

CHAPTER III

RESEARCH METHODS

Research methodology was followed the conceptual framework (Figure 1). The field survey included both the review of secondary information and collection of primary data through structured questionnaire and workshop.

The collection of primary data was conducted to acquire better contextual understanding of IPM-farmers and Non-IPM farmers of the study area. The study was conducted in two villages of Samraong Commune, Sotnikum District, Siem Reap Province. Three groups of farmers from each village were selected for the interview.

- IPM farmer from Botdangkor village (IPM project site)
- Non-IPM farmer-1 from Botdangkor village (IPM project site)
- Non-IPM farmer-2 from Samraongcheung village (outside project area)

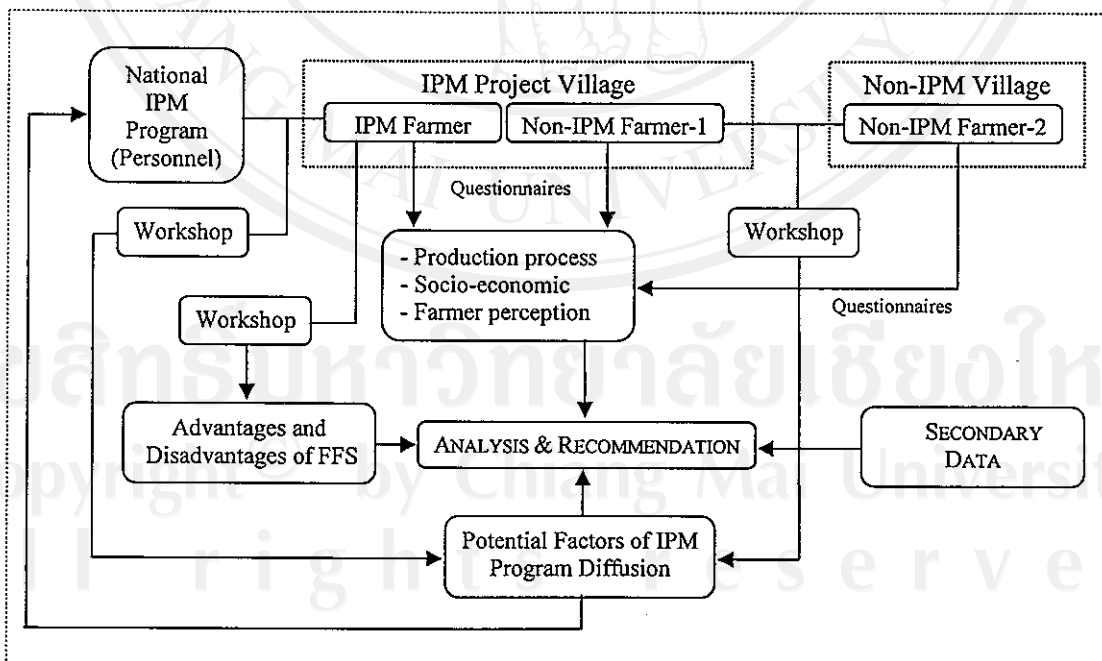


Figure 1. Conceptual framework of the study

3.1 Scope and limitation of the study

This research is mainly focused on the farmers' perception of IPM practices on cabbage production around the project site of National IPM program. This project is implemented under the National IPM program, Department of Agronomy and Agricultural Land Improvement (DAALI), Ministry of Agriculture, Forestry and Fisheries (MAFF). In collaboration with FAO, a project on vegetable was initiated by using the farmer field school model in Siem Reap province in 2000.

Limitation of time and inadequate information, references related to cabbage production were the main constraints of this study. The data used for analyzing were based on the information collected, site observation, workshops, and the secondary data. The general purpose of this study was to assess the farmer field school approach for IPM on cabbage production. Therefore, analysis and description on farmers' practices focused on three groups of farmers. Group one consisted of the IPM farmers who had access to the IPM program, while the other two groups were non-IPM farmer-1 and non-IPM farmer-2.

3.2 Selection of farmer respondent

A total of 60 farmers respondent from the commune's household list of 425 households were selected randomly for the survey. Structured questionnaires were used for the interview. From the village of Botdangkor, the project area, 20 farmers out of 181 families were selected for the IPM farmers and 20 farmers for the non-IPM farmer-1. The other 20 farmers for the non-IPM farmer-2 were selected from a total of 244 families of Samraongcheoung village, outside project area. Pre-testing of the questionnaire was done twice in order to adjust, delineate and making it flexible according to the field situations. Hence 15 extra samples, 5 each from the three groups of farmer were required to achieve the pre-testing of questionnaire.

The Table 3 shows the number of farmer respondents randomly selected from the village categories.

Table 3. Distribution of sample size

Village	IPM farmer		Non-IPM farmer	
	Household interviewed	Total no. of household	Household interviewed	Total no. of household
Botdangkor	20	181	20	181
Samraongch.	0	0	20	244
Total	20	181	40	425

Source: Survey data, 2003.

3.3 Data collection

A semi-structured interview approach was employed to gain new insights, raise questions, and examine situation from different perspectives and from key informants. These informal interviews were useful for providing background information for determining the issues to be addressed in the study site, on which well defined questionnaire for field survey was developed for primary data collection and subsequent analysis. The study employed two methods of data collection, secondary and primary data.

3.3.1 Secondary data

Data on farmers' attending IPM program in farmer field school on cabbage production were collected by working with National IPM chairperson, IPM staff, IPM trainers, Farmer trainers, IPM farmers and all levels under Siem Reap provincial Agriculture, Forestry and Fisheries department, and other relevant ministries and organizations. The source of secondary data included various publications such as journals, unpublished research works, literature, annual reports, workshop proceedings, and trial and demonstration results.

3.3.2 Primary data

The primary data was divided into two parts. The first part includes the general information about the socio-economic structures of the commune, which was

based on the information gathered through interview with the knowledgeable people in the study area.

During the second phase, structure questionnaires were prepared which were pre-tested, and finally administered to gather the primary data from sample households about the information on source of income, land holding, production process, production cost, productivity and farmer knowledge on IPM, seed selection, land preparation, fertilizer application, pesticide application, pest, natural enemies, disease, constraints for cabbage production and farmers' responses to IPM were collected during the survey. Workshops were conducted in three steps as following:

- 1- Workshop to understand and identify factors influencing dissemination of IPM program was conducted with 14 IPM staff of the National IPM program, department of Agronomy and Agricultural Land Improvement, ministry of Agriculture, Forestry and Fisheries at National IPM office in Phnom Penh.
- 2- IPM farmers' workshop was organized at Botdangkor village to identify advantages and disadvantages of farmer field school to assess the effectiveness of farmer field school approach for IPM program and identify factors influencing dissemination of IPM program.
- 3- The third workshop was organized at Samraongcheoung village with non-IPM farmer-2 to identify factors for potential diffusion of IPM among the cabbage growers.

3.3.2.1 Household survey

Household surveys were conducted into two stages. Semi-structured questionnaire and direct interviews were used to learn more about farming practices at the commune.

3.3.2.2 Key informant interview

In order to gain maximum information about farmer field school for Integrated Pest Management activities at study site, commune chairpersons, village leaders, IPM trainers, farmer trainers, and commune agricultural agents were interviewed.

3.4 Data analysis

The general profile and vegetable production system of the study area were described through the information generated from biophysical and socio-economic survey and other relevant documents. This information was useful in understanding all the aspects of cabbage production system and further defined the current farming practices and the part to pesticide and chemical fertilizer application, insect pests, natural enemies' awareness and adoption of IPM practices.

Results of data collected from the sample household survey were coded, tabulated and analyzed by using Microsoft Excel 2000. Descriptive statistics such as percentage, mean, standard deviation (SD), coefficient of variation (CV), and ANOVA were calculated and used to measure the objectives.

To grasp the economic picture of the pest management systems practiced, all variable costs, including seed, fertilizer, land preparation and insecticide cost, invested were summed for the estimation of gross margin. Gross margin was used to compare the profitability between IPM farmer, non-IPM farmer-1 and non-IPM farmer-2 from their cabbage production in objective one. In the analysis, fixed costs and labor costs were ignored, since, by their nature, they had to be met whatever was produced or even if nothing was produced. Moreover, gross margin is appropriate activities in the small subsistence farming systems without significant market interaction that will lead to qualitative assessment of profitable or not profitable (McConnell *et al.*, 1997). As suggested by Turner and Taylor (1998), the comparative study was solely concentrated on the performance of enterprise relating to output and variable cost. The gross margin computations were based on the following equations:

Gross margin (R/ha) = Total revenue (R/ha) – Total variable cost (R/ha)

$$\begin{aligned} \text{GM} &= \text{TR} - \text{TVC} \\ &= (\text{kg/ha}) \times (\text{R/kg}) - (\text{R/ha}) \end{aligned}$$

Where:

TR = Total production in kg/hectare multiply by per unit price in Riel

TVC = Cost of the inputs (R/ha), ignore fixed cost and cost of labor
= (seeds, cow manure, fertilizer, pesticide, and land preparation)

Acceptability index (I_a) was used to assess the acceptability of IPM practice on cabbage production to analyze a part of objective two. The Food and Agriculture Organization (Hildebrand and Poey 1995, cited in Norman *et al.*, 1995) applied this method for analysis and evaluation of technology. The index of acceptability was calculated as follows:

$$I_a = (C \times A) \div 100$$

Where:

I_a = index of acceptability

C = percentage of farmers who were participated in IPM farmer filed school training and using the IPM practices on at least part of the crop at the time of the interview.

A = percentage of the area they planted with the IPM practices compared to the total area planted to the particular crop.

The data on IPM farmers' knowledge in natural enemies, insect pests and diseases from field survey and workshop results of IPM farmer were described to fine out the effectiveness of farmer filed school approach in IPM program (*Objective 3*). Multi-Criteria, Multiple Scale Performance Space (MCMSPS) were used to visualize the differences between three farmer groups in productivity, profitability, and the use of chemical fertilizer farmers' knowledge. The results of workshop between IPM staff and IPM farmer; and non-IPM farmer-2 were described to identify potential factors for IPM program diffusion among non-IPM cabbage growers (*Objective 4*).