Summary Report

Advanced Training Course on Integrated Pest & Production Management in the context of Climate Change

08 March-05 April 2013

For Participants from

Ministry of Agriculture, Irrigation and Livestock (MAIL) Afghanistan

Supported by:

FAO's IPM Programme in Afghanistan

Organized by:

Asian Center of Innovation for Sustainable Agriculture Intensification (ACISAI)

Asian Institute of Technology (AIT)
Bangkok, Thailand

EXECUTIVE SUMMARY

A four-week long course for 15 Afghan Agriculture Ministry sponsored by FAO-Afganistan's IPM Programme was organzied by ACISAI, AIT, Thailand. The course was develped utlilising agreed four modules covring FFS design, monitering evaluation, Biologicla control and special tropics as agreed by participants.

First two week was devoted to re-orient the particiaptns to the basics of FFS, insect-zoo, disocovery learning though both class room and field work. Also, expeirnces form other Asian and African coutnries were shared at relevant juntures to share the adaption in basic designn of FFS as a guidlens for the needful back in Afganistan.

Third week, the particiapants stayed at Chonburi Pest Managment Center of Department of Agriculture Extension, Royal Goverment of Thailand, and engaged in baisc and applied biolocial control agents and also learn the mass-rearing techniques. During thei period they spent time visitng the practical field use of biolocial control as well.

Other field trips included a visit to the Regional Center of Asian Vegetable REseach and Development Center, Kampenseng Sean Campus where particiaptnrs spent time learning the role of crop breeding for cucurbit crops and also learn the bean pest control.

During the last week a range of special topic as desired by particiaptns was delivered by experts from AIT and drawn from FAO and DoAE, Thailand. These topic included Melon fly management, Weed control in cereal crops, crop intensificaton and soil management, biolocial control, important pest of potato esp. Plant viruses etc. During this week a post-test was organzied to acesses the advancement of knowledge among participants and it was found that majorty of the participants gained knowledge comapred to their pre-coruse test. Training was concluded with distribution of a certificate of attendence to each participant.

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1. RATIONALE

In 2010, FAO launched a four years project on Integrated Pest Management (IPM) in Afghanistan with the financial assistance of Norway Government to strengthen the capacity of the Ministry of Agriculture, Irrigation and Livestock (MAIL), especially the Plant Protection and Quarantine, and the General Extension directorates. The project aims to build the capacity of these two directorates to shift from an emergency mode of operation in plant protection issues to a longer term, sustainable approach to pest management in the country through promotion of environmental friendly, ecological practices of crop production. The project has been working closely with the above directorates to establish the foundation for a national IPM programme in the country for development and implementation of such approach across the country.

Drawing on the lessons and successes of IPM programmes in South, Southeast and Neareast Asia, the project plans to introduce Farmer Field School (FFS) to the communities to develop their capacity in sustainable crop production and pest management. The project conducted two four months, season-long Training of Trainers (TOT) Courses on IPM in rice, wheat, melon, potato and vegetables, and trained **61** field level plant protection and extension officers from 11 north and northeastern provinces of Afghanistan to work as facilitators to conduct Farmer Field School (FFS) to develop the capacity of farmers in sustainable crop production and pest management. A third TOT has been on-going on rice since last June for another 25 staff from 3 eastern provinces.

As of today 129 FFS has been conducted on wheat, melon, potato and rice in 14 provinces of the country. The project also developed 8 National Master Trainers who are part of the training team in the project and working closely with the facilitators to monitor their work and provide necessary technical backstopping support to them. The project is also conducting participatory action research to identify effective management practices for epidemic pest insects through systematic investigation and participation of farmers.

1.1 Specific Objectives/Outcomes of the Course

- ***To improve further facilitation skills of the facilitators in IPM/FFS through an intensive sharing process of FFS in the training from the experience of other countries in the region.***

  This enhanced knowledge of the participants from the course will improve the quality of FFS implementation in Afghanistan.

- ***To enhance planning, coordination, and management skills of both the facilitators and Master Trainers.***

  This will help to improve the capacity of project and thereby MAIL to strengthen the existing coordination and planning system of the current IPM programme with various stakeholders including farmers, other facilitators, and government and non-government agencies both at the provincial and national level.

- ***To increase their technical knowledge on management of fruit crops, especially on non-chemical control measures including bio-control in management of various pest and diseases in melon, pomegranate and grapes, and system of crop intensification for rice and wheat.***

  The new knowledge of the participants on fruit crops will help to introduce FFS on fruit crops.

2. MAJOR COURSE CONTENT AND DURATION OF THE COURSE

The duration of the course was four weeks, covering both theoretical and practical aspects. The course was organized from 08-05 April 2013.

The course would be divided in 4 modules, one module per week, to cover the following contents to enrich further skills and understanding of the participants, namely:

2.1 Module 1: Adult education and discovery learning (04-09 March 2013)

This module covered basic understanding of and some important pointers in adult education and discovery learning approaches as it relates to successful season-long farmer field school (FFS) implementation, namely:

Adult Education

- What is learning? Who qualifies as an adult?
- How learning takes place among adults?
- Basic differences between child learning and adult learning
- Importance of visualizing and self-discovery in adult learning
- Adult learning as an experiential process
- Non-formal education methods for farmer field school
- Principles that guide the learning process in a farmer field school

Discovery Learning

- 'Ballot Box' Pre- and Post-test Exercises
- 'What is this' Exercise
- Agro-ecosystem Analysis (AESA)
- Field Collection, Sorting, and Ecological Function Identification of Arthropods and Field Problems
- Group Exercises on Hazard on Use of Pesticides to Humans and the Environment
- Insect and Disease Zoos Exercises
- Familiarization Exercises through Moving Exams
- Group Dynamics, Team Building Exercises, and Special Topics
- Folk Media Presentation

2.2 Module 2: FFS Planning, Design, Management, Quality Monitoring and Evaluation, and Post-FFS Activities (11-16 March 2013)

This module covered the basic understanding on community mobilization, organization, and planning leading to setting-up FFS and post-FFS action research designed by the community of farmers and trainers.

Following areas were covered using both theoretical and practical aspects with pertinent examples from various Asian countries:

- Participatory Planning Perception
- Baseline Surveys, Season and Crop Calendars, Problem Identification and Analysis
- Developing Schedule and Curricula for the FFS
- Daily Planning, Monitoring, and Evaluation
- Field Days, Mass Graduation, Farmer's Diaries, and Analysis of the FFS
- Planning of the FFS at Community Level
- Establishing Coordination and Management System
- Backstopping, Monitoring, and Evaluation System (ensure quality)
- Technical Backstopping to the Crops
- Field Days to National Planning and Evaluation Workshops on IPM
- Planning and Implementation on Skill-up Gradation of the Facilitators
- Life After FFS: How to Plan Community Learning
- Various Methods of Post-FFS Follow-ups
- Participatory Action Research (PAR) or Participatory Technology Development (PTD): Concept and examples
- Setting of Action Research, Planning and Implementation
- Observation and Data Collection System
- How to Use the Data: Participatory Analysis and Conclusion
- New Learning and Feeding to the FFS Curricula

2.3 Module 3: Biological Control, hands-on exercise on mass-reading of the commonly available bio control agents in Thailand

- Biological control
- Predators
- Parasitoids
- Entomopathogens
- Laboratory and mass rearing
- Field visit

2.4. Module 4: System perspective of the crop management (Sustainable crop intensification)

- Special Topic: Weed Control
- Special Topic: Gender and IPM (held earlier in first week)
- Special Topic: Weed mangeement in Rice and Wheat crop
- Speical Topic: Food Safesty
- Special Topic: IPM to holistic plant management
- Special Topic: Principle and Practices of sustainable crop intensification (Rice, Wheat etc.)
- Special Topic: Soil and Root (Rhizosphere management)

3. HIGHLIGHTS OF ACTIVITIES

3.1. Module 1 and 2

3.1.1. Participatory discussions on: 'Creating an effective environment for adults in an FFS setting'

What is learning?

- Process of acquiring some new knowledge, attitudes & practice (KAP)
- Not a sole preserve of younger people; adults do continue to learn, to grow & to change; nobody is too old to learn

Who qualifies as an adult?

- As individual: responsible for his/her own life; self-directing
- Biological: physically mature
- Legal: 18 years old (as stipulated by law)
- Social: performs adult roles (as parent, livelihood earner, head of households)

How learning takes place among adults?

- *Existing popular knowledge recognized &valued*
  Participants already possess some knowledge; synthesis of popular knowledge with existing scientific knowledge strengthens learning experience
- *New knowledge built on existing knowledge*
  As people begin to appreciate what they already know, they are more open to seek new information, enhancing learning process
- *Participants learn to exercise control*
  Emphasizes active participation to generate their own knowledge; take responsibility for their own learning; constitutes a powerful impetus to learn & exercise control over their learning
- *Learning becomes a collective process*
  As a result, participants learn to get together, collectively seeking & analyzing information
- *Learning creates informed options*
  Collective analysis opens up various alternatives, debated based on concrete information; participants able to accept & reject options on an informed basis; creates a sense of empowerment, on confidence that information was understood & interpreted
- *Actions emerge out of this analysis*
  Involvement in process of analysis creates a sense of ownership of that knowledge & willingness to transform that situation; participants then are able to take concrete actions

Basic Difference between Child learning and adult learning

The participatory discussions on 'Creating an effective environment for adults in an FFS setting' were summarized by comparing the basic differences between child learning (also known as pedagogy) and adult learning (also known as andragogy) as shown in **Table 1**.

Table 1. Basic Difference between child learning and adult learning

PARAMETERS	CHILD	ADULT
1. Nature of learners	▪ Children have less knowledge & experience	▪ Adults possess relevant knowledge & experience to be used in learning process
2. Motivation to learn	▪ External pressure from parents or teachers; competing for grades; consequences of failure	▪ Driven by internal motivation (desire for recognition, increase confidence or self-esteem; better quality of life)
3. Role of trainer/teacher	▪ Possesses expertise & authority; source of knowledge & information	▪ Facilitates process; participants' experiences are acknowledge & use
4. Learning need	▪ Application for 'real' life & future	▪ In response to needs relevant to present situation
5. Content	▪ Experts decide on learning (formal & uniform curriculum)	▪ Participant-centered; emphasis on process
6. Orientation	▪ Subject matter-centered; emphasis on content mastery	▪ Participant-centered; emphasis on process
7. Methodology	▪ Information transfer from teacher to student	▪ Sharing stimulates learning between or among peers thru participatory processes

Importance of visualizing & self-discovery in adult learning

- Instead of providing 'right' answers, facilitator creates an environment to engage participants in critical thinking & arrive at answers by themselves
- Facilitator poses problem, facilitates participants to search causes & analyze situation, discover solutions & come up with an action plan
- Tests have shown that people remember 20% of what they HEAR, 40% of what they HEAR & SEE & 80% of what they DISCOVER FOR THEMSLEVES!!!

Adult learning as an experiential process

- Experiences something directly, then;
- Reflects on experiences as something new or related to other experiences, then;
- Develops some concepts, which he/she;
- Uses in subsequent action & derives new set of experiences.

3.1.2. Field collections, identification, classification of live specimens, and conduct of insect and disease zoo exercises with the training participants

The training participants, together with the FFS Specialist undertook field exercises, in small groups, to collect, identify, and classify common insect pests and their natural enemies as well as diseases and other crop abnormalities in adjoining fields. After collecting live specimen, the FFS Specialist joined and assisted the training participants in identifying and classifying their field collections. In this regard, the FFS Specialist and training participants jointly classified the specimen based on their ecological functions. Using this method, the specimens were initially sorted out as either pests, natural enemies of pests, or diseases. The pests were then classified either as: defoliators, stem-borers, sap feeders, root feeders, grain/storage pests, or disease vectors as described in **Tables 2**. On the other hand, the natural enemies of pests were classified either as: predators, parasitoids, or insect diseases as shown in **Table 3**; while plant diseases were classified as: viral, fungal, or bacterial diseases and physiological disorders as reflected in **Table 4**.

Table 2. Classification of insect and other pests according to their function in crop ecosystem

Ecological Function	Specimens Collected	Destructive Stage
1. Defoliators	Skipper moth, butterfly Short-horn grasshopper Golden apple snail Pumpkin beetle Leaf-feeding ladybird beetle	Larva Nymph, Adult Young, Adult Larva, Adult Larva, Adult
2. Borers	Fruit borer	Larva
3. Sap feeders	Bugs Aphids	Nymph, Adult Young, Adult
4. Root feeders	Mole crickets White grubs	Nymph, Adult Larva
5. Storage/grain feeders	Grain weevil	Larva, Adults
6. Disease vectors	Whitefly Aphids	Adult Young, Adult

Table3. Classification of natural enemies of pests according to their function in crop ecosystem

Ecological Function	Specimens Collected	Kind and Stages of Pests Attacked
1. Predators (eat the whole insect or body parts of their prey)	Spiders	Moths, Butterflies, Green Leafhoppers, Larvae
	Ladybird Beetles	Eggs, Small Larvae, Aphids
	Dragonflies, Damselflies	Moths, Butterflies, Green Leafhoppers
	Ground Beetles	Soil-dwelling Pests
2. Parasitoids (lay eggs on eggs, larvae, pupae of other insects and complete their life cycle inside the insect pests	Parasitic Wasps	Parasitizes eggs, larvae, or pupae of armyworms, cutworms, leaf-folders, and other lepidopterous pests
	Parasitic Flies (no specimen collected)	Parasitizes eggs, larvae, or pupae of armyworms, cutworms, leaf-folders, and other lepidopterous pests
3. Insect diseases (microbes that cause disease of insects and attack larvae and adults of insect pests)	Fungal Diseases (no specimen collected)	Produce spores or mycelia on larvae and adults of insect pests
	Bacterial Diseases (no specimen collected)	Attack the digestive systems of insect pest larvae
	Viral Diseases (no specimen collected)	Attack/colonize insect body cells and causes body disintegration of insect pests

Table 4. Classification of crop diseases according to their causal organisms

Causal Organism	Specimens Collected	Characteristic Symptoms
1. Viral Diseases	Cucurbit leaves with curling & yellowing (suspected viral disease)	Yellowing, mottling, mild or severe stunting, curling of leaves, gall formation, ragged leaf edges
2. Fungal Diseases	Various leaves showing leaf spots/lesions & cottony or powder-like substances	Necrosis or discoloration, dry lesions or spots, presence of powdery substances (spores, mycelia) on the surface of lesions
3. Bacterial Diseases	Various leaves showing leaf spots/lesions	Necrosis or discoloration, water-soaked lesions, streaks, or stripes, presence of bacterial ooze, foul odor
4. Physiological Disorders	Leaves & fruits with deformities, yellowing & stunting	Aborted flowers, deformed fruits, general yellowing, uneven crop stand

During the process of identification and classification of field-collected specimens, there were heated discussions as to whether the insects collected were indeed pests or natural enemies of pests. There were also confusions as to whether the plant samples collected showing some abnormalities were caused by diseases or physiological disorders. It was at this juncture that the FFS Specialist proposed that they (training participants) jointly develop insect and disease zoo exercises to better understand the ecological functions of their field-collected specimens (e.g., insect pests, natural enemies of pests, or diseases) in crop ecosystem. These exercises were elucidated in details by the FFS Specialist, while the English Interpreter later described the same to the training participants, who subsequently agreed to undertake the set-up, as follow:

- An insect zoo exercise involves the rearing of insects in small containers, such as used transparent plastic bottles or any similar vessels, which are wide enough for the insects to move freely inside and visible enough for farmers to observe insect behavior. If an insect is a suspected pest then it was reared together with a suspected host plant or plant part for keen observation inside a suitable container. If, however, an insect was suspected as a natural enemy of a pest, then it was introduced into a container together with a suspected host pest for verification.

- A disease zoo, however, involves the rearing of a suspected diseased plant or plant part in a suitable container that will allow farmers to observe the development of a suspected abnormality. After providing the necessary conditions (e.g., moisture, temperature, oxygen) and the suspected abnormality developed further (e.g., lesions grew bigger) then it was probably a disease. If, however, it did not develop at all, then it was most likely a physiological disorder (e.g., nutrient deficiency or toxicity, damaged caused by low or high temperatures or pest or herbicide injury).

After 24 hours, the training participant and the FFS Specialist discussed the results of the insect zoo exercise that they conducted. These were summarized in **Table 5**. In their succeeding field activities, the training participants together with FFS Specialist established disease zoo exercises immediately after field collection to ensure the use of fresh specimens. The results of their disease zoo exercises are described in **Table 6**. Take note that based on the insect zoo studies they have set-up, the training participants have very little knowledge yet on other types of natural enemies of pests, such as parasitoids and insect pathogens. Similarly, their knowledge on predators is still limited, it being confined to common species, like ants, dragonfly, and spiders. In like manner, the training participants did not have enough practical skills in identifying crop diseases and physiological disorders. This means that future fine-tuning activities should focus more on such concerns.

Table 5. Results of an insect zoo exercises on pests & their natural enemies conducted by the training participants

GROUP	STUDY UNDERTAKEN	RESULTS/CONCLUSIONS
I (Azim, Humayoon, Wazir, Saboor, Farooq)	1. Damselfly vs. Aphids (find out if damselfly will prey on aphids)	▪ Aphids were gone & assumed eaten by the damselfly probably because no other prey was available ▪ There is a need to repeat the exercise to validate results
	2. Short-horned grasshopper vs. Aphids (find out if short-horned grasshopper is a pest)	▪ Aphids were gone & assumed eaten by the short-horned grasshopper probably because no other prey was available ▪ There is a need to repeat the exercise to validate results
	3. Wasp (suspect pest) vs. Leaf (find out if the wasp is a pest)	▪ Wasp died maybe because it is not a pest but a predator (natural enemy) ▪ There is a need to repeat the exercise to establish if the wasp is a predator (natural enemy)
	4. Golden apple snail egg-mass (determine how many days will the egg-mass hatch into young snails	▪ The egg-mass did not hatch after 2 days ▪ Longer observation period is needed to establish how long will the egg-mass hatch into young snails
	5. Aphids vs. Leaf (find out if aphids are pests)	▪ The leaf surface colonized by the aphids wrinkled or curled due to aphids' sap feeding ▪ Therefore, the aphids are pests
II (Naseer, Khaibar, Zafar, Nazar, Atiqullah)	1. Ladybird beetle (adult) vs. Aphids (find out if ladybird beetle adult is a predator)	▪ Therefore, the ladybird beetle adult is a natural enemy ▪ Ladybird beetle adult ate all the introduced aphids colony
	2. Short-horned grasshopper vs. Aphids (find out if short-horned grasshopper is a pest)	▪ Short-horned grasshopper did not eat the leaf & aphids ▪ Probably short-horned grasshopper is a pest & the food (leaf) given was not appropriate ▪ There is a need to repeat the exercise to validate results
III (Ashraf, Shafi, Ali, Ershad, Yousuf)	3. Ladybird beetle (larva) vs. Aphids (find out if ladybird beetle larva is a predator)	▪ Ladybird beetle larva ate 80% of the introduced aphids colony ▪ Therefore, the ladybird beetle larva is a natural enemy
	4. Dragonfly vs. Aphids (find out if dragonfly will prey on aphids)	▪ Aphids were gone & assumed eaten by the dragonfly (but it died) probably because no other prey was available ▪ There is a need to repeat the exercise to validate results

Table 6. Set-up of disease zoo exercises for suspected crop diseases & physiological disorders conducted by the training participants

GROUP	SPECIMEN SET-UP	
	Suspected Disease	**Initial Size of Lesion**
I (Azim, Humayoon, Wazir, Saboor, Farooq)	1. Leaf with lesions suspected to be either a fungal or a bacterial disease	▪ Lesions developed cottony structures on the surface of the lesions ▪ Therefore, it is fungal a disease
	2. Leaf with spots suspected to be a physiological disorder	▪ Lesions did not developed & leaf surface did not produced powdery or cottony structures ▪ Confirmed that the leaf spots is not caused by a disease but probably a physiological disorder
	3. Leaf with spots suspected to be a bacterial disease	▪ Lesions did not developed & leaf surface did not produced powdery or cottony structures ▪ Therefore, the leaf spot is not caused by a disease but probably a physiological disorder
II (Azim, Humayoon, Wazir, Saboor, Farooq)	1. Leaf with lesions suspected to be a bacterial disease	▪ Lesions developed cottony structures on the surface of the lesions ▪ Therefore, it is fungal a disease
III (Ashraf, Shafi, Ali, Ershad, Yousuf)	1. Leaf with lesions suspected to be either a fungal or a bacterial disease	▪ Lesions developed brown color & produced white powdery substances on the surface of the lesions ▪ Therefore, it is fungal a disease
	2. Leaf with lesions suspected to be a bacterial disease	▪ Leaf with lesions did not developed ▪ Probably the lesions are caused by a nutritional deficiency
	3. Leaf with black lesions suspected to be a fungal disease	▪ Leaf with lesions did not developed ▪ Probably the lesions are caused by a physiological disorder

3.1.3 Developing and conducting supplementary discovery-based exercises with the training participants, such as the 'moving exam' and 'ballot box' test

Taking a cue from previous activities, the FFS Specialist suggested to the training participants that supplemental field-based activities should be undertaken during FFS so that the enthusiasm and interest of farmer-participants can be further sustained. Thus, it was decided that the training participants will collect again pests, their natural enemies, plant diseases, and other crop abnormalities for another round of identification, classification, and insect zoo exercises. After these exercises were through, another exercise was set-up, known as a 'moving exam'.

A 'moving exam' is a very practical tool used to progressively assess the participants' skills in identifying pests, their natural enemies, plant diseases, and other crop abnormalities from the field. It consists of allowing a group of farmers to move around, observe, discuss among themselves, and select the best answer from among specimens secured in flip charts, that will best describe the organisms' ecological function (e.g., whether the specimen is a predator, a parasitoid, a plant disease, or a physiological disorder). The 'moving exam' questions administered to the maize TOT participants are as follow:

1. *Identify these specimens (leaf with lesions): (a) bacterial or fungal disease; and (b) bacteria or fungal disease?* Specimens (answers): (a) [leaf showing symptoms of a] fungal disease; and (b) [leaf showing symptoms of a] bacterial disease
2. *Identify these specimens: (a) beetle or butterfly; and (b) grasshopper or leafhopper?* Specimens (answers): (a) [pumpkin] beetle; and (b) [short-horned] grasshopper
3. *Identify these specimens: (a) moth or butterfly; and (b) moth or butterfly?* Specimens (answers): (a) [skipper] moth; and (b) [semi-looper] butterfly
4. *Identify these specimens: (a) predator or parasitoid; and (b) parasitoid or predator?* Specimens (answers): (a) [spider] predator; and (b) [ants] predators
5. *Identify these specimens: (a) disease or physiological disorder; and (b) insect damage or disease?* Specimens (answers): (a) [leaf showing lesions of a bacterial] disease; and (b) [leaf damaged by a defoliator] pest damage
6. *Identify these specimens: (a) larva or pupa; and (b) pest or natural enemy?* Specimens (answers): (a) [leaf-eating ladybird beetle] pupa; and (b) [skipper adult] pest
7. *Identify these specimens: (a) disease or physiological disorder; and (b) pest damage or disease?* Specimens (answers): [sun scald] physiological disorder; and (b) [leaf-eating ladybird beetle] pest damage

After doing the 'moving exam' exercise, a quick analysis of the training participants' performance in the said activity revealed that their average skills was fairly satisfactory at 64%, which means that the participants can correctly identify the ecological functions of a little over 6 out of 10 animals or crop abnormalities that they commonly observed in the field. Nevertheless, the results imply that future fine-tuning of the training participants' identification skills for pests, their natural enemies, pest damages, and disease symptoms should be more regularly undertaken. The percentage scores achieved by the training participants in the

'moving exam' for pests, their natural enemies, pest damages, and diseases symptom identification are shown in **Table 7**.

Table 7. Percentage scores achieved by the training participants in moving exam for pests, their natural enemies, pest damages, and diseases symptom identification

GROUP	% SCORE
I (Azim, Humayoon, Wazir, Saboor, Farooq)	50
II (Azim, Humayoon, Wazir, Saboor, Farooq)	79
III (Ashraf, Shafi, Ali, Ershad, Yousuf)	64
AVERAGE % SCORE	**64**

At this point, the FFS Specialist silently solicited feedbacks from the training participants as regards their impression of the exercise. This was decided upon to find out if it will be relevant to them and to FFS farmers. Thus, some of the useful comments made by the training participants on the conduct of the 'moving exam' exercise are summarized below:

1. This is an excellent way of reviewing what was covered in previous sessions (e.g., pests, their natural enemies, pest damages, and symptoms of maize diseases);
2. There is equal participation of members in small groups;
3. It allows clear identification of pests, their natural enemies, pest damages, and symptoms of crop diseases;
4. It arouses constructive debate.

On the next day, the training participants collected again pests, their natural enemies, plant diseases, and other crop abnormalities for another round of identification, classification, and insect zoo exercises. After these exercises were through, another exercise was set-up, known as a 'ballot box' test. 'Ballot box' test is a field-based test administered to participants without using pens or pad papers. It uses specimens (e.g., materials, objects, plants, or animals) in actual crop ecosystem. Questions in a 'ballot box' evaluation dealt mainly on knowledge and skills in identification of plants, pests, pest damages, disease symptoms, arthropod pests and their natural enemies, fertilizers, chemicals, as well as soils, irrigation, and environmental stresses in crops. For each question, there are three 'ballot boxes' representing possible correct answers to choose from and where participants put a replicate of their assigned numbers corresponding to a correct answer. A question may refer to a plant indicated by a string attached to three specimens in a crop ecosystem as possible answers. In another instance, a question may refer to a specimen indicated by a string attached to three plants in a crop ecosystem as possible answers. Past experiences showed that for a 'ballot box' test to be effective, questionnaires should be framed to focus on functions of organisms or specimens rather than on their technical definitions. This particular exercise was designed to develop functional 'ballot box' questionnaires for FFS on crops. This exercise is valuable for developing an evaluation instrument to assess pre- and post-training knowledge and skills gained by the FFS participants in crop production. The exercise consisted of two aspects, namely; (a) developing functional 'ballot box'

questions, and (b) undertaking the 'ballot box' test using the functional questions developed by the training participants. The scores obtained by the training participants in undertaking the 'ballot box' test are presented in **Table 8**. The highest % score obtained was 79% while the lowest % score was 50%. Overall, the average % score they garnered was relatively low at 63%, indicating that their field problem identification skills may still need further enhancement. On the other hand, their ability to develop functional 'ballot box' questions have improved tremendously, gauging from their outputs as listed below:

Group I (Azim, Humayoon, Wazir, Saboor, Farooq)

1. Which of these is pest damage? [Specimens: (a) leaf damaged by a defoliator; (b) leaf showing symptoms of physiological disorder; (c) leaf showing a disease symptom];
2. Which of these is a predator? [Specimens: (a) locust adult; (b) predatory ladybird beetle; and (c) Colorado beetle];
3. Which of these is a parasitoid? [Specimens: (a) predatory ant; (b) sun-pest; and (c) parasitic wasp];
4. Which of these is a fungus disease? [Specimens: (a) leaf with symptoms of bacterial disease; (b) leaf with symptoms of fungal disease; and (c) leaf showing symptoms of physiological disorder]; and
5. Which of these is a broadleaf weed? [Specimens: (a) common broad leaf weed in the area; (b) grassy weed; and (c) maize crop].

Group II (Azim, Humayoon, Wazir, Saboor, Farooq)

1. Which one is a natural enemy? [Specimens: (a) predatory ladybird beetle; (b) short-horned grasshopper; and (c) aphids];
2. Which of these damages was caused by insect pests? [Specimens: (a) leaf damaged by a defoliator-insect; (b) leaf with a disease symptom; and (c) leaf showing symptom of a low temperature damage];
3. Which one shows symptoms of cold weather damage? [Specimens: (a) plant damaged by insects; (b) plant showing symptom of frosting; and (c) plant with symptom of physiological disorder];
4. Which of these weeds is difficult to control? [Specimens: (a) weed that is difficult to control in a specific location; (b) weed that is not too difficult to control; and (c) weed that is easy to control];
5. Which one of these is a specimen of a parasitoid? [Specimens: (a) dragonfly; (b) long-horned grasshopper; and (c) parasitic wasp];
6. Which of these is a specimen of a diseased plant? [Specimens: (a) plant showing symptom of a physiological disorder; (b) plant showing symptom of a bacterial disease; and (c) plant showing symptoms of pest damage].

Group III (Ashraf, Shafi, Ali, Ershad, Yousuf)

1. Which of these is pest damage? [Specimens: (a) leaf damaged by a sap-feeding insect; (b) leaf with symptom of a disease; and (c) leaf showing symptom of a physiological disorder];
2. Which of these is a parasitoid? [Specimens; (a) spider; (b) ant; and (c) Trichogramma];
3. Which of these is a predator? [Specimens: (a) ant; (b) locust; and (c) predator wasp];
4. Which of these is showing symptom of a fungal disease? [Specimens: (a) leaf with symptom of a bacterial disease; (b) leaf with symptom of a fungal disease; and (c) leaf symptom of physiological disorder];
5. Which of these is a broadleaf weed? [Specimens: (a) grassy weed (b) potato plant growing out of place; and (c) sedge].

Table 8. Percentage scores achieved by the training participants in 'ballot box' test for pests, their natural enemies, pest damages, and diseases symptom identification

No.	Name	% SCORE
1	Mr. Ahmad Ershad Fazel	57
2	Mr. Abdul Saboor Sazgar	64
3	Mr. Sayed Ashraf Mangal	64
4	Mr. Mohd Zafar Zahir	57
5	Mr. Sayeed Farooq Hussaini	71
6	Mr. Azim Khan Habib	79
7	Mr. Kh. Mohd Shafi Seddeqi	57
8	Mr. Mohd Wazir Nazari	57
9	Mr. Mohd Naseer Ahadi	57
10	Mr. Mr. Khaibar Ahsas	79
11	Mr. Humayoon Rahmani	50
12	Mr. Attiqullah Hosiny	64
13	Mr. Nazar Mohd Adib	71
14	Mr. Mohd Yousuf Ebrahimi	57
	AVERAGE % SCORE	**63**

3.1.4 Developing a discovery-based exercise to show the hazards of pesticide use to non-target organisms in crop ecosystem

A discovery-based exercise was also undertaken by the training participants to demonstrate the effect of pesticides, even the green-labeled ones as defined by the World Health Organization (WHO), on non-target organisms in the ecosystem. This exercise is valuable as a 'scaring' session tool for farmers in enhancing their decision-making skills on how to use more environment-friendly options as alternative strategies in pest management. The result of the exercise is summarized in **Table 9**. Clearly, the results show that, indeed, even green-labeled pesticides can have detrimental effects to non-target organisms such as the natural enemies of pests.

Table 9. Results of an exercise undertaken by the training participants on effects of green-labeled pesticides (insecticide, herbicide & fungicide) to non-target organisms in the ecosystem

GROUP	STUDY UNDERTAKEN								
I	**Initial**		**Final**						
(Azim, Humayoon, Wazir, Saboor, Farooq)	**With Insecticide**	**No Insecticide**	**With Insecticide**			**No Insecticide**			
			30 min	**1 hr**	**2 hrs**	**30 min**	**1 hr**	**2 hrs**
	1 spider, 1 field cocroach	2 spiders, 1 field cocroach	All dead	All dead	All dead	All alive	All alive	All alive
II	**Initial**		**Final**						
(Azim, Humayoon, Wazir, Saboor, Farooq)	**With Herbicide**	**No Herbicide**	**With Herbicide**			**No Herbicide**			
			30 min	**1 hr**	**2 hrs**	**30 min**	**1 hr**	**2 hrs**
	7 aphids, 1 ladybird beetles	12 aphids, 1 ladybird beetles	All alive	All aphids dead	All aphids dead	All alive	All alive	All alive
III	**Initial**		**Final**						
(Ashraf, Shafi, Ali, Ershad, Yousuf)	**With Fungicide**	**No Fungicide**	**With Fungicide**			**No Fungicide**			
			30 min	**1 hr**	**2 hrs**	**30 min**	**1 hr**	**2 hrs**
	3 ants, 2 ladybird beetles, 1 moth	3 ants, 2 ladybird beetles, 1 moth	All alive	1 ant dead	1 ant dead	All alive	All alive	All alive

3.1.5 Workshop on: 'Non-formal education (NFE) methods used in FFS', 'Component activities of FFS', and Qualities of a good facilitator'

Non-formal education (NFE) methods used in FFS

- Discovery-based learning techniques (AESA, PAR/PTD, collection, identification & functional classification of insects, diseases & other abnormalities, insect 'ballot box' pre- & post tests, moving exams, insect and disease zoos)
- Experiential learning methods (sharing of experiences among participants, facilitators, and technical resource persons)
- Participatory approaches (discussions, group dynamics & team building exercises, special topics)

FFS as a 'school without walls'

- Crop growth & agro-physiological issues form core of FFS curriculum
- Farmers share ideas on what is happening in the field & why these are happening
- Season-long, hands-on training of 25-30 farmers doing experiments & field studies in a 'learning field'

Component activities of FFS

- Agro-Ecosystem Analysis: Direct experience & critical analysis of plant health, water, weed, soil & nutrient management, plant disease surveillance, and observation & collection of insect pests, predators & parasite
- Group Dynamics: Socio-cultural aspects such as team building & leadership training
- Special Topic: Specific issue or concerns like good seed selection, biodiversity conservation, composting, post harvest & processing, marketing, etc.

Focus on Farmers' Skills Development

- Management and decision-making skills on agronomic and ecological factors
- Leadership skills facilitating group learning activities and problem-solving processes
- Critical skills enabling farmers to identify and analyze problems and take action

3.1.6 Participatory discussions on: 'FFS curriculum in crop production'

A farmer field school (FFS) is a 'school without walls'. The FFS on crop production brings farmers together to carry out an intensive training on integrated production and pest management (IPPM) methods and issues over the life cycle of crop. Thus, FFS farmer-participants meet for 14-16 weeks (a whole cropping season), from land preparation to harvest. Each FFS has at least 1,000 m^2 'learning field' containing a farmer-run comparative study of IPPM and other relevant field experiments. Each week, farmers practice agro-ecosystem analysis (AESA) in the 'learning field' which includes plant health, water management, weather, nutrient management, weed density, disease surveillance, and observation and collection of insect pests, beneficial predators and parasitoids.

Through direct experience and critical analysis, farmers interpret their observations in the AESA to make field management decisions. Thus, FFS trains farmers to become experts in their own fields. The FFS training team (e.g., composed of facilitators) is assisted by agricultural technicians assigned in a crop production area where the FFS on crop production is located. The principles that guide an FFS learning process are:

- *The field is the primary learning resource.* All learning activities take place in the field and are based on what is happening in the field.

- *Experience forms the basis for learning.* The activities that take place in the field and their farms form the basis for discussions and analyses by farmers who arrive at concepts which they test and improve through further field activities.

- *Decision-making guides the learning process.* Training focuses on analysis of corn ecosystem. The combination of analytical methods, ecological principles, and basic IPPM methods helps farmers gain insights into the ecological interactions in a cornfield and provide them with greater confidence in making crop management decisions.

- *The training curriculum is based on local conditions of the FFS.* The FFS curriculum and materials are based on their appropriateness, the local conditions, problems, and needs of farmers in the FFS.

- *Training last the entire cropping season.* Farmers acquire a firm understanding of relevant IPPM concepts for each growth stage of the corn crop as well as the factors that influence crop management decision-making at all stages of plant's growth.

The andragogic and experiential approach of the FFS is a direct contrast to the pedagogic, diffusionist, and top-down extension methods of the Green Revolution. Government agencies involved in the Green Revolution were basically target-oriented and rigid in fulfilling their mandates. These agencies prescribed small farmers to use inputs in accordance with centrally-determined recommendations, resulting in a 'de-skilling' of rural communities. Farmers were expected to be passive recipients of new technologies rather than active innovators.

An FFS for crop production consists of 25-30 farmers meeting for half day each week to share and discuss AESA observations and plan out activities for the following week. The crop growth stage and agro-physiological issues related to these stages form the core of the FFS curriculum. Field monitoring through AESA culminates with the development of an agro-ecosystem drawing that is used for analysis. These are then shared through small and large group discussions guided by facilitators.

In the small group discussions, farmers share their ideas on what is happening in the field and why these things are happening. Facilitators circulate among the group and help farmers analyze their observations by posing problems and scenarios. In the large group discussions, the small groups share their ideas with the whole FFS group. Facilitators help participants in the discussions, posing 'what if' scenarios. They also share additional information related to plant growth and ecosystem not covered by the group discussions.

Aside from serving as an experiential learning tool for farmers, FFSs also cater to the socio-cultural aspect of crop production. Hence, group dynamics exercises are regularly included in FFS activities. Group dynamic exercises are aimed to:

- Develop participants into a closer knit IPM team;
- Establish a learning climate that is enjoyable as well as fruitful;
- Help participants experience and identify aspects of teamwork such as mutual support, the importance of individual roles to a team's success, and behaviors that can build or hamper teamwork; and
- Help participants experience what can be accomplished by working together.

Together with group dynamics exercises, special topics are likewise an integral component of FFS activities. Special topics sessions concerns specific problems like rat damage or a field study being carried out in the learning field. Special topics usually reflect individual FFS needs. Some special topics are planned ahead of the FFS while others are developed as the FFS progresses.

A typical profile of an IPM farmer field school for rice, corn, cotton, coconut, vegetables, mango, and other crops at any given day is:

- ***Field observation:*** *07:00-08:00 am.* Farmers form small groups, makes observations of the whole field, and then examine 5 staked plants per plot, recording agronomic data per plant, type and number of insects, and any other details.
- ***Agro-ecosystem analysis:*** *08:00-09:00 am.* Each group prepares drawing of their field observations including information on the condition of plants, pests and diseases; natural enemies of insect pests; weather, soil and water conditions.
- ***Presentation and discussion:*** *09:00-10:00 am.* Each small group presents their drawings and discusses their observations and conclusions in the whole group. The whole group reaches consensus about crop management practices that they will carry out during the coming week.
- ***Break:*** *10:00-10:15 am.* A short break allows participants and facilitators to refresh and invigorate themselves in preparation for the succeeding activities.
- ***Group dynamics exercise:*** *10:15-10:30 am.* This activity aims to stimulate attention and participation, as well as strengthen group communication and increase solidarity.
- ***Special topics:*** *10:30-11:30 am.* The facilitator guides the group in experiments, lessons, exercises, and discussions on special topics related to what is actually occurring in cornfield.

- ***Evaluation and planning:*** *11:30-12:00 nn*. This activity allows the group to identify 'what went well' and 'what needs improvement' of the day's activities and plans activities to be undertaken in the coming week.

3.1.7. Participatory discussions on: 'Gathering baseline data for planning and evaluating FFS activities'

There are several methods of gathering baseline data for planning and evaluating FFS activities. The most common are the (a) participatory rapid appraisal [PRA] and (b) use of baseline survey form [BSF].

- Participatory rapid appraisal [PRA] is a tool use to gather baseline data from prospective FFS farmer-participants that can be used immediately for planning FFS activities. In many instances, it employs focus group discussions (FGD) as a means of gathering relevant baseline data from target project beneficiaries. In IPM-FFS, information on pest problems, pest management, and cultural practices are easily obtained in a participatory discussions with selected farmers representing a specific situation or pest problem area.

- Baseline survey form [BSF], on the other hand are used to gather baseline data that will be relevant in evaluating the impact of an FFS-IPM program on farmer-participants in a specific situation or pest problem area sometime after implementing IPM-FFS interventions. It uses a formal questionnaire in obtaining relevant baseline data on pest problems, pest management, and cultural practices from target project beneficiaries. An example of a baseline survey form (BSF) (**Annex B**) used by the Philippine National IPM Program was presented by the FFS Specialist as a reference material during a participatory discussions with the training participants.

3.1.8. Participatory discussions on: 'Framework of knowledge generation and use for conducting PTD Studies'

By relating ground working, village immersion, and follow-up activities in practice FFS sites, the training participants are able to validate and adapt a previously developed framework of knowledge generation and use_in the practice FFS sites. Thus, the TOT and FFS participants, in establishing PTD studies in their respective learning fields can use this framework. This is illustrated in **Figure 1**.

It should be realized that in PTD: (a) some people (e.g., facilitators, technical experts, and other stakeholders) in an organization and the community under study participate actively with farmers throughout the technology development process, from initial design of studies to presentation of results and discussions of their action implications; (b) they act less as a disciplinary expert and more as a coach in team building; (c) they also see to it that as plenty of relevant expertise as possible is mobilized from all over the community; and (d) they can also help bring in technical experts from outside organizations as the need arises.

The aforesaid process illustrated in **Figure 1** is exemplified by the regular FFS and PTD activities being undertaken by the Philippine National IPM Program (KASAKALIKASAN). In 1995, the TOT and FFS participants of IPM for vegetables at Canlaon City, Negros Oriental, initially tried this process. Their experiences indicated that some important considerations are needed to ensure the successful implementation of PTD activities when addressing specific field problems in a community, such as:

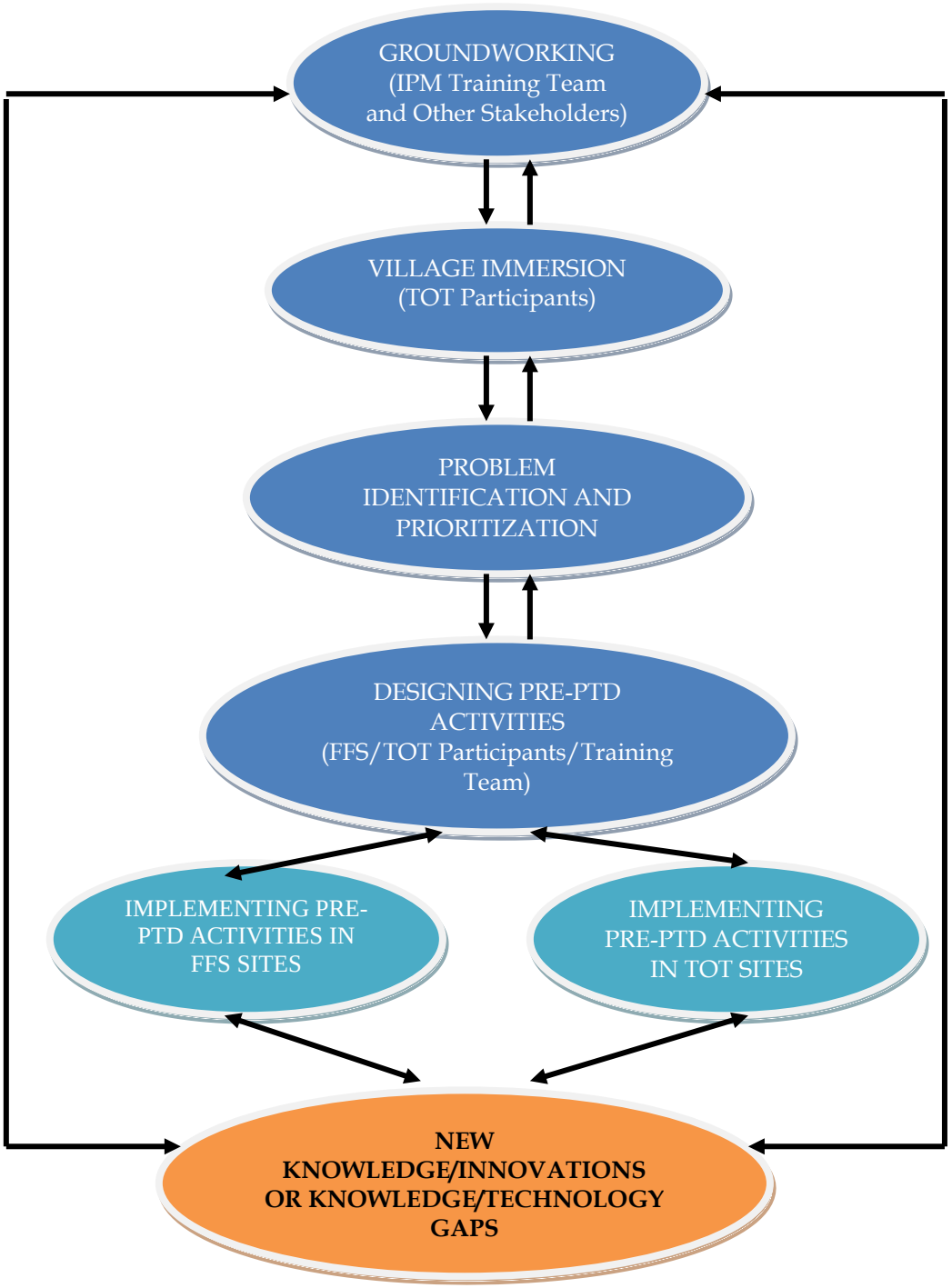
1. Adequate ground working activities followed by equally sufficient village immersion and follow-up activities by farmers, facilitators (IPM training team and TOT participants), technical experts (researchers, scientists, and extension workers), and other stakeholders should be conducted to identify, validate, and prioritize local field problems;

2. The PTD studies to be set-up in farmers' fields should be jointly identified, established, and managed by FFS farmer-participants, facilitators, and technical experts based on prioritized local field problems in close coordination and consultation with local researchers and other stakeholders;

3. New knowledge/innovations, knowledge/technology gaps, or new problems resulting from the PTD studies should be used as additional basis for prioritizing or addressing field problems and designing activities in succeeding PTDs to be established in the community; and

4. PTD methodologies or approaches should be standardized and thus, a database system can be established for every community. A compilation of all learning experiences from previous PTD studies should be made available as a reference for future PTD activities.

Figure 1. Framework of knowledge generation and use in the practice FFS sites



3.1.8. Participatory discussions on: 'General guidelines in conducting discovery-based exercises for FFS activities and PTD studies on crop production'

The discussions on 'General guidelines in conducting discovery-based exercises for FFS activities and PTD studies on crop production' are summarized in **Table 10**.

Table 10. General guidelines in conducting discovery-based exercises for FFS activities and PTD studies on corn production as agreed upon by the TOS participants.

A. *General guidelines in conducting discovery-based exercise for FFS activities on corn:*
1. The exercise should be preceded by a field activity (e.g. field walk, filed observation, field visit, etc.) 2. The procedure should enhance participatory, discovery-based, and experiential learning 3. The exercise should be designed to facilitate regular FFS activities, such as AESA, field studies, cultural management practices, and special topics. 4. The exercise should encourage the use of environment-friendly control measures such as biological, cultural, mechanical, and other indigenous practices, which should discourage or consider pesticide usage as the last option to control. 5. The exercise should use appropriate non-formal education (NFE) techniques like the use of actual specimens or farmer-made visual aids as learning tools. 6. The exercise should be focused on farmer's understanding of the ecosystem and harmful effects of pesticide usage.
B. *General guidelines in conducting PTD activities on corn:*
1. PTD studies should be designed as follow-up activities for interested FFS farmer-graduates. 2. PTD studies should be designed to address local pest, disease, or other cultural management problems. 3. PTD treatments should be designed as options for farmer's considerations and not as recommendations (e.g. farmers identify problems, suggest solutions and scientists suggest additional options but not recommendations) 4. PTD options considered should encourage use of environment-friendly control measures such as biological, cultural, mechanical and other indigenous practice, which should discourage or consider pesticide usage as the last option to control. 5. PTD options should include farmer's current best practice as a basis for comparison. 6. PTD studies should be designed as a group activity for at least ten neighboring FFS farmer-graduates having a common problem with a minimum of five doing a PTD in one site. 7. PTD studies shall be established in a minimum of one and a maximum of three sites per location. 8. Farmers may opt to meet weekly for their AESA and discuss progress of their PTDs. 9. PTD studies should encourage discovery-based, experiential, and participatory learning. 10. Long-term PTD studies shall be determined after one PTD cropping season and experiences may be shared after every cropping season. 11. If possible, short-term PTD studies shall be designed as components of long-term PTD studies.

3.1.9. Participatory discussions on: 'Qualities of a good facilitator'

The participatory discussions on 'Qualities of a good facilitator' are summarized in **Table 11**. These were focused on comparing the difference between a 'boss' (likened to a teacher) and a 'leader' (likened to a facilitator).

Table 11. Difference between a 'boss' (teacher) and a 'leader' (a good facilitator)

'BOSS' (TEACHER)	'LEADER' (GOOD FACILITATOR)
▪ **Drives employees (participants)**	▪ Coaches (facilitates) them
▪ **Depends on authority**	▪ Depends on goodwill
▪ **Inspires fear**	▪ Generates enthusiasm
▪ **Says 'I'**	▪ Says 'We'
▪ **Places blame for the breakdown**	▪ Fixes the breakdown
▪ **Knows how it is done**	▪ Shows how it is done
▪ **Uses people (participants)**	▪ Develops people (participants)
▪ **Takes credit**	▪ Gives credit
▪ **Commands**	▪ Asks (appeals)
▪ **Says, 'Go'**	▪ Says, 'Let's go'

3.1.10 Sharing of experiences & Participatory discussions on: 'Weekly FFS evaluation & planning'

In the Philippines, weekly FFS evaluation is conducted by the FFS facilitators to find out 'what went well' and 'what needs improvement' during FFS implementation. Result of this evaluation exercise is then used as a basis for planning the FFS activities in the succeeding week. An example of a weekly FFS evaluation result, sjhared with the training participants, is presented below:

WHAT WENT WELL	WHAT NEEDS IMPROVEMENT
1. **Everybody is present** 2. **WE learned how to set-up the insect zoo** 3. **Everybody actively participated in the field activities** 4. **We had nice snacks prepared by the host team**	1. Some participants were late 2. A few participants cannot identify yet some of the insects they collected 3. No environment-friendly pest management options were discussed to control some pests

Using the example above, the planning for the next week's activities may result to the identification of the folling activities:

- Continue with the regular weekly AESA activity;
- A group dynamic activity should be undertaken to address recurrent problem of tardiness among the FFS participants; and
- A special topic on 'Environment-friendly pest management options' must be carried out by the FFS facilitator with the assistance of an invited technical resource person.

3.1.11 Participatory discussions on: 'Training Team's FFS diary for documentation of weekly FFS activities'

The Training Team's FFS diary is a simple documentation instrument used to record the highlights of weekly FFS activities undertaken by the facilitators (picture templates of the dairy were shown & provided to the training participants). It is a record kept at the Municipal Agriculture Office (MAO) which can be used to monitor the quality of FFS implementation at the municipal level. It also serve as a community database sytem. Among others, the diary contains the following:

- Basic information: name of local government officials, members of the training team/facilitators, crop, name of co-operator, location of FFS, start-up and end date, municipal and provincial logos, specimen signatures of municipal mayor and provincial governor;
- Complete list of participants indicating their genders;
- Short description of the FFS curriculum;
- FFS site information: major field problems as validated in village immersion;
- Participatory action researches (PAR) or participatory technology development (PTD) activities established, e.g., IPM vs. FCP and other field experiments;
- Description of FFS site, e.g., soil type, cropping pattern, distance to town proper, location of FFS processing site;
- Records of participants' pre- and post-test scores and weekly attendance;
- Weekly highlights of activities, e.g., AESA, group dynamics, special topics, others;
- Economic data, e.g., actual and extrapolated 1-ha data

3.1.12 Participatory discussions on: 'Some FFS quality pointers during FFS field visit, monitoring and evaluation'

Role of Technical Experts and Training Facilitators

- Technical Experts

The technical experts (e.g., resource persons and other technical working group [TWG] members) shall be responsible for: (a) providing technical inputting on appropriate technical topics required at the time of their field visits; (b) enlightening both the FFS participants and facilitators on accuracies or misconceptions of technical information that might have aroused during FFS implementation; (c) coordinating with local training team in the design of appropriate participatory technology development [PTD] as FFS follow-up activities; (d) assisting local training team in determining location-specific and most cost effective technology options; (e) collaborating with local training team in FFS curriculum development; and (f) participating in FFS quality monitoring and assessment.

- Training Facilitators

The training facilitators (e.g., national, regional, and provincial IPM Coordinators, as well as provincial and municipal-based FFS facilitators) shall provide assistance on the following: (a) monitoring and assessment of training process quality and standard; (b) development of appropriate participatory, experiential, and discovery-based exercises; (c) collaboration with technical experts in developing non-formal education (NFE) methodologies to carry out their technical topics for FFS sessions; (d) coordination with technical experts and local training team in FFS curriculum development; and (e) collaborate with technical experts and local training team in conduct of appropriate reinforcement or refresher courses for FFS facilitators.

Training Process

- Participatory Approach (Was there too much or lesser use of lectures?)

Facilitator must allow every participant to actively participate in all FFS activities. He or she should see to it that no one dominates discussions and allows everyone to share their ideas.

- Experiential Approach (Did it allow more sharing of experiences among participants and facilitators?)

We must never forget that farmers may already have plenty of experiences on a particular topic. We will need to listen to and learn about farmers' experiences. We will gain new ideas and insights from local practices, as well as having a better idea of areas where they are lacking in technical information or understanding.

- Discovery-based Approach (Was there enough field activities and field observations conducted?)

The field provides main learning materials for FFS while other fields in villages provide us with an extra resource when needed. Any exercise that we design should have its roots in the fields. This means that we need to go out to the fields and observe *before* we start any discussions or activities.

If activities are rooted in the field, they are also based on what is happening in the field at *this time*. We cannot generally discover something *now* if it either happened in the past, or will happen in the future.

Training Components

- Agro-ecosystem Analysis [AESA] (Was it properly conducted?)

The AESA, considered as the soul of an FFS dealing with ecosystem management, is important not only to understand the pest-natural enemy dynamics, but more so to better assess the effects of fertilizer, irrigation water, soil, or cultural management practices on the growth and development of the crop and the ecosystem. It is a *group*

activity that should be closely supervised by trained FFS facilitators to enhance group participation and self-discovery.

During the 14-16 weeks, which typically covers the growing season for a crop, farmers in an FFS will have the opportunity to observe a crop in every stage of its growth and development. Field monitoring activities in small groups result in an agro-ecosystem drawing that is used for analysis. This is related to plant growth, agronomy, crop-field ecological issues (e.g., effects of soil fertility, water, weeds, etc.), and decision-making questions provided as discussion guide. These are treated in small and big group discussions.

The small group discussions get farmers to talk about their ideas on what is happening in the field and why these things are happening. The facilitator team circulates among the groups and helps them to examine their ideas by posing problems and scenarios. The large group discussion is the time when small groups can present their ideas to the full group. At this time the facilitators help them clarify their thinking by posing 'what if' scenarios. The facilitators also use this time to present any additional information related to plant growth and ecosystem issues that might not have come out in the discussions.

- Group Dynamics and Team Building Exercises (Were these used to process recurrent FFS problems in a non-threatening manner?)

This component (a) develops the participants into a closer knit of FFS team. It (b) establishes a learning climate that is enjoyable as well as fruitful. It also (c) help participants experience and be able to identify such aspects of team work as mutual support, the importance of individual roles to the team's success and behavior that can build or hinder team work. Likewise, it (d) helps participants experience what can be accomplished by working together. Group dynamics exercises, if processed properly, are important in resolving issues such as tardiness, absenteeism, domineering, among others.

- Special Topics (Did it re-enforced participants' needed relevant technical knowledge?)

The special topic sessions might concern particular issues such as rat damage or they may be involved in a field study being carried out in the FFS learning field. These special topics usually vary from FFS to FFS and reflect the individual FFS needs. Some of the topics are planned out in advance of the FFS and others are developed as the FFS progresses.

- Weekly Evaluation and Planning (What were the important lessons learned?)

This activity allows the group to identify 'what went well' and 'what needs improvement' of the day's activities and plans activities to be undertaken in the coming week. Special topics for next week are normally identified together by the participants and facilitators as during weekly evaluation and planning. It may include a reinforcement activity in response to 'what needs improvement' or an

additional activity aimed at enhancing technical knowledge needed by the participants at this FFS stage.

Punctuality

- Weekly Attendance (Was there at least 90% weekly attendance?)

An ideal FFS stabilizes its attendance at 25-30 participants after two to three weekly sessions. Otherwise it becomes a critical concern. Since absenteeism often becomes a recurring FFS problems, it must be given due reflection by facilitators. Absentee farmers, more often than not, tend to annoy non-absentees for their often immaterial queries when they attend in succeeding FFs sessions. Experienced facilitators usually manage such problem by undertaking appropriate group dynamics activities, which can be critically processed with the participants in a non-threatening manner to arrive at more doable solutions that they will be willing to comply with.

- Tardiness (Did the FFS start at 7:00 am?)

Similarly, tardiness is the second most recurrent FFS problem needing considerable thoughts from facilitators. During the first few weeks of the FFS session, farmer's value of time is rather quite disoriented. If the facilitators say that 'session will start at 7:00 am', to many of them, it really means that 'session will start at 8:00 or 9:00 am'. As a result, agro-ecosystem analysis (AESA), which is supposed to be a group activity, is usually undertaken by a few participants. Similarly, other FFS components, such as group dynamics and special topics may be sacrificed due to lack of time. Eventually, it may even tend facilitators to use lectures in favor of participatory, experiential and discovery-based approaches.

Other Non-formal Education (NFE) Techniques

- 'Ballot Box' Pre- and Post-Evaluation (Was it conducted on-field using actual specimens and functional questions?)

It is a simple, easy-to-use pre- and post-training evaluation tool for farmers of their knowledge and skills in integrated pest management (IPM) and integrated crop management (ICM). It makes use of questionnaire that focuses on functions of organisms or specimens rather than their technical definitions.

- Insect Zoo and Disease Zoo Exercises (How many insect zoo and disease zoo exercises were already undertaken by the time of FFS visit?)

These are supplementary discovery-based exercises that allow farmers to validate and confirm the ecological functions of biotic and a-biotic factors that they observed in the agro-ecosystem analysis (AESA). Better understanding of the agro-ecosystem through AESA develops farmers' critical thinking abilities and decision-making skills.

- Folk Media Presentation (Did it generate commitment from various stakeholders to sustain local FFS implementation?)

It is a learning tool used to convey a developmental message using the most appropriate local medium that is familiar to a group of people. It is usually performed by FFS participants as a component of their field day or graduation ceremonies. Local songs, dances, poems, proverbs, stories, tales, legends, and drama are some of the common forms of folk media.

- Field Day and Graduation Ceremonies (Similarly, did it generate commitment from various stakeholders to sustain local FFS implementation?)

These are occasions, normally conducted simultaneously, when famers show other people or the community what they have learned and the results of their participatory technology development (PTD) activities. The best time to have a simultaneous field day and graduation ceremonies is when there is still standing crop nearing maturity except in an emergency situation (e.g., pending typhoon) and there is no choice but to harvest early.

These occasions are the FFS participants' affairs. This means that they plan and implement these activities. They may choose to invite co-farmers from the same or neighboring villages. Non-government organizations (NGOs) and other possible stakeholders (except pesticide industries) may be invited to encourage them to support future FFS activities in their communities.

3.1.13 Participatory discussions & sharing of experiences on: 'Planning for field days, folk media presentation & mass graduation'

In FFS, the field day, folk media presentation, and graduation ceremonies are important culminating FFS activities where the main 'actors' are the FFS farmer-participants. Experiences, both in Afghanistan and the Philippines, indicated that the best timing in conducting a simultaneous field day and graduation exercises will be at about 1-2 weeks before harvesting, where the crop is at its best in term of crop stand, thereby creating additional positive impacts to current and prospective FFS stakeholders. Organizing a simultaneous holding of field day and graduation ceremonies is often opted to (a) reduce cost of undertaking the activities, (b) avoid problems associated with inviting the same guests for two separate occasions, and (c) allow only one preparation for folk media presentation. It was emphasized by the FFS Specialist that, in the Philippines, folk media presentation has been successfully used during field days and graduation ceremonies to enhance understanding of valuable IPM messages among FFS stakeholders and other guests. When feasible, a mass graduation ceremony is planned, in lieu of individual FFS graduation ceremonies, to create greater impacts if undertaken at municipal and provincial levels.

3.1.14 Participatory discussions & sharing of experiences on: 'Planning for FFS follow-up activities'

The FFS Specialist underscored to the training participants the importance of planning for FFS follow-up as a regular component activity of local government units (LGUs) at the community and provincial levels.

At the community level, FFS follow-up activities are planned to address concerns arising from initial FFS implementation in the community. Some examples are :

- Participatory plant breeding to address the unavailability of crop varieties suited to specific needs or location-specific conditions;
- Participatory technology development activities to generate new knowledge on crops cultural management;
- Livestock production as component of existing farming system; or
- Activities to counter the ill-effects of HIV and child malnutrition.

At the provincial level, FFS follow-up activities are planned to deal with concerns of farmers having similar needs in sustaining IPM adaption in a much wider area. Some examples are:

- Village Pest Brigades, a farmer-managed crop and animal pest & disease surveillance system: (a) identify/forecast hot-spots for pests and diseases for immediate community actions, and (b) develop municipal pest and disease profile;
- Village Bio-Control Laboratories, an income-generating community-based laboratories for the production of bio-control agents: (a) Trichogramma Mass Rearing Centers, (b) Nuclear Polyhedrosis Virus or NPV & Metarhizium Production Centers, (c) Earwigs, Lacewings and Other Natural Enemies Production Laboratories, and (d) Botanical Production Centers.

3.1.5 Participatory discussions & sharing of experiences on: 'Planning of FFS activities at the community levels'

After a lenghty discussions and sharing of experiences between the FFS Spedcialist (Philippine experience) and the training participants (Afghanistan experience), the follwong data were considered as necessary in planning of FFS activities at the community level, namely :

- Baseline data: (a) cropping calendar & proriority problems (based on PRA); (b) target villages; (c) target crop area; and (d) target farmer-beneficiaries;
- Logistical requirements: (a) availability of MAIL (current) & farmer (in the long-run) facilitators; (b) funding requirements; (c) sources of funding; and (d) prospective stakeholders ;
- Role and responsibilities of stakeholders: (a) village officials; (b) municipal officials & provincial officals; and (d) other stakeholders (NGOs, farmer oragnizations, others); and

- Consolidated national yearly action plan (sample forms [Annexes C1 & C2] were presented by the FFS Specialist to the training participants & they agreed to review the said forms for possible adaptation under Afghanistan conditions).

3.1.16 Participatory discussions & sharing of experiences on: 'Establishing coordination & management system'

To generate active participation among the training participants, the FFS Specialist presented the bird's eyeview of the coordination and management system in the Philippine National IPM Program. This consists of the following highlights:

- A National Program Office (NPO) under the Office of the Secretary of the Department of Agriculture (DA) who oversee the implementation of the National IPM Program at the national level;
- A Regional Coordinator (RC) in every region under the Director of the DA's Regional Field Unit (RFU) who oversee implementation of National IPM Program at the regional level;
- A Provincial Coorfdinator (PC) under the Governor's Office of the Provincial Agriculturist (OPAG) who oversee implementation of the National IPM Program at the provincial level; and
- A Municipal Training Team (MTT) under the Mayor's Municipal Agriculturist (MA) who oversee implementation of the National IPM Program at the municipal level.

On the other hand, the training participants shared their current coordination & management system for the IPM Project in Afganistan. This is presented as follows:

- An FAO Chief Technical Adviser (CTA) coordinates the IPM Project with the Chief of the PPQS who, together with trained MAIL Master Trainers, oversee the implementation of IPM project at the national level;

- An FAO National Agronomist (NA) under the CTA in every zone who coordinate the IPM Project with trained DAIL Provincial Facilitators at the zonal level; and

- Trained DAIL District Facilitators implement FFS at the district level.

Based on the information above that were shared by the FFS Specialist (Philippine experience) and the training participants (Afghanistan experience), the following observations were noted:

- A general consensus among the training participants that the Philippine model is a more systematic coordination and management system;
- An observation of too much visibility by the FAO's CTA and NA in the coordination and management of the IPM Project in all levels;
- A need to put in place a National Coordinating Office (NCO) at MAIL under the Office of the Professional Deputy to oversee the implementation of the IPM Project at the national level;

- Creation of a Regional Coordinating Office (RCO) under a Regional Director (RD), to be created as well, in every zone to oversee the implementation of the IPM Project at the zonal level;
- Putting in place a Provincial Coordinator (PC) under DAIL Provincial Office in every province to oversee the implementation of the IPM Project at the provincial level; and
- Establishing a core of trained DAIL District Facilitators (DF) in every district to implement IPM-FFS activities at the district level.

3.1.17 Participatory discussions & sharing of experiences on: 'Observation & data collection system in FFS implementation'

The training participants opined that a database system on FFS implementation should be established in every community that can be referred to and used by various stakeholders (e.g., farmers, administrators, NGOs, or even political leaders). Among others, these may include the following:

- Agro-ecosystem analysis (AESA) data (pest-natural enemy interaction, insect pests and diseases reaction data)
- Agronomic data (number of leaves, number of tillers, plant height, length of panicles, weight of grains)
- Yield data (actual yield, computed yeild)
- Data on expenses for inputs (pesticides, fertilizers, seed) and labor (land preparation, weeding, irrigation, haresting, drying)
- Cost and return analysis data (income and return on investment)

3.1.18 Participatory discussions & sharing of experiences on: 'How to use FFS data: Participatory analysis & conclusion'

A thorough discussion and sharing of experiences by the training participants and the FFS Specialist led to a general understanding that varied IPM stakeholders would use different kind of FFS data depending on the nature of their advocacies. It was agreed that these could be as follows:

- Data useful for farmers (data that will convince farmers to use alternative environment-friendly pest management options in lieu of pesticides);
- Data useful for local administrators (data that will convince local administrators to sustain and institutionalize IPM-FFS implementation in their respective areas of coverage); and
- Data useful for local political leaders (data that will convince political leaders to support IPM-FFS implementation by sponsoring and passing appropriate resulutions, orders, and laws that will ensure sustained IPM-FFS implementations at the municipal and provincial levels);
- Data useful for other stakeholders (data that will convince avocacy groups and non-government organization to commit their financial and manpower resources for the advancement of IPM-FFS paradigm).

3.1.19 Workshop: Sharing of experiences on 'Life after FFS' and 'Methods of post-FFS follow-up activities'

As a culminating activity for Modules 1 and 2 of the training course, small and big group discussions were undertaken by the training participants to answer the following questions:

Share your thoughts on: 'What is life afer FFS?

During the big group presentation of the small groups' outputs, most of the training particpants opined that 'life after FFS'will acrue more benifit to farmers in the project areas. Majority feels that because IPM-FFS implementation in Afghanistan is quite new, the activities undertaken in the recent past would impact more at the farmer level as summarized below:

- Farmers will have learned new knowledge from their sharing of learning experiences, use lesser pesticides due use of more environment-friendly pest management options, and improved their self-confidence as a result of their ability to critically analyze and take actions on any situation;
- Farmers will have adapted new farming methods learned, which will result to higher yield and better income; and
- Improved decision-making skills as a result of better understanding of their crop's ecosystem.

What are the methods of FFS follow-up activities that you will use in your respective areas of coverage?

As regards methods of FFS follow-uop activities, majority shared that their activities would concentrate, among others, on the following:

- Curriculum development to incorporate (a) new appraoches and learning experiences fro previous FFS activities; (b) improved training process and technical contents;
- Database development (putting in place an accumulated database of learning experiences useful for variou stakeholders in every community;
- Implementing FFS for other concerns (other crops, livestock, child nutrition).

In this regards, the FFS Specialist shared to the training participants some follow-up activities that are undertaken elsewhere in Southeast Asia which they may opt to consider, namely:

- Developing a core of farmer-researchers in every FFS community to lead in undertaking relevant PAR or PTD activities;
- Putting in place a core of farmer-facilitators who will implement IPM-FFS in their respecive villages;
- Organizing FFS activities on other concerns, such as livesttock production, child nutrition, school field schools, among others; and
- Organizing 'Farmers FFS Congresses' at district, provincial, and zonal levels to showcase novel farmers' IPM-FFS learning experiences.

4. HIGHLIGHTS OF MODULE 3

4.1. General

The Biological control modules begin by an Introduction to Agricultural Extension Eastern Region and Chonburi Pest Management Center and activites by Mr.Tiva Sampeth Director of Chonburi Pest management Center and Overview of pest situation and their control in Thailand. Introduction to DOAE, MOAC, Bureau of Agricultural product quality development.Thai policy concerning pest management and food security.

Followed to that vverview of biological control agents used in Thailand by Ms. Areepan Upanisakorn Chief of Biological control sub-division, Bureau of Agricultural products quality development, the Department of Agricultural Extension (DOAE), Bangkok Thailand.

Laboratory work was supported by 4 staffs of Chonburi Pest Management Center Introduced and facilitated all facilities used during the whole training program in the center and conducted the session on identification of common biological control agents.

4.2. Introduction to pest control problems, pest life cycle and limitation:

- Factors affected to pest control methods. Problem identification leading to find more control methods. How importance of Pest Management and Biological control of pest in the Cash crop in Thailand: cabbage pest control, rice pest control and cassava pink mealy bugs control as the cased study in Thailand. All factors effected to integrated pest control methods (what when where why?) What are the biological control agents: Predators, parasitoids, Entomopathogens etc. What are those specific conditions effected to biological control agents selection (what when where why) by Ms. Areepan Upanisakorn Chief of Biological control sub-division, Bureau of Agricultural products quality development, the Department of Agricultural Extension (DOAE), Bangkok Thailand.

- Principle of rearing natural enemies: predators, pathogen, parasitoids of the pests. How to apply those biological control agents by Mr.Tiva Sampeth Director of Chonburi Pest management Center

4.3. Laboratory session

- Practice rearing natural enemies: Entomopathogens and their mass production (every process). Participants practice rearing 2 predatory bugs: Sycanus collaris and Eocanthecona furcellata

- Produce pathogenic fungi: Trichoderma harziaanum and Beauveria bassiana by 4 staffs of Chonburi Pest Management Center
- Results and analysis of all previous studies. Summary presentation and work plan development for their integration into FFS in Afghanistan. Ms. Areepan Upanisakorn Chief of Biological control sub-division, Bureau of Agricultural products quality development, the Department of Agricultural Extension (DOAE), Bangkok Thailand and Mr.Tiva Sampeth Director of Chonburi Pest management Center
- Field Visit and interaction with farmers in Chonburi by Mr.Tiva Sampeth Director of Chonburi Pest management Center and his staffs and Ms. Areepan Upanisakorn Chief of Biological control sub-division, Bureau of Agricultural products quality development, the Department of Agricultural Extension (DOAE), Bangkok Thailand.

4.4 Evaluation of the training

Feedback from participants

1. Knowledge and technology which were transferred to participants are satisfy easy to learn and most useful to adapted to Afcanistan those data are:

    - The use of Biological control agents (predator, parasite, pathogen)
    - Reduce pesticide used
    - NE conservation
    - ransfer biological control technology to farmer practice

2. Practical work:

Predatory bugs: *Eocanthecona furcellata* and *Sycanus collaris*
Pathogens: *Beauveria bassiana* and *Tricharoderma harzianum*

Only 3 participants who have experience on produced Biological control agent but the others are not. All of them present that:

- They have gained more knowledge on easy method to produce and real used
- The easy material can adapted for rearing
- Know mechanism of predation and parasitization
- Reduce cost of input
- Transfer technology to farmer

3. Duration of training : Participants propose that the time is too short to study and practice

4. Training facilities:
    - Training
    - Laboratory
    - Training office
    - Other facilitation

5. HIGHLIGHTS OF MODULE 4

Several importnat speicla topics either in week 4 of before were carreid out on request of paprticiaptnrs to cover the importnat plant protection challanges of Afghanistan. The first special topic deleived by Ms. AlmaLinda Abubakar of FAO-IPM Programme focused on role of wome and IPM FFS. She shared her experiecnes of the same form various Asian countries and provdied pointers for the same for Afghan IPM programme. The next special topic was delivered by Dr. Watchreeporn, Director, Pest Managment Divion of DoAE, and Thaialnd on the topics of fruit fly pest managemnet expreicnes from Thaialnd. In her presentation she presneted work carreid out under her leaership in Thaialnd spanning 2 devades to combat the meance of fruit fly for various fruit and vegetbale crops using SIT and non-SIT techniques. The topic was futher supplemend by Dr. Kumar form experinces of the Asian Fruit Fly IPM Programme. Other importnat topic came from Dr. Abha Mishra, Co-Director, and ACISAI on Soil, Watre and Roots on intensificaiton. Dr. Anil K. Anal, Asst. Professor talked on the safe food and final topci came from Dr. A. Datta on weed managmeent for rice and wheat crops.

A Post assesment test revleaved that most of the particiaptns benefited from teh training (annex d) and fig. 1.

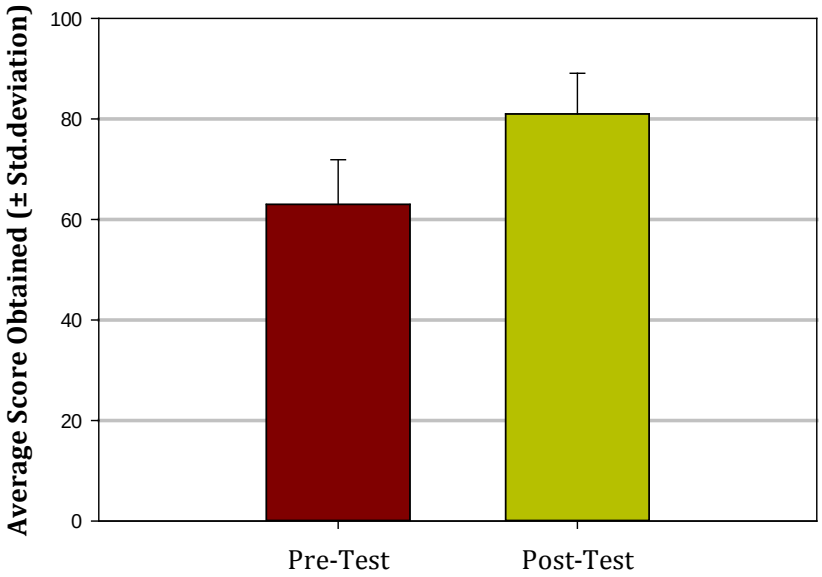


Fig.1. Average Pre and post assesment test score of particiaptns

Annexes

Annex A

TRAINING SCHEDULE FOR MODULE 1 (PRINCIPLES AND METHODS OF ADULT EDUCATION) AND MODULE 2 (DISCOVERY LEARNING APPROACHES)

DATE	DAY	AM	PM
10 Mar	SUN	ARRIVAL AND REGISTRATION OF PARTICIPANTS AND FACILITATORS	
11 Mar	MON	Opening & Overview of Programs: ▪ AIT & FAO Dignitaries ▪ Photo Session ▪ AIT Course Introduction ▪ FAO's Regional IPM Programme Overview	Participatory discussions on 'Creating an effective environment for adults in an FFS setting': ▪ What is learning? ▪ Who qualify as an adult? How learning takes place among adults? ▪ Basic difference between child learning & adult learning ▪ Importance of visualizing & self-discovery in adult learning ▪ Adult learning as an experiential process
12 Mar	TUE	Field collection, identification & classification of pests, their natural enemies & diseases based on their ecological function	Group activity: Setting-up of insect zoo & disease zoo exercises
13 Mar	WED	Processing of results: ▪ Insect zoo on pests & their natural enemies ▪ Disease zoo for bacterial diseases, fungal diseases & physiological disorders	Participatory discussions: Improving set-up of insect & disease zoo exercises Group activity: Preparation of 'ballot box' set-up & conduct of 'moving exam'
14 Mar	THU	Field collection of pests, their natural enemies, diseases and physiological disorders Conduct of exercise on: 'Hazards of pesticide use on non-target organism	Conduct of 'ballot box' test Workshop: Development of functional ballot box questions
15 Mar	FRI	Processing of results on: 'Hazards of pesticide use on non-target organism Processing of results on: Development of functional ballot box questions Workshop on: ▪ NFE methods used in the FFS ▪ FFS components ▪ Qualities of a good facilitator	Technical inputting: Introduction to plant diseases (abiotic & biotic factors in disease development)
16 Mar	SAT	FREE DAY	- SAT
17 Mar	SUN	FREE DAY	- SUN

DATE	DAY	AM	PM
18 Mar	MON	Participatory discussions on: ▪ NFE methods used in FFS ▪ FFS component activities ▪ Qualities of a good facilitator	Participatory discussions on: ▪ FFS curriculum development ▪ FFS implementation: Philippine experience ▪ Conducting discovery-based exercises for FFS activities & PTD studies ▪ FFS component activities ▪ FFS Baseline data gathering ▪ Knowledge generation & use for FFS & PTD activities
19 Mar	TUE	Participatory discussions on: ▪ Weekly FFS evaluation & planning ▪ Training Team's FFS Diary: Documentation of weekly FFS activities ▪ FFS field visits, monitoring & evaluation	Participatory discussions on: ▪ Planning for field days, folk media presentation & mass graduation ▪ Planning for FFS follow-up activities
20 Mar	WED	Technical inpitting: Whitefly Management	Participatory discussions & sharing of experiences on: ▪ Planning of FFS activities at community levels ▪ Establishing coordination & management system
21 Mar	THU	Participatory discussions & sharing of experiences on: ▪ Observation & data collection system ▪ How to use FFS data: Participatory analysis & conclusion	Participatory discussions & sharing of experiences on: ▪ Life after FFS ▪ Methods of post-FFS follow-up activities
22 Mar	FRI	Technical inputting on: Fruit fly management	Technical inputting on: Gender issues in FFS
23 Mar	SAT	FREE DAY	- SAT
24 Mar	SUN	FREE DAY	- SUN

Module 3: Biological Control- Theory and Practices

DATE	DAY	AM	PM
25 Mar	MON	Overview of biological control agents used in Thailand	Laboratory walk and identification of common biological control agents
26 Mar	TUE	What are the biological control agents: Predators, parasitoids, Entomopathogens etc.	Practice mass rearing of common insect predator (PM), Laboratory session Setting individual studies and maintenance
27 Mar	WED	Parasitoids of the insect-pest	Practice mass rearing of common insect parasitoids *Laboratory session* Setting individual studies and maintenance Data recording
28 Mar	THU	Entomopathogens and their mass production	Mass rearing methods and their uses Setting individual studies Date recording Results and analysis of all previous studies
29 Mar	FRI	Summary presentation and work plan development for their integration into FFS in Afghanistan	Field Visit and interaction with farmers
30 Mar	SAT	FREE DAY	Viral Diseases of Potato
31 Mar	SUN	FREE DAY	- SUN

Module 4: Integrated Pest Management to Holistic Plant Management

DATE	DAY	AM	PM
01 April	MON	Visit to AVRDC	AVRDC
02 April	TUE	ST: IPM to Holistic plant management ST: Principle and Practices of sustainable crop intensification (Rice, Wheat etc.)	Special Topic: Soil and Root (Rhizosphere management): Dr. Abha Mishra Special Topic: Food Safety Dr. Anil Anal
03 April	WED	ST: IPM and Gender ST:	ST: IPM and Weed Management (Dr. Avishek Datta)
04 April	THU	ST: Planning and session guide development	ST: Presentation on planning Post ballot Box test
05 Mar	FRI	Continue to discuss and plan	Wrapping –up and certificate award ceremony

Annex B

BASELINE SURVEY FORM FOR INTEGRATED PRODUCTION AND PEST MANAGEMENT (IPPM) FOR CORN-BASED PRODUCTION SYSTEM

A. PERSONAL INFORMATION

1. Name of Farmer: _____ Nickname: _____

2. Address: _____

3. Age: _____ 4. Sex: [ ] Male [ ] Female

5. Status: [ ] Single [ ] Married [ ] Widow/widower

6. Education [ ] Elementary [ ] High school [ ] College

[ ] Others: _____

7. Name of Spouse: _____

8. No. of Years in Corn Farming: _____

9. Tenural Status [ ] Owner/cultivator [ ] Leaseholder

[ ] Tenant [ ] Others (please Specify)

10. No. of Household Members Involved in Farming: _____

11. Membership in Community Organizations:

Organization	Position
_____	_____
_____	_____

12. Last two agricultural training attended:

	Sponsored by:	When
_____	_____	_____
_____	_____	_____

13 Awards Received

	When
_____	_____
_____	_____

14. FFS Graduate: [ ] Yes [ ] No

B. FARM PROFILE

1. Farm Area (ha): a) Major crop: _____ area: _____
b) other crops: _____ area: _____

2. Cropping Pattern: _____

3. Soil Type: _____

4. Irrigation: [ ] NIA [ ] Communal [ ] Pump [ ] Rainfed

[ ] Others (Specify) _____

5. Sources of Income other than Corn farming: _____

6. Sources of Capital:

a. Credit	Dry Season	Wet Season
Production Loan (Pesos)	_____	_____
Percent per annum	_____	_____
Source	_____	_____
b. Self-financed (Pesos)	_____	_____

7. Cropping Pattern (arranged from largest area planted)

DRY SEASON	AREA (ha)	WET SEASON	AREA (ha)
1.			
2.			
3.			
4.			
5.			

C. FARM MANAGEMENT

1. Crops Planted

CROPS	AREA (ha)	VARIETY	SEED CLASS	SEEDING RATE/Ha	COST/Ha

2. Cost of Land Preparation and Weeding

CROPS	LAND PREPARATION			WEEDING		
	Off-barring	Hilling-up	Intertillage Cultivation	First	Second	Third

3. Seed Bed Preparation, Planting and Fertilization

CROPS	COST (Including labor-head/family)			FERTILIZER USE				
	Seed Bed	Pulling	Planting	Qty	Kind	Unit Cost	Labor Cost	Total Cost

Have you been using non-commercial fertilizers (e.g. animal manure, rice straw, compost, azolla, etc.) in your farm? [ ] Yes [ ] No
If yes, since when? _____

4. Pesticide Use

CROPS	HERBICIDE				INSECTICIDE			
	Qty	Brand	Unit Price	Total Cost	Qty	Brand	Unit Price	Total Cost

CROPS	FUNGICIDE				OTHERS			
	Qty	Brand	Unit Price	Total Cost	Qty	Brand	Unit Price	Total Cost

How many times did you spray your crop with pesticides? What was the cost of application?

CROPS	HERBICIDE		INSECTICIDE		FUNGICIDE		OTHERS	
	No. of Times	Cost of Appl'n	No. of Times	Cost of Appl'n	No. of Times	Cost of Appl'n	No. of Times	Cost of Appl'n

What was your basis for spraying? Please check

[ ] Farmer friend told me so [ ] Technicians/pesticide dealer told me so

[ ] Following the calendar spraying [ ] Others (please specify)

What were the common pest problems encountered?

CROPS	PEST PROBLEM ENCOUNTERED	
	Insects	Diseases

What insects/animals would you consider as

FARMERS' FRIEND	ENEMIES

D. PRODUCTION (Season: _____)

CROPS	COST (Pesos)		YIELD PER HECTARE		ACTUAL YIELD/HA
	Harvesting	Hauling	Kilograms	Amount	

Date Interviewed: _____ Interviewer: _____

Ballot Box Score Pre-test: _____ Post Test: _____

ANNEX C1. SUMMARY OF FFS-URCS RE-ENTRY ACTION PLANS (MODULE II) TO BE CONDUCTED BY TOT-URCS FACILITATORS IN UPLAND RICE-BASED CROPPING SYSTEMS (URCS) PROJECT AREAS, 2011 WS (JANUARY–JUNE) & 2012 WS (JANUARY-JUNE)

PROVINCES/ MUNICIPALITIES	Total Upland Rice-based Area (Ha)	Total Upland Rice-based Farmers	TOTAL NUMBER OF EXTENSION WORKERS		Potential FFS-URCS Sessions[2]	TARGET FFS-URCS SESSIONS	
			TOT/TOS Trained Facilitators	TOT/TOS Untrained AEW[1]		Wet Season (2011)	Wet Season (2012)[3]
1. Iba, Zambales							
2. San Jose, Mindoro Occidental							
3. Baco, Mindoro Oriental							
4. Busuanga, Palawan							
5. Quezon, Palawan							
6. Iriga City, Camarines Sur							
7. Tabuk, Kalinga							
8. Paracelis, Mountain Province							
9. Salug, Zamboanga Norte							
10. Dumingag, Zamboanga Sur							
11. Iligan City, Lanao Norte							
12. Paquibato, Davao City							
13. Bagangga, Davao Oriental							
14. Glan, Sarangani							
15. Bagumbayan, Sultan Kudarat							
TOTAL							

[1]Refers to Agricultural Extension Workers (AEW) not trained in any season-long TOT/TOS course but will attend first FFS-URCS session in their respective project areas.
[2]Refers to total number of upland rice-based farmers in project area divided by 30 farmers (e.g., number of farmers per FFS-URCS session).
[3]Refers to additional number of FFS-URCS sessions to be conducted in 2012 WS by tandem of TOT-URCS facilitators and AEWs who will attend the first FFS-URCS sessions.

ANNEX C2. SUMMARY OF BUDGETARY REQUIREMENTS (PhP) FOR FFS-URCS RE-ENTRY ACTION PLANS (MODULE II) TO BE CONDUCTED BY TOT-URCS FACILITATORS IN UPLAND RICE-BASED CROPPING SYSTEMS (URCS) PROJECT AREAS, 2011 WS (JANUARY–JUNE) & 2012 WS (JANUARY-JUNE)

PROVINCES/ MUNICIPALITIES	2011 WS COUNTERPART FUNDING (PhP)				2012 WS COUNTERPART FUNDING (PhP)				GRAND TOTAL (PhP)
	Number of FFS-URCS[1]	LGU[2]	DA-RFU[3]	SUB-TOTAL	Number of FFS-URCS[1]	LGU[2]	DA-RFU[3]	SUB-TOTAL	
1. Iba, Zambales									
2. San Jose, Mindoro Occidental									
3. Baco, Mindoro Oriental									
4. Busuanga, Palawan									
5. Quezon, Palawan									
6. Iriga City, Camarines Sur									
7. Tabuk, Kalinga									
8. Paracelis, Mountain Province									
9. Salug, Zamboanga Norte									
10. Dumingag, Zamboanga Sur									
11. Iligan City, Lanao Norte									
12. Paquibato, Davao City									
13. Bagangga, Davao Oriental									
14. Glan, Sarangani									
15. Bagumbayan, Sultan Kudarat									
TOTAL									

[1]Assumed that total cost of an FFS-URCS is PhP30,000 (e.g., includes t-shirts, TSF of facilitators, food for field day, and other supplies)
[2]At least 15% of an FFS-URCS cost will be borne as counterpart of provincial and municipal LGUs covered by URCS project
[3]Refers to regular DA-RFU funds or supplemental DA funds released to DA-RFU for URCS project

ANNEX D: PRE AND POST BALLOT BOX TEST

No.	Name	% SCORE	% Score	Change
		Pre	Post	
1	Mr. Ahmad Ershad Fazel	57	78	21
2	Mr. Abdul Saboor Sazgar	64	90	26
3	Mr. Sayed Ashraf Mangal	64	78	14
4	Mr. Mohd Zafar Zahir	57	75	18
5	Mr. Sayeed Farooq Hussaini	71	90	19
6	Mr. Azim Khan Habib	79	95	16
7	Mr. Kh. Mohd Shafi Seddeqi	57	75	18
8	Mr. Mohd Wazir Nazari	57	75	18
9	Mr. Mohd Naseer Ahadi	57	75	18
10	Mr. Mr. Khaibar Ahsas	79	90	11
11	Mr. Humayoon Rahmani	50	70	20
12	Mr. Attiqullah Hosiny	64	80	16
13	Mr. Nazar Mohd Adib	71	90	19
14	Mr. Mohd Yousuf Ebrahimi	57	75	18
AVERAGE % SCORE		63.14	81.14	18.00