

## CHAPTER VI

### ASSESSING THREE TECHNOLOGY DISSEMINATION SYSTEMS IN VEGETABLE PRODUCTION OF STUDY VILLAGES

#### 6.1 Extension system in Cambodia

Extension is a key factor for developing Cambodian agriculture. All production activities require extension contribution. Agriculture extension has been introduced into 23 provinces by CAAEP (Cambodia-Australia Agricultural Extension Project) and government at 1998 for assisting rural farmers. Staff shortage is the constraining factor of extension<sup>4</sup>, limiting government to achieve final goals of improving farming and marketing systems. At present, the generation of the agricultural technologies as well as the dissemination process to farmers are being carried out by MAFF and NGOs. Besides the government budget provided, there has been a few budget for the agricultural extension services comes from the subsidy of the local government and NGOs (DOAE, 2000). This chapter consists of two parts. The first part relates to the roles of extension. The second part focuses on the types of agriculture dissemination services systems in Cambodia.

##### 6.1.1 Role of extension systems in Cambodia

Agriculture extension in Cambodia is to facilitate and carry out dissemination of knowledge, information and technology of agriculture including: (i) participatory training and extension methodology, (ii) strengthening agricultural development community and farmer organization, (iii) agro-ecosystems analysis and farming systems, (iv) mass media and broadcasting of agricultural technology and (v) household food production and income generation (CAVAC, 2007). The agricultural extension agents need to become catalysts, helping communities achieve goals. This means learning to interact closely with social groups and communities, and becoming better listeners and facilitators. The improvement is to enhance communication

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<sup>4</sup> *There are only around 500 extension officers in the whole country to serve more than two million rural households (JICA, 2007)*

process between the community and rural service institution (CEDAC, 2004). Other role of the extension agent is encouraging farmers to experiment with ideas and techniques emanating from their own knowledge or from outside sources. This helps to re-value local knowledge, its combination with new techniques. It encourages dialogue between the different knowledge and understanding gained through the experimentation process strengthens farmers' confidence in their capacity and knowledge. This led to increases their ability to choose the best options and to develop and adapt solution appropriate to their specific ecological, economic and socio-cultural circumstances (Chan, 2001).

## **6.2 Type of extension systems**

There are various extension service systems in Cambodia.

### **6.2.1 Government system**

There is a hierarchical structure of services from Ministry of Agriculture, Forestry and Fisheries (MAFF) through provincial down to district level. There are various types of agricultural dissemination systems as illustrated in Figure 6.1. The government extension workers are the main actors in disseminating technology. They are responsible for advising and guiding, both individually and in groups of all farmers.

Figure 6.1 shows that roles, process and structure are considered critical to the success of the system. There have been defined at national, provincial and district levels, where will be developed by district based farming systems research extension (FSRE) teams comprising both district agriculture office staff and other support subject matter specialists (SMS's) who are located at either provincial offices or national department level. These district terms will have a range of skills for example: extension, agronomy, animal health and where necessary fisheries and operate in planned and organized way through a range of extension channels to deliver new techniques or improved technologies to all stakeholders.

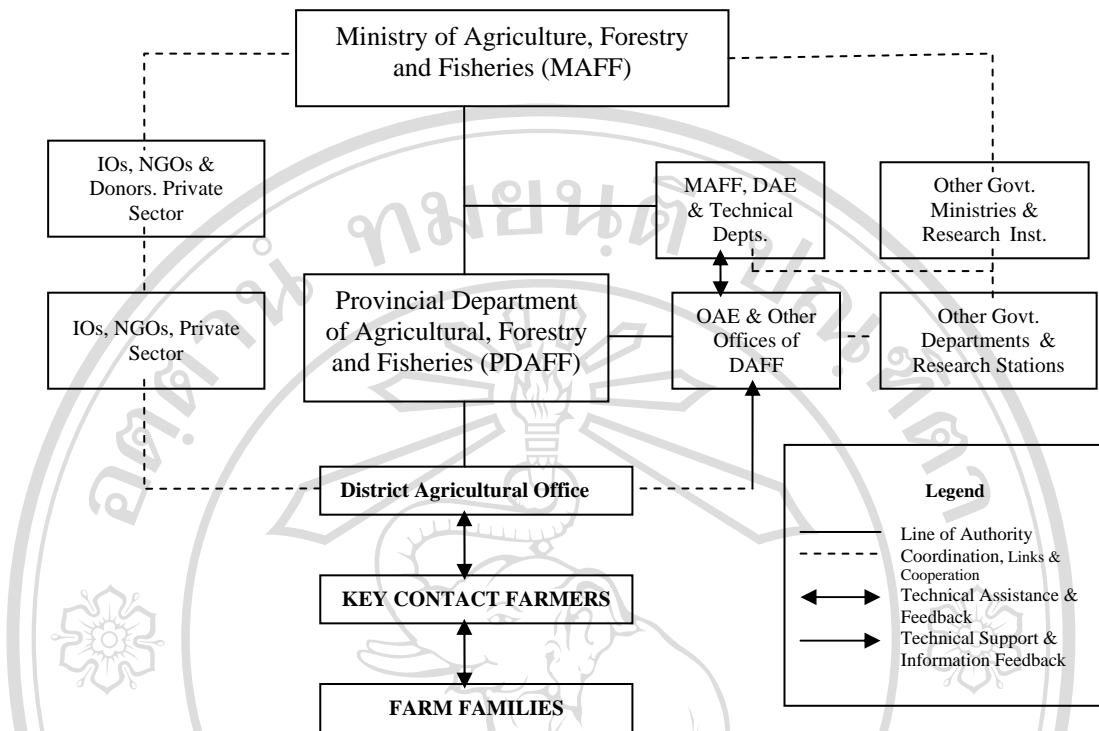


Figure 6.1 Organization structure of government system in Cambodia

Source: AusAID and MAFF, 2000

### 6.2.2 Non-government organizations system (NGOs)

The NGOs have played a key role in disseminating and encouraging adoption of recommended technology that suits farmers' needs. One of the premises for privatized extension improving the quality and relevance of the service to farmers is based on there being a choice of service provider and a degree of competition between them. In many cases, it is the development of a large enough service organization but several competing ones that has taken considerable time and resources (ADB, 2006).

However, non-government organization aims at empowering impoverished farmers through farmer led activities, farmer networking, farmer organization and farmer knowledge on ecological agriculture, community based development in Cambodia.

In case of learning process, there were depending on project as six months or one year. The course was lead by two or three training of trainer including the technical staff. Most of topic on integrated homestead production (IHSP) and making

compost by garnering cow manure was carried out for 5-7 days with 25 farmers. This training focused on the knowledge and skill of how to establish small-scale integrated homestead production units around the house according to the guideline. Using participatory learning approaches, the training focused on advanced levels of homestead production. After training was finished, all farmers could prepare home garden by themselves and demonstrate knowledge of how to grow vegetables and to make the compost. Every farmer received vegetable seed support and started their home garden such as yard long bean, cucumber, tomato, eggplant and various herbs. The demonstration farmer showed the integrated farming systems and land use management surrounding their home compound. Other demonstration in some farmers had livestock (cow, chicken, pig and duck) or fish pond.

In the follow up was done regularly to individual household to coach on home garden with techniques staff for provide some suggestion to improve the observed home garden techniques. Home garden had provides nutritious food for their family consumption and sale of the surplus in the local market to supplement farmer' regular income.

The result from farmer interview under non-government organization indicated that most of farmers produced their own fertilizer by mixing a variety of plants with manure and water in a pit next to their field. They were compared in different combinations of chemical fertilizers and manure or compost. Results generally showed that a compost or bio-fertilizer increased their profit by increasing yield and decreasing costs (Srer khmer, 2006).

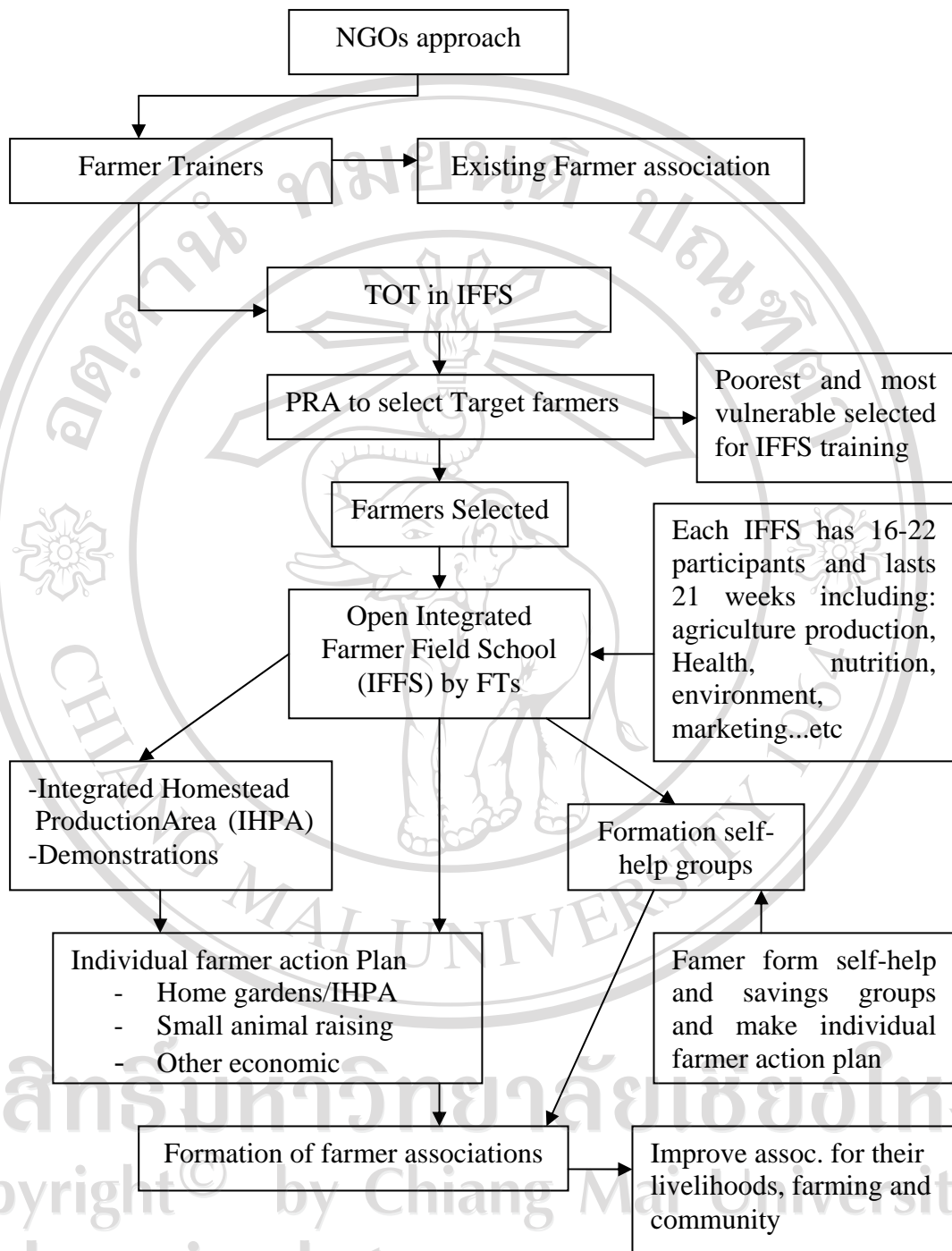


Figure 6.2 Organization structure of non-government organizations system in Cambodia

Source: Srer Khmer, 2006

### 6.2.3 Farmer to Farmer system (Farmer group)

Farmer group is commonly organized by farmers having similar objectives. The technical information comes from practical experience and flows among farmer network. Therefore, farmer to farmer transfer of information will have important role (Michelle and Robert, 2001). Other main rational behind community cooperation is self-help and collective power to increase values to assist the members like collective labor for operation planting and harvesting in Cambodia.

Currently, farmers groups cover a wide variety of forms which can be classified as farmers groups, farmer associations, farmer communities, farmer cooperative and farmer federations. These entire groups totaled 13,017 aim to help each other through collective action (Ngin, 2008). Farmers groups are supported technically and financially by non-government organization or government. The majority for government is to focus at district and through contact farmers who are farmers' trainers.

Interview with a farmer trainers in Chroy Thore village indicated that nearly all farmers acquired their knowledge from their parents, own experience, and neighbors. The farmer trainer's demonstration plot had become the learning field for other farmers to discuss and share knowledge and skill on vegetable production, especially on pest management, news vegetable species provided by extension program. When he had started new group with new technique, farmers were interesting to visit and learn.

He added that he had do the new crops like chinese cabbage, chinese kale and radish which provide better price. He wanted to test the new crops with new technique by his new knowledge. From this result, most of farmer were interested come to visit his field, he had mad up group meeting with 5-8 persons to discuss, share experience, and information. Mostly he had shared about new technique that he had learned to other farmers. This is one way to deliver or disseminate improved technology among farmers group.



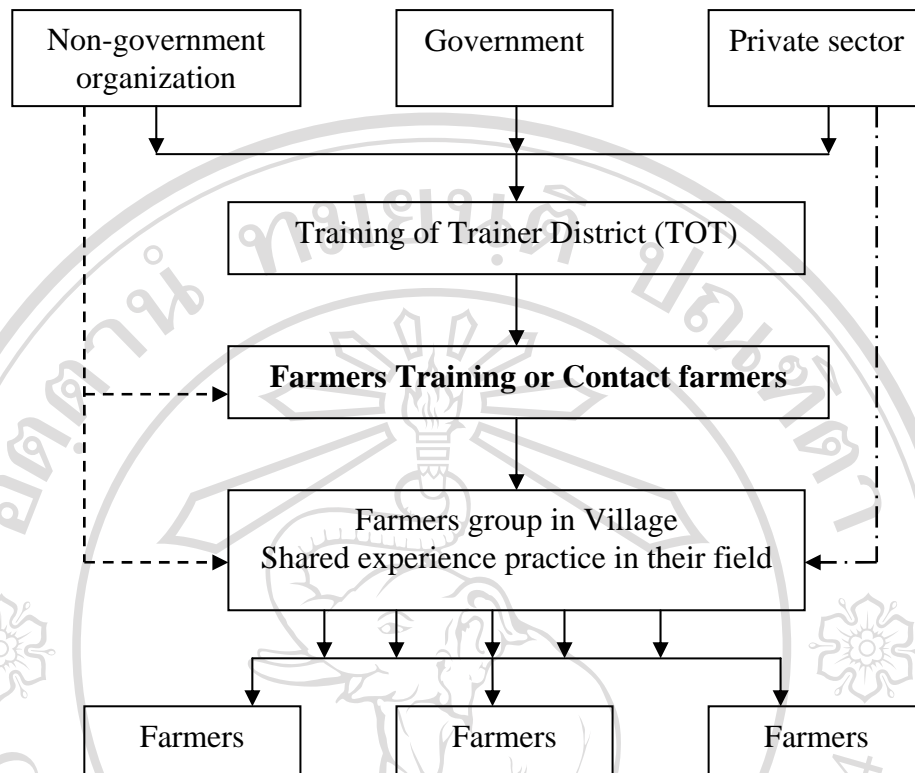


Figure 6.3 Organization structure of farmer to farmer system in Cambodia  
Source: DANIDA, 2006

### 6.3 The assessment of IPM/FFS lead by extension program

Extension services and an integrated pest management (IPM) through farmer-field school (IPM/FFS) program on vegetable production practices are important systems at Somroung Thom commune. The study investigated farmers' practices on vegetable production of three groups of farmers, where there were different practices in extension approaches like government, non-government organizations (NGOs) and farmers group. A total of 105 households in three villages were selected randomly for interview

The villages selected for the study are Preak Thaker village, where the government had supported on vegetable project, Somroung Ker village where the NGOs project supported and Chroy Thore village, where farmers learnt from contract farmer, and no government or NGO support. The more detailed information on respondent was present in Table 6.1 below.

Table 6.1 Farmer households access to extension program at Somroung Thom Commune

Village	Project-farmer (n=70)			Non-project farmer (n=35)		
	Female	Male	Total	Female	Male	Total
Preak Thaker	12	23	35	-	-	-
Somroung Ker	7	28	35	-	-	-
Chroy Thore	-	-	-	11	24	35
Total	19	51	70	11	24	35
Percentage	27	73	-	31	69	-

Source: Survey data, 2008

#### **Farmer trainers or contact farmer**

In Kien Svay district, there were five farmer trainers selected by the provincial coordinator of IPM/ extension program. The selection was based on farmers' interest, and willingness to joint activities with the extension program. The selected farmers had indicated that they wanted to help develop their communities on vegetable production.

Farmer trainers were farmers who had participated in an IPM/FFS and who had participated in an additional 15 days training of trainer program where mostly organized by national IPM under MAFF or NGOs. Activities focused on allowing trainees to observe, discuss, interact, brainstorm as well as analyze the agro-ecosystem, make decision, solve problem and develop skills. All this process led them to become facilitator of learning process and at the same time enhance technical expertise on IPM/FFS. They are community members, not government employees. Most of farmer trainer had traveled to other villages for disseminating new technologies to other farmers. Interview with two of farmer trainers indicated that they did not only train the farmers but they also train the students at high school in his district about growing vegetable in their home garden during school vacation. This program had support by MAFF or Ministry of education, youth and sport or NGOs to develop capacity building for adults in agriculture sector.



The extension program including IPM/FFS is to help farmers to improve their knowledge on crop production practice as seed selection, land preparation, fertilizer application, pesticide spraying and harvesting. Result from the field survey indicate that 60 percent of farmers under government program and 54 percent of farmers in NGOs program hand attended training course at least one time per year, there was less opportunity for farmer in Chroy Thore, about 71 percent had never attended technical training organized by government extension system (Table 6.2).

Table 6.2 Farmers' access to technical training

Village	No.	Received Training	% Attended training (per year)				
			Not attended	One time	Two times	Three times	More than four times
Preak Thaker	35	Govt.	0	60	34	3	3
Sumrong Ker	35	NGOs	0	54	40	6	0
Chroy Thore	35	FoF	71	14	9	0	6

Source: Survey data, 2008

The important objectives of the GO and NGO projects are not only help them to improved their vegetable production, enhance but also to there competence to become a trainer and be able to train other farmers in villages.

#### 6.4 The effectiveness of extension program on vegetable production

##### 6.4.1 Productivity

The survey result on the average yield of yard long bean among three groups of farmers showed that the average productivity was statistically different as the average yield of government farmers at 3.6 t/ha and non-government farmer at 7.2 t/ha, while the farmers group received the average yield only 2.2 t/ha (Table 6.3). The yield difference was mainly due to the difference in crop management practices as resulted from training. This outcome is similar to Srer Khmer (2006) who found that

IPM training in Takeo, Kampong Speu, Kampong Cham, Siem Reap, where training had improved vegetable production.

Table 6.3 The average productivity of yard long bean among three groups of farmers

Farmers group	Average productivity	
	(ton/ha)	Standard deviation
Preak Thaker (Govt. farmers) (n=35)	3.57	± 1.81
Samroung Ker (NGOs farmers) (n=35)	7.22	± 2.11
Chroy Thore (Farmers group) (n=35)	2.28	± 0.96

Source: Survey data, 2008

#### 6.4.2 Profitability

Farmer in Somroung Ker who received training by the NGO had highest net income, almost twice higher than farmers receiving government training, but they had higher production cost. The farmers in Chroy Thore who did not get any extension service from GO or NGO, but received and shared technical knowledge from contract farmers, increased higher production cost than the farmers trained by the government, showed lower yield. However, being near the city, the farmers received better price, so the farmers obtained higher net income than farmers from Preak Thaker (Table 6.4)

Table 6.4 Cost and benefit of vegetable production (riels/ha)

Item	Preak Thaker	Somroung Ker	Chroy Thore
	(n=35)	(n=35)	(n=35)
	Average	Average	Average
<b>Material cost</b>			
Seed	82,214	116,988	181,848
Fertilizer	409,100	332,228	319,442
Chemicals	229,937	225,314	248,300
Rent machine	6,257	13,342	31,671
Gasoline	244,008	289,737	290,560
Cow manure (cow dung)	20,000	42,500	16,500
<b>Labor cost</b>			
Land preparation	98,714	106,142	122,285
Transplanting	59,600	82,714	103,742
Maintenance	85,457	109,071	177,914
Harvesting	485,185	514,442	379,888
Water use (Irrigation)	16,500	36,857	52,228
Total cost	2,564,750	4,761,250	2,918,750
Total income	2,815,250	5,414,750	3,239,275
<b>Benefit (B=I-C)</b>	<b>250,500</b>	<b>653,500</b>	<b>320,525</b>

\* \$1US = 4,035 riels, Cambodia (2007)

Source: Survey, 2008

The average net returns of the farmer in Somroung Ker, Chroy Thore and Preak Thaker were 653,500, 320,525, and 250,500 riels / ha. They were significantly different.

#### 6.4.3 Farmers' knowledge

Majority 7 farmers sprayed chemical when they detected insect pest in vegetable plots, especially farmers in Chroy Thore (80 percent). However, farmers in Somroung Ker also sprayed based on schedule. It was noted that in the government trained farmers from Preak Thaler village, over 20 percent farmers sprayed when they observed more pests than their natural enemies (Table 6.5).

Table 6.5 Farmers' decision on pesticide use in vegetable production

Description	Preak Thaker	Somroung Ker	Chroy Thore
	(n=35)	(n=35)	(n=35)
	----- (%)-----		
See insect-pest	63	43	80
More insect than natural enemy	23	6	11
More damage	11	11	6
Depend on schedule	3	40	3

Source: Survey data, 2008

All farmers interviewed recognized that pesticides are not good for their health. While most farmers related with short term health impact following spraying. It is difficult to attribute a direct cause and effect between pesticide use and detrimental effects on health without the diagnosis of a physician.

There were over 94% farmers believed that pesticides had some effect on human health, living things and environment especially for user. For aquatic life, The Somrong Ker village at 49 % knew that it is dangerous while Preak Thaker has 23% farmers and only small amount of 11% farmers at Chroy Thore believed pesticides were bad for aquatic life. Eighty six percent of farmers at Preak Thaker, 66% of farmers of Somroung Ker Village and 29 % of farmers at Chroy Thore knew the pesticides make the soil become poorer and poorer. While more than 80% of farmers in three villages agreed the air pollution by pesticides. Farmers at Somroung Ker were more concerns about pesticide effects on consumers' health than other two villages. Farmers in Chroy Thore who received no extension training, only a few were concerned about consumers' health. All farmers seemed to have lower about pesticides effects on farm animals (Table 6.6).

Table 6.6 Farmer perception pesticide hazarded

Impact of pesticide	Preak Thaker (n=35)		Somroung Ker (n=35)		Chroy Thore (n=35)	
	Average	%	Average	%	Average	%
Health of farmer users	33	94	33	94	35	100
Aquatic life	8	23	17	49	4	11
Soil organism	30	86	23	66	10	29
Air	28	80	35	100	35	100
Farm animal	5	14	12	34	9	26
Health of consumer	10	29	25	71	1	3

Source: Survey data, 2008

With the field observation most of famers stored pesticides in their home. Typical place of storage included hanging on a wall, storage in the kitchen and hanging from supports in the lower location in house. The remaining 34% of farmers stored their pesticides outside the home, either hanging from a tree and on the fields for both Preak Thaker and Chroy Thore village while the Somroung Ker farmers had 11% were just put on. For the village that has extension programm several farmers had get bottle or plastic box for bury over 57% farmers while the non-program village had only 26% of famers buried the bottle. The majority of farmers were not concerned affect on environment like farmers at Chroy Thore village disposed the used containers into stream, canal, pond, lake and river. only a few farmers at Chroy Thore reused the pesticide containers (Table 6.7). Thus farmers who had access to practical training would have better knowledge about pesticide effects on environment and on management of pesticide waste.

Table 6.7 Farmers' disposal of empty pesticide containers

Description	Preak Thaker		Somroung Ker		Chroy Thore	
	(n=35)		(n=35)		(n=35)	
	Average	%	Average	%	Average	%
Do nothing	12	34	4	11	12	34
Garth bottle for bury	20	57	23	66	9	26
Throw to pond, lake and river	3	9	8	23	12	34
Reuse/recycle	0	0	0	0	2	6

Source: Survey data, 2008

overall the majority of farmers showed their knowledge and information on vegetable production, especially on fertilizer use and pest management. Farmers in Chroy Thore, because there was no organized training, seemed to be independent and no collective activities, thus sharing information was relatively less than other two villages (Table 6.8).



Table 6.8 Sharing knowledge and information with other farmers

Description	Preak Thaker	Somroung Ker	Chroy Thore
	(n=35)	(n=35)	(n=35)
Share information			
Yes	25	32	14
No	10	3	21
Planting method	11	2	1
Use of chemical and fertilizer	14	18	8
Natural enemy/compost	6	14	5
Pesticide application	16	23	9
Crop protection	2	12	5

Source: Survey data, 2008

## 6.5 The information access on vegetable production

This part will analyze how farmers have access to the information sources for their vegetable production.

### 6.5.1 Information approaching to improve vegetable production

Farmers in three villages were asked about their source of technological information for improving vegetable production. Table 6.9 shows the most important source of information over a period of 12 months.

The information sources such as neighbors, relatives, and from chemical supplier were the most important sources. While very few farmers sought information from extension books or posters. They relied relatively on TV and radio. To a certain, farmers in Preak Thaker and Somroung Ker were more exposed to extension officers

than Chroy Thore village. A farmers workshop could identify common knowledge, information and experiences shared among farmers, and also key farmers who could serve as resource persons for technology dissemination (Sanzidur, 2003).

Table 6.9 Farmers' information sources on vegetable production

Information source	Preak Thaker (n=35)		Somroung Ker (n=35)		Chroy Thore (n=35)	
	Average	%	Average	%	Average	%
Extension officers	60	13	52	19	12	3
Neighbor or relatives	196	41	84	32	199	40
Chemical shop	148	31	42	16	159	32
TV	20	4	32	12	65	13
Radio	31	7	37	14	55	11
Extension books/poster	19	4	20	7	5	1
Total	474	100	267	100	495	100

Source: Survey data, 2008

### 6.5.2 Extension visited after training and activities with extension program

Thirty six percent of households had not vegetable production visited by extension officer at least once within the last year for seasonal (Table 6.10). Sixty-four percent of farmers respondents indicated that they were visited by extension officers, but more often in the two village, Preak thaker (government supported) and Somroung Ker (NGO supported), where farmers also attended at least one farmer field day and field visit. Farmers in the non supported villaged, Throy Thore, only a few attended a field day event (Table 6.10).

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Table 6.10 Number and percentage of extension officer had visited and farmer activities with extension program

Type of extension	No.	Extension visited after training		Number of activities with extension (Farmer field day and field visit)				
		No	Yes	Not	One time	Two times	Three times	More than
		Govt.supported	35	6	29	4	15	10
NGOs_supported	35	4	31	0	23	9	1	2
Farmer-to-Farmer	35	28	7	28	3	2	1	1
Total	105	36%	64%	30%	39%	20%	2%	9%

Source: Survey data, 2008

### 6.5.3 Credit access on vegetable production

MoP (2007) indicated that access to credit is when farmers' ability to purchase inputs increases particularly important to improve technologies and increase productivity.. There were two major types of credit in the Somrourng Thom commune, namely the formal credit source like Association of Cambodia Local Economic Development Agencies (ACLEDA) and farmer organization and from the non-formal source such as relative, friends, private money lenders, buyer of vegetable etc. For vegetable and other crop production, farmers mostly depend on borrowed capital to buy seed, chemical fertilizer, pesticide and other materials from buyer vegetable. There were higher at 11 percent, 14 percent and 26 percent in three villages, respectively. They had to pay back after harvesting without an interest rate. But they will sell their production to them. Some buyers will charge interest rate of 1-2 percent per month.

The data from field survey (Table 6.11) showed that farmer in three villages sought credit supports from ALLEDA Bank, about 9.20 and 12 percent of households, respectively. These sources require high interest rate ranged from 3 to 5percent per

month. Some farmers were hesitated to borrow because of the fluctuation of vegetable price on the market and low productivity.

However, for the government farmers interview are mostly borrow loan from relative at 18 percent higher than borrow loan from farmer organization and vegetable buyers at 11 percent because they did not worry about interest rate and price of vegetable. Farmers in Chroy Thore would borrow money from vegetable traders than for the Bank. They could sell their products directly to the trades.

Table 6.11 Number and percentage of farmers had borrowed loan in study area

Credit source	Preak Thaker (n=35)		Somroung Ker (n=35)		Chroy Thore (n=35)	
	Average	%	Average	%	Average	%
Non borrower	18	51	21	60	19	54
Bank (ACLEDA)	3	9	7	20	4	12
Farmer Organization	4	11	1	3	0	0
Relative	6	18	1	3	2	6
Money lender	0	0	0	0	1	9
Land owner	0	0	0	0	0	0
Vegetable traders	4	11	5	14	9	26

Source: Survey data, 2008

### 6.6 Implementation of extension program on IPM/FFS practice

This section explores the implementation of IPM practice with a focus on IPM/FFS farmers, who were trained the technological packages on vegetable production.

There were 70 farmers in study area participating in the extension program in government and non-government organizations. These farmers were interviewed on

vegetable production practices, chemical application, and technology dissemination from the extension agent.

Table 6.12 Number of farmer better knowledge after participation in training course

Village	Planting methods	Land preparation	Pest control	Use of chemical fertilizer	Natural enemies	Use of compost
Preak Thaker	26	1	15	13	1	3
Somroung Ker	9	1	19	10	3	15
Chroy Thore	1	2	5	3	1	4

Source: Survey data, 2008

Most of two villages that support by extension agency were better information about pest control and use of chemical fertilizers, especially in Somroung ker Village, where farmers had better knowledge and used compost or organic fertilizer (table 6.12).

In Preak Thaker, Farmers had better knowledge on planting method pest management and use of chemical fertilizer, but paid less attention on compost. While the NGO approach in Somroung Ker village, farmers were encouraged to use compost for vegetable production.

### 6.7 Advantage and suggestion of IPM approach

Table 6.13 show that highest percentage of farmers (93%) after being gone through IPM/FFS, were able to reduce production cost. They had better knowledge on use of chemical fertilizer (90%), pesticide application (86%), and identification of natural enemy (74%), and increasing knowledge on crop protection (64%) while led to increased productivity (87%). The seed selection practice was rated lowest.

Table 6.13 Percentage of farmer indicated improvement of management practice through IPM/FFS approach

Description	IPM/FFS farmers (%)	
	------(n=70)-----	
	Yes	No
Seed selection	57	43
Land preparation	79	21
Chemical fertilizer use	90	10
Natural enemy	74	26
Pesticide application	86	14
Crop protection	64	36
Increase productivity	87	13
Reduce the production cost	93	7

Source: Result of workshops, April, 2008

The result of study found that all IPM/FFS farmers interviewed stressed that the IPM/FFS approach offered them practical knowledge, where farmer can practice opportunity and rather on result with the extension officer by being involved field demonstration and decision marking. Farmers learn in group activities involving vegetable production where farmers have to conduct their own field experimentation. The IPM/FFS was provided opportunities to discuss with enhanced understanding of farmers.



Table 6.14 Farmers' perception and need in extension program

Farmers' need to support	Preak Thaker (n=35)	Somroung Ker (n=35)	Chroy Thore (n=35)
1. More training course	10	12	10
2. Regular visits of extension agents	7	3	5
3. Set up village extension	5	2	3
4. Supporting farmer organization	3	7	2
5. Market development	5	1	1
6. Price reduction for fertilizer and pesticide	4	8	9
7. Reducing interest rate for credit	1	1	0
8. Seed and fertilizer support	0	1	1
9. Stop free importation of vegetables from foreign countries	0	0	4

Source: Survey data, 2008

At the same time over 30 farmers (31%) of three villages had suggested that IPM/FFS training by extension program is important for all farmers who wanted to practice with new technology especially in study area where most farmers were interested in new crops like tomato, mungbean, snap bean and chinese kale. These crops had good market demand and high price.

Institutional supports such as village extension program, farmers' organization and regular visits of extension officials were given high priorities, indication that farmers across three villages had valued the knowledge-based production practice. At policy level, farmers would like to see price control measure on chemical fertilizers and pesticides. Farmers in Chroy Thore, being close to the city were more aware of vegetable importation from foreign countries, had asked the government to regulate or even stop the free importation of vegetables to improve incomes of vegetable farmers.

### **6.8 Potential dissemination of extension program**

The FAO Inter-country Programme for IPM on vegetables in South and Southeast Asian had set up cooperation with MAFF of Cambodia. This project was considered to be appropriately institutionalized at national and province levels. Project also conducted refresher course for district trainers, farmer trainer and farmers to improve technology dissemination for their community.

In Kien Srvey district, Kandal province where vegetable IPM training project was supported by FAO-IPM in 2006 by using the IPM/ FFS approach, it was shown the number of farmers' adoption IPM has dramatically increased from 25 farmers at 2006 to 125 farmers in 2008. While over 1,000 had benefited from IPM led by extension programme. It also indicated that IPM/FFS run by extension programme had great potential in Cambodia. It leads to successful the extension programme and also influenced by rapid expansion on vegetable production for urban market (NCSC, 2008).

Result from the discussion conducted with extension staff and farmers to identify some factors that influence the potential for IPM/FFS project dissemination among non-IPM project farmers. Farmers indicated the lack of information and technical knowledge support were constraining factors for improvement of farmers' vegetable production system.

Table 6.15 Important factors contributing to success of dissemination as seen by extension staff and farmers had project areas in two villages with extension program

Factor	Extension staff (n=12)			Farmer project (n=70)		
	Yes	No	Not sure	Yes	No	Not sure
Technical knowledge	83	17	0	80	13	7
Farmers participation	75	17	8	87	10	3
Funding	92	8	0	97	3	0
Farmer needs	58	25	17	76	6	18
Administrative	42	42	16	64	14	22

Source: Survey data, 2008

Table 6.15 shows that both extension staff and farmers in the project area identified funding is necessary for supporting dissemination activities. While both considered administration matter less important.

Table 6.16 Critical problems as perceived by vegetable farmers in non-project village (Chroy Thore village)

Description	Farmer to Farmer (n=35) %		
	Yes	No	Not sure
Lack of knowledge	80	15	5
Pest and Disease problems	100	0	0
Low productivity	92	8	0
Low income	98	1	1

Source: Survey data, 2008

In Chroy Thore village where farmers learnt and acquired their technical knowledge only from contract farmers, without proper training by extension officials, farmers perceived pest and disease problems were the most critical problem. The

problem was intensified by lack of knowledge resulted in low productivity and low income (Table 6.16).



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