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Regional Integrated Pest Management (IPM) Programme in the Near East

FAO's FFS Approach in Iran: Concepts, Practical Examples and Feedbacks

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1. INTRODUCTION

This paper is the second of three papers prepared under the aegis of the FAO Regional IPM Programme, GTFS/REM/070/ITA, in Iran. The first paper reviewed the history of IPM/FFS in Iran. It briefly introduced the pilot projects implemented by different institutions from the beginning of the approach in Iran to the present. Then it provided an insight to the main activities and achievements of the FAO Regional IPM Programme in Iran, focusing only on the institutional and performance aspects. The first paper ended with a conclusion that IPM/FFS is now in the critical stage of scaling up from a pilot idea into a mainstream approach in Iran.

This Second Paper discusses the FFS concepts, approaches and methods introduced by the FAO Regional IPM Programme in Iran, providing definitions, practical examples and reflections of the participating farmers, facilitators and trainers. The Paper has two components: conceptual and practical. The concepts are based on the following document: "Facilitators' FFS Manual, PART I: A training resource manual on planning, organizing, implementing and evaluating Farmer Field Schools for Integrated Pest Management in the Near East", published by the Regional Integrated Pest Management Programme in the Near East. The practical examples are gathered by the authors from the Project sites in different provinces of Iran.

The IPM methods applied by the FFS groups for controlling the pests and diseases in the selected crops and a comparison of their results with those of the conventional farmers are introduced in the third paper.

2. A BRIEF INTRODUCTION TO IPM

2.1 Definition

In 1957, "Integrated Pest Management" was first proposed as a concept which promoted the use of biological control, good agronomic practices, and other means before investing in chemical pesticides to control pests. At that time, as now, many farmers used pesticides on a calendar basis, governments promoted their use, and they were considered an essential aspect of "modern" agriculture. Sometime later, largely due to basic misuse of "economic thresholds", IPM also began to be defined as "spray only when the pest exceeds the threshold". The original concept was to promote good practices; the second concept was useful for selling pesticides.

A wider view of IPM has been developed in recent years as a result of farmer focused Farmer Field School programmes. The basis of this view is derived from the original biologically intensive IPM concepts. Some elements are shown in the table below:

Conventional	IPM
Economic (more technology, more inputs, yield)	• Economic (improving crop management, decreasing production costs, increasing yield and profit) • Ecology (reducing pesticides, conserving/augmenting natural control) • Social (group building, networks, communication skills, education, health factors, employment, etc)

IPM is location specific, based on local field ecology and socio-economic conditions. IPM is not a centrally defined "packaged technology" that must be taught to farmers. Farmers need skills to define a local optimum of management practices that result in the highest economic yield, without destroying the environment and health of the community. IPM in our program means a lot more than just "pest control", and some of the principles and contents are described below.

2.2 The Principles of Integrated Pest Management

Sustainable agriculture requires that today's production needs are met while *improving* the production resource base for future generations. IPM, as a corner stone of sustainable agriculture, seeks to improve farmer practices in order to create higher profits while not only protecting, but *improving* environment quality and community health. In order to do this IPM implementation is based on four practical principles:

Grow a Healthy Crop. This principle allows plants to recover better from environmental or pest injury, avoids nutrient deficiencies related with pest attack (insects and disease), and promotes natural defenses against many insects and diseases inherent in plants. Proper crop and plant management methods include using proper fertilizers (chemical and organic), irrigation, use of sanitation practices (removal of crop debris) and soil management which are critical for healthy plants. A healthy crop can *resist* diseases and *compensate* for damage caused by pests so that plant injury does not always lead to yield-losses. A robust healthy crop is the first step in IPM methods, and foundation for an optimal yield.

Preserve Natural Enemies. In all agricultural ecosystems, there are predators, parasites and diseases which attack eggs, larvae, nymphs, pupae, and adult stages of insect pests. There may also be micro-organisms that work against disease-causing pathogens. These "natural enemies" often occur naturally in fields and they are the "friends of farmers" because they may biologically control plant pests. Learning to recognize and manage these natural enemies is one major focus of IPM training so that they are not destroyed by unnecessary applications of pesticides but are allowed to work for the farmer's benefit.

BOX 1. FARMER AND PEST PREDATORS

Negin Kurdestani, female farmer from FAO Regional IPM Programme FFS site in Kermanshah:
"*We had no knowledge of predators before IPM/FFS. But now we know many things about some of them, like syrphid fly, which feeds on aphids. Now when we see these flies emerging on aphids, we hold on spraying. We wait to see if the population of the predator increases over the coming weeks. Then we decide if the field needs spraying or not.*

Observe Fields Regularly. Regular field observation is necessary to assess crop development, pest (including insects, diseases and weeds) and natural enemy populations, and weather or climatic conditions. Observations should determine how the crop is growing and if there are pests causing yield-loss; remembering that not all crop injury causes yield-loss.

Proper assessments must be made to effectively and profitably manage the use of inputs such as labor, quality seed, resistant/tolerant varieties, fertilizers, drainage or irrigation systems,

community organizing and pesticides in order to ensure profitable production. Inputs used are based on an ecological and economic assessment. Observation skills and decision making skills are key elements to becoming an expert IPM farmer and require field level practice for most farmers and extension staff.

Farmers become Experts. This is crucial for a modern agriculture in which farmers are responsible for farm level management. Future gains in yields, profits, and sustainability will be the result of farmers making better use of available and new technologies and (limited) resources. More emphasis in all agriculture programs must be placed on the ability of farmers to make better decisions, increase their own efficiency, and become better managers. Expertise implies a basic understanding of the agro-ecological system, and decision making processes. The future of food production and food security will depend on how well farmers can innovate and manage systems. IPM is implemented by farmers and thus requires an emphasis on farmers' skills and knowledge.

2.3 The content of IPM training programs

The content of IPM training programs for field agents and farmers is not limited to the traditional plant protection methods (e.g. mechanical, biological, cultural, and economic threshold levels). It also includes crop development and physiology; agronomic methods; varietal impact; soil fertility and water management; pest biology; natural enemies; field observation skills; pesticides issues; and economic management skills. The season-long nature of training is required for several scientific and social factors including:

- Pest problems are specific to each crop growth stage so training should be carried out over all stages of the crop.
- Population dynamics, disease epidemics, plant compensation, and crop development are processes which develop over the course of the cropping season and need to be observed completely.
- The results of management decisions made during one crop stage are observable only at a later crop stage, and most often at harvest (e.g. profitability, yield and crop quality components). For some perennial crops, the effects of management decisions sometimes become apparent only in the next season. For example, mechanical removal of affected branches of mildew on young shoots of apple. This would plead for a continuation of field activities for a second season.
- Farmers are often isolated from scientific and (socio-) economic advisors and therefore must be able to solve most problems without outside assistance. A longer field-based training provides these skills, and contributes to developing more efficient links with service providers.

BOX 2. FFS PROVIDES AN OPPORTUNITY FOR EXPLORATION

The experience in the majority of IPM projects in Iran shows that the farmers at the initial stages are most interested in learning about the dynamics of the animals living on their farms.

Mr. Jaafari, a wheat farmer participating in FAO-supported Sunn Pest IPM project in Kermanshah, describes his experience:

"I was astonished when I learned that many insects on my farm feed on other insects, not the plants. I was surprised that the insects undergo metamorphosis. I learned methods to see these things by myself.

In the past, I though the Sunn pest descends from the mountains to feed on the wheat and goes back there after eating the crop. But through FFS I learned that it does not get back, but lays eggs on the field and the eggs grow into full insects. It is this new generation that migrate to the mountains. So if we can break this cycle, we can save our crop".

3. THE FARMER FIELD SCHOOL

3.1 The concept of Farmer Field School

A Farmer Field School (FFS) is a season-long training program conducted in the field. The activities follow the different developmental stages of the crop and their related management practices. There are different models for a FFS, but the process is always learner-centered, participatory and relying on an experiential learning approach. Some of the basic elements of our Farmer Field Schools include:

- A group of farmers is involved,
- The FFS is field-based and lasts for one cropping season (from seeding/transplanting to harvest and possibly post-harvest and marketing in annual crops, and from the first activities in spring (e.g. plowing in grape) to harvest and possibly post-harvest and marketing in perennial crops),
- The FFS participants have regular meetings during the cropping season,
- In a FFS, participants conduct a study comparing an IPM strategy with conventional practice,
- A FFS often includes other field studies, based on local field problems,
- A FFS includes special topics that deal with specific issues selected by the participants,
- Each meeting includes at least an agro-ecosystem analysis activity conducted in the field,
- FFS educational methods are experiential, participatory, learner-centered, and based on non-formal education,
- The FFS group is guided by at least one facilitator offering experiential learning opportunities, rather than delivering top-down instructions.

Since many years, farmer field schools (FFS) have been the platform in many countries for educating farmers on integrated pest management (IPM) and an increasingly broader range of topics.

In a traditional research and extension system, research stations study topics and -in theory- deliver “answers” to the extension agencies which, in turn, have to pass on the information to the farmers. In this system, farmers are passive receivers of “packaged technology” which is not necessarily related to their actual field problems.

The FFS model links the expertise of various sources (farmers, research, extension but also other partners) into one platform: the FFS. In the FFS, all parties are equal partners in providing locally adapted crop management practices. Researches and Extension officers learn from farmers through FFS compared to the traditional extension model and therefore, could help farmers better. For example, a pest control specialist who is not experienced about irrigation, farming systems or soil management, but during the FFS, he/she can increases his/her knowledge about these issues.

3.2 Sustainable IPM implementation: from FFS to community IPM

In order for IPM to become sufficiently embedded into a community, activities should not stop after one season of FFS. Follow-up activities are crucial for a sustainable IPM implementation.

All Field Schools normally have at least one follow-up season, the intensity of which will be determined by the motivation of the Field School participants, time constraints of participants and facilitator, and to some extent - funding. Follow-up has been known to be a little as monthly support sessions for farmers to discuss their own problems in implementing IPM, to as much as farmers running a complete Field School for other farmers. Often farmers agree to repeat the Field School process for one more season to verify findings, or to repeat the process of the FFS on a new crop to learn IPM for the next crop. Also, studies have been done to study a specific crop problem in more detail, for example management of bacterial wilt disease in tomato. Some groups begin to form associations, people's organizations, and clubs that are officially or un-officially organized and carry on studying as a group. The facilitator usually becomes less central in the process if he/she has done a good job, more often providing some technical backstopping and stimulation for the group.

3.3 The FFS facilitator

3.3.1 The role of the facilitator

The role of the facilitator is crucial in a FFS. In general the facilitator organizes the field school, facilitates the activities associated with the meetings of the FFS, takes care of basic administrative issues, and maintains constructive communications with local government officials, NGOs and other institutions.

3.3.2 Facilitation

A facilitator in a FFS guides the process, offering experiential learning opportunities, rather than delivering top-down instructions. Facilitation is not teaching farmers, but creating learning opportunities.

In general, the facilitator introduces an activity, clarifies the process, sets participants to work, asks open-ended and "what if" questions as groups make their presentations. He/she summarizes presentations underlining the important points that were learned during the exercise, and divides action points/responsibilities over the participants. The facilitator has an eye for participants with leadership capacity, who might be interested to take up some of the facilitation work for future training activities. Organizing a FFS requires a facilitator to:

- Determine the site for the FFS;
- Plan timely conduction of a baseline assessment (also see point 3 below)
- Conduct preparation meetings;
- Identify potential participants, select participants in discussion with the broader community;
- Determine (with FFS participants) local endemic problems to be treated by the FFS;
- Identify (with the FFS participants) a "study field" - preferably a field belongs to one of the FFS members, and decide with the participants what the topic for the study field will be;

- Determine an outline for the FFS curriculum (to be further specified with FFS participants);
- Plan meetings (with the FFS participants);
  - Invite resource persons when necessary;
  - Determine needs for materials and organize timely procurement;
  - Respect local traditions and habits (e.g. public holidays).

3.3.3 Communications

Constructive communications with local leaders and supporting agency staff essentially means that the facilitator needs to keep these persons informed about what is happening in the FFS. Simple steps to good communications with local leaders include inviting them to FFSs, visiting their offices and possibly taking them to see the FFS study fields. A field day, an activity late in the FFS schedule, is meant, in part, to let these leaders see the results of a FFS.

Communications with local newspapers or local radio/television may also help for the FFS activities to become more visible to a larger public.

3.3.4 Selection of facilitators

The facilitator is the key to success in a FFS. Selection of facilitators should therefore be very carefully considered.

IPM facilitators should come from agencies that work at field level with farmers and/or from the farming community itself (farmer-facilitators). These IPM facilitators should be able to spend several hours per week on IPM activities for at least three seasons. There are some differences between those facilitators that come from the NGOs or government staffs with local facilitators. The project or national IPM programme should find good ways to support local facilitators to follow up the activities after the project is finished.

In the follow-up stage of the IPM program, the IPM facilitator will facilitate community based actions to raise funds, set-up a community fund (this can be supported by the government and the community and may include cash and goods) and implement further programs as desired by the FFS participants.

BOX 3. SELECTION OF FACILITATORS IN IRAN

The main criteria for selection of facilitators in Iran are personal interest and volunteering. In most of the projects in Iran, the identification of the facilitators is usually done through the local project coordinators. Before initiating the process, a one-day workshop is convened at which the local coordinators are given a deep insight on the functions and responsibilities of the facilitators, the selection criteria, and the identification process. Then the coordinators go back to their districts and start identifying the candidates.

The selected trainers first take part in a short 10-day TOT programme, where they simulate facilitation techniques. The qualified graduates are then offered to participate in further stages. Those who sign in are usually utilized as assistant facilitators for the first season to gain adequate hands-on experience. In the second season, they may be recruited as fully-fledged facilitators.

3.3.5 Training of facilitators

A training of trainers (TOT) is required for field facilitators to become proficient in the principles of growing a crop, in implementing IPM, and in learning how to implement IPM training through the Farmer Field School model. A TOT builds a team of facilitators, which are crucial to the success of the IPM programme.

By the end of a TOT, trainees learn the main principles and problems of growing a crop and facilitation methods. They know how to make effective plant protection field decisions, solve new problems presented in the field, and initiate training farmers using the Farmer Field School education model.

In the history of FAO IPM programmes, several models were developed for training of facilitators. One main model used in Asia, but also in Iran is a season-long training of trainers with regular (e.g. weekly) meetings of about 25 future facilitators. Like in FFSs, the learning approach is non-formal and based on experiential learning. After 2 months of basic training, the TOT participants form sub-groups of about 5 persons and these sub-groups organize and implement FFSs on the side. Planning and running of the FFSs is prepared and evaluated in the TOT.

BOX 4. POINTERS ON TRAINING AND WORK OF FACILITATORS IN IRAN

In the early IPM/FFS projects in Iran, the TOT programmes were usually organized in the form of 10-15 day intensive courses. Learning from their experience, however, the later projects tailored the training more in the form of TOT/FFS programmes, where the facilitators experienced more or less the same season-wide training. This resulted in further improving the skills of the facilitators and, subsequently, in more effective FFS field activities.

The way the facilitators work is largely defined by local specific conditions. In a rural district in Kermanshah, for example, according to the guidelines, three female facilitators were first assigned to organize three individual FFS groups each in a separate village. But they decided to make a team and run all the three sites together. The reason for this decision was that traveling alone would be a problem for them due to remoteness of the sites, but they could travel conveniently if they were in a group.

BOX 5. A CORE GROUP OF FACILITATORS TRAINED BY THE FAO IMP PROGRAMME IN IRAN

The FAO Regional IPM Programme in Iran has formed a core group of facilitators by intensive training workshops and on-the-job training with (FAO) back-stopping visits during the running of the first season of pilot FFSs:

Year	No. of TOTs/ Master TOTs	Facilitators trained in IPM/ FFS*		Total
		Male	Female	
2004-05	2	32	13	45
2005-06	4	53	32	85
2006-07	3	38	27	65
2007-08	2	33	19	52
2008-09	2	59	14	73
2009-010	2	91	25	116
Total	15	306	130	436

About 95% of the trainees were from Non-Governmental sector. About 42.5% were females.

BOX 6. TRAINING OF FACILITATORS AT VOCATIONAL LEVEL HELPS EXPANDING THE SYSTEM "BEYOND" THE GOVERNMENT ASSISTANCE

The Agricultural Engineers Organization is an NGO with more than 120,000 agricultural graduates as its members across the country. It is a rich source of human capital in agriculture sector. Recently this organization has evinced great interest in having TOT/FFS programmes organized for its members and several TOT courses have already been held for its members. This has opened tremendous opportunities for promotion of IPM/FFS at the vocational level.

3.3.6 Farmer exchange visits and cross-monitoring visits

For both farmers and facilitators it can be very useful to visit another FFS, possibly in one of the surrounding countries. A different FFS organization, a different facilitation style, innovative ideas on pest management, interesting discussions with colleagues, or simply noting that this FFS is part of a large regional network for IPM. There are many good reasons for exchange visits.

For facilitators, it can be very inspiring to visit colleague-facilitators to monitor the process and content of another FFS. Ideas, problems, and suggestions for improvements are exchanged to the mutual benefit of both visiting and hosting facilitator.

BOX 7. THE ROLE OF EXCHANGE VISITS, AN EXAMPLE

A study tour of Mazandaran rice group to pistachio IPM/FFS in Damghan had a key role in enhancing the group's belief in practicability of the approach. Mr. Hashemi, who was a member of the visiting group, recalled a discussion among the group members on the way back from that visit:

"*On the bus going back home, we talked about what we had seen in Damghan. We were impressed by the pistachio farmers' ability to manage two or three pests and diseases at the same time. We said to ourselves that if a method is good to manage more than two pests on pistachio, for sure it would be useful in solving our problem with a single pest in rice. This made us more determined to continue with IPM/FFS*".

In general, it is common to form clusters of FFSs in the same area rather than spreading a low number of single FFSs over a country. A cluster of FFSs stimulates building a critical mass of FFS groups that can interact and thus strengthen farmer networks.

The more a farmer is dependent on farming, the more likely he or she gets interested in the FFS. Conversely, part-time farmers may well turn out to be part-time participants in a FFS. Thus, FFSs are often located in areas where farmers are more likely to be full-time farmers and full-time participants. The kind of crops grown in an area, and prevalent practices should also be considered. The larger the gap between current practices and IPM, the more likely farmers will be interested to join a FFS-IPM programme.

Another important criterion for selecting a FFS location is the travel distance for the facilitator (the closer the facilitator lives to the FFS location, the better), especially because many of our facilitators run a FFS in addition to other tasks and assignments.

BOX 8. FFS SITE SELECTION

In Iran, FFS site selection is usually made by the farmers themselves. The facilitator only puts forth some key questions before the farmer to familiarize them with the main criteria for a good site, including accessibility, seclusion from other farms, and basic characteristics to represent the agro-ecological and socio-economic conditions of the region.

3.4.2 Selection of participants

Participants are selected from those interested to learn about IPM and other crop production topics. The more a farmer is dependent on farming (full-time), the more likely he or she will be an active participant in a FFS. Full-timers may also have more farming experience.

In addition to this, FFS groups are formed with participants coming from a similar crop production background. Large estate farmers are not mixed with small farmers or the greenhouse production with open field farmers. These farmers usually have different training needs.

The optimum number of participants in a group is 15 to 25. Larger groups tend to become either chaotic or passive. Discussions and sharing of experiences may not develop well in smaller groups. Experience has shown that 20-25 farmers can constitute a reasonable critical mass in support of further IPM development in the village.

BOX 9. FFS SITES ESTABLISHED BY THE FAO REGIONAL IPM PROGRAMME IN IRAN

Year	Crops	# FFS	# Farmers trained
2004-05	Grape, Cucumber	20	214
2005-06	Grapes, Cucumber, Apples and Grapes-pistachio	53	718
2006-07	Grapes, Cucumber, Apples and Grapes-pistachio	55	1105
2007-08	Grapes, Cucumber, Apples	115	1525
2008-09	Grapes, Cucumber, Apples	125	2515
2009-010	Grapes, cucumber, apples, olives		
Total		368	6077

3.4.3 Gender issues

Generally women play a major role in a rural community life and are important decision makers at household level. It is important to make an analysis of the situation regarding labor division according to gender, at a first gathering of community members (consulting men and women).

BOX 10. A MAIN FEATURE IN IRAN: FEMALE FACILITATORS

A prominent feature of facilitating as an emerging career is the strong presence of women. About 60 percent of all facilitators trained or recruited through ten years of IPM/FFS in Iran are females. In Jiroft region, where after two or three seasons of pilot work, IPM/FFS gained a widespread popularity, more than 90 percent of the facilitators were females. They played a key role in mainstreaming the approach.

The motivations of the Iranian women for acting as facilitators are social rather than economic. They see it as a social duty for themselves to facilitate the process of sustainable development in their community. The ongoing facilitator selection criteria in the Iranian projects, which largely favor volunteers rather than tasked officials, the women find this opportunity. And they have proven that they do the job quite efficiently.

This analysis can be the basis of a discussion on who should participate. The project specifically aims at an active participation of women both as facilitators and as participants in FFS. Where mixed groups of males/females are not culturally accepted, separate women groups may be organized. It is important to include women facilitators in the program.

3.4.4 Planning of an introductory meeting

Once a farmer group is interested the facilitator organizes an introductory meeting to explain the basic information about the project objectives, the objectives of this FFS, the benefits for the participants, the requirements, and other necessary information.

The local agricultural officers, or staff from extension agencies, NGOs, etc. that are active in this region are involved in order to establish a basis for good communication and cooperation.

At the end of the introductory meeting, the facilitator asks which of the group members would want to be participant in a FFS. A registration list with names, addresses and contact numbers should be made.

BOX 11. TIMING OF INTRODUCTORY SESSIONS

In Iran, introductory sessions are held before the start of the crop season, when the farmers have sufficient time to negotiate with the externals. This also allows for the group to incorporate the key problems of the farmers in the seasonal plan. This simple point counts a lot particularly in FFS sites for protected and field crops. In rice for example, allocation and preparation of the FFS plot should be done well before the season. Otherwise the season can be missed.

3.4.5 Designing the FFS curriculum

Before the FFS curriculum is designed, baseline information must be collected to determine the main problems and issues of your farmers and the area. With this information, the facilitator can select -with the farmer group- elements to study in the FFS. Then a set of learning objectives are defined: What should FFS participants know, or be able to carry out after the FFS? The facilitator drafts a curriculum for the FFS, based on baseline information, learning objectives and the number of meetings planned. All these steps, and more, are described below.

3.4.6 Elements of an IPM FFS curriculum

In the FAO Regional IPM Programme in Iran, FFSs are season-long and have regular meetings. The FFS-curriculum elements include field study (season-long), agro-eco-system analysis (AESA), special topics, and group dynamic activities.

3.4.7 Participatory curriculum development

Steps to developing a FFS training curriculum include:

- Determine field activities and learning topics
- Design field studies (how to design the field study)
- Plan number of meetings per season
- Plan "routine" activities during FFS (AESA, meeting schedule)
- Plan special topics
- Plan "less traditional IPM topics" e.g. subsidies, marketing, etc.
- Plan farmer exchange visits/cross-monitoring visits
- Budget planning.

3.4.7 Baseline information and needs assessment

Baseline information is information about farmers' current practices, problems, and inputs/outputs in farming as well as general farm data. Needs assessment is an inventory of farmers' needs to support farming. Often, needs assessment is done as part of baseline information gathering, because farming needs are an obvious next step after listing current practices.

3.4.8 Participatory problem identification and determining the field topics

The following steps are usually involved in solving a problem and are also be used to identify topics to be included into a FFS curriculum.

1. Problem identification
- Field visits (baseline survey)
- Cropping calendar
- Meetings with farmers

2. Problem analysis
- Prioritize problems
- Cause-effect analysis
- Production practices and field history
- Farmers knowledge and perceptions

3. Listing of potential solutions
- Farmers' options
- Facilitators' options

4. Selection most potential solution
- Suitability
- Sustainability
- Economic and social viability
- Field study design and draft curriculum

- Planning of field activities

5. Implementation of plans

- Training of facilitators
- FFS (or participatory research activities, follow-up, etc)

6. Review and sharing results

- Discussion and presentations during FFS
- Field days
- Workshops/meetings
- Local media
- Recommendations for further study (improving curriculum, scaling up of activities, etc)

In a session with farmers the baseline information collected earlier (or during that session) are analyzed and priorities set (step 2 in problem solving cycle). Listing of potential solutions and selection of most potential solution is done with the farmer group (steps 3 and 4 (partly)). Farmers give inputs and determine what major topics they would like to study in the FFS.

3.4.9 Comparing IPM with conventional agricultural practice

The FFS method proposes that no technology will necessarily work in a new location, and therefore must be tested, validated, and adapted locally. Thus, IPM methods are always tested in comparison with conventional agricultural practices. The end result is that beneficial aspects of IPM are incorporated into existing practices.

The study field is essential for a FFS because farmers can carry out studies without personal risk allowing them to take management decisions that they might not otherwise attempt in trials on their own farm. This provides farmers a way of testing a new method themselves before applying it to their own fields. It also allows for more interesting research topics such as defoliation simulations in which leaves are removed. It is important to remember that the study field is to be maintained by the group - not by the facilitator or the owner alone - and is not a typical demonstration plot traditionally used in many programmes.

After the FFS is finished, farmers may agree to repeat the FFS process for one more season to verify findings, or to repeat the process of the FFS to study one factor, e.g. disease management, specifically. Designing a field study

When topic and the learning objectives for a field study have been selected, the facilitator works out the details, preferably with the farmers group. Typical elements of a field study include background, objectives, duration, materials needed, procedure, evaluation, economic analysis, and conclusions.

3.4. 10 Meeting Schedule for FFS

The following FFS meeting schedule is a sample for a FFS with 12 meetings. It is subject to adjusting to local conditions, field problems and farmers' interest.

Pre-season	Meet with farmers in the FFS area to explain the FFS and to recruit participants. Be sure to clarify all obligations of FFS participation. Arrange for a study field within easy reach of the FFS participants. Do Baseline survey/needs assessment.
Meeting 1 (before planting in annual crops, and before start of season in perennial crops)	Opening ceremony with introductions, possibly pre-test (knowledge) and planning of field studies by FFS participants and facilitators. Possibly cropping calendar exercise to identify issues for inclusion as Special topics.
Meeting 2	Team building exercise Introduction to Ecosystem and Agro-Ecosystem Analysis
Meeting 3	Agro-Ecosystem Analysis (decision making) Special topic
Meeting 4	Agro-Ecosystem Analysis (decision making) Special topic e.g. natural enemies
Meeting 5	Agro-Ecosystem Analysis (decision making) Special topic e.g. weeds
Meeting 6	Agro-Ecosystem Analysis (decision making) Group dynamics Pesticides & Pesticide Toxicity
Meeting 7	Agro-Ecosystem Analysis (decision making) Group Dynamics Special topic, e.g. mapping
Meeting 8	Agro-Ecosystem Analysis (decision making) Brainstorming on follow-up activities Diseases or other topic
Meeting 9	Agro-Ecosystem Analysis (decision making) Special topic
Meeting 10	Agro-Ecosystem Analysis (decision making) Proposal Writing, Work plans, Budget Community Self-Survey
Meeting 11	Agro-Ecosystem Analysis (decision making) Field Day Planning
Meeting 12	Post-test Field Day/Harvest and Weighing of Field Trials Closing Ceremony with Certificates
Post-FFS	Inform FFS participants of pre- and post-test scores Evaluation of field studies, and training as a whole Make regular visits to follow-up activities, if applicable

In addition to this meeting schedule, the facilitator plans the contents of every FFS meeting in more detail, listing time needed and responsible resource person. An example of one typical FFS meeting is presented in table below.

Time	Activity	Facilitator
08.00 – 08.10h	Welcome and explanation of today's programme. Sharing of important issues from participants related to this training or from their own fields.	Main facilitator
08.10 – 09.00h	Field work: sampling the field, recording of field observations, preparing posters that include analysis of field data and necessary action (decision making).	One farmer facilitator for every subgroup
09.00 – 09.30h	Presenting field data of every sub-group to the whole group, discussion and conclusions.	Farmer facilitators
09.30 – 09.45h	Summarizing results and comparison with data of last meeting. Appointing members responsible for specific actions or follow-up if so decided by the group.	Main facilitator or farmer facilitator
09.45 – 10.00h	Group dynamic activity	Main, or Farmer facilitator
10.00 – 10.50h	Special topic	Main, or resource person
10.50 – 11.00h	Summarizing meeting, lessons learned, planning for next meeting and topics to be discussed then. Closing.	Main facilitator

3.4.11 Materials and standard forms needed during the FFS

Some materials useful during the FFS are:

- Flap-over, large papers, and marker pens.
- One notebook and a pen for each participant.
- 3 sets of color pencils.
- Traps (yellow sticky or pheromone) for monitoring specific insect populations.
- Plastic jars or bags to collect insects and/or to set up insect zoos.
- Different cages to study life cycles, emergence of larvae, etc.
- Polystyrene (or other soft material) and needles to set up an insect collection.
- Colored rope to mark plants or traps in the field.

3.4.12 Record keeping

The following records are being kept and updated at every FFS meeting by the facilitator: Baseline information; attendance record per meeting; pesticide usage in the field study (IPM and conventional plot); economic data; field study data; and decisions for management practices for the study plots. In addition, the (summary) field data show population dynamics of pests (and diseases) at the various crop growth stages and are used at the end of the FFS/field study for analysis and evaluation.

Record keeping is also an essential topic (special topic) in the curriculum of a FFS. It is important that farmers get used to keeping farm records, for those who do not do that already. Basic records allow for comparison of treatments, economic analysis, and are a helpful tool in comparisons and decision making over the consecutive growing seasons.

3.4.13 Budget planning for the Farmer Field School

Each FFS requires a budget to ensure that activities are supported. The elements included in the budget are normally materials for the FFS (papers, markers, pens, materials for insect zoo, etc), field materials, field day activities, travel costs for the facilitators and participants if necessary, and incentive for the facilitators.

For each item the facilitator provides details on how many units are needed for the activity, and the unit price. This helps to prepare the detailed budget. Each facilitator makes a budget at the beginning of the season. When the FFS groups decide to continue their FFS activities during a 2nd season, the budget is drawn up together with the farmer group, where the contribution of the group members is anticipated.

3.4. 14 Local funding

Some of the FFS activities focus on future planning and fund raising. There is an explicit goal for groups to become independent and seek local support separate from (inter)national funding. In national programmes, it is desirable to have funds available directly to farmer groups that request support for their local activities.

The facilitator can also discuss with the farmers whether they themselves could support some of the costs for the FFS. For example, each farmer in the FFS may pay a small contribution to be member of the group (this fund should be managed by the group), so the group has some funds to continue activities even if support of the project is no longer available. In some areas, farmers take a percentage of the net profit made from the study field/FFS site and put this into a separate fund to allow continuation of the group activities. In Egypt, FFS group members contribute with giving land as study field, and sharing responsibility for field management practices such as cultivation, irrigation, weeding, etc.

Facilitators can also assist the farmer group to apply for other funds, e.g. from NGOs or other external sources. See the example from Iran in box below.

In the future farmers might be willing (or have) to pay for services and information such as extension that is of use to them and their farming. By making the budgets together, and discussing cost-sharing, farmers become more aware of costs, and are encouraged to raise funds as a group to have access to certain services.

BOX 22. FUNDS ARE CRUCIAL FOR SUSTAINABILITY

In its third season, the IPM/FFS site in Asiab Tanoure Village in Karand Township, Kermanshah Province set up a women's community fund, using seed money (2,500 dollars given by an NGO. As the first activity, the Fund bought 1,800 roaster cheeks from a private company that propagates and sells native poultry varieties in Kemrmanshah. The agricultural organization provided free of charge training to the fund members on how to rear the roasters, including how to vaccinate and feed them. The organization also gave to them about 750 dollars worth of feed mixture free of charge as donation to the fund. It was about one third of the feed the member farmers needed for the six-month rearing period.

Each member of the fund has received about 110 chicks. The fund returned 30 percent of the profit from this activity to the NGO. But the NGO replenished the same amount to the Fund to start activities on IPM/FFS and income generation for women. The Fund is planning about the future activities after finishing with the roosters."

About 28 other similar funds have been set up in Kermanshah, with totally 1,027 memberships. About 22 IPM/FFS female facilitators of the Regional IPM Project had the principal role in facilitating the establishment of the funds.

Some of these activities are only appropriate when the crop has reached a certain age, or growth stage. Then these activities are gradually incorporated into the FFS meeting schedule. In addition to these routine activities, participants may choose to conduct additional experiments on the FFS field.

3.5.1 Field observation & sampling

The final goal of IPM is to improve decision making for better production and profits. Sampling is one of the first steps in the management methods. Sampling has many goals depending on the person sampling. For a researcher, sampling usually must be very precise, and requires a lot of observation time. For Pest Observers, it is sufficient to estimate the level of populations in specific fields. For a farmer, sampling should tell him/her if the population is above a damaging level, and if the population is increasing or decreasing. It is not important for farmers to know the exact level of populations in the field, but they have to be able to make an accurate estimate.

Sampling for IPM is looking at a few plants in the field or greenhouse and estimating what is happening in the whole field/greenhouse. The result of sampling will be used with other information such as thresholds (if applicable), natural enemy efficacy, plant health, farm budget and weather to make an analysis of the field for decision making

3.5.2 Analysis of the Agro-ecosystem

The goal of Agro-Ecosystem Analysis (AESA) is to assess what type of action will be needed to best produce a profit for the farmer. Each subgroup pools the information gathered at their sampling sites and discusses the observations, differentiating between positive and negative elements for crop, field, environment, and personal health. The subgroup formulates a summary of their observations and draws conclusions about the state of crop health, after taking into account the balance between positive and negative elements.

3.5.3 Presentation of results and discussion

Each subgroup presents their results to the entire group. The other subgroups ask questions and raise discussion points. After all the groups have finished, the facilitator guides the group as they formulate an overall summary of field and plant conditions, draw conclusions and recommend actions (crop management practices) to be implemented during the upcoming week(s) until the next FFS meeting.

One or more of the participants should be responsible for follow-up of the action points.

3.5.4 Economic analysis

A major goal of evaluating the study results is assessing the cost-effectiveness of IPM technology. This is usually done only at the end of the FFS, except for crops with longer harvesting periods such as greenhouse tomato.

The FFS group keeps a record of all the activities, inputs and outputs for the FFS field during the whole season, as well as data about price fluctuations in the market. Results are evaluated by measuring the yield and quality

BOX 24. ECONOMIC MIND SUPPORTS IPM

Mr. Nemat Mohammadi, local greenhouse facilitator/farmer from Jiroft:

"Last season I managed to save 400,000-500,000 tomans [equivalent to US$ 400-500] by reducing the pesticides by applying methods that I'd learned at FFS. One of the useful techniques I used was aerating the soil, which led to much less disease. I also monitored the plants using the techniques taught at FFS. Then I sprayed only the plants that were infected.

To control aphids, I used beetles to control leaf feeder, without using any pesticides. I just instructed the farm laborer to pick it by hand whenever he sees the moth. These were part of the things that I'd experienced at FFS".

3.5.5 Group dynamics

Group dynamic exercises help a facilitator to work with a group and develop a true team out of it.

Facilitators build up a repertoire of activities, used for interesting opening that help participants to become comfortable with each other. During the cycle of the FFS over one season, energizers and team fun are used more at the beginning of the season, with more emphasis on Team Skills near the end of the season, especially in preparation for community organizing.

3.5.6 Special topics

Special topics support the agro-ecosystem analysis by dealing in more detail with specific issues relating to the agro-ecology, crop development, IPM principles, biology of insects, group dynamics, and provide training in basic experimentation methods. Often, special topics are identified during baseline surveys/needs assessment or during the participatory curriculum development. It is also possible to extract special topics out of a group discussion during which many technical topics are raised.

After the facilitator introduces the special topic and explains the steps to be used in the process, the participants assume the active management of the experiment or activity. Most special topics follow a structure similar to field studies. They have an objective, procedure, time needed, guiding questions, suggestions for evaluation/conclusion, etc.

Special topics can be handled by the facilitator, when he/she is familiar with the subject. In special cases, a resource person can be invited to the training.

3.5.7 The Field Day

At the end of a FFS, a "Field Day" is organized to present the results of the FFS other farmers, agricultural staff, NGOs, and local government officials in the community. Colleagues, local and national media, government officials, and other people are invited to join the Field Day.

Field Days are organized before the crop is harvested. Visitors will be able to see activities in the field, e.g. different study treatments, traps, insect collections, etc.

4. IRANIAN IPM FARMERS STORIES

The following collection of stories, narrated in first persons by Iranian farmers, is meant to give a realistic picture of the Project in the everyday life of the beneficiaries' communities.

4.1 IPM AND EMPOWERMENT

Recollections of Ms. Naheed Rezaei, 26, member of IPM/FFS group in FAO IPM Programme in Kermanshah:

"Each time we attend the IPM/FFS site, we write down our experiences and findings in our notebooks. Then we try to repeat them on our own farms. Often we have to do this in a small plot at a remote corner of our family farm, because our fathers, husbands or brothers are still dubious about our new abilities and they would not allow us to use them on the whole farm.

When the first time I told my father about the possibility to fight the powdery mildew without chemical spraying, he ridiculed me, but I did not get disappointed, because I recalled my own feelings in the first FFS sessions. From my own experience I knew that with patience I could help them learn by experience. Once it came to my mind to help my family members undergo the same process that I had experienced in my FFS group. So I helped each member of my family to make his own experimental plot and, gradually, I transferred to them whatever I had learned at the FFS.

The result was very good. Now all my family members, even the younger ones, are very keen. They even help other farmers to learn and use IPM. It meant to me a lot when I saw that those who argued with me the most at the beginning were now helping us in providing the materials needed for IPM.

8 June, 2010

4.2 FARMERS AS EXPERTS

Mr. Aziz Keshmeshi, a 60 year old farmer from FAO Regional IPM Programme FFS Sites in Krend:

"Over the years I had gained a lot of information about chemical pesticides, so that I was often called on by other farmers who sought my advice on what pesticides to use on different crops and how to use them. Three years ago I happened to pass by an FFS class. It immediately attracted my attention and, since then, I have become a faithful attendant. I have visited FFS groups in other provinces as well. I am now a good friend with the FFS rice farmers in Mazandaran and Gilan provinces. I have visited their farms. They have also visited my hometown Krend upon my invitation.

At the central FFS site (Kashani Orchard), I head a subgroup working on weeds. In my own orchard also I host a regular monthly FFS facilitated by a female expert.

In the past, I destroyed every kind of grass I saw on my orchard. I believed that all of them should be eradicated by herbicides. But in the FFS we studied all the grass type and we learned that some of them are not harmful at all. In our investigations we also found out that we often don't need to spray against the harmful ones. Rather, we can cut them with scythe and spread on the orchard bed. Because our observations showed that covering the orchard bed with cut grass acts better than animal manure, wood dust and plastic in preserving bed moisture. The end result is better orchard bed moisture and less money spent in herbicides. "

4.3 EXPERTS IN THE CLASS AND EXPERTS IN THE FIELD

Ms. Fatemeh Khodadadi, female greenhouse facilitator/farmer in the FAO Regional Programme FFS sites:

"I am a university graduate of Plant Pathology. But I did know much about the pests and diseases that occur in the greenhouse. The TOT courses gave me an opportunity to expand my knowledge about these agents.

At the moment I am working as a facilitator with an IPM/FFS group at Band Saraji district. The members of my group used to spray their fields up to five times per season against aphids. But we managed to reduce the number of applications to only two times, and just on the hot spots, not on the whole field. Only this improvement saved about 200,000 tomans [US$200] for the group.

The group also developed good skills in applying non-chemical methods, including yellow trap and installing nets on the windows.

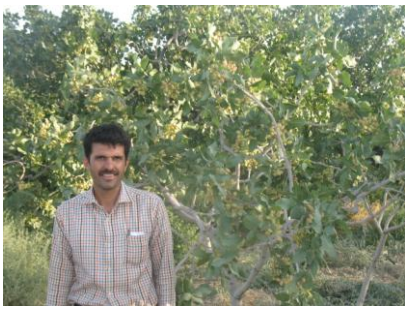
First we did not know that powdery mildew and the disease alternaria have the same symptoms. When we learned this during FFS experiments, we managed to reduce pesticide application by spotting the disease. This simple technique led to reduction of the costs of pesticides used for this disease from 1 million tomans to 500,000 tomans [US$500].

Another 200,000 tomans (UD$200) was saved by reducing the costs of weed control through introducing soil solarization"

4.4 IPM/FFS AND COMMUNITY EMPOWERMENT

Like many other regions in the world, the transition from traditional extensive agriculture to a more intensive one in Iran has not been accompanied with adequate measures to enable the farmers to manage its implications such as the outburst of plant pests and diseases. The results of IPM/FFS projects under the umbrella of the Regional IPM Programme and other similar projects have proven that, through appropriate approaches, the farmers can be effectively empowered not only to make their farming practices more sustainable, but to help other farmers do so.

The following section illustrates these intrinsic capacities of the farmers, giving the example of a community of pistachio farmers in Zarrinabad Village of Damghan Township, who became masters of IPM/FFS in less than a decade



This story is narrated by Mansour Abbasian, a farmer from Zarrinabad:

"Before coming to know about IPM, we used to spray our pistachio orchards heavily against the pests. Only for one pest, Psylla, we treated the orchards five to seven times a season. We almost bathed our trees with chemicals. Indeed it was like we bated the trees. That was why when we talked about the right time for spraying, we would ask each other: "when are you going to wash your trees? But the more we applied chemicals, the higher got the population of the Psylla. We always complained from the Government because we thought the chemicals they were giving to us were not as good as before.

Our way of looking at things changed totally when the first IPM/FFS sites were set up in our community some five years ago. In one season we learned about the useful bugs and the harmful ones. We studied their lifecycle. We observed how the useful bugs eat up the harmful ones. The community learned for the first time that the pesticides are not the only way to control the pests, and that the pesticides destroy the useful insects beside the pests. It was of course very difficult at the beginning to believe that what we learned in the FFS site could make a real life difference on our orchards. My own mother kept warning me that she would disown her mercy from me if I stop spraying the orchard. She kept asking me not to listen to the Facilitator. And her concerns were quite understandable, because our trees were the only means of our sustenance, and as my mother put forth: 'Who would save us from starving if the trees die after we abandon spraying?'

But things began to change in just two season s. The farmers began to get more and more serious about the IPM/FFS exercise. I personally developed a strong sense of curiosity about anything that moved in the orchard. One day, I happened to observe, just by accident, how lacewing larva fed on Psylla in my own orchard. This made me more determined to create a safe environment for the growth of lacewing and other useful insects. Next season, I cultivated barley between the pistachio rows. This returned a lot: The population of useful insects such as lady beetles and lacewing increased greatly on the barely and ten moved to pistachio trees.

Early in the spring, I turned the barley soil and it helped in the orchard's better fertility. Particularly, substantially less chemical fertilizers were now needed to make up nitrate deficit,

because barley soil is rich of it. By and large, the peer farmers in our community managed to minimize pesticides use through better understanding and analysis of the farm ecosystem. Just in the first seasons with IPM/FFS the participating farmers gained the following:

- Substantial saving in the costs of production by about 400,000 tomans (=$400) per orchard every season.
- Amazing skills in analyzing the orchards and the fields and making informed decisions on problems of various natures.
- Better team-working and knowledge sharing among the peer farmers.
- Community-wide awareness on the negative impacts of the pesticides on the ecology and human health.

My own father, who was a great supporter of IPM/FFS, died of a cancer allegedly related to pesticides. Before his departure, he bequeathed the yield of one tree in our orchard to our master Facilitator Mr. Heydari as a token of his belief in what he learned in his last years. We fulfill his will every year and send the yield of that specific tree to the Facilitator, or donate its equivalence to farmer training activities upon the Facilitator's request.

Our community has now gone a long way in the path of IPM. We are now recognized by the local and even national agricultural authorities. As a model farming community we have been visited by numerous high officials and men of state, including ministers and deputy ministers. In these official visits we explain our IPM/FFS activities and give recommendations on how this way of thinking can be used in other areas. That we are visited so often by the authorities heartens us because we see it as a sign of success.

Recently our community was directly contracted by the FAO Office in Iran under the Regional IPM Programme to assist in empowering the farmers of other communities to apply IPM/FFS approach on mixed pistachio-grapes orchards.

Some of our members, including myself, have been recently linked with a Tehran-based IPM group which looks for crops produced under IPM principles. So we supply our produce to them directly without the interference of intermediaries. This has brought us higher profit margins.

I am happy that I it used to IPM/FFS practice. I do believe that the future belongs to healthy products, free of poisons and harmful remnants of pesticides and chemicals."

4.5. THE ROLE OF THE FACILITATOR

Mr. Nadir Aghaei, Farmer from Balu Village, Azarbaijan Gharbi:

"In the past we used pesticides according to calendar, because we didn't know any other way. We did not have any knowledge about the pests. We just knew them from their damages on the crop. We sprayed the field to prevent them. Two times, three times, any times we felt it would be sufficient.

When the FAO project came to our region, the township agriculture office sought my help in gathering the farmers to a meeting. I did so. And when we attended the first meeting, we encountered concepts and discussions that were totally new to us. Mr. Heidari, the Facilitator, put forth questions that challenged our attitudes towards many subjects. On pests, for example, after a couple of questions and answers, we realized that we knew almost nothing about them. In one single meeting we got to know that to solve our problems in a right way, we first need to understand the problem in all its aspects. For example, what is the pest? Where does it come from? How does it affect our crop? How deep would be the damage? What are the different ways to control them?

When we decided to start working in practice, the rest was fairly simple. According to FFS method, we chose a small orchard plot and simply started our weekly sessions. Our group was assisted by the Facilitator and a couple of other experts who were trained by him during the season".

4.6 PERSONAL MOTIVATION: A KEY TO BECOME A FACILITATOR

Fatemeh Afsharipour, female facilitator in FAO Regional IPM Programme:

"My first involvement in IPM/FFS was through one of my friends, who familiarized me with the aims and ingredients of this approach. After I told her that I was interested in this system, she arranged everything for my participation in the FFS as an assistant facilitator.

In the TOT/FFS course, I learned how to control pests and diseases of protected farms, particularly cucumber, and at the same time reduce the pesticides use.

To me, knowing the pests and diseases and measuring their population are crucial steps in IPM. Only by this simple method we reduced the use of fungicides by 50 percent and that of pesticides by 30 percent just in one season".

4.7 FEELINGS OF A FEMALE PARTICIPANT OF IPM/FFS ACTIVITY IN KERMANSHAH:

Our village is located in a remote area, with about 80 kilometers distance to the nearest town. Because of road conditions, it is difficult to communicate between our village and the town. Therefore, we do not have many visitors.

Like many other girls at our village, I did not have much access to training and education, so I could not be as useful to our people as I wished.

We grow apples, grapes and field crops in our village. Most of the orchard work is done by the women. But even there we are often ignored. I remember that some experts came from the city to train the farmers. But we women were not invited to the sessions.
When the FFS was introduced into our village, they invited the women to take part in the classes. As a habit we were first dubious to show up. But after two sessions we realized that FFS creates an atmosphere for women to work with other farmers.
This week we held the 15th session of the FFS at our small site. We have realized that with cooperation and consultation we can reduce the costs and increase production and make it safe. This social activity in our small village is helping us to make the orchards and our environment safer.
16 July 2010

4.8 THE DIFFERENCE

"It is interesting that in the past we did not even know how to pronounce the word 'project'. We were unable to write a short description about anything we did. But with participation at FFS we got the knowledge to speak with our farm. If we listen and observe carefully, we can see that our farm informs us when it needs to be fed or watered. The farm itself tells us how to fight its pests and protected its friends.
In the pas, the moment first farmer started spraying his farm, all other farmers were triggered to do the same. But today we would never decide to spray without examining things carefully.
The change in our behavior first started when my friends, or better say my 'FFS classmates', and I experimented identifying harmful and useful insects. We used discarded boxes, leaves, fruits and other insects to feed and rear them. This simple experiment motivated us to continue IPM/FFS. We put forth questions about our problems on the farm and tried to find answers to them".
From the diaries of a farmer in Kermanshah, 1st May, 2010

4.9 THE VALUE OF SAMPLING

Mr. Hashemi, veteran of IPM/FFS from Sooteh Village, Fereidoonkenar, recognizes the knowledge and skill to observe and analyze as the most valuable asset that IPM/FFS bestowed to him and his community farmers. He gives the following example:
"Once I head-counted the polluted plants on my fields. There were only 21 polluted bundles in one hectare. This was almost nothing compared to total 240,000 bundles of paddy per hectare, as I had learned in the FFS. More striking to me was that out of those 21 bundles, only 11 were polluted with stem borer, which meant no real harm to the crop. This observation awakened me. It showed to me how I used to waste my money and the environment for almost nothing. From that season, I never again did sheath spraying and I am using all my energy to stop other farmers doing so."

4.10 HEALTH IS A CROSS-CUTTING TOPIC IN ALL IPM/FFS ACTIVITIES

"Before the FFS we thought that the pesticides, or the 'drugs' as our elders called them, were the best way to take care of our orchards and crops. Every time we saw a pest or any other irregularity on our farm, we rushed for spraying. When the FFS started, talking about the problems of pesticides was part of the activities. We didn't believe much of what we were told about the damages caused by them.

Once on the way from the FFS to the village, a scene occurred to us that changed many things to us: a farmer was washing his sprayer under the community tap water. He did not use gloves. As he was doing the washing his hands touched his eyes and face several times. The waste water flew into the duct and from there to a nearby stream.

Our facilitator kept us watching the scene for a few minutes. Then he approached the farmer and asked him if you could lend his sprayer for a minute for a test. Then he fetched some ink and repeated the washing of the sprayer which this contained a small amount of ink. After washing the sprayer, the facilitator asked us to chase the trace of the ink in the stream. This helped us realize how deep the poison penetrates into the water, the soil, the animal feed and even to our own bodies. It was really shocking and frightening to us because we always washed the sprayer the same way as that farmer did.

Next session we did another small test to see if the pesticide also destroyed the useful insects on the farm. After all we had learned about the benefits of these useful insects. For this, we sprayed a couple of trees. Again we got really shocked to see the results of the test. The farmer who had lent his sprayer to do the test was so moved with the result that he instantly broke the equipment and quit spraying for ever.

We continued our experiments in the next sessions. When we did the mummy test, we further learned how the poison affects our skin.

These experiments made us determined to follow the path of IPM. Now we are IPM farmers and we manage our orchards with knowledge and skill. Instead of pesticides, we try to find out and use ways and means that are available at our village.

A farmer from Asiab Tanoureh Village, Kermanshah,
Quoted from the diaries of Ms. Elham Mahtabi, IPM/FFS Facilitator, April 2010.

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