Community study programmes for integrated production and pest management: Farmer Field Schools

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This article provides a brief overview of Farmer Field Schools (FFS), which are designed to provide farmers with on-the-job training in environmentally friendly plant protection and soil fertility management methods through integrated production and pest management (IPPM). IPPM methods can increase both production and profits and play a major role in poverty alleviation. FFS activities aim to bring together a group of farmers regularly in a field. Courses are hands-on and practical. They provide structured learning exercises that allow farmers to combine local knowledge with scientific ecological approaches, using the field itself as a teacher. IPPM-FFS programmes have been established in more than 40 countries across Asia, Africa and Latin America.

Programmes d'études communautaires pour la gestion intégrée de la production et de la lutte contre les ravageurs: écoles pratiques d'agriculture

Le présent article donne un bref aperçu des écoles pratiques d'agriculture (FFS) qui ont pour but de fournir aux exploitants agricoles une formation sur le tas dans le domaine de pratiques respectueuses de l'environnement concernant la protection des plantes et les méthodes de gestion de la fertilité des sols, et ce, grâce à la Gestion intégrée de la production et de la lutte contre les ravageurs (IPPM). Les méthodes IPPM sont censées accroître à la fois la production et les gains, jouant un rôle majeur dans la lutte contre la pauvreté. Les FFS ont pour but de regrouper périodiquement des groupes d'exploitants agricoles sur le terrain. Les cours dispensés sont simples, pratiques et basés sur des exercices structurés. Ils permettent aux agriculteurs de joindre leurs connaissances locales aux approches scientifiques et écologiques et d'apprendre directement sur le terrain. Des programmes IPPM-FFS ont été établis dans plus de 40 pays d'Asie, d'Afrique et d'Amérique latine.

Programas de estudio comunitarios para la producción y lucha contra las plagas integradas: escuelas de campo de agricultores

En el presente artículo se describen brevemente las Escuelas de campo de agricultores (ECA), que tienen por objeto impartir a los agricultores capacitación sobre métodos de protección de las plantas y ordenación de la fertilidad del suelo inocuos para el medio ambiente (Producción y lucha contra las plagas integradas (PLPI). Los métodos de PLPI pueden aumentar tanto la producción como los beneficios y desempeñan una función importante en el alivio de la pobreza. Las ECA tienen por finalidad reunir periódicamente a un grupo de agricultores en un campo. Los cursos son de carácter directo y práctico. Constan de actividades de aprendizaje estructurado que permiten a los agricultores combinar los conocimientos locales con sistemas ecológicos científicos, utilizando el propio campo como lugar de enseñanza. Los programas de las ECA y la PLPI han sido aplicados en más de 40 países de Asia, África y América Latina.

The problem of pollution caused by pesticides and fertilizers has long been recognized by the member countries of FAO, and is a major area of focus in the United Nations Conference on Environment and Development (UNCED, also know as the Earth Summit) Agenda 21.

Constraints to addressing and solving these issues are numerous and include lack of access to non-polluting technologies; policies that promote excessive use of inputs; and inappropriate decision-making by farmers themselves. Many farmers lack basic knowledge and information on the proper use of fertilizers and pesticides, do not appreciate their impact on health and non-target species, and often overuse products - usually to their own economic disadvantage.

Proper crop cultivation using a wider variety of environmentally friendly plant protection and
soil fertility management methods can increase both production and profits, thereby playing a major role in poverty alleviation - especially for small-scale farmers using scarce cash resources uneconomically (Kenmore, 1996). Such methods and technologies are referred to as integrated production and pest management (IPPM). They require better ecosystem management concepts and skills - and therefore farmer education - in order to be implemented profitably.

IPPM educational field programmes focus on growing a healthy crop in healthy soils, improving field-level management decision-making and, in general, assisting farmers to reach a higher level of IPPM expertise. Such programmes are not "message-based", but rather concentrate on basic ecosystem management principles which can then be applied to the local conditions and to problem solving over time.

Farmer Field Schools

IPPM programmes have promoted a field course called Farmer Field Schools (FFS). The FFS training method was first developed by the FAO-assisted Indonesian National Integrated Pest Management (IPM) Programme in 1989, and was inspired, in part, by previously developed programmes for literacy and primary health care. The concept behind an FFS is that groups of farmers meet on a regular basis in a field to do practical structured learning exercises that allow them to combine local knowledge with scientific ecological approaches (Settle et al., 1996). All courses are very hands-on, practical and field-based, with few or no lectures and using the field itself as a teacher.

FFS activities are a response to and an evolutionary step within the training and visit (T&V) framework. Instead of using the T&V demonstration plot/field, which was managed by extension staff, the FFS site (a field in the community) is managed directly by the farmer group as a study field where structured learning exercises and experiments are carried out by the farmers themselves (Box). The extension officer's role has evolved from that of a primary knowledge source to that of the facilitator of knowledge creation. He or she no longer has to have all the answers, and the "messages" of extension are not centrally contrived but, instead, relate to locally relevant problems emerging from the FFS study field. The FFS methods have transformed farmers from recipients of information to generators and manipulators of local data (Mangan and Mangan, 1998).

The FFS participants (usually about 25 people) meet regularly throughout the season, from pre-planting to harvest, to learn about agro-ecology and to decide how to manage the studied crop or crops. For field crops, this involves weekly meetings and, for orchards, monthly meetings. In addition, the FFS curriculum also includes team building and organizational skill development activities.

FFS are essentially activities carried out by community-based study groups and are similar to other community-based study programmes operating worldwide. Examples of community programmes include the Netherlands' village agricultural study programmes, in which local farmers organize study groups; Danish folk high schools, in which the public has study opportunities on various outdoor topics; and the Study Circle and Adopt-a-Stream movements which are organized groups focusing on specific study topics. In many cases, the FFS study group will continue for more than one season. The groups may continue to study one crop, refining their skills and seeking new approaches and information on particular subjects, such as a deeper knowledge of soil fertility management or community-level management of certain social pests (e.g. rats or whiteflies). In other cases, groups may decide to continue meeting on a regular basis without a specific study plan (Ooi, 1998).

FFS activities either strengthen existing groups or lead to the development of new groups. It is important to be clear, however, that FFS are activities carried out by groups and are not intended to be lasting organizations themselves. The members of water users', youth and
Structured learning activities

Farmers use hands-on activities for learning. This process seems to be one of the most innovative aspects of the FFS, according to the most commonly mentioned aspects appreciated by both farmers and facilitators. Examples of hands-on activities include the following.

**Insect zoos:** Farmers rear insects through all life stages in order to learn about life cycles. These activities are sometimes combined with rearing predators such as spiders and beetles or parasites in order to study the concepts of predation, parasitism and natural population regulation (Photo 1).

**Disease incubators:** Similar to insect zoos, these exercises have been developed to allow farmers to study disease progress and causal agents.

**Seed banks:** These employ a method for learning about weed seeds in soils and are part of weed management. Farmers collect and moisten soil, allow weed seeds to germinate and count them. The soil is allowed to dry and is mixed, and the process is repeated several times until no more weeds emerge.

**Rat population growth:** Simple and fun quizzes form a powerful process for developing population model approaches that lead to better community-based rat management. Farmers solve such problems as: assume that a mating pair of rats have a litter of six, half of which are male and half female, every three months; assume that rats become fecund in three months and that there is no mortality; after 13 months, how many rats will there be?

**Agro-ecosystem analysis:** This is perhaps the most strongly structured exercise and organizes field observation into an ecological model, reinforcing identification skills. It combines local and ecological knowledge and leads to decision-making that is based on agro-ecosystems incorporating soil, water, plant condition, pest, natural enemy and economic parameters (Photo 2).
A paradigm shift towards sustainable livelihoods?

Sustainable livelihood approaches emphasize the larger development agenda, which includes building not only technical skills, but also group, community and policy dimensions. The FFS approach represents a major shift away from traditional extension approaches and takes into consideration these other dimensions of development. Perhaps the most important aspect of this shift is the move away from technology transfer or message delivery through training to a participatory and educational approach. This has enabled research results and ecological concepts to be combined with indigenous knowledge (ecological, social and economic) to give local communities greater ownership of extension or educational processes, including greater control over their content, methodology and quality (Dilts, 1999).

A major shift is also occurring towards building community-level institutional capacity. Farmers are no longer mere "contact targets" for T&V extension staff, but meet for the benefit of the farmers' group as a whole. Although crops, soil and water resources are managed by farmers, whose individual knowledge and skill will determine how well they do, some decision-making aspects are determined by neighbours or greater communities which apply peer pressure to the farmers. Community issues often lead to poor decision-making, such as needless spraying or "cosmetic tillage". The group focus of FFS activities allows community efforts to provide positive outcomes.

Individual farmers' decision-making at the community level is also influenced by the interaction of higher-level environmental, social and economic interests. It is therefore essential that IPPM activities do not only focus on basic individual economic gains but also address social and organizational issues. For IPPM to have an impact on poverty alleviation, both the technical and the social approaches need to be stressed. The new emphasis given to sustainable livelihoods by international agencies is in many ways a recognition that the development process requires looking beyond simple cost-benefit analysis of individual technologies and towards a wider range of benefits and capital formation.

Finally, IPPM programmes are concerned with the policy dimensions of sustainable livelihoods. Pesticides and fertilizers are heavily regulated in many countries, owing to their
polluting and dangerous characteristics as well as their perceived importance for national food security. Pesticide and fertilizer policy issues are thus an important element of IPPM programme development. Too often, however, policy issues are not related to or based on farmers' field experience and knowledge. As part of the FFS process by which farmers become better organized, their field experiences, results and needs can be more clearly voiced and more widely heard.

Conclusions

While the positive results achieved to date indicate that IPPM is a significant step forward towards more environmentally friendly production and pest management, several questions still need to be addressed within IPPM. From a technical point of view, better plant and pest management technologies need to be developed in the field. For example, many of the production and pest management products and methods being used in the organic agriculture sector are less polluting and more effective for long-term soil and ecosystem management. In addition, there are significant social issues to be studied. Key among these is how development is to become community-focused. Can groups coalesce around IPPM-FFS methods - which are basically an extension entry point based on bugs and production - and move towards addressing wider community issues such as health and education? Will IPPM-FFS and similar programmes help groups make the leap to greater local action? Will the move towards decentralized government and greater local accountability mean that locally organized farmers' groups become more effective development partners? What is certain, is that there is a need for greater commitment, on the part of governments and development organizations (including agricultural extension programmes), to community-level development, the environment and "cleaner" technology.

To extend IPPM, there is also a need to find sustainable community-level funding through various methods (Van de Fliert, Pontius and Roling, 1995). These range from earmarked taxes on pesticides and fertilizers, based on the "polluter pays" principle (and used by local government for farmer education), to more straightforward publicly funded adult education initiatives. The latter would include sustainable agriculture, literacy and life skills for farmers. Another area of concern is how to maintain lower-cost information flows on improved technology after FFS or other community study programmes finish. IPM/IPPM programmes have found that such problems are more easily solved when organized community groups become active partners in their own development process.

1 IPPM is new term being developed by African and Latin American programmes in order to move beyond the notion that integrated pest management (IPM) activities focus primarily on pests.
2 See the Community IPM Web site at: www.communityipm.org
3 See the Sustainable Livelihoods Web site at: www.livelihoods.org
4 See the Organic Materials Review Institute Web site at: www.omri.org

References


