CHAPTER V

FARMER FIELD SCHOOL

5.1 Typical IPM farmer field school

The IPM farmer field school is a field based learning experience for a group of farmers from 25-30 (women and men) with a common interest, who get together for half morning a day each week on a regular basis to study. The field school starts from the time of sowing seed and lasts for a full cropping season until harvest, meeting at least 12 times with an approximate length of four to five hours per meeting. Field School's members are divided into smaller groups of five, which make detailed observations of the crop and field conditions called "agro-ecosystem analysis". Each meeting consists of a set pattern of activities: agro-ecosystem field observation, analysis and presentations; special topics; and group dynamics activity.

The IPM farmer field school meets throughout the cropping season in order that participants can observe and analyse the dynamics of the cabbage field ecology across a full season. The field school is a learning process for groups of farmers during which they discover the ecological relationship between pests, natural enemies and other factors affecting the heath of their crop, thus enabling them to make more efficient and healthier crop management decisions. Members of the field school have also started examining other aspects of crop production, such as selection of seed varieties, plant nutrition and water management.

The primary learning material at a field school is the cabbage field, which is used as the "FFS book" providing all the information that is needed for the learning process where most field school activities take place. The size of the fields of an IPM field school varies up to a total area of 1,000 m^2. At field school plots receive two treatments. A set of plots will be designated to receive an IPM farmer treatment and another set will be designated as non-IPM farmer or local treatment. The content was flexible and could be changed according to the requirement of the farmer participants.

The participants attending field schools include farmers, disabled farmers, school teachers and students. The detailed programs for each session are as follows:

7:30 **Into the field:** Five small teams observe general field conditions, sample cabbage plants, collect insects, make notes, and gather live specimens from field study plots. The field provides all of the basic learning materials and subject matter for the field school.

8:30 **Agro-ecosystem analysis (AESA):** This is the core of the weekly process. Each team uses their field samples and notes to create a visual analytical tool combining key factors such as pest/predator densities, cabbage plant health, field conditions, weather, and current management treatments.

9:30 **Decision-making:** The output of analysis is a field management decision thoroughly discussed in small groups and defended in open discussion for the full group of participants. What is the problem posing further hones analytical skills during the discussion among groups.

10:00 **Group dynamics:** Activities in problem solving, communication, leadership, and team building are conducted weekly to strengthen group cohesion, maintain motivation, and help participants develop organizational skills.

10:15 **Special topics:** These activities are linked to crop stage and to specific local issues. This part of the curriculum is tailored for each field school from a larger selection of 'Field Guide Activities' mastered by facilitators during extensive training. These exercises require more fieldwork on topics such as community insect control, crop physiology, health and safety, food webs, field ecology, economic analysis, and water/fertilizer management. Supporting studies such as 'insect zoos' for learning plant-insect and insect-insect interactions are also initiated as part of special topics.

11:45 **Review and planning:** Weekly summaries of developments in the field are conducted by reviewing results of the AESA. At the end of the season the group does final yield and economic analysis. Other long-term activities are reviewed during this session. Such activities may include the development of insect zoos for learning about plant-insect and insect- insect interaction, insect collections, insect control trials, plant nutrient experiments, and plant

compensation studies. The planning of future field school activities also takes place at this time.

5.2 Key process of farmer field school

5.2.1 Planning

Farmer field school requires significant institutional commitment and support, usually provided by the national extension service, although other mechanisms are possible where this is lacking. Several weeks before planting the facilitating organization should begin to:

- Consult and coordinate with other programs working in the region;
- Identify communities that fulfill the criteria for establishing FFS; and
- Identify participants and make plans with them for conducting FFS.

The community leader and interested farmers attend a preparatory meeting, where they:

- Characterize and map the village, identify main problems faced by farmers, and select the meeting site and fields for trials;
- Analyze the participation of women and men in cabbage production activities and identify individuals who can benefit from attending the field school; and
- Motivate the community by explaining FFS objectives and processes, select participants and formalize commitment by signing a learning contract.

5.2.2 The learning cycle-observation, analysis and action

Farmer field school for cabbage is hold weekly meetings throughout the crop cycle (three months). The first session usually begins one to three weeks after transplanting so that field observations cover all critical phases of crop growth. Improved decision-making emerges from an iterative process of analyzing a situation from multiple viewpoints, synthesizing the analyses, making decisions accordingly,

implementing the decisions, observing the outcome, and then evaluating the overall impact. New knowledge and insights at each stage require revision of earlier stages and modification of initial assumptions. This process is conducted within the framework of an agro-ecosystem analysis (AESA), originally developed by Conway (1985 and 1987) with Thai colleagues. To discover key agro-ecological principles, each FFS plants a cabbage field (about 1,000 m^2) that is divided into two plots. Local crop management practices on the non-IPM plot are compared with those based on the participants' AESA on the IPM plot. The control (non-IPM plot) is based on farmers' conventional management, where the application of insecticide eliminates natural enemies of insect pests. Participants learn about the agro-ecosystem and insect population dynamics during the process of making observations in the two plots throughout the crop cycle.

Small groups of four to five farmers carry out an AESA. The groups observe 10 cabbage plants in each plot, noting the insects (types, numbers, location, etc.). Afterwards, farmers draw what they have observed on large sheets of paper. The drawings show the development stage of the cabbage plants and the pests and natural enemies observed, as well as other information considered relevant to crop management by the participants (e.g. soil, insect pest, climate, etc.). Based on their AESA, the farmers reach a consensus on the management practices that should be carried out in the IPM plot the following week. Each group presents its analysis and proposed actions in a plenary session, followed by questions and discussion. Drawings from previous sessions are available as reference material to enrich the discussion. Yields and profitability are compared at harvest.

5.2.3 Developing agro-ecological knowledge

Agro-ecological systems-even complex ones-are structured by a few key processes. When managing an agro-ecosystem, it is important to understand not only its components but also the patterns and processes defining the relationships among them. Scientists use quantitative techniques to study ecosystem components, while patterns and processes are studied qualitatively, making it possible to map

interrelationships. Farmer field school include special topic field activities designed to uncover unknown agro-ecosystems relationships.

A classic example of such a field activity is the insect zoo which consists of placing an insect in a cage with a cabbage plant covered by muslin netting that allows the farmers to observe the insect in order to determine whether it is neutral, plant-feeding or beneficial.

5.2.4 Developing the capacity for collective action

Each farmer field school meeting includes a group dynamics exercise to strengthen teamwork and problem-solving skills, promote creativity and create awareness of the importance and role of collective action. The facilitator suggests a problem or a challenge for the group to solve. These exercises usually involve physical activity but sometimes take the form of mental puzzles or brainteasers-they should be fun while offering an opportunity to work together towards solving a specific problem.

5.2.5 Motivating and sustaining interest

To stimulate interest in farmer field school beyond the immediate participants, the field school invites the whole village and farmers from neighboring villages to attend the harvesting of its plots and participate in analysis of results.

5.2.6 Facilitation

The facilitator's role and attitude are key factors in determining the success of an FFS. His or her duties include serving as catalyst, encouraging analysis, setting standards, posing questions and concerns, paying attention to group dynamics, serving as mediator and encouraging participants to ask questions and come to their own conclusions. A facilitator who provides answers instead of raising new questions will fail in an FFS environment. For example, if someone asks, 'What's this insect? Is it a

pest?' a good facilitator would answer with another question: 'What can we do to find out?' Extension workers who serve as facilitators have completed a training program that lasts an entire crop cycle and provides them with first-hand experience in cabbage cultivation, while developing facilitation, leadership and administrative skills. Each facilitator is expected to guide at least three farmer field schools per year.

Today, the trend is to strengthen the role of farmers as facilitators (Braun, 1997). This occurred spontaneously in Indonesia: in 1990 a former alumni of one district organized field schools for their neighbors and by 1993 formal training of farmers as facilitators had begun (Settle *et al.*, 1998). Candidates for the role of farmer-facilitator are identified during farmer field school, where participants' capacities and potential as facilitators are easily observed. They are given one week of training and are supported in their tasks by an extensionist-facilitator. Farmer-facilitators have proven to be motivated and sometimes more effective than their professional counterparts because farmers appreciate learning from peers with similar experience who speak their local language (van de Fliert *et al.*, 1995).

5.3 Characteristics of the farmer field school approach

5.3.1 Farmers as expert

Learning by doing is the training approach used. Farmers learn by carrying out for themselves the various activities related to the particular farming practice they want to study and learn about. This could be related to annual crops, livestock/fodder production, orchards or forest management. The key thing is that farmers conduct their own field studies. Their training is based on comparison studies (of different treatments) and field studies that they, not the extension/ research staff conduct. In so doing they become experts on the particular practice they are investigating.

5.3.2 The field is the primary learning material

All learning is based in the field. The field is where the farmers learn. Working in small sub-groups they collect data in the field, analyze the data, make

action and decisions based on their analyses of the data, and present their decisions to the other farmers in the field school for further discussion, questioning, and refinement.

5.3.3 Extension worker as facilitator not teacher

The role of the extension worker is very much that of a facilitator rather than a conventional teacher. Once the farmer know what it is they have to do, and what it is that they can observe in the field, the extension worker takes a back seat role, only offering help and guidance when asked to do so. Presentations during meetings are the work of the farmers not the extension worker, with the members of each working group assuming responsibility for presenting their findings in turn to their fellow farmers. The extension worker may take part in the subsequent discussion sessions but as a contributor, rather than leader, in arriving at an agreed consensus on what action needs to be taken at that time.

5.3.4 Curriculum is integrated

The curriculum is integrated. Crop husbandry, animal husbandry, horticulture, silviculture, land husbandry are considered together with ecology, economics, sociology and education to form a holistic approach. Problems confronted in the field are the integrating principle.

5.3.5 Training follows the seasonal cycle

Training is related to the seasonal cycle of the practice being investigated. For annual crops this would extend from land preparation to harvesting. For fodder production it would include the dry season to evaluate the quantity and quality at a time of year when livestock feeds are commonly in short supply. For tree production and such conservation measures as hedgerows and grass strips training would need to continue over several years for farmers to be able to see for themselves the full range of costs and benefits.

5.3.6 Regular group meetings

Farmers meet at agreed regular intervals. For annual crops such meetings may be every one or two weeks during the cropping season. For other farm/forestry management practices the time between each meeting would depend on specific activities required to be done, or be related to critical periods of the year when there are key issues to observe and discuss in the field.

5.3.7 Learning materials are learner generated

Farmers generate their own learning materials, from drawings of what they observe, to the field trials themselves. These materials are always consistent with local conditions, are less expensive to develop, are controlled by the learners and thus can be discussed by the learners with others. Learners know the meaning of the materials because they have created the materials.

5.3.8 Group dynamics/team building

Training includes communication skill building, problem solving, leadership, and discussion methods. Farmers require these skills. Successful activities at the community level require that farmers can apply effective leadership skills and have the ability to communicate their findings to others.

5.4 Farmer field school curriculum

Field school curricula encourage learning from peers and strengthening communication skills and group cohesion. The aim of organizing farmer field school is to educate farmers about the effective crop management practices which lead to higher yield, better gross return and lower risk associated with health and environment. As Gallagher (cited in CIP-UPWARD, 2003) said that the farmer field school is not about technology: it is about people development. Table 7 shows the details and outline of farmer field school curriculum on cabbage in study area:

Table 7. Farmer field school curriculum on cabbage

Week	Growth stage	Activities	Field work	Special topic	Methodology/ Discovery learning activity
1		Baseline survey		Method to collect data and analyze	Interview individual farmer and then summarize the data in group
2		Opening ceremony			
		Introduction			
		What's IPM?		Concept of IPM	Short explanation on what is IPM
		What's FFS?			Short explanation on what is FFS
		Norm setting			Discuss with participants to set the norm for FFS
3		Grouping		Why grouping	Using a game to divide participants into sub group
		Expectation			Brainstorming to get ideas from participants
		Ballot box test	Preparing questions in the field	Ballot box	Conducting ballot box test in the field with real specimens and samples
		Local pest problem			Discussion with participants to find out what are the major pest problem in their location
4	Germination	Germination stage discussion	Observe the plant	Factors influencing the germination stage	Select samples and study morphology of germinated plant in the field
		Host teaming		Role of the host team	Discuss the role and functions of the host team
		Land preparation	Preparing the field	Criteria of good land preparation	Whole group go to the field to practice land preparation and make discussion in the spot
		Sowing in pots preparation			Pots made out of banana leaf & usually removed pot at transplanting
		Seed testing		Seed quality	All participant practice testing seed germination
5	Seedling	Introduction of AESA	Practice AESA in field	Importance of doing AESA	Whole group go to the field to practice AESA & discuss its importance for IPM training
		Field walk	Walking through the field to study the ecosystem	Agro-ecosystem components	Sub-group walk across the field, observe and discuss what they see in the field and discuss the interaction between components in the field
		Field design	Designing field	Experimental design	Group discussion on how the field should be designed for experiment
		Discussion on seedling stage	Observe & collected plants in the field	Factors influencing to seedling stage	Study morphology of seedling & then discuss the factors influencing the growth

6	Seedling	Nutrient management		Role elements in supporting plant growth	Whole group discussion on the role; sources, kinds of nutrient and mgt. method
		Transplanting	Preparing field	Criteria seedbeds	Whole group go to field & practice transplanting
		Game			
		Weekly evaluation			
7	Vegetative	Discuss on Flea beetle	Observe and collect damaged plant and insects in the field	Morphology, biology damage and management (mgt.)	Observe and collect infected plant and insects to study morphology, biology and damage and set study in insect zoo. Discussion on mgt.
		Insect zoo	Collect specimens from field	Advantage of using zoo for study	Set up the zoo & collect specimens from field & put them in zoo to study
		AESA	Doing AESA		Observe and collect data in the field. Discuss and analyze and then do a presentation
8	Pre-cupping	Discussion on growth stage	Observe & collected plants in the field	Factors influencing to seedling stage	Study morphology of seedling & then discuss the factors influencing the growth
		DMB discussion	Observe and collect damaged plant and insects in the field	Morphology, biology damage and management	Observe and collect infected plant and insects to study morphology, biology and damage and set study in insect zoo. Discussion on mgt.
		Insect zoo	Collect specimens from field	Advantage of using zoo for study	Set up the zoo & collect specimens from field & put them in zoo to study
		Game			
		Weekly evaluation			
9	Cupping	Webworm disc.	Observe and collect damaged plant and insects in the field	Morphology, biology damage and mgt.	Observe and collect infected plant and insects to study morphology, biology and damage and set study in insect zoo. Discussion on mgt.
		Insect zoo	Collect specimens from the field	Advantage of using zoo for study	Set up the zoo and them collect specimens from the field and put them in the zoo for study
		Game			
		Weekly evaluation			
10	Cupping	AESA	Doing AESA		Observe and collect data in the field. Discuss and analyze and then do a presentation
		Fertilizers application		Role of elements in supporting plant growth	Whole group discussion on the types, role of fertilizer and mgt. method
		Natural enemies	Collect specimens in the field	Classification & roles of natural enemies in the ecosystem	Participants collect insects in the field and then make classification. Discussion on groups and functions of the natural enemies. Setting up insect-zoo to study the functions
		Game			

11	Early head formation	Leaf rot	Observe the infected plants in the field	Symptoms, causing factors and management	Observe and collect infected plant to study the symptoms, causes and then set up disease zoo for experiment. Discussion on management
		Health study		Pesticide classification	Collecting pesticides that are commonly used by farmers & then make classification based on formula actions and WHO hazards
		Pesticide application	Visiting spraying field spraying demo.	Pesticide use and calculation	Organizing spraying demonstration to see the body parts where are most exposed to pesticides. Then discussion on the method to calculate the spraying volume per season and dosage of active ingredient
		Game			
		Weekly evaluation			
12	Head fill	Soft rot	Observe the infected plants in the field	Symptoms, causing factors and management	Observe and collect infected plant to study the symptoms, causes and then set up disease zoo for experiment. Discussion on management
		Health study	Visiting field to see left containers	Pesticide storage and disposal	Participants go to observe the pesticide storage in house of other farmers & observe the disposal of pesticide contains in the field. Participants draw a map to show what they have seen and discuss in the class about the danger of pesticide use.
		Final ballot box test	Preparing questions in the field		Conducting ballot box test in the field with real specimens and samples
13	Mature	Harvesting stage	Evaluate the maturity of the head in field	Harvesting method	Discussion on evaluation of the maturity of the in the field and the method of harvest
		Economic analysis		Method to calculate economic return	Discussion on the method to analyze economic return
14		Field day			Invite non-IPM farmer, local authority and NGO to attend the field day & discuss with IPM farmers on FFS' s results

Note: AESA=Agro-ecosystem analysis

Source: Survey data, 2003.