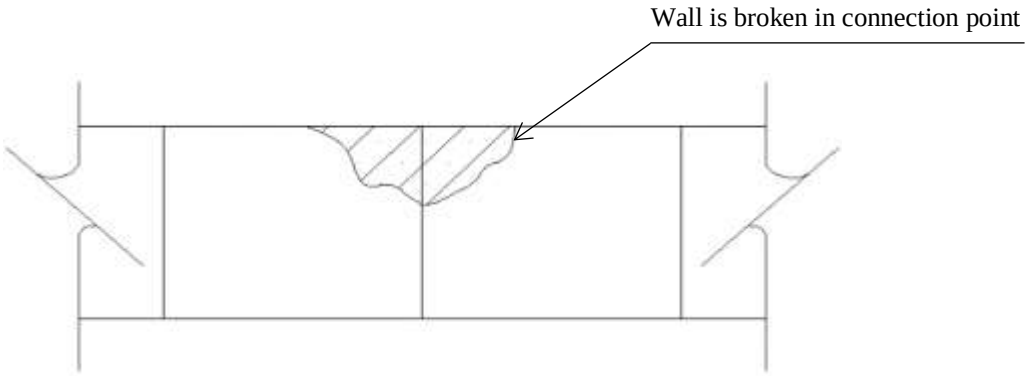
Case study 02: The soil erosion beside the main canal

Clean the repaired area

Put the sandbags in erosion part

Case study 02: Wall's canal broke in the connect point

- Hold the meeting with WUO include village authority to make an appointment for repairing day, make a plan for use and nominate person to be responsible for each work
- Clean repaired area (break the wall until the steel part)
- Design and match the wall level
- Watering before cover the cement
- Mixed cement with amount 1:2:3
- Leave it for 05-07 days, and pour water at lease 1 time per day
- Clean repaired area



Canal broken point (Side view design)

Broken situation

Broken situation

Repair by WUO

Case study 03: Digging main canal by WUO (Kengkok Neua)

(Back ground)

- Kengkok Neua has 2 main canals. Concrete section is only 100m, and remain section is earth canal.
- WUO has cleaned and dug canal by human powered in previously, therefore, canal cleaning wasn't sufficient. During irrigation, downstream farmers didn't only receive sufficient water but also stopped irrigation.
- Downstream farmers complained to WUO the situation.
- Under this situation, WUO board member visited to Tonhen WUO to learn water management work, and participated some training implemented by project.
- After that, WUO has confidence to improve their irrigation facility condition by themselves. They tried to extend irrigation area with digging canal.

(How to dig canal by themselves)

- WUO board member discussed the canal condition and how to solve this problem.
- Agriculture development bank came to village to suggest a loan plan for WUO.
- WUO considered the suggestion for irrigation area extension. and they decided borrowing money from bank and digging main canal.
- When they have meeting, board member informed it member farmers.
- They borrowed and dug canal.

(Achievements)

- Kengkok Neua increased irrigation area ***ha compared to last dry season.

<Loan condition>
(1) Borrower : Water User Organization
(2) Lender: Agriculture development bank
(3) Borrowing amount: 42,000,000kip
(4) Interest: 0.88%/year
(5) Repayment term: 2years
(6) Total repayment amount: 43,000,000kip
<Use way of money>
(1) Digging canal by excavator of private company

Before (Cleaning by manpower)

Before (Canal condition)

After (Dug canal)

After (Water flow condition)

(2) Overhauling procedure and cost of pump motor

1) Pump motor needs to overhaul every 5-6 years for life cycle extension.
2) WUO needs to save money for it.

(Implementer: DAFO, WUO, Technician)

(Explanation)

When motor pump is broken it should be overhauled for repairing and moving, the pump operator must follow below:

1) Separating each motor part (removing)
   1-1) Find the crane truck for holding the heavy motor
   1-2) Prepare materials and tools
   1-3) Cut off power supply
   1-4) Clean obstacle around pump station for convenience while repairing
   1-5) Use string to tie lifter truck and motor tightly
   1-6) Take all cable out and keep it
   1-7) Take all screws out
   1-8) Use lifter truck to remove motor out and control direction by people
2) Assembling motor
   2-1) Check size of screw holes and location
   2-2) Use string to tie motor and lifter truck for security
   2-3) Set nut tightly
   2-4) Connect cable with motor
   2-5) Check the accuracy of motor
   2-6) Test spinning direction of motor pump by turning on the motor
   2-7) If is correct, then put each part together
   2-8) Test by turning on motor around 02 hours to observe motor working

Installing motor after overhauling

Case study 1: Pump motor overhauling cost (Tonhen site)

The project support brought Tonhen's motor size 150 kw to overhaul in CS motor service in Thailand for 1 week. The overhauling price around 50,000,000 kip including transportation fee.

Overhaul cost

Item		Quantity	Unit price (kip)	Price (kip)
Overhaul	(Repair motor TECO 150kwh 380V 985RPM)			
	Rewinding stator	1	18,000,000	18,000,000
	Replace bearing DE6220 SKF	1	2,000,000	2,000,000
	Replace bearing NDE NU220 SKF	1	4,500,000	4,500,000
	Repair rebush housing DE	1	1,500,000	1,500,000
	Repair rebush housing NDE	1	1,500,000	1,500,000
	Repair shaft metalization DE	1	1,500,000	1,500,000
	Repair shaft metalization NDE	1	1,500,000	1,500,000
	Balance rotor	1	1,500,000	1,500,000
	Subtotal			32,000,000
Install		1	2,000,000	2,000,000
Transportation	Tonhen - Mukdahan	1	5,000,000	5,000,000
	Mukdahan - Bangkok	1	6,000,000	6,000,000
	Subtotal			11,000,000
Total				45,000,000

(3) Daily inspection and maintenance of pump motor

1) The motor is the main thing for irrigation to support cultivation. So, we have to take care and check for using a long time.

(Implementer: PAFO, DAFO, WUO)

(Explanation)

WUO executes daily inspection as bellow table during pump working. When pump working hours pass 2000h or 3 months, pump operator needs to add grease. When 4000h or 6 months pass, operator and WUO need procession of every switch and light check. When 8000h or 12 months pass, they need to take out cover and check fan. PAFO (OM unit), DAFO need to give advice daily inspection and support adding grease, procession and check fan on field.

Table of daily inspection and maintenance

Check (□ ✔) Repair (□ ▸) (while pump is working)	Normal	2000 hours or 3 months	4000 hours or 6 months	8000 hours or 12 months
Adding grease		▸		
Wrong sound	✔			
Pressure V	✔			
Electricity currency I	✔			
Wrong reverberation	✔			
Check wire in electric board and motor	✔			
Wrong temperature	✔			
Leaching crack on pump or pipe	✔			
Visual inspection of general condition of pump	✔			
Perfection of axis	✔			
Procession of every switch in the system			✔	
Light (external, internal, emergency) – check for standi			✔	
Take out coverer and then check fan it's ready for use or not				▸

1) Practical techniques for WUO and DAFO staffs

a. The main things to make motor broken easily

(Implementer: WUO, DAFO)

(Explanation)

There are many points to make motor broken very easily such as installing level didn't match with the shaft, the shaft was not straight, not enough grease inside the bearing, the grease was low quality etc…

Installing

Not enough grease

Low quality grease

Suggestion

Before installing the pump, the technician, PAFO, and DAFO should check the level of the shaft by using the Laser Alignment.

Example: Laser Alignment

Price 300,000 bath (Thai)

- WUO and DAFO staffs should check the bearing to see the grease amount
- WUO and DAFO staffs, should check the grease quality, buy the grease that can heat resistant and has a certificate

If any question, please contact following person
- Mr. Sanh Phimthongsing 041216009 (TPT DAFO)

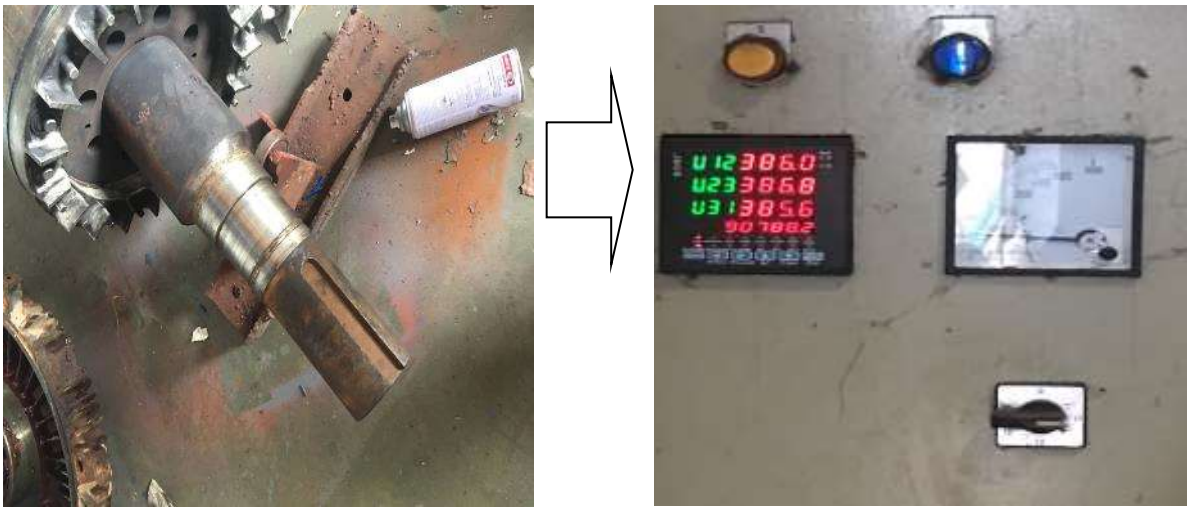
b. The right way to use motor

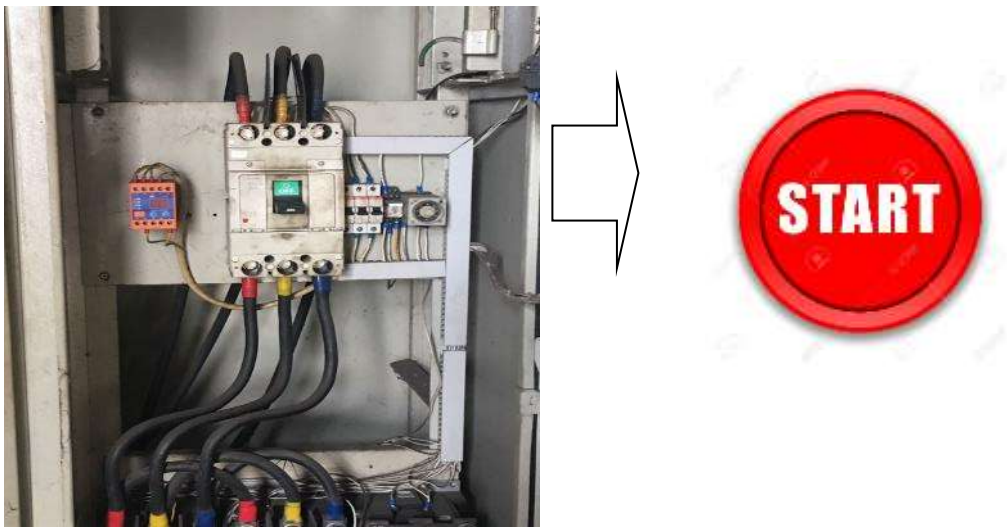
(Implementer: WUO)

(Explanation)

WUO should follow the guidebook or expert suggestion. These techniques are to prevent the risk to make motor have a problem.

1 The wiring should in the good condition
2 Moving the shaft to check how it's work
3 Check V and A of electric
4 Open big breaker
5 Open fuse breaker
6 Start





If any question, please contact following person
- Mr. Vanlakone 041212152 (PAFO)

c. The way to save electric use amount

(Implementer: WUO)

(Explanation)

- Many projects site, the electric fee increase too much if compare with the neighbor site
- The main thing to make an electric fee increase are: the pump was old, the decrease of magnetic, working performance is not good.
- Each time to turn on the pump will pull on a high electric
- Each time to turn on the pump will charge 30,000 kip

Suggestion

WUO should use the pump for 24 hours, or until get enough water, then pump up water again 3-4 days later.

If any question, please contact following person
- Mr. Vanlakone 041212152 (PAFO)

d. The grease type that we should use

(Implementer: WUO)

(Explanation)

- The grease is very important to make motor and bearing working smoothly.
- WUO should add a lot of grease inside the new bearing (figure 1)

Figure 1: Put much grease in the bearing is good

- The grease that uses, should select the high quality and heat resistant
- The grease should heat resistant between 80 ◦c - 120 ◦c (figure 2)

figure 2: The grease that use in the bearing

- The grease life is 10,000 hours
    a. If WUO use a pump 10 hours/day; 30 days = 300 hours
    b. If WUO use a pump 24 hours/day; 30 days = 720 hours
- If WUO use until enough 10,000 hours, WUO should take out the bearing to wash and put the new grease again.
- When WUO use the pump for a while, WUO should check and add more grease until appropriately amount
    a. If WUO use a pump 10 hours/day; *3 months later add more* 60-100mg
    b. If WUO use a pump 24 hours/day; *3 months later add more* 200-300mg

- If WUO use the grease inappropriately amount, too much or too small it will be a problem of the motor. (get burn and high humidity)

If any question, please contact following person
- Mr. Vanlakone 041212152 (PAFO)

e. The pros and cons of cutting and connecting the electrical system

(Implementer: PAFO, DAFO)

(Explanation)
PAFO and DAFO need to consider improvement of electrical system.

Connecting the electrical system

- **Good point**
  - Can prevent the lobber from stealing the electric wire
  - Can prevent the animal comes inside the motor
  - Keep appropriately warm of copper
- **Bad point**
  - It can make an electric shock in the rainy season and flooding time.

Cutting the electrical system

- **Good point**
  - Not afraid of electric leakage
- **Bad point**
  - The humidity can appear inside the motor.
  - Some animals will bring slivers or make a nest inside the motor.
  - If we install heat control wire, it will not work when we cut electric
  - Lose more money to the electric company for connecting

The front cover of motor full of leaves and sliver

If any question, please contact following person
- Mr. Soutsavanh 041212152 (PAFO)

f. The comparison between an Old motor and a New motor

(Implementer: PAFO)

(Explanation)

- Old motor and new motor have good point and bad point different by:

Item	Good point	Bad point
Old motor	Strong and thick	Heavy
	Can use for a long time	Use much electric amount
	Good heat dissipation	
New motor	Cheap	Easily broken
	Light	Thin
	Use small electric amount	Easy to get hot and easy to get cool
		If broken has to throw away

- PAFO (OM unit) needs to inform this to DAFO and WUO.

Old motor

New motor

If any question, please contact following person
- Mr. Vanlakone 041212152 (PAFO)

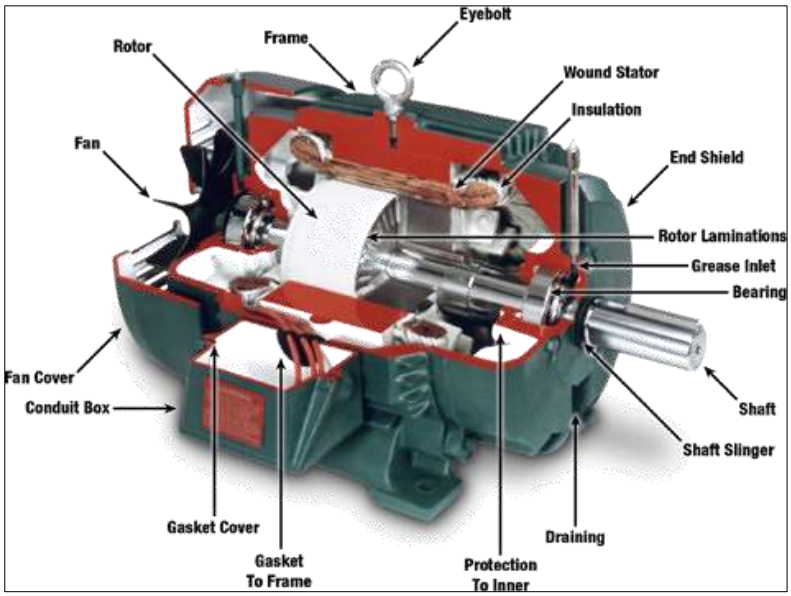
g. 70% of broken, we have to buy a new motor

(Implementer: WUO, DAFO)

(Explanation)

The Motor has 2 important parts:

1. Rotor: Shaft…
2. Housing: Copper, stator winding…



(Rotor)

(Housing)

➢ Case study: Tonhen Motor

- ❖ Repair item
  - Motor Cover
  - Rotor (shaft Metallization)
- ❖ Changing
  - heat control wire 2 sets
  - Motor terminals block 1 set
  - Terminal wires 3 sets
  - Bearing 2 sets
  - Copper

Base on repair cost, Tonhen motor was broken only 50%

Information

- o The rotor can repair but if the stator broken, WUO have to buy the new one because the technician cannot repair. So, WUO should pay attention on the stator.
- o When the motor broke more than 70% if WUO repair the cost it will be the same as buying a new motor, so It's better to buy a new one.
- o DAFO needs to support WUO consideration whether they repair or buy.

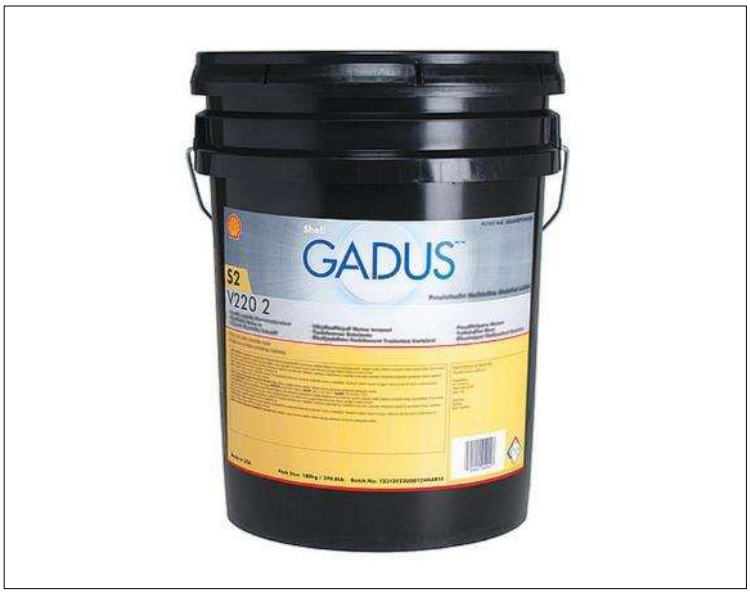
If any question, please contact following person
- Mr. Sanh Phimthongsing 041216009 (TPT DAFO)

h. The grease that Thai people mostly used

(Implementer: WUO)

(Explanation)

The grease is very important for the bearing, we should select the good brand, and can heat resistant more than 80 °C - 120 °C. In CS motor service company, used the Shell brand because good quality and suitable for overhaul motor.



Suggestion

- WUO check should check the heat bearing before buying the grease to put on. Should select a good brand of grease, and don't forget to check the heat resistant level in the box.
- DAFO staffs have to tell WUO to change and use Shell brand.

If any question, please contact following person
- Mr. Sanh Phimthongsing 041216009 (TPT DAFO)

i. The problem of using too much grease

(Implementer: WUO)

(Explanation)

If WUO use too much grease, it's will flow to the copper, and become much humidity. This is the main problem to make the motor burn.

Tips and tricks for prevention.

- WUO should not add the grease in every day if the pump working 10 – 12 hours/day. It's better every 3 months add more 60-100 mg.
- If motor working 24 hours/day. It's better every 3 months add more 200-300 mg.
- Every time adding the grease, should add until full of the tube.

If any question, please contact following person
- Mr. Vetsada Chanthavongsa 041211016 (XBL DAFO)

j. The importance of the rust-proof paint

(Implementer: WUO)

(Explanation)

Every steel part of the motor is very important, WUO has to check which part not yet have the rust-proof paint then WUO has to paint it.

Used the rust-proof paint

Not using the rust-proof paint (rust)

If any question, please contact following person
- Mr. Vetsada Chanthavongsa 041211016 (XBL DAFO)

k. Thermometer laser temperature gun

(Implementer: WUO, DAFO)

(Explanation)

- The thermometer laser temperature gun is the brand of DIGICON DP-88. WUO and DAFO can measure by pointing to everywhere of the part we need, then the temperature will show on the monitor screen.
- The price of thermometer laser temperature gun is 3,500-4,000 bath (Thai)
- D : S = 8 : 1
- Temperature : Lower than 60 degree Celsius -------Condition is O.K.
  Higher than 60 degree Celsius ------Stop and inspect

thermometer laser temperature gun

Point to the place you want to measure

The temperature results

If any question, please contact following person
- Mr. Soutsavanh 041212152 (PAFO)

l. The way to clean the valve and shaft before putting the bearing

(Implementer: DAFO, WUO)

(Explanation)

Before adding the new grease DAFO should advise WUO to clean the valve and the shaft clearly to prevent the old grease and the rush stocking by using gasoline. If WUO do not clean clearly it will become a big problem to the pump.

The valve

If any question, please contact following person
- Mr. Vetsada Chanthavongsa 041211016 (XBL DAFO)

2) Practical techniques for PAFO and DAFO staffs

Following page from “a” to “k” are basic knowledge to PAFO and DAFO staffs. When they observe overhauling of pump motor, they need pay attention these focal points.

a. The process of pressing copper into the magnet

(Explanation)

1. Cleaning the magnet hole
   - Step 1st take out the rotor, stator by the crane
   - Take out an old copper by burning gas and lacquer thinner
   - Take the Frame to clean by water and burn by gas fire to make it dry.
2. Putting the mylar papers
   - There are 72 magnet holes, before putting the mylar papers the technician should sharp the rasp to prevent mylar papers tear
   - Use the mylar paper (DMD) that can heat resistant between copper to copper.
3. Pressing copper into the magnet
   - There are 18 sets coppers in TH motor, the technician uses the copper number 17. 1 set including 10 copper strings, 6 times surrounding.
   - After preparing the copper set, the technician was carefully to press the copper inside the magnet hole.
4. Mylar paper (DMD)
   - Before cutting the mylar papers, the technician calculated the size of the magnet hole. If the paper is not in the same size, it will be a problem to make the motor burn when we use.
5. Mylar paper and fiberglass sleeving electrical.
   - Used mylar paper to prevent heat resistant between copper and copper
   - Tight the fiber white string to hold and prevent copper to move.
6. Drying the motor
   - This is the last step after pressing copper into the magnet. Have to dry the motor inside the heated oven for 2 days.

Cleaning

Mylar paper in the magnet hole

If any question, please contact following person
- Mr. Soutsavanh 041212152 (PAFO)



Pressing

copper


Mylar paper and tight fiber white string to prevent copper moved

Finished pressing the copper


completed

If any question, please contact following person
- Mr. Soutsavanh 041212152 (PAFO)

b. The easily way to take out and in of the propeller

(Explanation)

The hole of propeller and shaft is the same, so it quite difficult to put in each other. The easy way is we have to make to propeller hole become hot by burning the hole because heater can make the hole bigger and easily to put the propeller on the shaft.


Burning the propeller hole

Suggestion

- PAFO and DAFO should check with the technician and inform them do not knock the propeller by hammer but they should burn the hole in 80 – 100 °C. This way is very easy to take out and put the propeller on the shaft
- If the technician knocks the propeller by hammer it will make the hole distorted

If any question, please contact following person
- Mr. Soutsavanh 041212152 (PAFO)

c. Mylar papers and fiberglass sleeving electrical

(Explanation)

1. Mylar paper (DMD) is the paper made by fiberglass, which can be heat resistant and prevent the copper to get hot and burn. The price is 170,000 bath/roll and 560 bath/kg
2. There are many sizes of fiberglass sleeving electrical Ø 1,2,3,4,5,6,7,8,9,10,12,14,26,20,25,30 and 40 mm and heat resistant to $600^{\circ}c$. In TH overhaul motor used 3 sizes Ø 3,10,50 mm, the price is 30 bath and 60 bath. Can heat resistant $220^{\circ}c$

Mylar paper

Fiberglass sleeving electrical

Suggestion

- PAFO and DAFO staff should check the overhaul motor company in Laos or Savannakhet use the mylar paper and fiberglass sleeving electrical or not.

If any question, please contact following person
- Mr. Sanh Phimthongsing 041216009 (TPT DAFO)

d. The importance of heat control wire (Space heater)

(Explanation)

The heat control wire is very important for the copper inside the motor because it can keep warm and prevent the humidity inside the copper. If much humidity inside the motor it will make the motor get heat and burn immediately.

Space heater

Suggestion

- WUO should tell the electrician to connect electricity in none irrigation season because the heat control wire cannot work if electric cut.
- If cut electric will make the copper easily to get cool and has much humidity.
- The heat control wire price 2 – 2.5 million kips
- If necessary to cut the electric, WUO should connect the electric from a house for a heat control wire working.

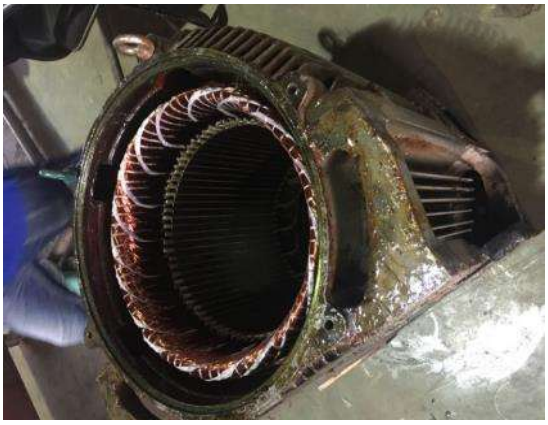
If any question, please contact following person
- Mr. Vetsada Chanthavongsa 041211016 (XBL DAFO)

e. Why Drying the motor in a heated oven?

(Explanation)

- If much humidity inside the motor, a big problem is the electricity will leak and cause shock. So, when the humidity increases or new overhaul motor, have to dry it in the heat oven to decrease the humidity (less than 50 MΩ)
- The duration of drying the motor depends on the case but usually will follow by

Item	Temperature	Duration
Urgent motor	200 °C	4 hours
Not urgent motor	100 °C	8 hours



Drying oven

Setting the temperature

If any question, please contact following person
- Mr. Vanlakone 041212152 (PAFO)

f. The pros and cons of using electric control board

(Explanation)

- **Good point**
  - Can control the motor to spin fast or slow
  - It can control the electric use amount when we start using a motor.
  - Can use for the motor in the different rotate
  - Can control the electric level when we use the motor.
- **Bad point**
  - Not suitable in the area that not enough electric
  - The board for the motor 132-150 KW the price 200,000 bath/set (very expensive)

Electric control board

g. The step of making motor balance

(Explanation)

PAFO and DAFO staff should follow the step when the technician balances the motor

- Before balance should clean by the gasoline to take out the old grease.
- Before balance motor should measure the length, the level and set in the control board before starting to balance.
- The sensor will count the spin time of motor
- The balance level should not more than gram

Balancing the motor

If any question, please contact following person
- Mr. Vetsada Chanthavongsa 041211016 (XBL DAFO)

h. The different between AC and DC motor

(Explanation)

- **AC motor (Alternating Current)**
  Is the motor that use for pumping water and furniture factory.
- Easily to repair and spare parts is not too much
- Cheap cost to repair
- Shortly repair
- **DC motor (Direct Current)**
- Usually they use for industry
- Use high electric level but can't use for normal electric
- When the motor broken, it takes time and difficult to repair, the technician should high technique and have to be expert
- expensive cost to repair

AC motor

DC motor

If any question, please contact following person
- Mr. Vetsada Chanthavongsa 041211016 (XBL DAFO)

i. The easily way to set bearing

(Explanation)

- Use the warming machine to make the bearing become hot around 70-80 °C before putting into the shaft.
- Do not use hammer to knock and burn by fire because it will make the bearing break and cannot use.

Warming machine

Put bearing into the shaft

If any question, please contact following person
- Mr. Vetsada Chanthavongsa 041211016 (XBL DAFO)

j. The way to clean each part of motor before rust-proof paint

(Explanation)

- Before rust-proof paint in motor cover DAFO and PAFO staff have to check with the technician and notice that they clean the grease and the rush yet? After cleaning they have to burn by fire to make the cover dry and use sandpaper number 600 to brush around before using rust-proof paint
- The rust-proof paint that CS company used is KOBE 909 brand, size 400CC from TOA company
- The price of the rust-proof paint is 45 baths

Clean each part

Drying by fire

Using the rust-proof paint

If any question, please contact following person
- Mr. Vetsada Chanthavongsa 041211016 (XBL DAFO)

k. The size and number of coppers that using in overhaul motor

(Explanation)

- The number of a copper will be different and depend on motor size.
  Ex: the motor 1 – 11 KW use the copper number 20 up and heat resistant more than 200 °C
- If the number of coppers did not match with the magnet hole, we cannot press the copper into the hole.
- The number of coppers that used for motor 37 KW – 150 KW are number 17 and heat resistant more than 180 – 200 C.
- CS motor company used the copper brand HITACHI from JAPAN, the price is 330 bath/kg, number 17 and 20 is 333 bath/kg

The copper rolls

Preparing the copper to overhaul

Pressed the coppers into the magnet

If any question, please contact following person
- Mr. Vetsada Chanthavongsa 041211016 (XBL DAFO)

2 Water management

(1) Water velocity measure

1) In order to give WUO appropriate advice regarding water management, PAFO and DAFO staffs need to measure water velocity.

(Implementer: PAFO, DAFO)

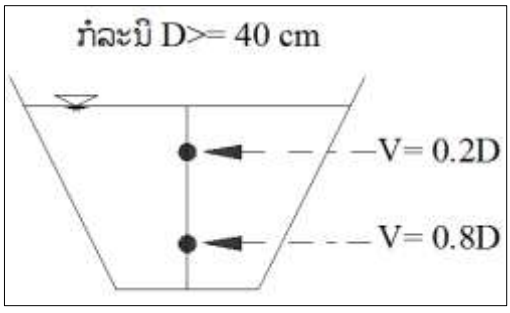
(Explanation)

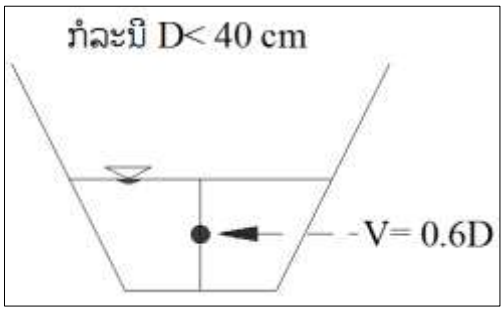
Water velocity is to calculate water qualitative(Q) that motor absorb or Intake from drainage, calculate all water volume used for dry season cultivation and bring the result to disseminate to improve water management for next coming year.

1. Duration: From November to April
2. Measure point: Main canal close to head work
3. Implementer: Irrigation staffs
4. Frequency of measuring: Every day
5. Measuring tool: Water flow meter (Irrigation section has tool for lend)

Case Study: water velocity in Sesalalong during dry season in 2018-2019, 04 months long, from December to March. Irrigation staffs take responsibility for collection information by using water flow meter, measure in main canal near head work, the level of measuring depends on the depth of water (D) in canal.

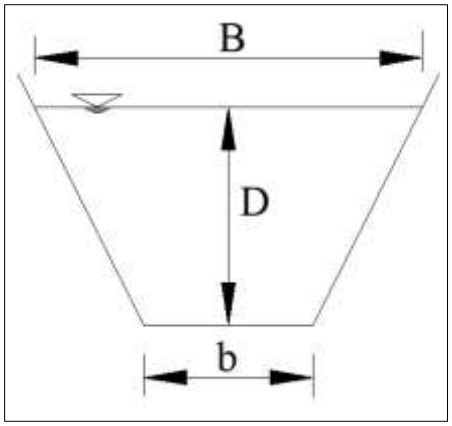
- The water depth(D),D ≥ 40cm Velocity(V)of water is on 02 points: the depth 0.2D and 0.8D
- The water depth (D), D < 40cm Velocity(V)of water is on 01 point at 0.6D





Formula of canal Area(A)

$$A=1/2(b+B)D$$



Formula of Qualitative water (Q)

$$Q=AV$$

Q is qualitative water (m^3/s)
A is Area canal (m^2)
V is velocity (m/s)

Qualification of water velocity

Screen of water flow meter

Measure Water velocity

ຟອມບັນທຶກການວັດແທກຄວາມໄວການໄຫຼຂອງນ້ຳໃນຄອງເໝືອງ

ບ້ານເປົ້າໝາຍ: ບ້ານ ຄົ້ງປາງ ໂຄງການ ຊົນລະປະທານ ເຊລາວວອງ

ລ/ດ	ວັນທີ,ເດືອນ,ປີ	ຊື່ພະນັກງານວັດແທກ	ປະຕູນ້ຳທີ່ເປີດໃຊ້	ຄວາມເລິກຂອງນ້ຳ	ຄວາມໄວຂອງກະແສນ້ຳໄຫຼໃນຄອງເໝືອງ					ຄວາມໄວ	ເນື້ອທີ່ໜ້າຕັດປຽກ	ປະລິມານນ້ຳ
			(ຊັງຕີແມັດ)	(ຊັງຕີແມັດ)	ລະດັບຄວາມເລິກD(cm)		ຄັ້ງທີ 1	ຄັ້ງທີ 2	ຄັ້ງທີ 3	m/s	m²	m3/s
1	3-Jan-19	ທ.ສີ້ນ ພົມທອງດີ	07	81	0.2*D	16	0.5	0.5	0.5	0.43	1.79	0.78
					0.8*D	65	0.3	0.4	0.4			
					0.6*D							
2	4-Jan-19	ທ.ສີ້ນ ພົມທອງດີ	07	65	0.2*D	13	0.3	0.4	0.4	0.30	1.25	0.38
					0.8*D	52	0.3	0.2	0.2			
					0.6*D							
3	5-Jan-19	ທ.ສີ້ນ ພົມທອງດີ	07	70	0.2*D	14	0.3	0.5	0.4	0.35	1.38	0.48
					0.8*D	56	0.3	0.3	0.3			
					0.6*D							
4	6-Jan-19	ທ.ສີ້ນ ພົມທອງດີ	10	58	0.2*D	12	0.5	0.5	0.5	0.45	1.08	0.49
					0.8*D	46	0.3	0.5	0.4			
					0.6*D							
5	7-Jan-19	ທ.ສີ້ນ ພົມທອງດີ	10	72	0.2*D	14	0.5	0.5	0.5	0.45	1.43	0.64
					0.8*D	58	0.4	0.4	0.4			
					0.6*D							
6	8-Jan-19	ທ.ສີ້ນ ພົມທອງດີ	10	72	0.2*D	14	0.6	0.5	0.5	0.47	1.43	0.67
					0.8*D	58	0.4	0.4	0.4			
					0.6*D							

The record example

(2) Recording working hour of pump motor

1)WUO needs to record of pump working hours and electric amount to analyze water use amount.

(Implementer: WUO)

(Explanation)

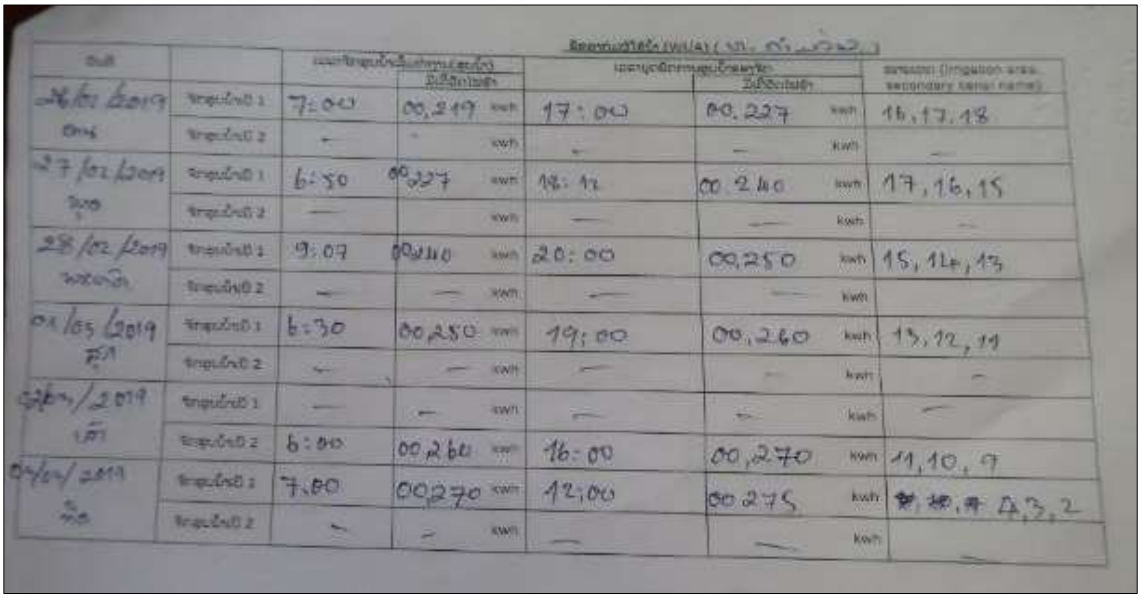
Recording the working hour of motor pump is one of the most important information for water management work because those information and amount of electricity used for each day will share to board group and member, how many hours for turning on motor pump a day,how much or less of electric used and how many cubic meters of water amount .

1. Duration: from November to April
2. Recording place: Electric meter
3. Implementer: Pump operator
4. Frequency of recording: Pre and post turning on motor pump
5. Recording form: working hour of motor pump

Case Study:

Recording the working hour of motor pump in Nongbualuang, Xonnabuly, Savannakhet.

- Turn on 12 hours/day, start turning on at 6 : 30 number of electricity mater is 00048, turn off at 18 : 50 number of electric mater is 00061
- Electric meter multiplier 40 base on size of electric boat
- Electric power used is equal 13x40 = 520 kwh



Recording Form the working hour of motor pump

(Attachment: Recording format of pump working)

WUG (WUA) name (　　)

Date		Start time		End time		Remarks(irrigation area, secondary canal name)
			(electric meter)		(electric meter)	
	Pump1		kwh		kwh	
	Pump2		kwh		kwh	
	Pump1		kwh		kwh	
	Pump2		kwh		kwh	
	Pump1		kwh		kwh	
	Pump2		kwh		kwh	
	Pump1		kwh		kwh	
	Pump2		kwh		kwh	
	Pump1		kwh		kwh	
	Pump2		kwh		kwh	
	Pump1		kwh		kwh	
	Pump2		kwh		kwh	

(3) Data analysis of water used volume and disseminate to WUO

1) Every irrigation project is necessary to know and to have information about water velocity to make a plan for water management thoroughly and effectively

(Implementer: PAFO, DAFO)

(Explanation)

After receiving inf about recording the working hour of motor pump and amount of electricity power from pump operator and inf about water velocity from DAFO, then take those inf to calculate water amount and analyze the difference on using amount of water and electricity of each canal. After that, bring analyzed result to disseminate to board group and all canal leaders to check and consult in order to improve the way how to work of canal leader, try to reduce working hour of motor pump, save water and reduce electric fee.

Canal name ชื่อคลองน้ำ	Length ความยาว			Irrigation ชั่วโมงทำงาน						
		(Concrete) คอนกรีตเสริมเหล็ก	(Earth) คอนกรีตเสริมดิน	Days จำนวนวัน	Area เนื้อที่		Electric Consumption ค่าบริโภคไฟฟ้า		Water consumption ค่าบริโภคน้ำ	
				(1)	(2)	(2)/(1)	(4)	(4)/(2)	(5)	(5)/(2)
Yousawa ยูสวา ใหม่	650m	400m	250m	6days	48.0ha	8.0ha/d	23.0kwh	0.5kwh/ha	139,249m3	2,901m3/ha
Khaophone ข่าวพอน	2,100m	400m	1,700m	5days	32.0ha	6.4ha/d	19.7kwh	0.6kwh/ha	125,514m3	3,922m3/ha
Khamheng ข่ามเฮ็ง	2,400m	400m	2,000m	15days	49.0ha	3.3ha/d	45.0kwh	0.9kwh/ha	351,929m3	7,182m3/ha
							△10%(4.5kwh)		△10%(35,200m3)	
Pen เป็ง	3,100m	400m	2,700m	10days	36.0ha	3.6ha/d	32.5kwh	0.9kwh/ha	230,599m3	6,406m3/ha
				36days	165.0ha	4.6ha/d	120.2kwh	0.7kwh/ha	847,291m3	5,135m3/ha

Table: Data analysis of water amount and electricity

Share the velocity result to WUO

3 Improve of WUO's finance

(1) Accounting record conduction and following

1) DAFO needs to conduct WUO the accounting record, and check the recording book in regularly.

(Implementer: DAFO, WUO)

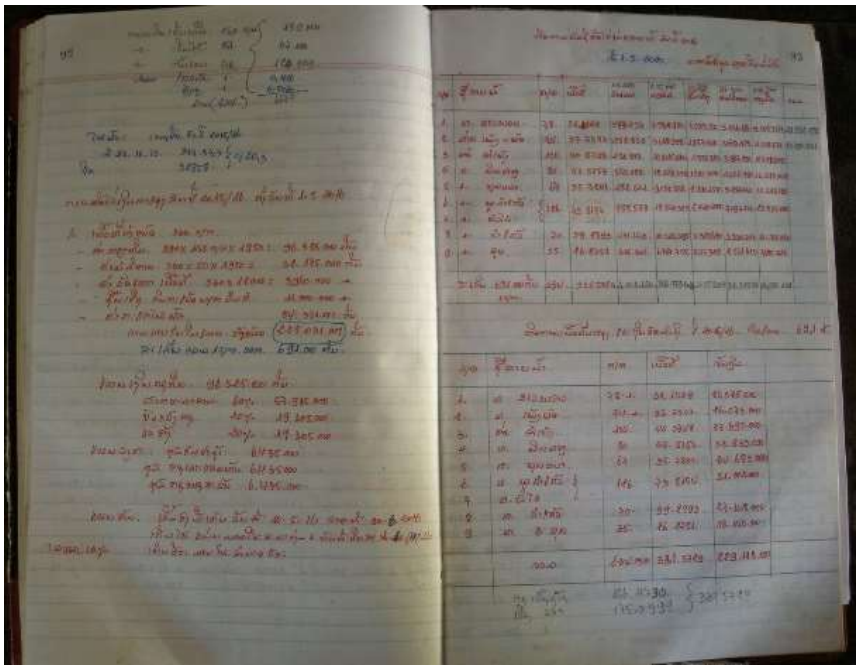
(Explanation)

Financing- accounting of group is so important for managing irrigation work for long-term. WUO must have clear accounting system and plan of budget using for maintenance clearly.

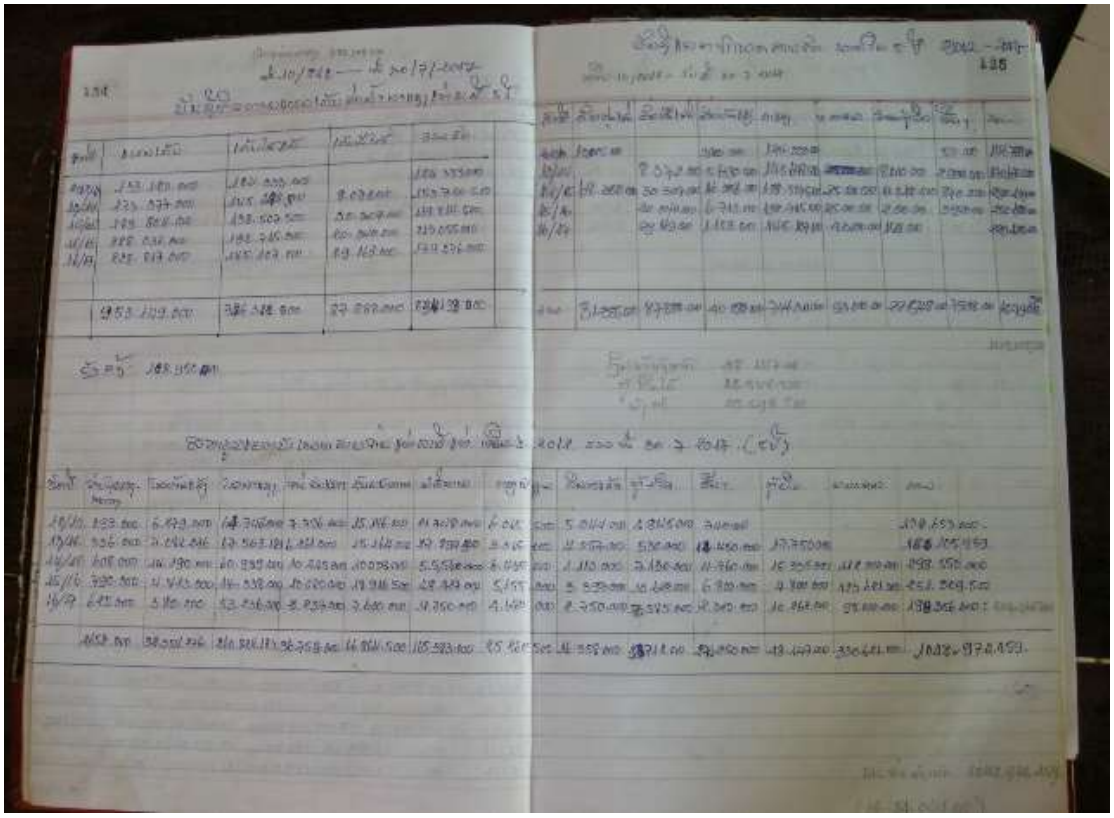
Case Study: Vern-Tonhen Project

WUO must check situation of head work system and current canal to plan for repairing in order to be ready for use. When we use canal, of course the damage will come later, so WUO must have sustainable fund, clear revenue-expenses accounts, have money in the bank for repairing in future. Also, WUO must make a plan for maintenance, long-term plan for irrigation repairing and plan for using budget on repairing clearly and WUG must have finance- accounting book such as:

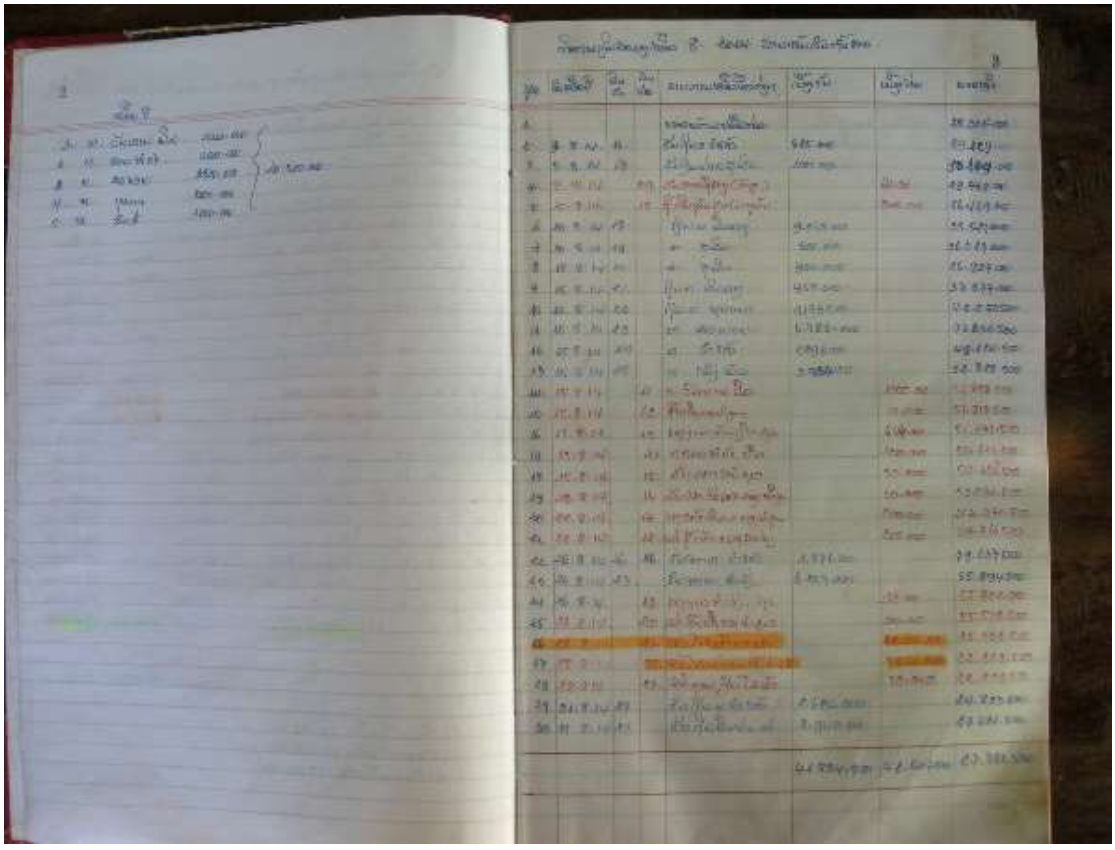
1. Create a book for water fee collection of each canal.
2. Create a book for following up provided treasury
3. Create a book to record revenue-expense of group
4. Create a book to record received debt- debt group need to pay
5. Create a book to follow deposit account of group
6. Create schedule for long-term repairing.



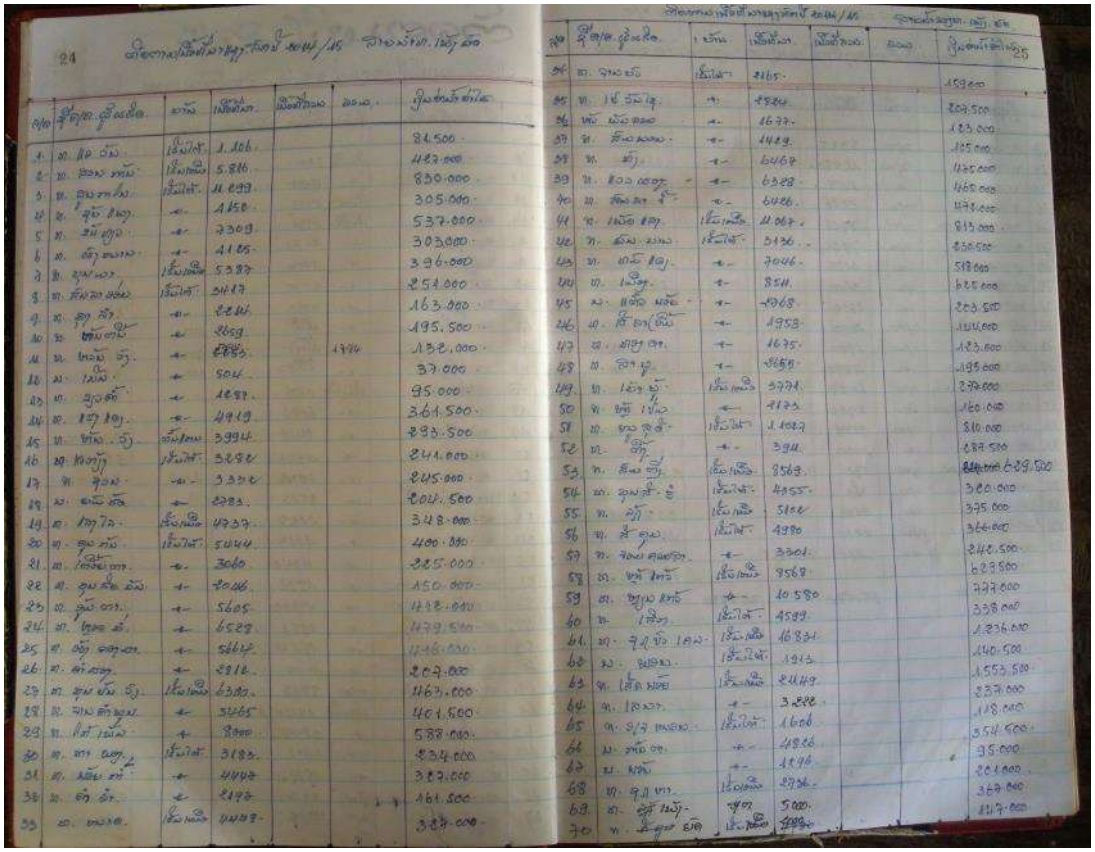
Book to follow up for providing collected money to head of treasury



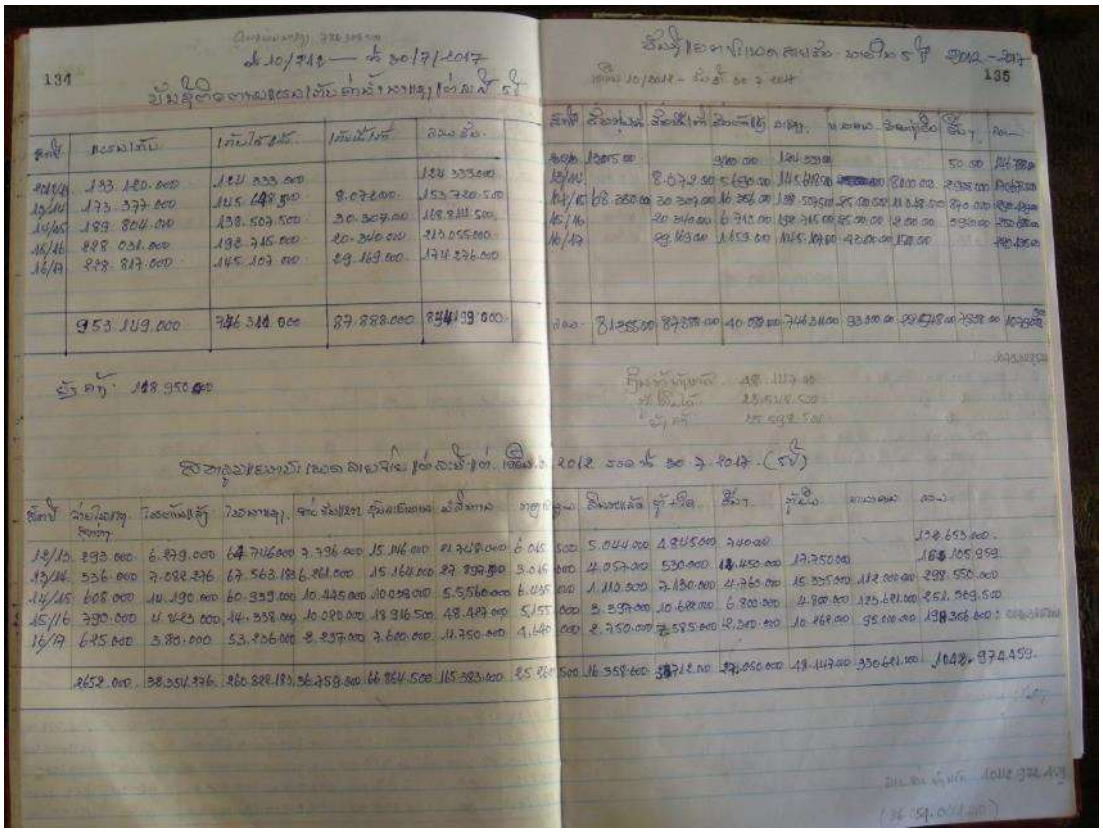
Book to record all revenue-expense of group



Book to follow up monthly revenue-expense of group



Book for money collection plan of each canal



Book for summary yearly revenue-expense of group

Case study 02: Vern-Tohen and Somsa-ad 1, Xaibuly district

After WOG participated in accounting training from PAD project October 10, 2018, WUG especially group accountant of both project Vern-Tohen and Somsa-ad 1 applied the key techniques from the training in their projects in order to improve their own accounting and easy to check. Also, Xaibuly DAFO staffs encourage and follow fee collection of group, follow on making the book for revenue-expense of both WUG every month.

Follow up on group accounting

Follow up on group accounting

Water fee collection record

NO	Name of second canal leaders	Name of member	2017-2018						Old debt	Total debt
			Irrigated area	Water fee	Paid			Remained		
			(Ha)	(Kip)	1st(Kip)	2nd(Kip)	3rd(Kip)	(Kip)	(Kip)	(Kip)
(ex.) 1	Mr. Lamkeo	Mr. Takaiysy	1.5	900.000	300.000			600.000	100.000	700.000

Book to record the detail of member

long-term rehabilitation plan of irrigation facilities

ปี	Pump system								Canal			Total (Kip)
	Pump 1	Pump 2	Motor 1	Motor 2	Electric board 1	Electric board 2	Cable wire	Pipe	Main canal		ปะตูน้ำ	
			135kw	135kw	135kw	135kw			LM 3.700m (Concretes) 300m (Earth canal) 3.400m	RM 3.000m (Concretes) 850m (Earth canal) 2.150m	15	
2019										Restore earth canal to become concrete canal (2000m) granted by GGP		
										o		
										Restore earth canal to become concrete canal (150m)		
										10.000.000		10.000.000
2020									Restore earth canal to become concrete canal (330m)			
									20.000.000			20.000.000
2021									Restore earth canal to become concrete canal (330m)			
									20.000.000			20.000.000
2022	Pump restored by government		Motor restored by governm ent		Electric board restored by Governm ent				Restore earth canal to become concrete canal (330m)			
	0		0		0				20.000.000			20.000.000
2023									Restore earth canal to become concrete canal (330m)			
									20.000.000			20.000.000
2024									Restore earth canal to become concrete canal (330m)			
									20.000.000			20.000.000
2025									Restore earth canal to become concrete canal (330m)			
									20.000.000			20.000.000
2026							Change cable wire		Restore earth canal to become			

									concrete canal (330m)			
							10,000,000		20.000.000			20.000.000
2027		Pump restored by governmen t		Motor restored by governm ent		Electric board restored by government			Restore earth canal to become concrete canal (330m)			
		0		0		0			20.000.000			20.000.000
2028									Restore earth canal to become concrete canal (330m)			
									20.000.000			20.000.000
2029								Chang e pipe	Restore earth canal to become concrete canal (330m)			
								20.000. 000	20.000.000			40.000.000

(2) Irrigation fee collection

1) Irrigation fee collection is one of the important works for WUG and uses it as a fund for sustainable irrigation maintenance.

(Implementer: DAFO, WUO)

(Explanation)

Case Study 1: Kengkok Neua, Champhone district

- In the past year, it was difficult to collect irrigation fee and it did not go as a planned that's why electric debt increased.
- WUG, member, village authority and DAFO consulted together about water fee collection, the conclusion of consulting agreed to collect **70.000** Kip/hour. Through implementation, water irrigation fee collection did not complete 100%.
- When PAD project came and led WUG to conduct the training, exchange the lesson with Vern-Tonhen project on finance-accounting management, implementation completed 100%.
- Group fund is collected in amount 400. 000 Kip/ ha/ season but: collect each month is 100.000Kip/ha within 04 months during cultivating period.
- This collection strategy is suitable for small area (Case study 01: KKN irrigated area can supply water is 42 ha)

❖ **Advantages**

- Money can collect 100%, electric fee reduced; water used amount reduced and water management is more comfortable.
- Farmers improve water use efficiency by themselves in order to decrease to buy ticket. This system introduced to this site in first dry season, farmers purchased irrigation ticket individually. Thus, downstream farmers needed to buy more ticket than upstream area farmers. Next dry season, WUO considered to solve this unfair situation and discussed with member farmers.
  They separated irrigation area to 5 groups. Each group bought ticket instead of every farmer, and asked WUG to supply water. During distributing water, the group farmers receiving water walked around main canal and checked water flow condition by themselves.

Case study 02: Vern-Tonhen in 2018-2019 totals irrigated area can supply water is 423 ha, irrigation fee is 730.000 Kip/ha.

- Farmer registration
- Meeting for water management plan.
- Together measure the area between WUG and farmers
- Calculate amount of irrigation fee collection
- Conduct the meeting and share to all farmers member.
- Irrigation fee collection completed within 02 months, after dry season.
- WUG report the result of irrigation fee collection 2 times a month to consult the remaining debt and provide collected money to head of the treasury and plan to collect 100%

- **Notes:** According to farmer who is remaining debt for irrigation fee, WUG work with village authority to invite those farmers to train them and make the contract for payment date, if the payment date came, but they did not pay, they would be fined base on group regulation and transfer the debt to next season.

4 Improve of WUO's administration

(1) Meeting and activity planning of WUO

1) For sharing information and discussion with member farmers, WUO need to have meeting in regularly. They had better have meeting at least 1 time in every month.
2) DAFO needs to attend the meeting to support them.

(Implementer: DAFO, WUO)

(Explanation)

Case Study: Tonhen site

Every time when WUG conduct regular meeting, village authority, all canal leadersມ, DAFO have to participate, Regular meeting has to be prepared a clear agenda such as timing, place, topics in order to let participants know early, before attending the meeting participants have to register and minutes clearly to be reference for next meeting.

Overall, regular meeting of WUG conduct 2 times a month, every 15 and 30 of month, if there is emergency case, WUG rush to conduct the meeting to solve the problem in time. Regular meeting for consulting and planning for next implementing is very important for irrigation management and it helps to solve problems in time.

Schedule of regular meeting for each project

NO	Project name	Meeting date	Note
01	Vern-Tonhen	15 and 30 every month	whole year
02	Xesalalong	15 and 30 every month	During water fee collection period

Table: participant registration of WUO meeting

Conducting of WUO meeting

(2) WUO's board member election

1) WUOs have their regulation. It mentions about board member election. Board member election need every 4 years under DAFO control. All member farmers attend the meeting and vote candidates.

(Implementer: DAFO, WUO)

(Explanation)

Step to WUO's board member election:

1. Nominate board member (not select who are assigned), by District of Agriculture and Forestry Office
2. Broach first target by village authority
3. Create village request letter to District of Agriculture and Forestry Office, by village authority.
4. Broach the second target by village authority with DAFO for minutes and report to upper level.
5. DAFO staffs with village authority lead group to summarize previous work.
6. Create request letter to district governor to ask for authorization to conduct meeting to improve by District of Agriculture and Forestry Office
7. Hold the meeting to consult about separating work role for each by District of Agriculture and Forestry Office and village authority.
8. Hold the meeting to summarize previous implementation, through future plan and election new board member minutes to report to upper level.
9. Request district governor to issue agreement.
10. Announce the agreement of district governor and transfer old and new duty.
11. Hold the training on OM Unit for mew board member.

Voting

Vote counting

(3) Farmer to Farmer for rising motivation of WUO

1) It is very useful for WUOs to know each other and learn from another WUOs.
2) Sharing organization's current condition is effective for rising motivation.

(Implementer: PAFO, DAFO)

(Explanation)

WUO always intends to their members, facilities and organization. So that, it is very difficult for them to review themselves because of no-information comparing to another group. In generally, not-strengthened WUO loose way how to improve. Because they don't have goal image of organization's management, finance and work. Thus, PAFO and DAFO need to implement study tour to good practice site and joint meeting.

(1) Study tour

<Key Point for fruitful tour>

- To make clear purpose and focal topic learning from model site.
  * If PAFO, DAFO don't clarify the topic, WUO visit to site like travel and they don't learn anything. Before study tour, PAFO and DAFO need discussion it and lecture participant farmers.
- To review the tour by participants and show their impression each other. Moreover, to make them pick up following techniques from model site.

Case study 1: Study tour to Lahanan site

- This study tour was implemented to improve WUO's finance condition.
- PAFO focused on that WUO strengthened un-payment fee collection techniques.
- Study tour was only discussion regarding solution of un-payment problem in Lahanan site. And all WUOs exchanged their actual problem each other.

Discussion meeting
(Introduction of Lahana activity)

Discussion meeting
(Exchange of Kengkok experience)

Case study 2: Study tour to Good practice in Vientiane Province

- This study tour focused on to improve WUO's water management and irrigation facility's management.
- Before study tour, PAFO staffs visited to those candidate site and interviewed WUOs to confirm the current situation, location and board members' motivation. This preliminary visit made PAFO staffs clarify what WUOs can learn and look from those sites.

Preliminary visit to candidate WUO

- When study tour started, PAFO explained to DAFO staffs the purpose and learning points to facilitate each WUOs.
- Study tour was mainly discussion meeting to exchange their experience each other.
- On last day of study tour, all participants had the review meeting. This review meeting was that each DAFO and WUO talked about this study tour. They summarized what they learned from visit site, what techniques they can use. And they presented each other.

Discussion meeting

Review session
(Presentation of learned topics)

(2) Joint meeting

- In order to make WUO and DAFO recognize current condition, PAFO has the joint meeting which all WUO and DAFO attend.
- This meeting is that each WUO present expenditure and income of organization, irrigation results and long-term rehabilitation plan.

PAFO support to summarize data

Presentation of accounting record

Summarize of account

Maintenance plan for 3years

<Project site repot: What WUO changed?>

Project implemented many irrigation activities to WUOs. Each WUO changed many things.

(1) Nong Boua Luang (Mr.On: XNB DAFO)

- What changed?
  - Water user group had clear accounting record, Water fee collection planning is faster than before, finish measured area on time.
  - Water user group has a harmony and good cooperation.
  - Have a rotation and water supply plan, the members followed the regulation and no water steal same as before.
- What did DAFO support to them?
  - Supported water user group by the documentation
  - Supported for land measurement
  - Give some advice for irrigation maintenance and suggested them to follow the regulation.
  - Be a consultant for solving their problem.

(2) Phanomxay (Mr.Bounmmy: PLX DAFO)

- What changed?
  - Electric fees decrease because of good water management.
  - Water user group has good cooperation of canal repairment.
  - Water user group used the lesson from accounting training with their water fee collection.
- What did DAFO support to them?
  - Supported water user group to make the rotation plan.
  - Led them to clean and repair the broken points canal.
  - Led them to hold a meeting to summarize the activities and plan for new activities in each month.
  - Follow up water supplied and in each group.
  - Supported for water fee calculating.

VII New site selection

1 Outline of new site selection process

1) Project sites need to be selected by selection process by related all people.
2) Selection process is composed of Preparation for 1st survey, 1st survey, Narrow down meeting, 2nd survey, Final selection meeting and Agreement of PAPC members.

(Implementer: PAFO, DPI, DOIC)

(Explanation)

1) PAD project is implemented by several sections, PAFO, DPI, DOIC, DOF and DAFO. When project sites are selected, main player, PAFO, DPI and DOIC need to commit with this selection process for appropriate evaluation to candidate sites.

2) Selection process has 6 steps as below,

2-1) Preparation meeting for 1st survey

PAFO and DPI collect information of nomination sites. At this time, no one can select candidate sites. But many government officials have some sites' information which want to be selected as new site. So, those sites are called the nomination sites.

PAFO and DPI coordinate the preparation meeting consisted of PAFO, DPI and DOIC, and make agreement the nomination sites and 1st survey plan.

(Hereafter, "Selection Team")

2-2) 1st survey for outline of nomination sites

1st survey is to visit to DAFO office of nomination sites and interview DAFO staffs to collect general information of those sites.

Furthermore, Selection Team grasps DAFO staffs' motivation through interview at this survey.

2-3) Narrow down meeting to select candidate sites

After 1st survey, Selection Team hold the Narrow down meeting to select candidate sites. Because nomination sites are many, they can't visit to all sites for 2nd survey. At this meeting, Selection Team evaluate nomination sites based on interview results, and 6-8 sites are selected as candidate sites to move to 2nd survey.

2-4) 2nd survey for comprehension of current situation in candidate sites

Selection Team visits to all candidate sites to collect current and detail information through farmers and WUG interview and field observation.

In this survey, Selection Team separates 3 groups, Agriculture, Marketing and Irrigation, and ask some questions to farmers and WUGs based on questionnaire sheet.

2-5) Final selection meeting

Selection Team has meeting to summarize farmers' answer and observation results. They give score to each candidate sites and order them.

They select new sites as proposal to PAPC meeting.

2-6) To report and get agreement of PAPC members

Selection Team hold PAPC meeting to report and get agreement from member.

2 Activity description in each process

(1) Preparation meeting for 1st survey

1) PAFO and DPI collect nomination sites' information.
2) Selection Team hold meeting to share this information and make 1st survey plan.

(Implementer: PAFO, DPI, DOIC)

(Explanation)

1) PAFO and DPI prepare new site selection activity.
At first, they make nomination sites[*1] list for Selection Team[*2].

*1 Nomination site: All sites which some project stakeholders think to select as new site.
*2 Selection Team: A group which is composed of project implementors; PAFO, DPI and DOIC staffs

<Case study>
Project made nomination site list based on related people's comment. (8DAFO, 11sites)

1 Virabouly DAFO (Natur site)
2 Phin DAFO (Huaysakuang site)
3 Champhone DAFO (Khampanae site, Thouat site)
4 Xaiphouthong DAFO (Phay-namlong site, Khanthachan site)
5 Kayson DAFO (Phakka site)
6 Xaibouly DAFO (Boungxee site, Phouheuaxaova site)
7 Xonnabouly DAFO (Dong-Boun site)
8 Songkhon DAFO (Dongsavang site)

2) Selection Team meeting
This meeting is that all implementors share new site selection schedule and nomination sites.

<1st survey plan>
Surveyors: PAFO (Planning & Finance, Irrigation, Agriculture, Extension)
DPI (International Cooperation)
DOIC (Trade & Product Promotion)

Day	Project site	Place	Purpose	Participants
1st		Xaipouthong district office	Report about the purpose of the survey team	Vice district governor, director of DAFO, Selection Team
	Khanthacharn Phay-namlong	Xaiouthong DAFO	Survey team interviews to DAFO staffs with interview sheet regarding candidate sites	The director of DAFO, DAFO planning, agriculture, irrigation, Selection Team
	Phakka	Kaisone DAFO	Survey team interviews to DAFO staffs with interview sheet regarding candidate sites	The director of DAFO, DAFO planning, agriculture, irrigation, Selection Team
2nd		Champhone district office	Report about the purpose of the survey team	Vice district governor, director of DAFO, Selection Team
	Khampanae Thouat	Champhone DAFO	Survey team interviews to DAFO staffs with interview sheet regarding candidate sites	The director of DAFO, DAFO planning, agriculture, irrigation, Selection Team
		Xonnabuly district office	Report about the purpose of the survey team	Vice district governor, director of DAFO, Selection Team
	Dong-Boune	Xonnabuly DAFO	Survey team interviews to DAFO staffs with interview sheet regarding candidate sites	The director of DAFO, DAFO planning, agriculture, irrigation, Selection Team

3rd		Songkone district office	Report about the purpose of the survey team	Vice district governor, director of DAFO, Selection Team
	Dongsavang	Songkone DAFO	Survey team interviews to DAFO staffs with interview sheet regarding candidate sites	The director of DAFO, DAFO planning, agriculture, irrigation, Selection Team
		Xaibouly district office	Report about the purpose of the survey team	Vice district governor, director of DAFO, Selection Team
	Boungxee Phouheuaxaova	Xaibouly DAFO	Survey team interviews to DAFO staffs with interview sheet regarding candidate sites	The director of DAFO, DAFO planning, agriculture, irrigation, Selection Team
4th		Phin district office	Report about the purpose of the survey team	Vice district governor, director of DAFO, Selection Team
	Huaysakuang	Phin DAFO	Survey team interviews to DAFO staffs with interview sheet regarding candidate sites	The director of DAFO, DAFO planning, agriculture, irrigation, Selection Team
		Vilabuly district office	Report about the purpose of the survey team	Vice district governor, director of DAFO, Selection Team
	Natur village	Vilabuly DAFO	Survey team interviews to DAFO staffs with interview sheet regarding candidate sites	The director of DAFO, DAFO planning, agriculture, irrigation, Selection Team

- Before starting project implementation of new site selection, preparations in team including :
  a. Make a plan (identify time) for implementation of new site selection.
  b. Set up team for data collection and interview.
  c. Discuss within team before going selection and divide responsibility for each details.
  d. Draft announcement letter to related DAFO.
  e. Prepare the contents to report purpose of project in district level and group of farmer to know project activity.

- After finish implementation survey, next steps are:
  a. Prepare documents to report in meeting to announce the result of selection to shares of provincial project.
  b. Propose the agreement to share of provincial project advisors to accept new project sites.
  c. Inform DAFO to establish share of district project advisor and project coordinator in district level to implement project.

(2) 1st survey

1) 1st survey is that Selection Team visits to DAFO of nomination sites to collect their general information.
2) Selection Team needs to listen not only interview but also DAFO's idea and recommendation.

(Implementer: PAFO, DPI, DOIC)

(Explanation)

1) 1st survey is to grasp wide range of information in nomination sites. Thus, Selection Team visit to DAFO and interview to DAFO staffs.

   This survey is to hold a meeting with DAFO staffs for observation. In this meeting, Selection Team introduce the purpose and schedule of new site selection. After that, the Team start interview to DAFO and other participants.

   Selection Team collect information as below,

   (General)
   - Number of villages,
   - Distance from DAFO,
   - Natural Disaster,
   - Number of farmers,
   - DAFO structure,
   - DAFO and farmer's motivation
   - Farmers' motivation
   - Another Donor project

   (Agriculture)
   - Field area (Rainy season, Dry season),
   - Chemical pesticide and fertilizer use,
   - Rice yield (Rainy season, Dry season),
   - Crop variety (Rice)
   - Rice cultivation technique
   - Others

   (Marketing)
   - Crop variety (Vegetables),
   - Agricultural group,
   - Others
   - Vegetable market
   - Other income

   (Irrigation)
   - Irrigation area (Plan, Actual),
   - Irrigation facilities
   - Electric debt,
   - Water resource
   - Water User Group
   - Others

1st survey (Kayson DAFO)

1st survey (Xonnabouy DAFO)

2) In this survey, Selection Team needs to ask to DAFO staffs their recommendation, idea and comments. They know not only nomination sites but also another site. When they request to add another site to new site selection, Selection Team should consider the recommendation to involve as candidate.

<Case study, DAFO's recommendation>

This survey is implemented to observe 10 sites. But, some DAFO suggest to exchange nomination sites to DAFO's request as below. Selection Team accepts the request and continue interview survey.

- Champhone DAFO
  (Team's plan) : Khampanae site, Thouat site
  (DAFO's recommendation) : Khampanae site, Thouat site, Sakuen site, Kengphone site
- Xaiphouthong DAFO
  (Team's plan) : Phay-namlong site, Khanthachan site
  (DAFO's recommendation) : Namphou site, Koudtapou site
- Xaibouly DAFO
  (Team's plan) : Boungxee site, Phouheuaxaova site
  (DAFO's recommendation) : Boungxee site, Naxengkham site
- Songkhon DAFO
  (Team's plan) : Dongsavang site
  (DAFO's recommendation) : Songkhone<Nasok> site, Nongdern site, Singtha site
- Phin DAFO
  (Team's plan) : Huaysakuang site
  (DAFO's recommendation) : Huaysakuang site, Huaykhai site

<All site can apply to this PAD project>

PAD project composes of Agriculture, Marketing and Irrigation activities. But every site doesn't need to use all activities. Some sites might need Agriculture and Irrigation, and other sites need to Agriculture and Marketing, and so on. Selection Team and DAFO consider to select new site this policy.

- Through DAFO interview received information is: district overview, special point and location, potential, enthusiasm and ownership of farmer in target villages
- Number of DAFO staffs in DAFO office ? how many volunteers? To get to know that, are there enough DAFO staffs to work with each team or not?
- Distance of DAFO office to new project sites villages
- What project used to support these villages? What villages is covered?

  Through DAFO interview: DAFO in district target has high motivation when new site selection team report project purpose and 3 main activities because those activities are also requirement in each district to support agriculture work such as : technical Agriculture support work which highlights the yield and result of old project site and real rice yield increased, make real income for farmer. And about seed and fertilizer lending program is also interesting for them. For irrigation activity support, there are many projects lack of knowledge for water management, techniques of pump maintenance and canal is still low. For marketing activity is so interesting, Houaysakhouang site, Phin district said that: farmers in this area mostly grow crops for sale but there is no market, they need help to set up the market to sell crops.

(3) To pick up candidate sites in Team meeting

1) Selection Team hold a review meeting regarding 1st survey results.
2) This meeting selects candidates from nomination sites based on collected information.

(Implementer: PAFO, DPI, DOIC)

(Explanation)

1) Selection Team holds meeting and shares all interview results among members. They summarize all information in table to grasp easily.

No			1
District			Xaiphouthong
Site			Kouttapoh
Topic	Question		
Genelal	Number of village		2villages
	Number of farmers		???
	Farmers' motivation		Not active
	Distance from DAFO		12km
	DAFO structure		22 staffs(Permanent) Irrigation : 3 Agriculture : 3 Mkt : 0 Others : 16 *Volunteer : 14
	Other Donor		None
	Natural Disaster		No flooding area
	Others		
Agriculture Marketing	Field area	Rainy season (Rice)	100ha
		Rainy season (Vege)	House consumption
		Dry season (Rice)	86ha
		Dry season (Vege)	House consumption
	Crop variety	Rice	Phonengam, Others
		Vegetables	-
	Chemical pesticide		Not use
	Chemical fertilizer		Use
	Capacity building		
Agriculture	Rice cultivation		Transplanting
	Rice yield	Rainy season	4.2t/ha
		Dry season	4.8t/ha
Marketing	Vegetable market		-
		(Transportation)	
	Agricultural group		???
	Other income		Construction worker, Catch fishes, Livestocks
Irrigation	Irrigation area		More than 100ha
	Water resource		Natural reservor (3,000,000m3)
	Irrigation facilites (Pump)		-
	Irrigation facilities (Canal)		Main canal 525m (Concrete) 2nd,3rd canal 1,000m * Construction (1986) Renovation (2019, Lao)
	Water User Group		112HH (Established 2019)
	Electric debt		

Table: Summarize format and example of description

When they organize data, they might have un-clarified information. At that time, Team meeting doesn't freeze discussion because of it but should omit that data and continue the meeting.

(Interview result at 1st survey, Site No.1-8)

No			1	2	3	4	5	6	7	8
District			Xaiphouthong		Kayson	Champhone				Xonnabouly
Site			Kouttapoh	Namphou	Phakka	Sakuen	Khengpoun	Khampanae	Thoad	Nong Boualao
Topic	Question									
Genelal	Number of village		2villages	1village	???	3villages	2villages	1village	8villages	1 village
Genelal	Number of farmers		???	17HH	120HH		100HH	28HH		???
Genelal	Farmers' motivation		Not active	Active	Not active	Active	Active	Not active	Active	Active
Genelal	Distance from DAFO		12km	13km	12km	24km	10km	12km	24km	30km
Genelal	DAFO structure		22 staffs (Permanent) Irrigation : 3 Agriculture : 3 Mkt : 0 Others : 16 *Volunteer : 14			43 staffs (Permanent, Female18) Irrigation : 3 Agriculture : 4 Mkt : 0 Others : 36 *Volunteer : 17				
Genelal	Other Donor		None	None	ADB will start (2020)			Water company* (on going) *Gold dolphin	ADB supporot canal(on going), Rice techniques project done.	India
Genelal	Natural Disaster		No flooding area	No flooding area		Flooding area	Flooding area	No flooding area	Flooding area	No flooding area
Genelal	Others							Marginalized village		
Agriculture Marketing	Field area	Rainy season (Rice)	100ha	24ha	907ha	250ha	150ha	???	1000ha	More than 50ha
		Rainy season (Vege)	House consumption	0ha	-	House consumption		1 ha community farm (28 HH)	House consumption	???
		Dry season (Rice)	86ha	12ha	100ha	150ha	70ha	???	500ha	???
		Dry season (Vege)	House consumption	50ha	???	Corn(5ha,20HH), Others	Corn(1ha,10HH), Others	1 ha community farm (28 HH)	Over 1lai/HH (20HH)	aprox 1lai/HH (60% of total HH grow)
	Crop variety	Rice	Phonengam, Others	TSN10, Others	TSN7, TDK8	TDK8, TSN8 (Buy new seed in every season)	TDK8, TSN8 (Buy new seed in every season)	TDK8, TSN8 (Buy new seed in every season)	TDK8, TSN8 (Buy new seed in every season)	TSN 8, TDK8 (some farmers use old seed)
		Vegetables	-	Cauliflower, Sweet corn, Peanut, Others	Spring onion, Red onion, Mint, Others	Corn, Long bean, Peanut	Corn, Peanut	Spring onion, Morning glory, Eggplant, Mint, other kitchen vegetables.	Water melon, Papaya, Cucumber Groundnuts	Corn, Long bean, Spring onion, Sweet potato (at river bank)
	Chemical pesticide		Not use	Not use	Not use	Use	Use	Use	Use	Not use
	Chemical fertilizer		Use	Use	Use			Use	Use	Use
	Capacity building						DAFO monitor agriculture working	Water company gave sowing machine and taught sowing techniques	DAFO monitor agriculture working	
Agriculture	Rice cultivation		Transplanting	Transplanting		Transplanting	Transplanting		Transplanting	Sowing
	Rice yield	Rainy season	4.2t/ha	3.5t/ha	4.2t/ha	???	???	???	???	3.5-3.7t/ha
		Dry season	4.8t/ha	-	-	???	???	???	???	5.3t/ha
Marketing	Vegetable market		-	Sweet corn : Middlemen (Come to village)	Market in Savannakhet	Corn : Market (21km from site)	Corn : Market (6km from site)	Water company used to buy all vegetables but stopped now	Market (21km from site)	Nong Boualao Market (37km from site), Pakson 60km, Palanxa 20km, Xonnabouly 30km
				Others : Muankay market (3km from Namphou site)		Others : Village		Currently they try XNB district market		
		(Transportation)			Motor bike, Tractor, etc.	Motor bike, Tractor, Truck	Mortor bike	Water company came to village to buy products but not now	Motor bike, Tractor, others	
	Agricultural group		???	None	None	None	None	Established	None	No
	Other income		Construction worker, Catch fishes, Livestocks	Construction worker, Catch fishes, Livestocks		Work to Thai, Catch fishes	Work to Thai, Catch fishes	Work to Thai, Catch fishes	Work to Thai, Catch fishes	Livestock keeping, Fishing, Working abroad
Irrigation	Irrigation area		More than 100ha	More than 12ha	350ha	250ha(Plan), 150ha(Act)	150ha(Plan), 70ha(Act)	No irrigation	1000ha(Plan), 500ha(Act)	50ha (by engine pump, only 1year)
	Water resource		Natural reservor (3,000,000m3)	Arttificial reservor (1,200,000m3)	River	Sui lake	River	No irrigation	Reservor (13,000,000m3)	River
	Irrigation facilites (Pump)		-	-	90kwh*2 (Floating pump, insalled in 1993)	75kwh, 37kwh	75kwh*2	No irrigation	None (Gravity irrigation)	75kwh*3 (Install 2020 by India)
	Irrigation facilities (Canal)		Main canal 525m (Concrete) 2nd,3rd canal 1,000m * Construction (1986) Renovation (2019, Lao)	No canal	Main canal 950m 2ndary canal : 2000m	Concrete canal *Supported by WB in 2017	Main canal 500m (Concrete) *Supported by WB in 2017	No irrigation (DAFO has plan canal construction.)	Main canal 5000m (Concrete) 2nd, 3rd canal	Main canal 150m (Earth)
	Water User Group		112HH (Established 2019)	11HH (Established 2019)	Established			None		Established (2019)
	Electric debt									None

No			9	10	11	12	13	14	15	16
District			Songkhon			Xaibouly		Phin		Vilabouly
Site			Singtha	Songkhon	Nong Dern	Buengxe	Naxengkam	Huaysakuang	Huaykhai	Natur
Topic	Question									
Genelal	Number of village		1 village	1 village	1 village	4villages	1village	7villages	???	4 villages
Genelal	Number of farmers		160HH	205HH	180HH	252HH	100HH		???	72HH
Genelal	Farmers' motivation		Fair	Fair	Fair	Active		Negative (Don't want to work with Donor project)	Negative (Don't want to work with Donor project)	Active
Genelal	Distance from DAFO		15km	15km	17km	16km	14km	15km	12km	???
Genelal	DAFO structure		59 staffs (Permanent) Irrigation : 5 Agriculture : 8 Mkt : 0 Others : 46 *Volunteer : 8			32 WUGs are supported 3 DAFO WB, ADB, India, JICA are implementing		50 staffs (Permanent) Irrigation : 1 Agriculture : 4 Mkt : 0 Others : 45 *Volunteer : more than 3		23 staffs (Permanent) Irrigation : 2 Agriculture : 6 Mkt : 0 Others : 15*Volunteer : 11
Genelal	Other Donor					ADB project (on going)		ADB will start soon. World vision finished supporting crop cultivation in 2013 (3yrs)	World vision is supporting crop cultivation and nutrition project btwn 2019-2021.	SMB (Mining company) supported Livestocks, Fish cultivation in 2014. ADB trained WUG.
Genelal	Natural Disaster		Flooding area (80% damaged)	Flooding area (80% damaged)	Flooding area (80% damaged)	Flooding area	Flooding area	No flooding area	No flooding area	
Genelal	Others		1st priority, Support to DS cultivation	2nd priority, Support to DS cultivation	3rd priority, Support to DS cultivation			Irrigation facilities repair is necessary. Many project supproted to DAFO, farmers. (i.e.UNDP, WV, etc.)	Many project supproted to DAFO, farmers. (i.e.UNDP, WV, etc.)	60km from DAFO to Xepon. Mining company give budget 300,000$/y to District
Agriculture Marketing	Field area	Rainy season (Rice)	???	???	???	???	???	200ha	1200ha	???
		Rainy season (Vege)	???	???	???	???	???		???	???
		Dry season (Rice)	58ha	???	???	???	???	30ha (Reducing)	500ha	105ha
		Dry season (Vege)	Corn 0.5ha/HH	???	0.5ha/HH (Cassava 70~80% total HH)	???	???	15ha (aprox.20HH, 1lai each)	???	63ha
	Crop variety	Rice	TDK8, TSN8, TSN9	TDK8, TSN8, TSN9	TDK8, TSN8, TSN9	TDK8	TDK8	TDK8, TDK11	TDK8, TDK11	TDK8, TSN8
		Vegetables	Corn, Eggplant, Chili, Cucumber, Banana, Papaya, Ginger, Galanagal\	Corn, Eggplant, Chili, Cucumber, Banana, Papaya, Ginger, Galanagal\	Cassava, Corn, Spring onion (kitchen garden) Farmers started cassava 3 years ago, now yield is getting less.	Tomato (9HH), Spring onion, Gourd	Corn (10HH, 0.16ha/HH)	Watermelon, Corn, Cucumber, Long bean, Chili	Kitechen vegetable for consumption	Corn, Watermelon, Bokchoy(200kg), Spring onion, Coriandar, Cabbage(400kg), Cucumber(400kg)
	Chemical pesticide		Use	Not use	Not use	Not use	Not use	Use		
	Chemical fertilizer		Use	Use	Use	Use	Use	Use (16-20-0, 46-0-0)	Use (16-20-0, 46-0-0)	Use (16-20-0, 16-8-8, 46-0-0)
	Capacity building			Clean agriculture technique training (1day, 30farmers)	DAFO monitor agriculture working	DAFO staffs follow on field and teach bio-pesticide.	Implemented rice cultivation training (Follow PAD contents) and bio-pesticide.		Vegetable cultivation training by World Vision	SMB implemented rice cultivation, marketing and livesock training.
Agriculture	Rice cultivation		Transplanting	Transplanting	Transplanting	Transplanting	Transplanting	Transplanting		Transplanting
	Rice yield	Rainy season	???	???	???	???	???	3.5t/ha	???	???
		Dry season	5.1t/ha (Ave. of 2 farmers)	4.5t/ha	4.75t/ha	???	???	3.6t/ha	???	4.2t/ha
Marketing	Vegetable market		Vendors at district market	Vendors at district market	Cassava (Xaimay company)			Xepon(46km from site) Vilabouly (40km)		Village, Vang city(in Vilabouly), Xaibouathong(Khamwan prov.)
										Vendor come to buy at site
										Mining company, Paper company
		(Transportation)	Private car, Localbus	Private car, Localbus	Private car, others	Motor bike, Tractor	Motor bike, Tractor	Private car, Tractor	Private car, Tractor	Motorbike, car, tractor,
	Agricultural group		None	None	None	None	None	Some farmers collect vegetables from other farmers for sales. Mainly individual production but sometimes sell together	None	None
	Other income		Livestocks, Catch fishes, ~~Work to Thai~~	Livestocks, Catch fishes, ~~Work to Thai~~	Livestocks, Fish farming, ~~Work to Thai~~ (family members tend to stay in the village)	Livestocks, Catch fishes, Work to Thai	Livestocks, Catch fishes, Work to Thai	Livestocks, Rubber tree planting, Construction worker (1.2million/mont/person)	Rubber tree planting, Livestocks, Work to Savannakhet	Livestocks, Collection of something to sell in forest
Irrigation	Irrigation area		120ha (Plan), 50ha (Act)	120ha (Plan), 50-60ha (Act)	150ha (Plan), 120ha (Act)	420ha (Plan), 296ha (Act)	??ha (Plan), 86ha (Act)	200ha (Plan), 30ha (Act)	373ha	250ha (Plan), 105ha (Act)
	Water resource		River (Xevanghian riv.)	River	Natural reservor	River	River	Reservor (1989y)	Reservor (26,000,000m3)	River
	Irrigation facilites (Pump)		75kwh*2 (1998)	75kwh*2 (1998)	75kwh*2 (1998)	250kwh*2 (2019)	75kwh*2(2015) 75kwh*2(1996)	None	None	None
	Irrigation facilities (Canal)		Main canal 650m (Concrete) 460m (Earth)				Main canal 550m(Concrete)	Canal will be renovated by ADB in 2020.	Constructing (Stopped now due to budget shortage, 60% done.)	Concrete canal (1975)
	Water User Group					Established(1996)	Established(1996)	Established	None	Established (2018)(No accounting)
	Electric debt		50,000,000kips	??kips		130,000,000kips	126,000,000kips			None, Mining company provide money to WUG 5,000-10,000$/y

2) After summarized, each group, Agriculture, Marketing, Irrigation and Planning, consider which site should be selected as candidate site from individual activity's point of view and select some sites.
All groups show select result and reason each other and make consensus the candidate sites. Candidate sites implement farmers interview, WUG interview and field observation in 2nd survey. This survey needs sufficient time, therefore number of candidate sites had better be maximum 6-8 sites.

Group discussion to consider information

Team discussion to select candidates

District	Site	Group proposal				Result
		Planning	Agriculture	Marketing	Irrigation	
Xaiphouthong	Kouttapoh	○	○			◎
	Namphou	○	○	○		◎
Kayson	Phakka					
Champhone	Sakuen				○	◎
	Khengpoun				○	
	Khampanae					
	Thoad	○	○			◎
Xonnabouly	Nong Boualao			○		
Songkhon	Singtha	○	○	○		◎
	Songkhon		○		○	◎
	Nong Dern			○	○	◎
Xaibouly	Buengxe	○				
	Naxengkam	○				
Phin	Huaysakuang	○	○	○		◎
	Huaykhai					
Vilabouly	Natur	○	○	○	○	◎

In this case, Team select low score sites like Sauen as candidate. They listen each group's thought why the group want to be candidate and respect it. Thus, Team member agree with the conclusion.

After this meeting, Selection Team move to 2nd survey.

(4) 2nd survey

1) 2nd survey is that Selection Team visits to village site to interview farmers, WUG, village office and observe current condition in site.
2) Selection Team separates 3 groups, Agriculture, Marketing, Irrigation, uses questionnaire in interview.

(Implementer: PAFO, DPI, DOIC)

(Explanation)

Selection Team asks to DAFO to coordinate interview meeting with stakeholders; farmers, WUG and villagers. Interview is executed at village office or temple.

<Interview meeting participants>

1 Interviewer : PAFO, DPI, DOIC
2 Coordinator : DAFO, Village authority
3 Interviewee : Farmers, WUG(Board member), villagers, others

* In order to collect widely information, interviewees had better compose of rice farmer and vegetable farmer at least 10-15 farmers.

When interview meeting start, Team needs to explain overview of this survey in order to prevent from misunderstanding.

<Explanation point>

When Government officials come and interview to farmers and villagers, most villagers expect that Government support and provide budget, materials and equipment. Team member need to explain most important topic as below,

1 This survey is only observation to select PAD project site.
2 PAD project doesn't give them anything but provide techniques, information and knowledge of agriculture, marketing and irrigation for increasing farm income.
3 The project style is participatory. Participatory means that farmers consider and decide whether they want to join project activity or not by themselves.

Interview meeting is separated 3 groups, Agriculture, Marketing, Irrigation. Each group asks to farmers, WUG and villagers using questionnaire sheet. This sheet is just basic contents for interview. All interviewers can ask other questions if necessary.

Introduction of meeting

Group interview (Agriculture)

Group interview (Marketing)

Group interview (Irrigation)

(Questionnaire sheet)

I	Irrigation	Question
1.1	**Water source**	
	Water pump (headwork)	How many kw of the water pump? During the last dry season cultivation, how many KW did you use?
		Reservoire (volume of water) m^3
		How many meters of the water pipe?
	Canal system	MC,SC,TC (m)
		How many the diversion structures of the irrigation facility are there? And How many sluice gates and farm turnouts ?
		What is the command area (ha) in 2014-15-16-17
1.2	**When was irrigtion construction completed?**	When was the irrigation repaired the last time? Do you know the name of the construction contractor?
		How much the construction cost? Who is the donor? Is it ADB/WB/LG/IFAD?
1.3	**Water management**	When was the farmers organization established? When was it improved ? Is there an organizational structure and how many members?
		How many villages benefited from the irrigation? How many irrigation blocks, and how many HH/members in each block?
		How did you maintain the irrigation facility? Do you clean the irrigation facility before-after the harvest?
		Rotation of the water supply and distribution? Did you discuss about the water supply and distribution, who is responsible for checking the water supply
		Did you have enough irrigation water last year?
		Do you have a budget for maintenance/repair?
1.4	**WUG's administration**	Is a montly/yearly meeting set up? (did you organize the meeting?)
		Do you have a report? To whom do you report/do you have a financial report ?
		Do you have a saving account? Do you have a fund? How much savings fund do you have? Do you save your money in the bank?
		Do you have a bookkeeping system? From whom you received the training?
		Who is in charge of water fee collection (water fee collector) ?
		How long does it take to collect the water fee payment from all members../ and how many percentage and the proportion of payment to un-payment
		Do you have an account for cash-debt? Do you pay for administration/fund/electricity fee?
		Did the DAFO staff follow up the activity? (what activity did they carry out? And what kind of advices did they provide?
II	**Agricultural Extention**	**Statistic data in the target site**
	1	See the Annex 01
	2	Training
	2.1	In a previous time, what kind of training did the farmers organization receive?
	2.2	What is the training subject? Number of training sessions? How many persons participated in the training, and when the training provided?
	2.3	What is the name of the organization that provided the training?
	2.4	How many time did you attend the study tour/exposure visit? Where? What is the name of the orgainzation provided the support?
	2.5	Did other projects/organizations come to your village for exchange of experience?
	3	Agriculture Technique
	3.1	Have you still still used the indigenous rice variety ?
	3.2	What type of rice variety do you use? Where do you get it from? How much does it cost for one Kilo?
	3.3	Do you apply the manure, chemical fertilizers and pesticides?
	3.4	How do you grow your rice, is it by transplanting, direct sowing, seeding by seeder? What is the name of the organizations provided the technical support?
	3.5	Rice plant treatment (do you have enough irrigation water and do you weed)?
	3.6	Do you harvest by hands, by machineery or hiring other people for harvesting?
	3.7	What is the transportation and storage?

III	**Marketing**	
	1	Cropping
	1.1	What kind of crops/vegetables do you grow, which one the farmers grow a lot compared to other crops/vegetables, is it easy to sell?
	1.2	Grow and sell (crop/vegetable)
	1.3	Did you grow for sales?
	1.4	If yes, how much did you sell? Where? To whom did you sell?
	1.5	Whet did you start growing that kind of crop/vegetables?
	1.6	How many HH dod they grow the same type of crop/vegetables? What is the name of the crop/vegetable?
	1.7	From whom did you receive the technical advices on the cultivation?
	1.8	What was the cultivation area (ha) when you started growing the crop for the first year (and when was it)? What is a cultivation area now?
	1.9	Does the main income of the farmers come from agriculture or other non agriculture work?
	1.10	In your familiy, how many labors engaged in the agriculture? (question for familiy only)
	2	Rice cultivation
	2.1	How many rice mills in your village? Do buyers come and buy rice in your village?
	2.2	Is rice cultvation area increased or decreased?
	2.3	What is the rice prices in last year? (wet and dry seasons)

(Annex 01: Statistic data on agricultural crops/vegetables cultivation)

No	Item	Area (ha)	No. of HH	Rice yieldT/ha	Year
1	Wet season rice				
	Dry season rice				
2	Other crop/vegetable				
3					
4					
5					
6					
7					
8					
9					
10					

(5) To summarize and select sites in meeting, and report to PMU meeting.

1) Selection Team hold meeting to summarize survey result and give candidate sites the score.
2) After giving score, Team finalize proposal new project sites.
3) Team repot result to PMU meeting to get agreement in official.

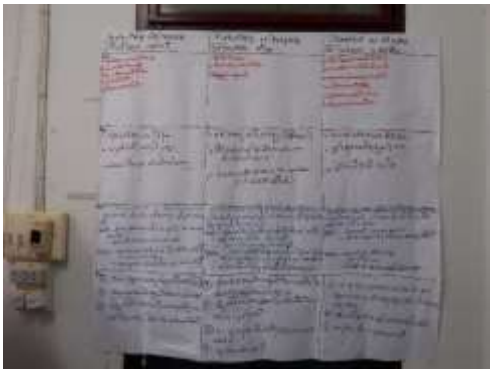
(Implementer: PAFO, DPI, DOIC)

(Explanation)

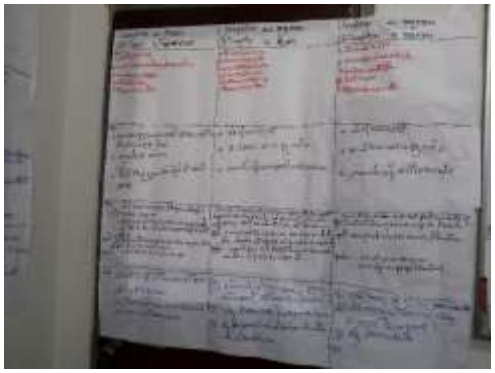
1) Selection Team hold meeting which organize collected information and share among members.
In this meeting, Team members separate 4 groups, Agriculture, Marketing, Irrigation and Planning, and each group pick up advantage points and disadvantage points from all information. Because 2nd survey collects many variety of agriculture, marketing, irrigation, village condition and others. If they share all information, most people confuse and can't grasp actual situation deeply.
So that, each team needs to summarize them and focus on strong point and weakness in sites.

Data summarizing (Planning)

Data summarizing (Marketing)



Summarized information



Summarized information

(Survey results: No.1-4)

District	Xayphouthong		Champhone	
Site	1 Kouttapoh	2 Namphou	3 Sakuen	4 Thoad
Irrigation	1. cultivated area 45% 2. Situation of irrigation is good 3. farmers have high motivation 4. Farmers are not on electricity debt 5. Project should support	1. There is not much area 2. There is only head work-but there is no canal 3. DAFO staffs do not cooperate	1. cultivated area e 56% 2. Canal condition are usable as normal 3. Main canal dig by fermers is not good situation 4. Farmers are not motivated 5. There are much electricity debt	1. cultivated area 15% 2. Irrigationsituation is not good, canal is damaged much. 3. Group has no motivation 4. There is no electricity debt 5. Project should not select
Agriculture	# farmers have high motivation # Road condition is good # Techniques and productivity is moderate	1. There is no rice cultivation in dry season (They do not know plan) 2. Some years rain condition is not convenient, yield decreased 3. Sandy soil 4. For rice cultivation, Farmers mostly do direct sowing (New techniuqes)	1. Farmers have no motivation 2. there is project for farmer school 3. Techniques is good enough	1. some farmers are motivated, interested in trying new thing. 2. Road condition is accessible 3. Fertilizer application techniques is not good enough.
Marketing	There are two villages, interviewed 1 village. Phonthan village mainly income is from rice and cassava selling. Second crop is kitchen crops. Advantage: # there are farmers can cultivate in rainy season and they can sell # Farmers are happy to get income from cassava selling. Disadvantage: # Farmers want customers and company come and buy, they do not bring to sell # Farmers do not trust company due to company didn't buy product from farmers	# Farmers mainly grow rice, grow crops in dry season, farmers get income from vegetable selling, avendor come and buy, farmers use chemecal for cultivation Advantage: # Farmers want to grow crops as products, farmers need to try new crops such orange # farmers have cultivation experience Disadvantage: # Farmers need avendor come and buy, they do not bring to sell, flooding area, farmers use chemecal, vegetable price is not high and there is no emty place in rainy season	Mostly farmers grow rice and grow crops for consumption, farmers are not interested to grow crops for sales Advantage: # Road condition is good # There are two markets for selling products Disadvantage: # Farmers are not interested to join meeting # Flooding area # There is no products and lack of knowledge about marketing	There are 7 village, there is a project supports only Thoad village, farmers in Vangmao village need project to help, remaining 5 villages that we've not interviewed yet, so we did not know farmers in those village they are interested or not ? Advantage: # Farmers joint training on cultivation techniques, compost making, and farmers also have experience about cultivation Disadvantage: Farmers lack of knowledge on marketting
Planning	1. Road condition is convenient/DAFO staffs are active 2. Village authority is strong 3. People have no experience to work with any project, farmers use pool over flow system to supply cultivation	1. Village authority has high motivation to improve market 2. people are interested but structure system is not ready. 3. DAFO staffs are well-cooperated 4. Road condition is good	1. people in the village are not interested in and village authority is not strong 2. Onec there was project come to support 3. Road condition is good	1. Model village, and there are many projects come and support. 2. Road condition is quite gooid. 3.It is a big project, many villages are included and it's hard to control.

(Survey results: No.5-9)

District	Songkhone			Phin	Vilabuly
Site	5 Singtha	6 Songkhone	7 Nongdern	8 Huaysakhuang	9 Nator
Irrigation	1. cultivated area 56% 2. Situation of head work are noot good 3. Farmers do not have high motivation. 4. There are much electricity debt 5. Project should not select	1. cultivated area 56% 2. Irrigation situation is not quite good 3. group has high motivation 4. There is not much debt. 5. Project should support	1. cultivated area 38% 2. Head work is usable as normal 3. Canal condition is good 4 High motivation 5. Not on electricity debt 6. Project should support	1. cultivated area 15% 2. Canal condition is not good 3. not on electricity debt 4. farmers are not interested 5. Project should support	1. cultivated area 37% 2. not good 3. No motivation 4. Not on electricity debt 5. Project should not support
Agriculture	1. Flooding every year. 2. Capacity is high 3. it's difficult to access in rainy season	1. It's flooding every year. 2. Capacity is high 3. it's difficult to access in rainy season	1. farmers are harmonious and enthusiastic 2. It connects to project current site, project can save time for driving. 3. Some areas are flooding.	# Road condition is convenient # 1. farmers are interested and enthusiastic # For yield, some areas it increased and some it decreased	1. it's too far, road condition is terrible 2. Yield is moderate
Marketing	Flooding area, there are 655 people in this village, mainly income is from crops cultivation and main crops are rice and cassava, second crops are corn, kitchen vegetable and indigo. Advantage: Farmers can grow crops, they have experiences and high motivation. farmers sell products by themselves in district market. Disadvantage: it's flooding 5 years continuely cause to cultivation, in dry season lack of water.	There are 1162 people, farmers grow rice and grow corn around river bank, farmers who has the area around river bank can get income from cultivation. Advantage: Farmers can grow crops and there are customers come and buy in the village. Disadvantage: It's flooding area, lake of labors. Vegetable is not high because many farmers grow the same crops	Main income is from rice and cassava, farmers are interested in growing cassava as products more than growing vegetable Advantage: Farmers are happy with their income, there is one farmer interst to grow vegetablep as product Disadvantage: Farmers have no area for cultivation-no motivation and lack of labors, also flooding.	Advantage: Farmers are interested in project, farmers have experiences about cultivation, Main income get from vegetable and livestocks selling. Irrigation do not use electricity. Disadvantage: There is no market (farmers can grow but it can not sell), farmers use chemecal for cultivation	Advantage: Farmers are interested in project 2. farmers have experiences for cultivating 3. Farmers have tried many varieties 4. Main income is from agriculture Disadvantage: Distance is too far, there is no market for selling products
Planning	1. there is lake surrounding the village, it's flooding every year and difficult to access in rainy season 2. People are interested to work with project 3. People in this village just grow crops for self-consumption, not for sales.	1. it's big village, there are many people (800-1000 people) 2. It connects to Nongbualuang (Dry season) 3.Farmers have high motivation	1. It's close to the current site (Nong Boua Luang Site) 2. farmers are enthusiastic and interested. 3. It's flooding every year 4. there was no project to support	1. Road condition is comfortable (Route 9) 2. farmers are interested in growing vegetable. 3. It is big project and many villages are included (it's difficult for controlling)	1. Distance is too far (Terrible) 2. Farmers have techniques for cultivation 3. WUG is not strong enough 4. There are other projects are supporting (SNV, WS)

2) All team members confirm this result. After this, each group gives score, and calculate total score in each site. Team select new project sites in order from highest score.
This score and survey results are reported in PMU meeting to get agreement in official.

Giving score and explaining the reason

Score of candidate sites

Activities	Xaiphouthong	Phin	Songkhone		Xaiphouthong	Champhone	Songkone	Vilabouly	Champhone
	Kouttapoh	Huaysakhuang	Songkhone	Nongderen	Namphou	Thoad	Singtha	Natur	Sakuen
Irrigation	5	3	4	4	2	1	2	1	2
Agriculture	4	4	3	4	3	4	3	2	2
Marketing	4	5	3	2	4	2	3	3	2
Planning	4	4	3	3	3	3	2	2	1
Total	17	16	13	13	12	10	10	8	7

Score (Priority)
5 Very high 4 High 3 Moderate 2 Low 1 No need

(6) To hold introduction meeting to new sites

1) After agreement, Selection Team has introduction meeting to new site to explain overview of PAD project for District governor, Director of DAFO, village authority, WUG and related people.

(Implementer: PAFO, DPI, DOIC)

(Explanation)

1) After PMU meeting agree with new sites, PAFO and DPI organize introduction meeting to new site members. In 2nd survey, Team explained outline PAD project, but they need to announce to all related members in new site about project.

<Introduction meeting>
Purpose: To announce that project selected new site and start activity in official.
To make related people of project understand project policy and approach style.
Participants:
- District Governor - DAFO (Director, Staffs) - DPI of District
- DOIC of District - Head of village - WUO (board member)
- Woman's union - Farmers - Others (If necessary)

Presenter
- PAFO (Planning section) - DPI

Venue: DAFO office or District office

Introduction meeting (Xonnabouly)

Introduction meeting (Songkhone)

The form of implementation of PAD project consisting 3 parts : self-capacity building, listening farmer's proposition and participate regularly, actively cooperation with related sections and 5 results:

- Establish PAPC including PAFO and DPI, DOIC and DOF.
- Capacity building for PAFO and DAFO staffs for project implementation and budget planning.
- Improve irrigation facilities effectively: enhance the ability to reduce irrigation fee and extend Irrigated area.
- Improve protection of cultivation, increase rice production, sale promotion, market-oriented production.
- Expand the project to other areas
- Summarized information focus on following:
  a. How is cooperation and coordination in district level? Is it cooperation well? Have high motivation and enthusiastic to implement project or not?
  b. Observe district development strategy in the area will be developed.
  c. For transportation, is it Accessible?
  d. Which parts of area or irrigation system should be extended or improved?
  e. Are farmers interested to join 3 main activities of projects or not?

VIII Monitoring & Evaluation

1 Purpose and overview of this activity

1) Monitoring is to grasp current situation in order to evaluate project.
2) Evaluation is to clarify achievement by project activity and consider graduation.
3) Monitoring & Evaluation team finds out good practice for announcement with this activity.

(Implementer: PAFO, DPI)

(Explanation)

1) Monitoring activity has the following purpose.
- To monitor Direct effects and indirect effects or change of some activities before and after finish the project.

2) Evaluation activity has the following purpose.
- To check and evaluate the project achievement of quantities and qualities base on the set plan of project activities.
- To see the progress and indicator set, and try to improve also consider for on-time achievement.
- To summarize the goodness and weakness points of the lesson learned, to report and request for recommendation of the related people to improve the activities.

3) Make a good practice to disseminate PAD model from Monitoring and Evaluation results.
- Monitoring & Evaluation team collects many quantitative and qualitative information through observation and interview to DAFO, WUG and farmers.
- There are a lot of good point in every project site. The team finds out those good points and summarize them as Good Case Study for making an appeal.
- The team presents the Good Case Study to related people, section and stakeholders to extend PAD model.

<M&E team needs to support other teams.>
M&E team doesn't work with farmers and WUGs, they observe activities of each teams and collect their results.
They need to point out not only goodness but also weakness. But they shouldn't become like supervisor or boss, they should become supporter for other teams.
In generally speaking, most people can point out weakness easily, but it is difficult to find out good points. Good points might rise up motivation, but giving weakness without useful recommendation might spoil motivation of farmers, WUGs and DAFOs.
M&E team should understand this and always pay attention how team support to other teams and activity for successful of project.

2 The method of monitoring and evaluation

1) Monitoring & Evaluation implements observation after rainy season and dry season.
2) This observation is mainly interview to DAFO and data collection from DAFO.

(Implementer: PAFO, DPI)

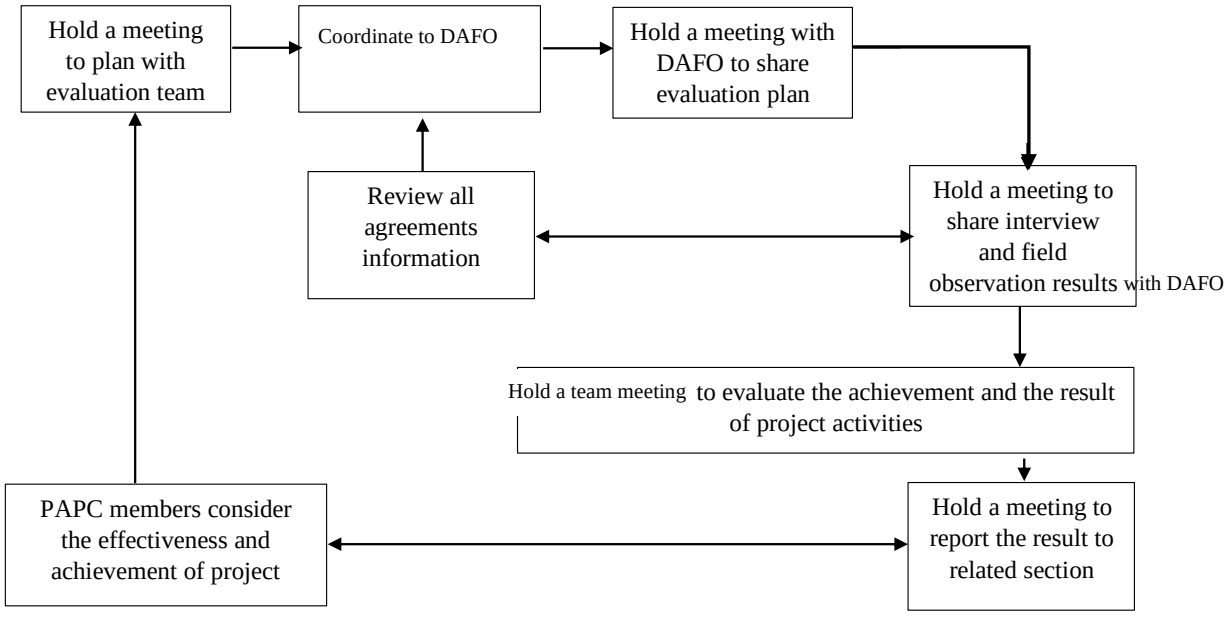
(Explanation)

1) Term of Monitoring & evaluate observation:
   - Observation period for dry season: June- July <December to May **(dry season)>**
   - Observation period for rainy season: December- January < June to November **(rainy season)**

The participant of interview
- DAFO and implementor of this activity (Interviewee)
- PAFO, PDI (Interviewer)

The rule and process:
- Hold a meeting to interview the participant ~~(2.2)~~, the meeting room should suitable for the participants' number.
- PAFO leads the meeting and introduce how to use a form and questionnaire, DAFO responsible for recording the information to a form.
- The interviewer should make sure all answer you get clear or not

The cycle of monitoring and evaluation



2) Interview observation to DAFO.

- This observation is implemented to DAFO staffs by M&E team. At first, the team has meeting to DAFO staffs, and there, they explain M&E team activity and monitoring purpose, detail work and schedules. If available, not only DAFO but also planning section of district had better join this meeting.

Explanation meeting with DAFO (Xonnabouly)

Monitoring sheet 1

Cost effectiviness calculation sheet

Profile	
Name of the Project	PAD project
Project Owner	Xaibouly DAFO
Siet	Somsa-ad
Monitoring season	2017/18 Dry season

Farmers' incremental revenue by PAD project			Before Project (2016/17DS) (a)		With Project (2017/18DS) (b)
Cultivation area (ha)		A	100	A'	115
Rice Yield (kg/ha)		B	2,500	B'	2,600
(Rice production (ton))	A*B/1000		(250ton)		(299ton)
Unit selling price (kip/kg)		C	2,200	C'	2,000
Farmers income (Kips)	D=A*B*C	D	550,000,000	D'	598,000,000
Admin, Fund and others' expenses paid to WUG (Kips/ha)		F	300,000	F'	350,000
Total expenses (Kips)	G= F*A	G	30,000,000	G'	40,250,000
Electricity (=Water fee) fee paid to WUG (kips/ha)		H	200,000	H'	250,000
Electricity fee (kips)	I = H*A	I	20,000,000	I'	28,750,000
Revenue (Income - expenses - electricity fee)	J =D-G-I	J	500,000,000	J'	529,000,000
Increasing revenue by the project	K'=J'-J			K'	29,000,000

Project cost

Administaration cost (Daily allowance, Fuel fee etc.)			L'	17,000,000
Farmers' training cost			M'	8,000,000
Others			N'	500,000
Total Cost for the Project	O'=L'+M'+N'		O'	25,500,000

Cost Effectiveness	Q'=K'/O'		Q'	114%

Monitoring sheet 2

Cost-effectiveness monitoring sheet

Items	Target indicator	1st period (2017/18DS)	2nd period (2018RS)	3rd period (2018/19DS)	4th period (2019RS)	5th period (2019/20DS)
Cultivation area		-115ha Area increased 15ha before project.				
Rice yield (Rice production)	increase by more than 10% since the beginning of the project	-2600kg/ha (average) (Production 299ton) The weather was normal. Yeild increased 100kg/ha.				
Unit selling price		-2000kips/kg Price decreased 200kip/kg compared to last year.				
Increasing revenue by the project		-29,000,000kips				
Project cost		-25,500,000kips Admin cost of the whole was 67%.				
Cost-Effectiveness		114%				
Comments on the Cost Effectiveness		First year's 114% can be said effective although selling price was down.				

Monitoring sheet 3

ຕາຕະລາງ 3

ຕາຕະລາງ ການປະເມີນຜົນ ຄວາມສຳເລັດຂອງໂຄງການ ນາແຊງ ປີ.....		
ກະສິກຳ	**ຕະຫຼາດ**	**ຊັບລະປະທານ**
ຜົນສຳເລັດ ທີ່ເປັນປະລິມານ	(ຜົນສຳເລັດ ທີ່ສາມາດຄິດໄລເປັນປະລິມານ)	(ຜົນສຳເລັດ ທີ່ສາມາດຄິດໄລເປັນປະລິມານ)
(ຜົນສຳເລັດ ທີ່ເປັນຄຸນນະພາບ)	(ຜົນສຳເລັດ ທີ່ເປັນຄຸນນະພາບ)	(ຜົນສຳເລັດ ທີ່ເປັນຄຸນນະພາບ)

3 Meeting with DAFO, interview farmers and field observation

1) M&E team collects all information from DAFO and interviews them.
2) In order to find out good case study, the Team implement farmer's interview and field observation.

(Implementer: PAFO, DPI, DAFO)

(Explanation)

1) Meeting with DAFO:
   - Meeting with DAFO is very important because they work directly with farmers, so we have to interview them to collect clear information, check their work every 3 months and annual reports.
   - For this meeting, DAFO fill in all blanks in Monitoring sheet 1 except input cost, Monitoring sheet 2, Monitoring sheet 3.
   - For this meeting, PAFO Planning section prepare input cost which is total expenditure for all activities; Travel allowance, Daily allowance and others.

Project input cost

ມູນຄ່າ ການໃຊ້ຈ່າຍລົງປະຕິບັດວຽກງານ						ຕາຕະລາງ 4
ກິຈະກຳ	ລາຍການ	ຕົ້ນທຶນ	ສົມສະອາດ	ໃໝ່ຫອງ ດອນແຍງ	ແກ້ງກອກເໜືອ	ອື່ນໆ
ດ້ານຊົນລະປະທານ	ອັດຕາກິນ					
	ຝຶກອົບຮົມ					
ດ້ານກະສິກຳ	ຝຶກອົບຮົມ					
	ອຸປະກອນຝຶກອົບຮົມ					
	ອັດຕາກິນ					
ລວມທັ້ງໝົດ						

   - In this meeting, the implementors should consider the information that we got, and the recording of WUG and farmers to get the agreement with each other. (see the reference form)
   - We should make sure the information that we have enough to share to related section and can get their recommendation to improve the activities.

DAFO Meeting

DAFO Meeting

<Focal point at meeting>

M&E team should pay attention not to make DAFO staffs afraid this activity. The team needs to explain that this activity isn't evaluate DAFO and DAFO staffs work performance. In generally speaking, when higher section comes to local office, local staffs can't tell real situation in field.

If the team continues the meeting under this situation, they may report that farmers and WUG didn't work well, most farmers didn't follow Government order, etc. Our team can't know truth.

Therefore, M&E team explains them many times; "We don't evaluate DAFO. We just collect field situation for improve and find out good point in field."

2) Interview farmers and field observation for Good Case Study

- This interview and field observation are collection of good information mainly. All project sites might have good point in somewhere. The team should try to find out this point.
- Before implementation, M&E team have internal meeting to make clear this survey purpose, interviewee, questionnaire, survey schedule.

Internal meeting

Survey schedule and question

<Focal point for survey>

This survey needs farmers cooperation for interview and field visit. M&E team should be conscious this survey uses farmer's time. Agriculture activity, Irrigation activity and Marketing activity give farmers and WUGs many useful information and techniques for farm income increase. So, farmers are happy to use time for them. But M&E activity can't give them anything. Our team need to understand and pay attention not to use farmer's time too much on interview and field visit.

2-1) Farmers interview

- Interview the farmers is very important, so the implementor should pay attention and high responsibility (see the reference form)
- The interview time need to finish within 30 min not to disturb farmers and WUGs.

Farmers interview

Farmers interview

2-2) Field observation

- The implementors should ask a general question for farmers to easily understand or ask them what they had done, then record short main information. If we interested in some points, we can ask them to clarifies, if possible take a picture to add in the report will be good.

Farmers field visit

Canal observation with DAFO

<We are equal.>

PAD project's main players are farmers, and DAFO staffs are main supporters. This means Provincial government staffs equal to farmers and DAFO. M&E team needs to respect them.

(The questionnaire)

ຮ່າງຄຳຖາມ ສຳພາດຊາວນາຜູ້ເຂົ້າຮ່ວມກິດຈະກຳໂຄງການ					
1. ດ້ານການຜະລິດ ແລະ ລາຍຮັບ					
ໄດ້ເຮັດນາແຊງບໍ່ປີນີ້					
ປີນີ້ປູກເຂົ້ານາປີ ຈັກເຮັກຕາ		ຜົນຜະລິດຈັກກະສອບ		ໄດ້ຂາຍຈັກກະສອບ/ໂຕນ	
ປີນີ້ປູກເຂົ້ານາແຊງ ຈັກເຮັກຕາ		ຜົນຜະລິດຈັກກະສອບ		ໄດ້ຂາຍຈັກກະສອບ/ໂຕນ	
ເຮັດສວນປູກຜັກບໍ ຈັກຕາແມັດ		ມີຈັກຄົນແຮງງານເຮັດສວນ			
ມີຜັກຊະນິດໃດແດ່ / ຜັກຊະນິດໃດໄດ້ຂາຍດີ					
ໄປຂາຍຢູ່ໃສ/ມີຜູ້ມາຊື້/ຂາຍຍ່ອຍ ຫຼືຂາຍສົ່ງ					
ໄປຂາຍຈັກຄັ້ງ ຕໍ່ເດືອນ		ໄດ້ຄັ້ງລະເທົ່າໃດ			
		ລວມຍອດຂາຍມາຮອດປະຈຸບັນ			
2. ການຈ່າຍເງິນຄ່ານ້ຳຊົນລະປະທານ					
ນາປີຜ່ານມາ(ຕ້ານແລ້ງ)ໄດ້ຈ່າຍເງິນຄ່າຊົນລະປະທານບໍ		ຈຳນວນເທົ່າໃດ		ຍັງຄ້າງເທົ່າໃດ	
ນາແຊງປີນີ້ຈ່າຍເງິນຄ່ານ້ຳຊົນລະປະທານບໍ		ຈຳນວນເທົ່າໃດ		ຍັງຄ້າງເທົ່າໃດ	
ໜີ້ຄ້າງຈ່າຍຜ່ານມາມີບໍ / ມີປີໃດແດ່		ຈຳນວນເທົ່າໃດ			
ຈ່າຍໃຫ້ໃຜ					
ມີໃບຍືນບໍ/ຂໍເບິ່ງເປັນຫລັກຖານ					
3. ດ້ານລາຍຈ່າຍຂອງຄອບຄົວ					
ຈຳນວນໃນເຮືອນມີຈັກຄົນ		ຄ່າໃຊ້ຈ່າຍສະເລ່ຍ/ເດືອນ		ພຽງພໍ/ບໍ່ພຽງພໍ	
ຮຽນໜັງສືຈັກຄົນ					
ປະຖົມ		ຄ່າໃຊ້ຈ່າຍສະເລ່ຍ/ເດືອນ			
ມັດທະຍົມ		ຄ່າໃຊ້ຈ່າຍສະເລ່ຍ/ເດືອນ			
ມະຫາວິທະຍາໄລ/ວິທະຍາໄລ		ຄ່າໃຊ້ຈ່າຍສະເລ່ຍ/ເດືອນ			
4. ການສ້າງລາຍຮັບນອກການຜະລິດກະສິກຳ					
ໃນຄອບຄົວມີຄົນໄປເຮັດວຽກນອກບໍ		ເຮັດວຽກຍັງ/ເຄີຍໄປເຮັດເລື້ອຍໆບໍ		ໄດ້ລາຍຮັບສະເລ່ຍ/ເດືອນ	
ໄປເຮັດວຽກຕ່າງປະເທດຈັກຄົນ					
ໄປເຮັດວຽກຕ່າງແຂວງຈັກຄົນ					
ໄປເຮັດວຽກຕ່າງເມືອງຈັກຄົນ					
ໄປເຮັດວຽກພາຍໃນບ້ານມີຈັກຄົນ					
ວຽກຫຍັງທີ່ສາມາດສ້າງລາຍຮັບໄດ້ຫຼາຍກວ່າໝູ່					
ນອກຈາກວຽກນີ້ແລ້ວ ມີວຽກອື່ນໆບໍ					
5. ຄວາມກະຕືລືລົ້ນ ຫຼື ຄວາມສົນໃຈອື່ນໆ					
ແຕ່ກ່ອນມີພະນັກງານລັດ/ບໍລິສັດເຂົ້າມາຝຶກອົບຮົມບໍ	ຫົວຂໍ			ມີຈັກຄັ້ງ	
ປີໃດ	ຊື່ໂຄງການ			ຜູ້ໃຫ້ທຶນ	
ການຝຶກອົບຮົມໂຄງການນີ້...ມີຄວາມສົນໃຈແນວໃດ					
ຫົວຂໍ້/ເນື້ອໃນ/ວິທີການອົບຮົມ ແທດເໝາະກັບພວກເຮົາບໍ					
ໄດ້ນຳຄວາມຮູ້ໄປນຳໃຊ້ໃນຕົວຈິງບໍ					
ຜົນໄດ້ຮັບ/ມີການປ່ຽນແປງແນວໃດ					
ຄອບຄົວອື່ນໆ ໃກ້ຄຽງມີຄວາມສົນໃຈແນວໃດບໍ					

*This questionnaire is basic questions. When interviewers want to focus on another topic, they can ask another question depend on situation.

4 Summarize the monitoring data and evaluation

1) M&E team organizes all information and summarizes them.
2) To fill in check list based on these results and make charts using quantitative data like rice yield, irrigation area and vegetable sales amount.
3) For dissemination and announcement of PAD model, the team makes Good Case Study sheet.

(Implementer: PAFO, DPI)

(Explanation)

1) To summarize all information.

All information from monitoring, and interview results.

The team collects following information.

Direct results:

1) Irrigation / Irrigated area increase and number of farmers increases.
2) Agriculture / Yield increase.
3) Marketing / Sale amount increase and number of farmers increases.
4) WUG / Irrigation fund increase, paid the electric fee in each season. (see the questionnaire)

Indirect results:

DAFO and farmers who joined the training, study tour, can be an expert on each topic. Indirect results are very important for direct results because direct results are the implementation of DAFO by using indirect results to get the achievement of qualities and quantities. (see the Monitoring sheet 3)

2) To fill in check list and make chart.

M&E team fills in check list in order to evaluate project achievement. At that time, they need to make charts regarding quantitative data for report.

Summarize information, Making check list

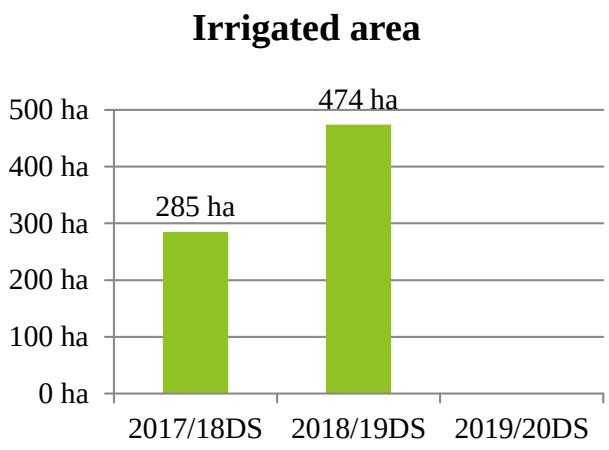
Chart making

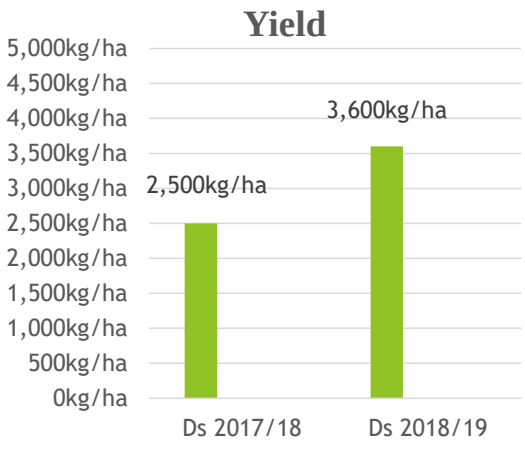
Check list of project achievement

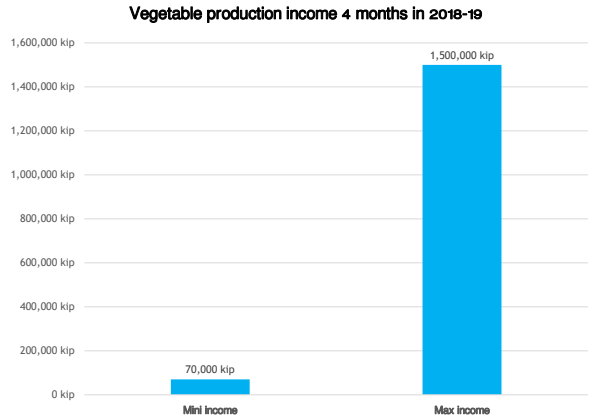
Check list of project achievements (Site:)

	Completed	(Comment)	Partially completed	(Comment)	No activity	(Comment)
1 Agriculture (Rice)						
(1) Production volume increases by at least 10% since project started.						
(2) 50% of households participates in the training program.						
(3) 70% of the households who participated in the training programs applies the key techniques, seed selection, fertilizer application, pest control, etc.						
2 Marketing (Vegetable)						
(1) Income from the vegetalbe production of households who adopted the PAD method increases at least 25% since project started.						
3 Irrigation						
(1) Irrigated area increases at least 20% since project started.						
4 Water User Organization						
(1) Regular meeting in dry season(Nov. - April) holds in every month.						
(2) Accounting is recorded in appropriately.						
(3) Electric fee is collected 100% and paied electric company completely.						
(4) Water fee (administration, irrigation fund) is collected at least 95% of plan.						
(5) Old electric debt reduces since project started. (as far as WUO has evidence of farmers' old debt)						
(6) Irrigation Fund increases since project started.						
(7) WUO has long-term rehabilitation plan of irrigation facilities.						
(8) Irrigation facilities are maintained by WUO.						
(9) Board member election is implemented according to regulation.						

Chart sample





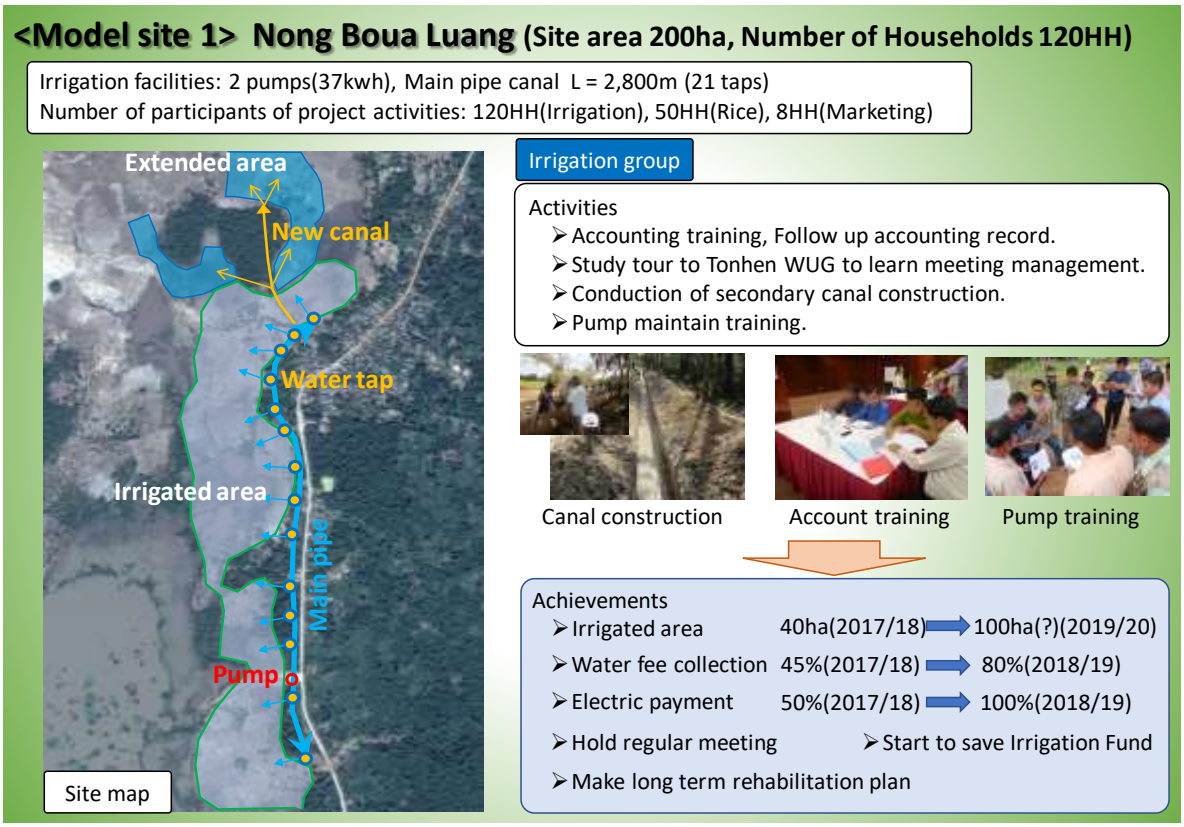


3) Good Case Study making (Model site sheet)

- M&E team collects many good things in project sites in interview and field survey. The team has responsible to announce project good achievements to related people including high ranking persons.
- In order to disseminate PAD model to other sites, it is necessary for high ranking persons to understand project's success case. Furthermore, when PAD model starts other sites, stakeholders; who are DAFO, Village authority, WUG and farmers, need to know about PAD project and approach style. Thus, the team make Good Case Study (Model site) for them.

<What changed with project?>
When making Case Study sheet, we need focus on not only number results but also farmer's life style, economic condition and agriculture work condition.
PAD model aims to increase farm income for better life. Increasing of yield, irrigated area and vegetable harvest amount are tools for farm income.
So that, Case Study sheet needs to show both information.

(Case study sheet)



Agriculture group

Activities
- Strengthen cultivation techniques (Lending seed and fertilizer program).
  [Training contents]
  Soil preparation, Seed selection, Basal dressing, Top dressing, Pest control, Pre-Post harvest
- Technical conduction in Intensive Guidance Field (IGF).

Training

Field conduction at IGF

Left: Program field, Right: Normal field

Achievements
- Number of trained farmers **HH(2018/19DS, 2019RS, @2019/20DS)
- Yield of participant farmers 2,020kg/HH(2017/18DS) ➡ 2,882kg/ha(2018/19DS)

What changes farmer's life? (by farmers' interview)

- ❖Increased income because they afforded to sell rice by yield increase.
- ❖They can save money and support family, relatives using income.
- ❖Rise up their motivation to follow those techniques because they believe the project techniques.
- ❖They are satisfied that C/Ps trained many techniques and conduction in field.

Marketing group

Activities
- Start up meeting with villagers to announce the participation of marketing activity and vegetable cultivation.
- Farmers' training
  Reviewing current financial situations, Crop selection based on market survey by farmers,
  Basic crop cultivation training (Compost making, Bio-pesticide making, Soil preparation and others.)
  Crop cultivation plan making, Study tour, Field observation and technical support
- Sales promotion (Facebook, Advertised on TV, Restaurants and shops visit)
- Introduction of roofing cultivation in Rainy season

Training (cultivation plan)

Compost making training

Business matching for crop

Roof cultivation in Rainy season

Achievements

What changes farmer's life? (by farmers' interview)

- ❖Increased income for selling vegetables, thus, family economic are better than before.
- ❖In order to cultivate more vegetables, farmer invested the electric pump. (before, he used watering can)
- ❖Farmers' motivation are very hight because C/Ps teach many techniques and always support to them.
- ❖Farmers would like to extend roofing to cultivate more vegetable for increase income.

5 Consider to graduate or stop support some achievement activities.

1) PAD model aims independence of farmers. Thus, when activities achieved necessary results, support needs to terminate. M&E team considers the graduation of project sites and report to PAPC meeting to get agreement.

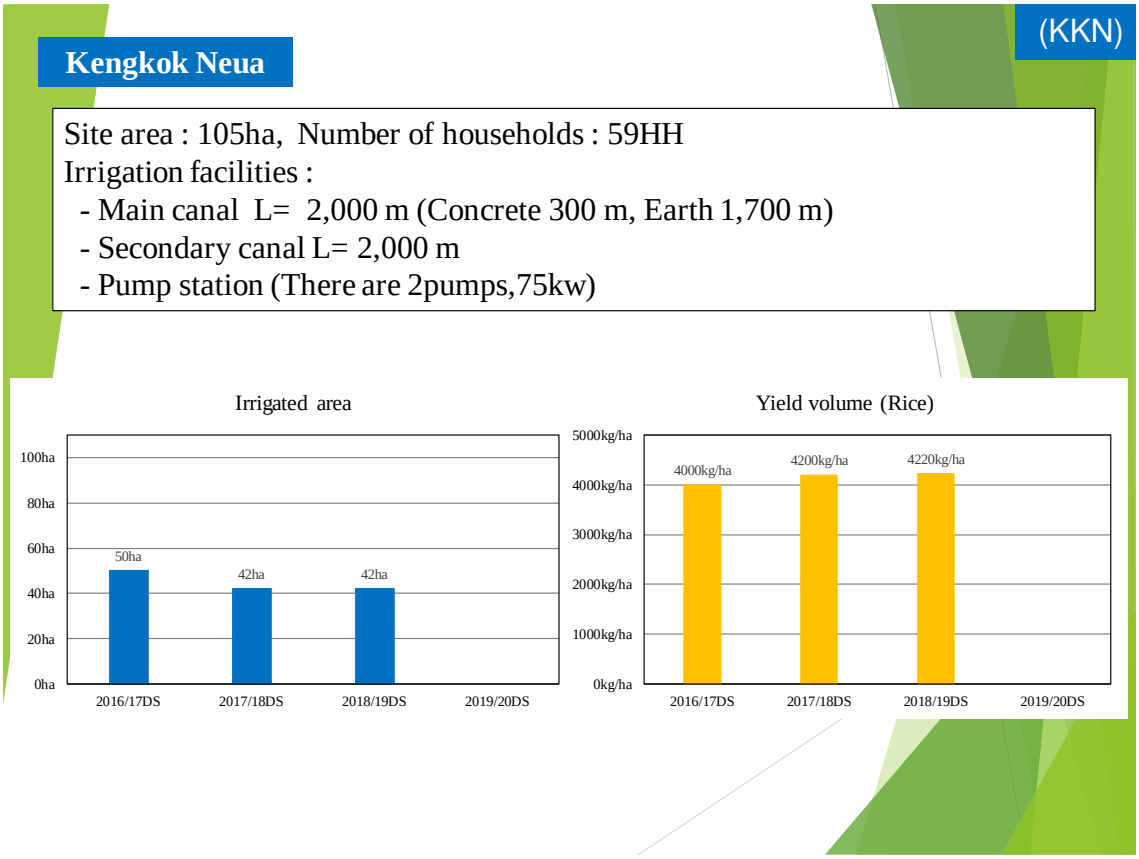
(Implementer: PAFO, DPI)

(Explanation)

1) To consider Input cost and Benefit by project activity.
- The budget is the ratio between the income and project implementation cost of each activity. If the result of budget invested cost lower or equal 100%, that's mean not effective, but if the ratio is higher than 100% that's mean effective.
- When M&E team collect benefit and input cost data, they calculate the ratio of benefit and cost.
  * Benefit: How much sales amount of rice and vegetable increased during project term.
  * Input cost: How much PAFO and DAFO spent budget for that site.
  * Ratio = Benefit / Input cost.

2) To report to PAPC meeting and make consensus a graduation.
- M&E team considers whether project site graduate or not from check list. When a site achieved all items on check list sheet, the site needs to graduate and implement all activities by farmers, WUGs and DAFO support without special budget.
- The team make these report documents for PAPC members.
- The evaluation team has to make summarize reports by the term of project implementation to report to related sections to get their recommendation to improve our activities.

(Report sample to PAPC meeting)



(KKN)

1. Water User Organization, Farmers

1) Rice cultivation training (Participant: 9farmers, Training course: Soil preparation, Seed selection, Fertilizer application, Pest and diseases control, Harvesting and other.
2) Accounting and Maintenance training (Participant: WUG, DAFO, Training course: Accounting record, Making long-term rehabilitation)
3) Accounting study tour to TH (Participant: WUG, DAFO)
4) Pump maintenance training (Participant: WUG, DAFO, Training course: Daily inspection and maintenance, Overhauling)

2. Capacity building of C/Ps

1) Accounting and Maintenance training (Participant: WUG, DAFO)
2) Accounting study tour to TH (Participant: WUG, DAFO)
3) Pump maintenance training (Participant: WUG, DAFO)
4) Meta-facilitation training (Participant: 3 DAFO staffs)
5) Agri-Marketing training (Participant: DAFO, Training course: Market survey and analysis, Crop selection, Sales promotion)

3. Input cost

1) 2017/18DS :5,024,250kip
2) 2018/19DS :5,195,000kip

(KKN)

Check list

1 Agriculture (Rice)		Completed	Partially completed		No activity
(1)	Production volume increases by at least 10% since project started.		*	5.5% increased Before 4,000kg/ha -> Present 4,220kg/ha	
(2)	50% of households participates in the training program.		*	15% of households participated (9HH/59HH)	
(3)	70% of the target households who participated in the training programs applies the key techniques, soil preparation, seed selection, fertilizer application, pest control		*	56% of households applied key techniques (5HH/9HH)	
2 Marketing (Vegetable)					
(1)	Income from the vegetable production of households who adopted the PAD method increases at least 25% since project started.			*	All farmers weren't interested in vegetable production who adopted the PAD method.
3 Irrigation					
(1)	Irrigated area increases at least 20% since project		*	1st year and 2nd year area decreased, but this	

(KKN)

4 Water User Organization		Completed	Partially completed	No activity
(1)	Regular meeting in dry season(Nov. - April) holds in every month.		* Held meeting in November only	
(2)	Accounting is recorded in appropriately.	* WUG records account in appropriately.		
(3)	Electric fee is collected 100% and.	* Electric fee in 2018/19 paid 100%.		
(4)	Water fee (administration, irrigation fund) is collected at least 95% of plan.	* Water fee was collected 100%.		
(5)	Old electric debt reduces since project started. (as far as WUO has evidence of farmers' old debt)		* WUG starts paying back old debt gradually.	
(6)	Irrigation Fund increases since project started.		* Irrigation Fund starts to save. (3mill.kip, as for now)	
(7)	WUO has long-term rehabilitation plan of irrigation facilities.	* Made already.		
(8)	Irrigation facilities are maintained by WUO.	* WUG use 2pumps and extended main canal.		
(9)	Board member election is implemented according to regulation.	* Implemented in 2019		

(KKN)

Summarize

1. Agriculture
   1) Rice yield volume increased 5.5% compared to beginning project.
   2) participated in the training programs applies the key techniques, soil preparation, seed selection, fertilizer application, pest control, harvesting and so on only 15% of participants are not made achievement.
2. Irrigation, WUG
   1) Irrigated area hasn't increased in first and second year
   2) WUG doesn't have regular meeting.
   3) Water fee and Electric fee are collected 100% in last dry season.
   4) Electric fee are payed to company. And WUG starts paying back old debt gradually.
   5) Group fund is less, it is on plan.
   6) WUG has long term plan for maintenance and maintain by themselves
   7) Finished new board member election in 2019.

Conclusion

According to evaluation, achievements partially. But each team has to improve their project activities for graduation. After harvesting in this dry season, M&E team needs to monitor again.

Attachment

1 Rice cultivation training materials

(1) Training 1

(Timing of training--- For dry season: November, For rainy season: June)

(2) Training 2

(Timing of training--- For dry season: December-January, For rainy season: July-August)

Training 3

(Timing of training--- For dry season: January-February, For rainy season: August-September)

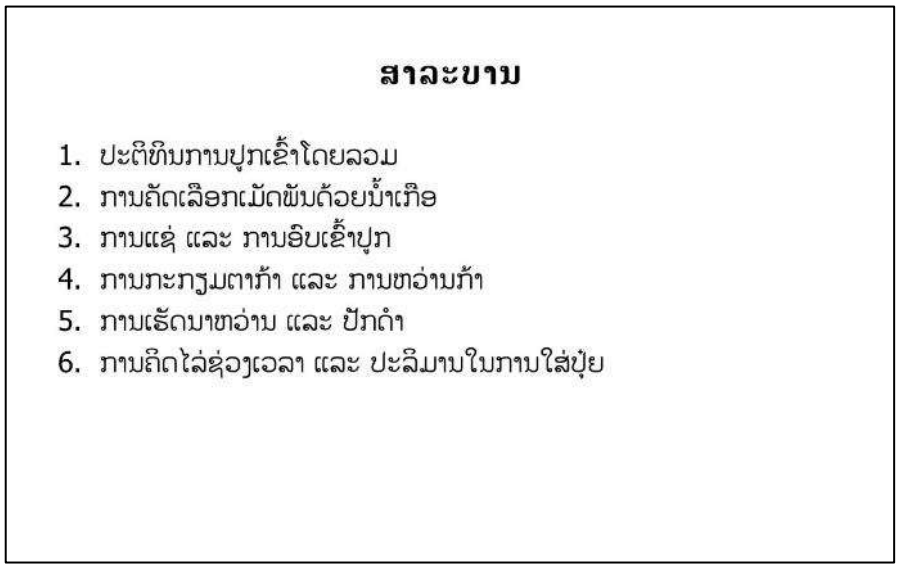
(3) Training 4

(Timing of training--- For dry season: March, For rainy season: September)

(Training 1)

Slide 1

Slide 2



Slide 3

(Training 1)

Slide 4

1. ປະຕິທິນການປູກເຂົ້າໂດຍລວມ

1.1 ປະຕິທິນການປູກເຂົ້ານາຫວ່ານ

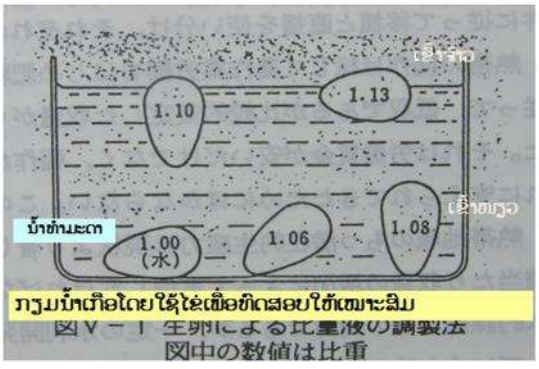
Slide 5

2. ວິທີຄັດເລືອກເມັດພັນໂດຍໃຊ້ນ້ຳເກືອ

- ເອົານ້ຳເກືອປະສົມໃສ່ນ້ຳໃນຖຸໃຫ້ມີຄວາມຖ່ວງຈຳເພາະປະມານ 1.06.
- ເກືອ 2 ກິໂລ, ນ້ຳ 30 ລິດປະສົມໃຫ້ເຂົ້າກັນລະອຽດເພື່ອກວດເບິ່ງຄວາມດຸ່ນ ດ່ຽງຂອງໄຂ່ດິບທີ່ ເອົາເຫັນດັ່ງໃນຮູບທີ 01 ຂ້າງລຸ່ມ:
- ເມື່ອສັງເກດເຫັນໄຂ່ມີລັກສະນະແນວນອນສະແດງວ່າຢູ່ໃນນ້ຳບໍ່ມີເກືອປະສົມ (1.00)
- ເມື່ອສັງເກດເຫັນໄຂ່ມີລັກສະນະແນວຕັ້ງ(1.08)ສະແດງວ່າຄວາມເຂັ້ມຂຸ້ນຂອງເກືອຢູ່ໃນ ປະລິມານສູງໂພດ, ບໍ່ເໝາະສົມໃນການຄັດເລືອກເມັດພັນເຂົ້າໜຽວ.
- ເມື່ອສັງເກດເຫັນໄຂ່ມີລັກສະນະທ່າອ່ຽງ(1.06)ສະແດງວ່າຄວາມເຂັ້ມຂຸ້ນຂອງເກືອຢູ່ໃນປະລິມານ ທີ່ເໝາະສົມສຳລັບການຄັດເລືອກເມັດພັນເຂົ້າໜຽວ.

Slide 6

ຮູບພາບ: ກຽມນ້ຳເກືອໂດຍໃຊ້ໄຂ່ເພື່ອທົດສອບໃຫ້ເໝາະສົມ



(Training 1)

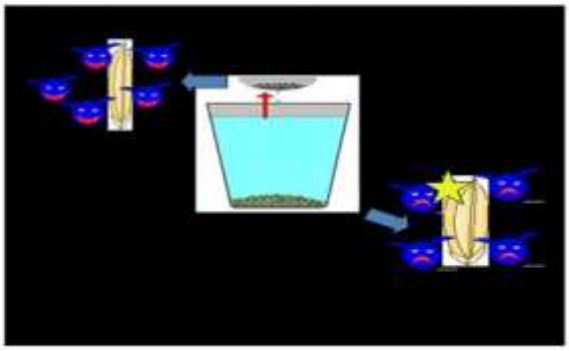
Slide 7

❖ ຮູບພາບ: ວິທີແຊ່ນ້ຳເກືອ

Slide 8

❖ ວິທີເອົາເມັດພັນເຂົ້າລົງໃສ່ນ້ຳທີ່ປະສົມເກືອແລ້ວ

- ເອົາເມັດພັນລົງໃສ່ນ້ຳເກືອທີ່ປຸໃນຖັງແລ້ວຄົນເຂົ້າກັບນ້ຳເກືອໃຫ້ລະອຽດ.
- ຫຼັງຈາກນັ້ນເອົາຈະສັງເກດເຫັນເມັດພັນເຂົ້າຟຸຂຶ້ນໜ້ານ້ຳແລ້ວຕັກເອົາອອກຖິ້ມ
- ໃຫ້ເລືອກເອົາແຕ່ເມັດທີ່ຈົ່ມລົງໃນນ້ຳ(ເພາະວ່າເປັນເມັດເຂົ້າທີ່ສົມບູນສາມາດໃຫ້ຄວາມງອກສູງ ແລະ ມີພູມຕ້ານຕໍ່ພະຍາດ).



Slide 9

❖ ວິທີທຳຄວາມສະອາດເມັດພັນເຂົ້າຫຼັງຈາກຄັດເລືອກແລ້ວ

- ຕ້ອງລ້ຳງເມັດພັນດ້ວຍນ້ຳທຳມະດາໃຫ້ສະອາດ ຖ້າຫາກສາມາດລ້ຳງຢູ່ຕາມແມ່ນ້ຳ ຫຼື ເຊ, ຍິ່ງເປັນການດີ ເພາະມີນ້ຳໄຫຼຕະຫຼອດ.
- ຄວນລ້ຳງນ້ຳເກືອອອກໃຫ້ໝົດເພາະເກືອອາດຈະເປັນສາເຫດເຮັດໃຫ້ເກີດບັນຫາກັບການງອກຂອງເມັດພັນ.
- ຫຼັງຈາກລ້ຳງເມັດພັນໃຫ້ສະອາດ ແລ້ວເອົາໄປຕາກໃຫ້ແຫ້ງລະອຽດ.

(Training 1)

Slide 10

3. ການແຊ່ ແລະ ການອົບເຂົ້າປຸກ

3.1 ການແຊ່

- ບັນຈຸແນວພັນເຂົ້າໃສ່ກະສອບ(ກະສອບຫວ່ຽດຫຼືກະສອບປ່ານ)ມັດປາກກະສອບໃຫ້ແໜ້ນ ແລ້ວເອົາລົງແຊ່ນ້ຳປະມານ 24 ຊົ່ວໂມງ(1ມື້ກັບ1ຄືນ)

Slide 11

3.2 ການອົບເຂົ້າປຸກ

- ກຽມສະຖານທີ່ອົບ ຄວນປຸເຟືອງໜາ 10 ຊມ
- ເອົາກະສອບເຂົ້າປຸກທີ່ແຊ່ຂຶ້ນຈາກນ້ຳ ແລ້ວວາງລົງທາງນອນ, ຫຼັງຈາກນັ້ນກໍ່ເອົາເຟືອງມາປົກ. ໃນຊ່ວງອົບໃຫ້ກວດກາ ເຊົ້າ-ແລງ ຖ້າເຫັນວ່າເຂົ້າປຸກແຫ້ງໃຫ້ຫົດນ້ຳກະສອບ.
- ໃນການຫົດແຕ່ລະຄັ້ງໃຫ້ປັ້ນກະສອບ ເພື່ອຮັກສາຄວາມຊຸ່ມ ແລະ ອຸ່ນຂະພຸມໃຫ້ສະໝ່ຳສະເໝີ
- ໃນກໍລະນີທີ່ແຊ່ໃນໜອງທີ່ມີນ້ຳຊຸ້ມຄວນລ້າງເຂົ້າປຸກໃຫ້ສະອາດກ່ອນຈຶ່ງອົບ.
- ປະໄວ້36ຊົ່ວໂມງ ຫຼື1ມື້ເຄິ່ງ ແລະກວດເບິ່ງວ່າເຂົ້າງອກດີ ຫຼັງຈາກນັ້ນກໍ່ນຳໄປຫວ່ານໄດ້ເລີຍ.

Slide 12

4. ການກຽມຕາທ້ຳ ແລະ ການຫວ່ານທ້ຳ

4.1 ການກະກຽມຕາທ້ຳ

- ເນື້ອທີ່ຕາທ້ຳປະມານ 600 ຫາ 1,000ຕາແມັດ ສາມາດຫວ່ານເຂົ້າປຸກ 60 ກລ,
- ຄວນເລືອກໄຮ່ນາທີ່ຢູ່ໃກ້ກັບແຫຼ່ງນ້ຳ,ສາມາດລະບາຍນ້ຳເຂົ້າ-ອອກໄດ້ດີ
- ຄວນເລືອກໄຮ່ນາທີ່ເປັນດິນທີ່ອຸດົມສົມບູນ (ເພາະຖ້າທ້ຳງາມ ເຂົ້າກໍ່ມີເປີເຊັນງາມສູງ)
- ຄວນໄຖສອງຄັ້ງ ຄືໄຖຮຸດ ແລະໄຖຄົ້ນ

(Training 1)

Slide 13

- ຫຼັງຈາກໄຖຄົ້ນແລ້ວ ຄາດໃຫ້ລະອຽດ 2-3 ຄັ້ງ ແລະປັບໜ້າດິນໃຫ້ຮາບພຽງດີ,
- ແບ່ງໄຮ່ນາເປັນໜານຂະໜາດລວງກວ້າງ 2 ແມັດ ສ່ວນລວງຍາວຕາມຄວາມຍາວຂອງໄຮ່ນາ
- ເຮັດຮ່ອງລະບາຍນ້ຳລະຫວ່າງໜານກວ້າງປະມານ 40 – 50 ຊມ
- ກ່ອນຈະຫວ່ານກ້າຕ້ອງລະບາຍນ້ຳອອກໃຫ້ໝົດ


Slide 14

4.2 ການຫວ່ານກ້າ

- ອັດຕາແນວພັນເຂົ້າ80ຫາ100ກຣາມຕໍ່1ຕາແມັດ,
- ຫວ່ານໃຫ້ສະໝ່ຳສະເໝີໃຫ້ແນວພັນເຂົ້າຝັງດິນປະມານ 2ສ່ວນ 3ຂອງເມັດ
- ບໍ່ຄວນໃຫ້ເມັດເຂົ້າຫຼົ້ມຕົມໂພດຈະເຮັດໃຫ້ຕົ້ນກ້າຝັງດິນເລິກ ເວລາຫຼົກກ້າຈະເຮັດໃຫ້ກ້າໂປດ

❖ ການປ້ອງກັນຮັກສາກ້າ

- ຫຼັງຈາກຫວ່ານກ້າໄດ້ 5 ມື້ໃຫ້ຮັກສາລະດັບນ້ຳໃນຕາກ້າປະມານ 1 ຊມ
- ຫຼັງຈາກນັ້ນໃຫ້ຮັງນ້ຳຕິດຕໍ່ກັນໃນລະດັບຄວາມເລິກປະມານ 2 ຂໍ້ມື (ຂຶ້ນກັບຄວາມສູງຂອງຕົ້ນກ້າ) ເພື່ອຄວບຄຸມຫຍ້າ
- ຫຼັງຈາກຫວ່ານກ້າໄດ້ 7 ຫາ 10 ມື້,ໃສ່ປຸ໋ຍສູດ 46-00-00 ໃນອັດຕາ 0.5 ກິໂລ/100ຕາແມັດ
- ຖ້າວ່າຕາກ້າບໍ່ມີນ້ຳ ຫ້າມຫວ່ານປຸ໋ຍເພາະຈະເຮັດໃຫ້ກ້າຕາຍ
- ອາຍຸກ້າທີ່ດີທີ່ສຸດສຳລັບປັກດຳແມ່ນອາຍຸລະຫວ່າງ 20 ຫາ 25 ມື້(ສຳລັບນາແຊງ) ຕ້ອງຂຶ້ນກັບສະພາບອາກາດຂອງແຕ່ລະທ້ອງຖິ່ນ


Slide 15

5. ການເຮັດນາຫວ່ານ ແລະ ການປັກດຳ

5.1 ນາຫວ່ານ

- ຂໍ້ດີ: ຜົນຜະລິດທຽບເທົ່າກັບນາດຳ ແຕ່ຫຼຸດຜ່ອນແຮງງານ, ການເຮັດນາຫວ່ານແມ່ນບໍ່ໄດ້ເສຍເວລາຕົກກ້າ ແລະ ປັກດຳ,ຕົ້ນເຂົ້າບໍ່ຍອບຊ້ຳຈາກການຫຼົກກ້າມາປັກດຳ, ສາມາດເກັບກ່ຽວໄດ້ໄວກວ່ານາດຳປະມານ 7 ຫາ 10 ວັນ.
- ຂໍ້ເສຍ: ໃນການເຮັດນາຫວ່ານຈະຕ້ອງເສຍເວລາໃນການປັບພື້ນທີ່ໃຫ້ຮາບພຽງ,ການຄວບຄຸມວັດສະພືດຕ້ອງເອົາໃຈໃສ່ເປັນພິເສດ (ໄຖ 2-3 ຄັ້ງ).

(Training 1)

Slide 16

❖ ການກຽມດິນ

- ຄວນເຮັດນາຫວ່ານໃນຂອບເຂດທີ່ສາມາດຄວບຄຸມນ້ຳໄດ້
- ຕ້ອງປັບພື້ນທີ່ນາໃຫ້ສະໜ່ຳສະເໝີເພື່ອຄວບຄຸມລະດັບນ້ຳໄດ້ດີ
- ໄຖດິນຕາກໄວ້ປະມານ 5 -10 ວັນ(ຖ້າມີນ້ຳກໍປ່ອຍອອກ) ເພື່ອໃຫ້ເມັດຫຍ້າເກີດຂຶ້ນ, ແລ້ວຈຶ່ງໄຖກົບຄືນອີກຄັ້ງ 1 ເພື່ອເຮັດໃຫ້ຫຍ້າຕາຍ ແລ້ວປະໄວ້ອີກ 4-5 ວັນຈຶ່ງໄຖ ແລະ ຫວ່ານເລີຍ (ໄຖ 3 ຄັ້ງ).

ການປັບພື້ນແມ່ນມີຄວາມສຳຄັນທີ່ສຸດ ໃນການຄວບຄຸມຫຍ້າ ແລະ ບັນຫາໜຶ່ງຄວນເຮັດ ເປັນແປງຫ່າງກັນ 5 ແມັດ ຍາວໄປຕາມໄຮ່ນາ ວິທີນີ້ແມ່ນສະດວກໃນການຍົວລະບັດຮັກສາ ທີ່ເປັນປັດໃຈສຳຄັນໃນການເຮັດນາຫວ່ານ.

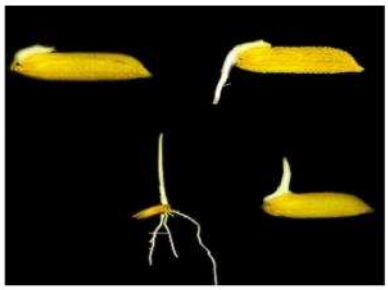
Slide 17

❖ ການກຽມເມັດພັນ

- ຫຼັງຈາກເຮັດເປັນແປງແລ້ວຄວນສັງເກດເບິ່ງດິນບໍ່ຄວນໃຫ້ແຂງຫຼືແຫ້ງເກີນໄປ,ກ່ອນຈະຫວ່ານໃຫ້ຫວ່ານເຂົ້າ 1 ເມັດທົດສອບເບິ່ງກ່ອນ, ດີທີ່ສຸດຄວນໃຫ້ເມັດພັນເຂົ້າລຸບລົງເຄິ່ງເມັດ. ການແຕກງອກຈະໄດ້ຮັບຜົນດີສຳລັບເມັດເຂົ້າທີ່ແຊ່ໄວ້12ຊົ່ວໂມງ ແລະ ບົ່ມປະໄວ້ 24-36 ຊົ່ວໂມງເມັດເຂົ້າເກີດມີຕຸ່ມຕາ,ຮາກຍາວປະມານ 1-2 ມີລີແມັດ,ຈຶ່ງນຳໄປຫວ່ານໄດ້

❖ ການບົວລະບັດຮັກສາ

- ເມື່ອຫວ່ານເຂົ້າລົງໄປແລ້ວຄວນລະບາຍນ້ຳອອກໃຫ້ໝົດແລ້ວຈຶ່ງສັງເກດເບິ່ງ
- ຫຼັງຈາກຫວ່ານເຂົ້າໄດ້ 7-15 ວັນ, ໃຫ້ປ່ອຍນ້ຳເຂົ້າປະມານ 2-3 ຊມ ເພື່ອຄວບຄຸມວັດສະພືດ (ຫຍ້າ).



Slide 18

5.2 ການປັກດຳ

- ໃສ່ປະມານ 3-4 ກົບ ຕໍ່ 1 ສຸມ
- ໄລຍະຫ່າງ: ຖ້າໃຫ້ດີສຸດແມ່ນ ປັກດຳເປັນຮຸບຈະຕຸລັດ
- ປັກດຳໃນໄລຍະຫ່າງ 20x 20 ຊມ
- ສະເລ່ຍ: ປະມານ 20 – 25 ສຸມ ຕໍ່ 1 ຕາແມັດ

(Training 1)

Slide 19

6. ການຄິດໄລ່ຊ່ວງເວລາ ແລະ ປະລິມານໃນການໃສ່ປຸ໋ຍ

6.1 ວິທີໃສ່ປຸ໋ຍຮອງພື້ນ.

- ໄຖຮຸດ,ໄຖຄົ້ນ,ຄາດປັບໜ້າດິນໃຫ້ສະໝ່ຳສະເໝີທົ່ວທັ້ງໄຮ່ນາ
- ໃສ່ປຸ໋ຍຮອງພື້ນກ່ອນຄາດຮອບສຸດທ້າຍ.
- ກ່ອນຫວ່ານປຸ໋ຍຄວນແບ່ງຈຳນວນປຸ໋ຍທີ່ຈະໃສ່ໃຫ້ຖືກກັບເນື້ອທີ່ນາແຕ່ລະໄຮ່
- ຖ້າເປັນນາໄຮ່ໃຫຍ່ຄວນແບ່ງອອກເປັນລ໋ອກວ້າງ 4-6 ແມັດ, ແລ້ວແບ່ງຈຳນວນປຸ໋ຍໃຫ້ຖືກກັບເນື້ອທີ່ນາແຕ່ລະລ໋ອກ, ຫວ່ານໃຫ້ສະເໝີກັນທົ່ວໄຮ່ນາ.

❖ ສູດປຸ໋ຍທີ່ນິຍົມໃຊ້ຮອງພື້ນແມ່ນ:

- ສູດປຸ໋ຍ 16. 20.00 ໃຊ້ກັບປະເພດນາດິນຊາຍ ແກມຕົມ.
- ສູດປຸ໋ຍ 15.15.15 ໃຊ້ສຳລັບນາດິນຊາຍ.
- ສຳລັບປຸ໋ຍທັ້ງສອງສູດແມ່ນໃສ່ໃນອັດຕາ 150 ກິໂລ/ເຮັກຕາ (ນີ້ແມ່ນຈຳນວນຂັ້ນຕ່ຳ, ຂຶ້ນກັບດິນແຕ່ລະເຂດ, ບາງເຂດສາມາດເພີ່ມຈຳນວນຂຶ້ນຫຼາຍກ່ວານີ້ກໍ່ໄດ້)

Slide 20

6.2 ວິທີໃຊ້ປຸ໋ຍເລັ່ງ

- ໃສ່ປຸ໋ຍເລັ່ງຄັ້ງທີ 1 ສຸດ 46.00.00 ຫຼັງປັກດຳ 20 – 25 ວັນ, ໃນອັດຕາ 30 ກລ/ຮຕ
- ໃສ່ປຸ໋ຍເລັ່ງຄັ້ງທີ 2 ສຸດ 46.00.00 ຫຼັງປັກດຳ 40 - 45 ວັນ, ໃນອັດຕາ 30 ກລ/ຮຕ
- ລວມປຸ໋ຍເລັ່ງ 2 ຄັ້ງແມ່ນ 60 ກລ/ຮຕ (ນີ້ແມ່ນຈຳນວນຂັ້ນຕ່ຳ, ຂຶ້ນກັບດິນແຕ່ລະເຂດ, ບາງເຂດສາມາດເພີ່ມຈຳນວນຂຶ້ນຫຼາຍກ່ວານີ້ກໍ່ໄດ້)
- ອາຍຸເຂົ້າໄດ້ 75 ວັນຂຶ້ນໄປບໍ່ຄວນໃຊ້ປຸ໋ຍເພາະຈະເຮັດໃຫ້ເຂົ້າບໍ່ກົ້ມ

Slide 21

6.3 ການຄິດໄລ່ຈຳນວນປຸ໋ຍຕໍ່ໄຮ່ນາ 1 ໄຮ່

ການຄິດໄລ່ຈຳນວນການໃສ່ປຸ໋ຍຕໍ່ໄຮ່ນາ 1 ໄຮ່

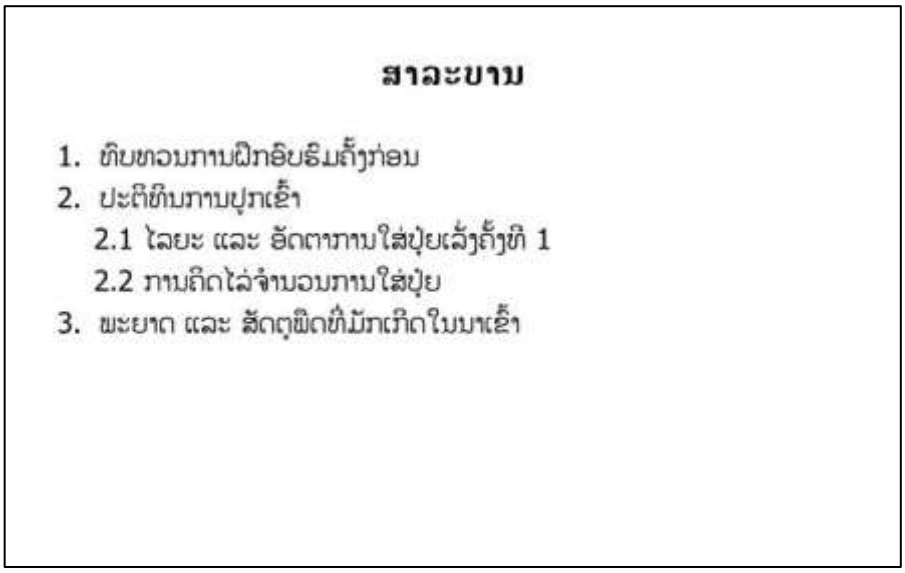
ຫ້ອງທີ	1	2	3	4	5	6	7	8	ອັດຕາ
ເນື້ອທີ່ໄຮ່ນາ ($ม^2$)	50	100	200	300	400	500	1,000	5,000	
ປຸ໋ຍຮອງພື້ນ	7.5 ຂີດ	1.5 ກລ	3 ກລ	4.5 ກລ	6 ກລ	7.5 ກລ	15 ກລ	75 ກລ	150/ຮຕ
ປຸ໋ຍເລັ່ງຄັ້ງທີ 1	1.5 ຂີດ	3 ຂີດ	6 ຂີດ	9 ຂີດ	1.2 ກລ	1.5 ກລ	3 ກລ	15 ກລ	30/ຮຕ
ປຸ໋ຍເລັ່ງຄັ້ງທີ 2	1.5 ຂີດ	3 ຂີດ	6 ຂີດ	9 ຂີດ	1.2 ກລ	1.5 ກລ	3 ກລ	15 ກລ	30/ຮຕ

ຕົວຢ່າງ: ໄຮ່ນາທ້າວ ສີ ມີເນື້ອທີ່ 250 m^2 ຈະໃສ່ປຸ໋ຍຮອງພື້ນເທົ່າໃດ ?
ແກ້: **ເອົາຫ້ອງ 3 + ຫ້ອງ1 = 3 kg + 7 ຂີດ = 3.7 kg**

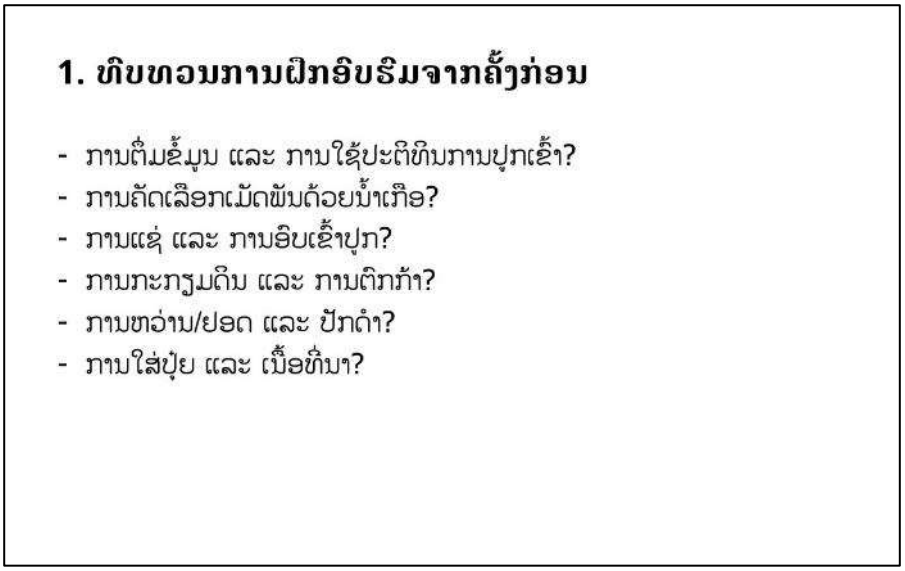
(Training 2, Training3)

Slide 1

Slide 2



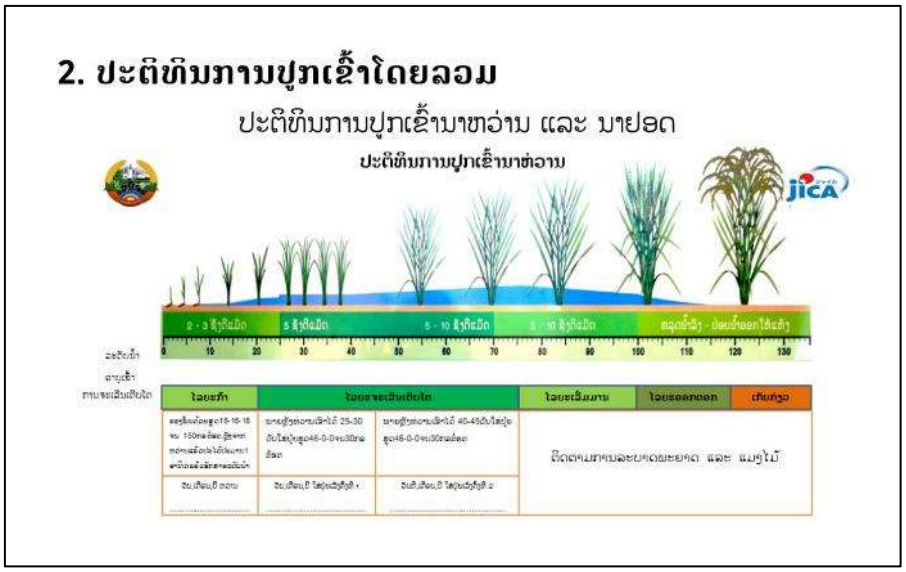
Slide 3



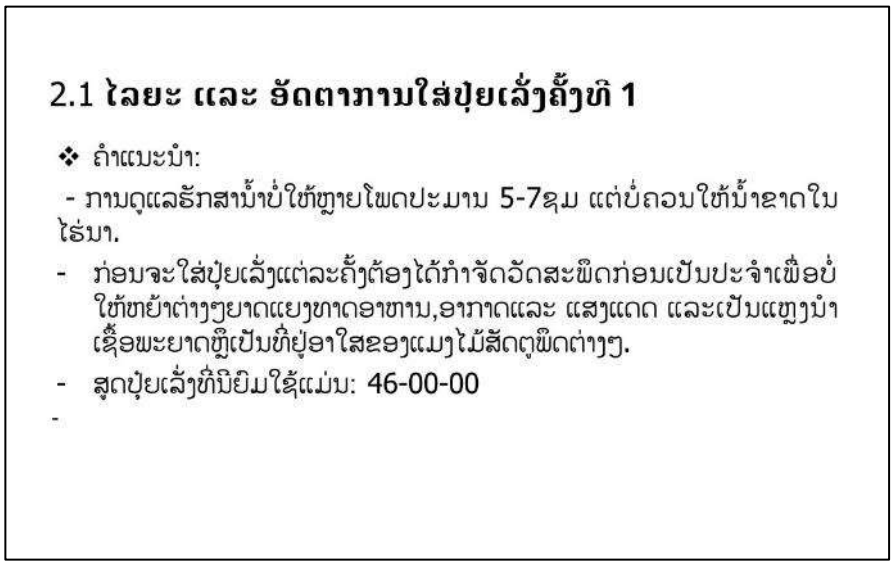
(Training 2, Training3)

Slide 4

Slide 5

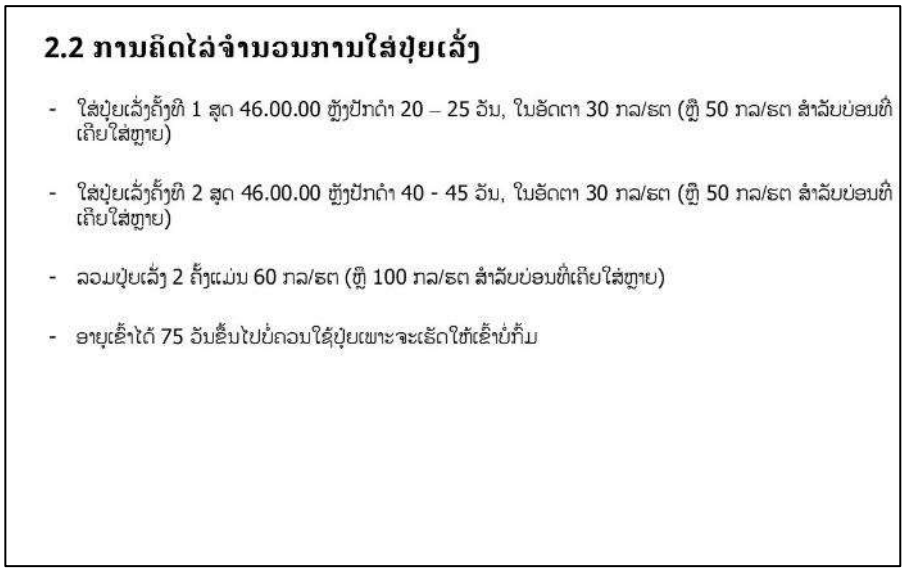


Slide 6



(Training 2, Training3)

Slide 7



Slide 8

Slide 9

(Training 2, Training3)

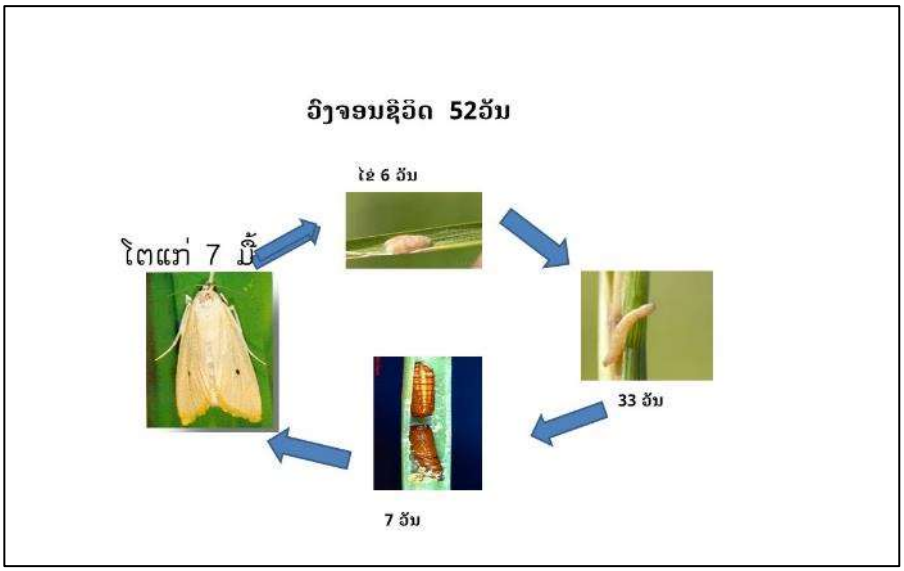
Slide 10

Slide 11

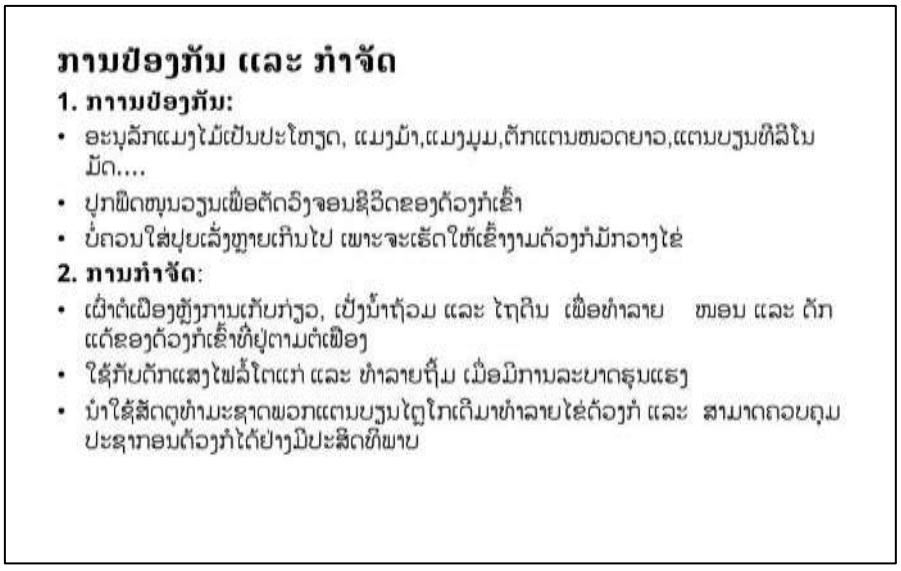
Slide 12

(Training 2, Training3)

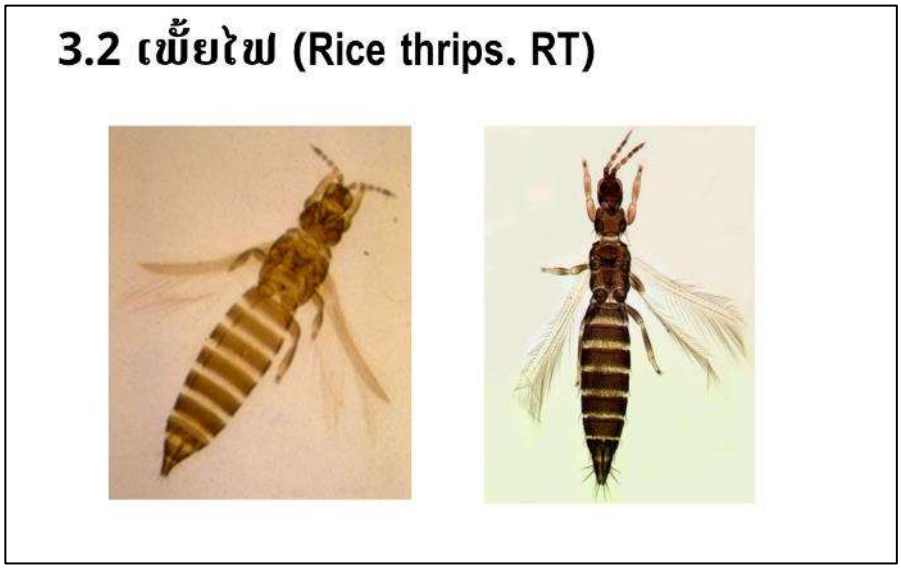
Slide 13



Slide 14



Slide 15



(Training 2, Training3)

Slide 16

❖ ວົງຈອນຊີວິດ

ເປັນແມງຈໍາພວກປາກດູດ ມີຂະໜາດນ້ອຍປະມານ 1-2 ມມ ມີທັງຊະນິດມີປີກ ແລະ ບໍ່ມີປີກ,ໂຕແກ່ ມີສີດໍາ, ໂຕແກ່ເປັນສີເຫຼືອງອ່ອນ, ໂຕແກ່ວາງໄຂ່ໃນເນື້ອເຍື່ອຂອງໃບເຂົ້າ, ໂຕອ່ອນມີ 2 ໄລຍະຄື: ໄລຍະເວລາໂຕອ່ອນຫາໂຕແກ່ປະມານ 15 ວັນ

1 – 2 ມມ.

Slide 17

❖ ລັກສະນະການທໍາລາຍ

- ເພັ້ຍໄຟ ໂຕອ່ອນ ແລະ ໂຕແກ່ ທໍາລາຍເຂົ້າໂດຍການດູດກິນນໍ້າລ້ຽງຈາກໃບເຂົ້າທີ່ຍັງອ່ອນ, ເງື່ອນໄຂເໝາະສົມໃນການລະບາດ ມີຝົນຂາດຊ່ວງ ອາກາດຮ້ອນອົບເອົ້າ, ໃບທີ່ຖືກທໍາລາຍ ຈະມ້ວນເຂົ້າ ໃບແຫ້ງຕາຍ

a: ໂຕແກ່;

b: ໃບທີ່ຖືກທໍາລາຍ;

Slide 18

❖ ການປ້ອງກັນ ແລະ ກໍາຈັດ

ການປ້ອງກັນ:

1) ບໍ່ຄວນໃຫ້ຂາດນໍ້າພາຍຫຼັງປັກດໍາ ຫຼືຫວ່ານ ໄດ້ 7 ວັນ

2) ເມື່ອກວດພົບເພັ້ຍໄຟ 1-3 ໂຕ ໃຫ້ປ່ອຍນໍ້າເຂົ້າໃຫ້ຖ້ວມຍອດ ປະໄວ້ 1-2 ວັນ, ເລັ່ງການ ຈະເລີນ ເຕີບໂຕ ຂອງເຂົ້າ ຫຼັງຈາກເຂົ້າມີ ອາຍຸໄດ້ 10 ວັນ ໂດຍ ການໃສ່ປຸ໋ຍ ປຸ໋ເລຍ ອັດຕາ 10 ກລ/ໄລ่

3 ຖ້າມີເງື່ອນໄຂສະດວກ ໃຊ້ກັບດັກແມງໄມ້ດ້ວຍແສງໄຟ ກໍາຈັດໂຕແກ່ ຫຼຸດຜ່ອນ ປະຊາກອນ ຂອງສັດຕູພືດ

ການກໍາຈັດ: ໃຊ້ສະໝຸນໄພສີດ

(Training 2, Training3)

Slide 19

3.4 ເພັ້ຍຈັກຈັ່ນສີນ້ຳຕານ (Brown planthopper, BPH)

Slide 20

❖ ລັກສະນະການທຳລາຍ

- ເພັ້ຍຈັກຈັ່ນ ສີນ້ຳຕານ ທັງໂຕອ່ອນ ແລະ ໂຕແກ່ ທຳລາຍເຂົ້າ ໂດຍການດູດກິນນ້ຳລ້ຽງຈາກເຊວທໍ່ນຳທໍ່ອາຫານບໍລິເວນເທິງລະດັບສູງກວ່າໜ້ານ້ຳເຮັດໃຫ້ເຂົ້າມີອາການໃບເຫຼືອງແຫ້ງລັກສະນະຄ້າຍຄືຖືກນ້ຳຮ້ອນລວກແຫ້ງຕາຍເປັນຍ່ອມໆ ເອີ້ນວ່າ: ອາການໄໝ້ (hopperburn)
- ໂດຍທົ່ວໄປພົບອາການໄໝ້ໃນຊ່ວງໄລຍະເຂົ້າແຕກກໍ ເຖິງໄລຍະອອກຮວງ
- ເພັ້ຍຈັກຈັ່ນຍັງເປັນ ພາຫະນຳເຊື້ອໄວລັສ ເຊັ່ນ: ພະຍາດໃບງິກ (rice raggedstunt) ເຮັດໃຫ້ເຂົ້າມີອາການຂອດ, ຕົ້ນເຕ້ຍ, ໃບແຄບ ແລະ ສັ້ນ, ໃບບິດເປັນກຽວ

ການລະບາດຮຸນແຮງ

ອາການໄໝ້ (hopperburn)

Slide 21

❖ ສະພາບເງື່ອນໄຂທີ່ມີການລະບາດ

- ການປູກເຂົ້າໜາແໜ້ນເກີນໄປເຮັດໃຫ້ອຸນຫະພູມ ແລະ ຄວາມຊຸ່ມເໝາະສົມຕໍ່ການຈະເລີນເຕີບໂຕຂອງເພັ້ຍຈັກຈັ່ນ
- ການໃສ່ປຸຍເລັ່ງໃບປະລິມານຫຼາຍ ເຮັດໃຫ້ເພີ່ມຈຳນວນເພັ້ຍຈັກຈັ່ນມີແນວໂນ້ມຫຼາຍຂຶ້ນ ເນື່ອງຈາກປຸ໋ຍເຮັດໃຫ້ເຂົ້າງາມ ແລະ ເໝາະສົມຕໍ່ການເຂົ້າທຳລາຍ ແລະ ການຂະຫຍາຍພັນ
- ໃນນາມີນ້ຳຂັງຕະຫຼອດເຮັດໃຫ້ເພັ້ຍຈັກຈັ່ນສາມາດເພີ່ມຈຳນວນໄດ້ຫຼາຍກວ່າ ສະພາບທີ່ມີການລະບາຍນ້ຳອອກບາງຄັ້ງຄາວ ເພາະມີຄວາມຊຸ່ມສູງ ເປັນເງື່ອນໄຂເໝາະສົມຕໍ່ການຈະເລີນເຕີບໂຕຂອງເພັ້ຍຈັກຈັ່ນ
- ການໃຊ້ຢາຂ້າແມງໄມ້

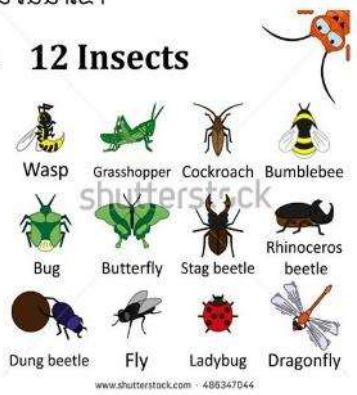
(Training 2, Training3)

Slide 22

❖ ແມງໄມ້ທີ່ເປັນປະໂຫຍດ

- ພວກເຮົາຄວນຮັກສາ ຫຼື ປ່ອຍແມງໄມ້ຕໍ່ໄປນີ້ໃນນາເຂົ້າ

- ແມງມຸມ
- ແມງມ້າ
- ແຕນບຽນ
- ແມງຫັ່ງນ້ຳ
- ແມງເຕົ່າທອງປີກລາຍ
- ແມງສາບ



Slide 23

3.5 ພະຍາດໃບໄໝ້

ຮູບລັກສະນະອາການ ແລະ ສເປ

ພະຍາດໃບໄໝ້ ເກີດຈາກເຊື້ອຣາ *Pyricularia oryzae* ສາມາດທຳລາຍເຂົ້າໄດ້ທຸກໄລຍະ, ແຕ່ເດີ່ມປູກຈົນເຖິງເກັບກ່ຽວ ພະຍາດໃບໄໝ້ຈະເກີດຂຶ້ນ ແລະ ແຜ່ລະບາດຮຸນແຮງ ຖ້າມີສິ່ງແວດລ້ອມທີ່ເໝາະສົມຄື: ໃຊ້ພັນເຂົ້າທີ່ບໍ່ມີຄວາມທົນທານ, ຄວາມຊຸ່ມຂອງອາກາດ ສູງຕັ້ງແຕ່ 80% ຂຶ້ນໄປ ໂດຍສະເພາະໃນຊ່ວງຕອນແລງເຖິງຕອນເຊົ້າ, ອຸນຫະພູມເໝາະສົມ 27-35 ອົງສາ , ເຂົ້າໜາແໜ້ນຈົນເກີນໄປ ແລະ ນາທີ່ໃສ່ຝຸ່ນໄນໂຕຼເຈນສູງ.

Slide 24

❖ ***ລັກສະນະອາການ:***

ໄລຍະຕົ້ນກ້າໃບມີຈຸດສີນ້ຳຕານຄ້າຍຄືຮູບຕາ, ມີສີເທົາຢູ່ກາງ ມີຂະໜາດແຕກຕ່າງກັນ ຄວາມກ້ວາງລະຫ່ວາງ 2-5 ມມ ແລະ ຄວາມຍາວປະມານ 10-15 ມມ ແລະ ບາດແຜຈະສາມາດລວມກັນທົ່ວບໍລິເວນໃບ, ໃນກໍລະນີເປັນພະຍາດທີ່ຮຸນແຮງຕົ້ນກ້າຈະແຫ້ງ ແລະ ຫຍຸບຕາຍ ອາການຄ້າຍຄືໄຟໄໝ້.

ໄລຍະແຕກກ໋ອາການຂອງພະຍາດຈະພົບຢູ່ໃບ, ກາບໃບ, ຂໍ້ຕໍ່ຂອງໃບ ແລະ ຂໍ້ຕໍ່ຂອງ ລຳຕົ້ນຂະໜາດຂອງບາດແຜຈະໃຫຍ່ກວ່າໄລຍະກ້າ,ບາດແຜຈະລຸກລາມຕິດຕໍ່ກັນຢູ່ບໍລິເວນຂໍ້ຕໍ່ , ໃບມີລັກສະນະສີນ້ຳຕານດຳ ແລະ ໃບຈະຫຼຸດອອກຈາກກາບໃບ.

ໄລຍະເຂົ້າອອກຮວງເມື່ອເຊື້ອພະຍາດເຂົ້າທຳລາຍຊ່ວງເຂົ້າເລີ່ມອອກຮວງ ເມັດຈະລີບ ແຕ່ຖ້າເປັນພະຍາດຊ່ວງຮວງເຂົ້າແກ່ໃກ້ຈະເກັບກ່ຽວ ຄໍຮວງຈະປະກົດມີຈຸດຊ້ຳສີນ້ຳຕານເຮັດ ໃຫ້ຮວງເຂົ້າຫັກງ່າຍ.

(Training 2, Training3)

Slide 25

❖ ການແຜ່ລະບາດ

ໃນໄລຍະຜ່ານມາພົບຊ່ວງລະບາດຢູ່ລະຫວ່າງເດືອນມິຖຸນາຫາເດືອນສິງຫາປະຈຸບັນໃນແຫຼ່ງທີ່ເຮັດນາສອງລະດູ ຈະເຫັນພະຍາດນີ້ແຜ່ລະບາດ ໂດຍສະເພາະໃນນາທີ່ໃສ່ຝຸ່ນ ໄນໂຕຼ ເຈນສູງ ຕົ້ນເຂົ້າຕຶບໜາມີສະພາບແຫ້ງແລ້ງໃນຕອນກາງເວັນ ແລະ ມີຄວາມຊຸ່ມສູງ ໃນຕອນກາງຄືນ ເຊື້ອພະຍາດສາມາດຕິດໄປກັບເມັດພັນ,ແຜ່ກະຈາຍໄປຕາມດິນ,ນ້ຳ,ລົມ ແລະເຟືອງ ເຖິງຈະມີພັນເຂົ້າບາງຊະນິດສາມາດຕ້ານທານພະຍາດດັ່ງກ່າວ ແຕ່ເຊື້ອລາຊະນິດນີ້ສາມາດສ້າງສາຍພັນໃໝ່ທີ່ຮຸນແຮງ, ສາມາດທຳລາຍພັນຕ້ານທານ.

ການປ້ອງກັນ ແລະ ກຳຈັດ:

- ໃຊ້ພັນທີ່ຕ້ານທານທີ່ເໝາະສົມແຕ່ລະທ້ອງຖິ່ນ ປະຈຸບັນພັນເຂົ້າທີ່ຕ້ານທານໄດ້ແກ່ ກຂ1, ກຂ9 ແລະ ກຂ 11.
- ບໍ່ຄວນວ່ານກ້າຖີ່ເກີນໄປ ຄວນແບ່ງເປັນແປງໃຫ້ມີການລະບາຍ ແລະ ຖ່າຍເທອາ ກາດໄດ້ດີ.
- ໃຊ້ຢາເຄມີຂ້າເຊື້ອລາປະສົມກັບເມັດພັນເຊັ່ນ ເບັນເລດ-ທີ, ຄາຊູມິນ ຕາມອັດຕາ ຄຳແນະນຳ 1cc /ນ້ຳ10ລິດ/10 ກລເມັດພັນ ນານປະມານ4-6 ຊົ່ວໂມງ.
- ໃນແຫຼ່ງທີ່ພົບການລະບາດໂດຍສະເພາະໄລຍະເຂົ້າເປັນມານຄວນສີດພົ່ນຢາຄາຊູມິນ, ເບັນເລດ, ຊີໂນຊານ, ບາຕິຊີດິນ ຕາມອັດຕາຄຳແນະນຳ 10 ຊຊ/ນ້ຳ20ລິດ

Slide 26

3.6 ພະຍາດໃບຈຸດສີນ້ຳຕານ (Brown spot)

ພະຍາດຈຸດສີນ້ຳຕານ ເກີດຈາກເຊື້ອຣາ *Helminthosporium oryzae* ສາມາດທຳລາຍເຂົ້າໄດ້ຕັ້ງແຕ່ໄລຍະຕົ້ນກ້າຈົນເຖິງອອກຮວງ ມັກເປັນຮຸນແຮງກັບຕົ້ນເຂົ້າທີ່ຂາດທາດອາຫານ.

Slide 27

- *ລັກສະນະອາການ*

ໃບມີຈຸດສີນ້ຳຕານມີຂອບສີເຫຼືອງ ຫຼື ສີນ້ຳຕານ, ມີຂະໜາດເສັ້ນຜ່າສູນກາງ 2-3 ມມ ແລະ ໃຫຍ່ກວ່າ 10 ມມ ເມື່ອບາດແຜ່ຂະຫຍາຍເຕັມທີ່ໃຈກາງມີສີເທົາ, ລັກສະນະອາການຢູ່ເມັດເຂົ້າເປືອກຈະເປັນຈຸດສີນ້ຳຕານເຮັດໃຫ້ເມັດເຂົ້າເສື່ອມຄຸນນະພາບເມື່ອສີເປັນເຂົ້າສານຈະຫັກງ່າຍ,ໃນກໍລະນີເປັນພະຍາດທີ່ຮຸນແຮງຈະເຮັດໃຫ້ນ້ຳໜັກຂອງເມັດເຂົ້າຫຼຸດລົງປະມານ 20 %ເຊື້ອລາຊະນິດນີ້ ແຜ່ກະຈາຍໄປຕາມດິນ, ລົມ, ເຟືອງ ແລະ ເມັດພັນ.

- ການປ້ອງກັນ ແລະ ກຳຈັ

-
-
-
- !20 I/ 160ດ
-

(Training 4)

Slide 1

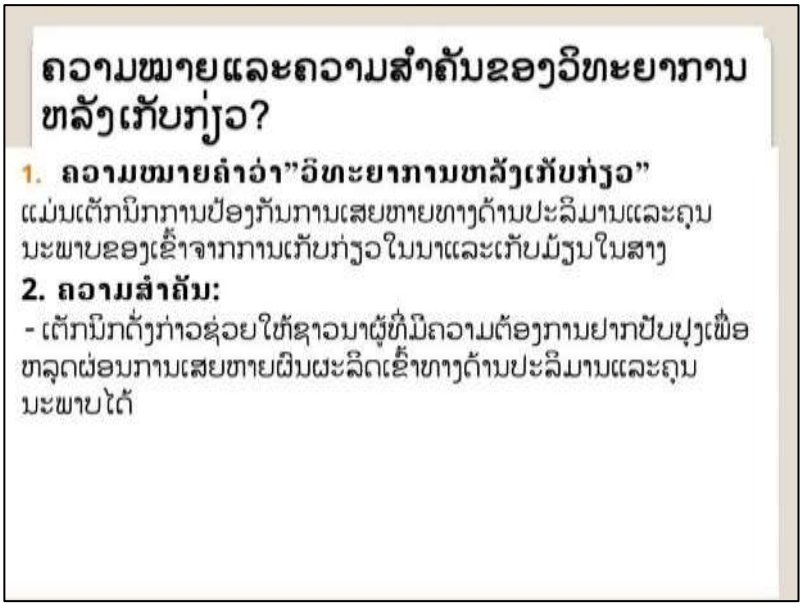
Slide 2

Slide 3

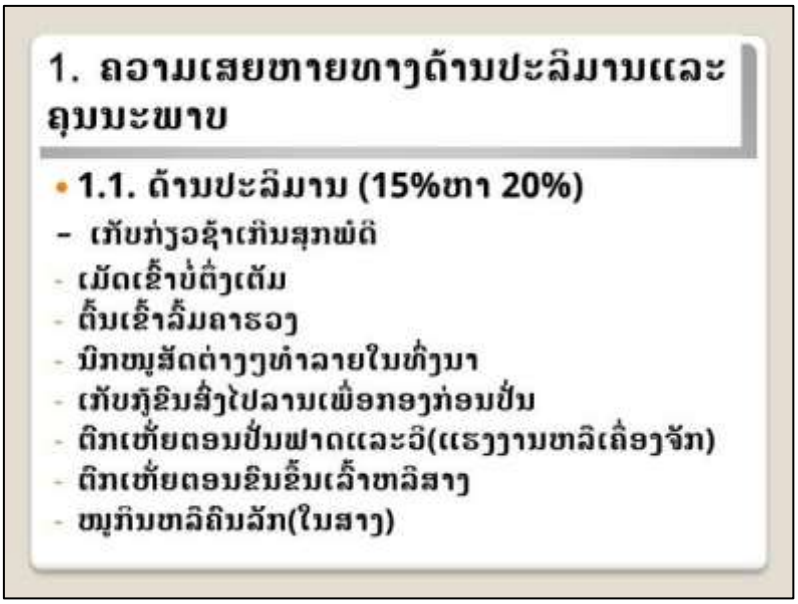
- - ຄວາມໝາຍແລະຄວາມສຳຄັນຂອງວິທະຍາການຫລັງເກັບກ່ຽວ
- - ການສູນເສຍທາງດ້ານປະລິມານແລະຄຸນນະພາບເຂົ້ານັບແຕ່ເຂົ້າເປັນ
  ໝາກຈົນເຖິງການເກັບກ່ຽວແລະເກັບຮັກສາ
- - ວິທີການປ້ອງກັນການສູນເສຍກ່ອນການເກັບກ່ຽວ
- - ວິທີການປ້ອງກັນການສູນເສຍຊ່ວງເກັບກ່ຽວເຂົ້າ
- - ວິທີການປ້ອງກັນການສູນເສຍຫລັງເກັບກ່ຽວ

(Training 4)

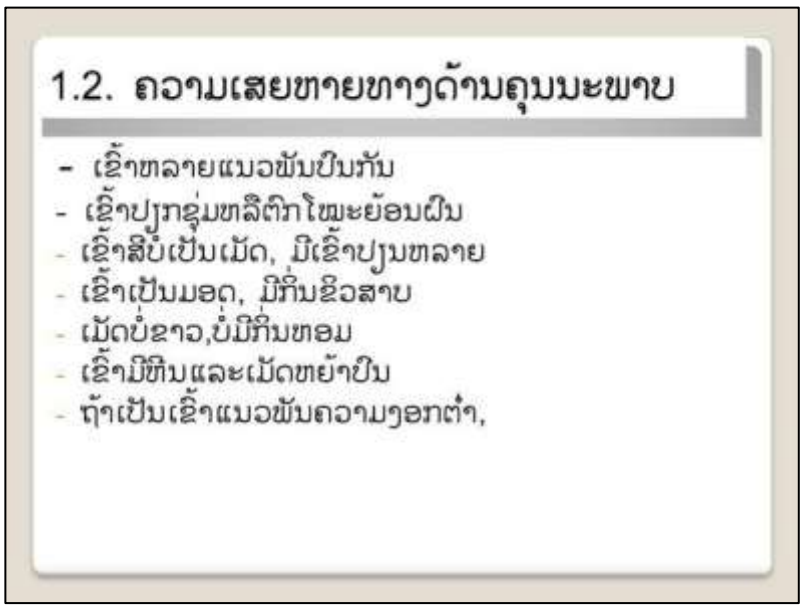
Slide 4



Slide 5



Slide 6



(Training 4)

Slide 7

Slide 8

Slide 9

(Training 4)

Slide 10

Slide 11

Slide 12

(Training 4)

Slide 13