# Farmer field schools reap long-term rewards

*It is almost 20 years since the first farmer field schools were held across Asia to combat the devastating brown rice hopper pest. Since then they have matured to become an adaptable educational tool that can be used in all continents and on many crops, helping farmers to address the shortcomings of agricultural modernisation.* ***Henk van den Berg*** *and* ***Janice Jiggins*** *report on their coming-of-age.*

The IPM Farmer Field School (FFS) was introduced in 1989 by the Food and Agriculture Organisation of the United Nations to reduce Indonesian rice farmers' reliance on insecticides. Due to its success the concept was soon extended to other Asian countries and other crops. From 1995, programmes were initiated in parts of Africa, Latin America, the Middle East and Eastern Europe. The programmes added new commodities and were encouraged to adapt to local conditions.

## Reduced use, increased yield

The key aims of FFS are to increase farmer knowledge and reduce pesticide use. Almost 20 years on available information indicates they have been successful. Trained farmers are more knowledge about pest management and crop cultivation, and have changed their pest management behaviour from prophylactic chemical treatments to observation-based management.

The majority of impact studies (mostly unpublished reports, but with an increasing number of published academic papers) report substantial reductions in pesticide use due to the effect of FFS participation[1]. In addition, some impact studies show an increase in yield. Notably, large-scale studies from Indonesia, Vietnam and Bangladesh recorded 35-92% reductions in insecticide use in rice. In Sri Lanka rice farmers trained more than five years previously in a FFS were still using only a third of the amount of insecticides being used by the control group. Recent results on cotton from China, India and Pakistan indicate 34-66% reductions in pesticide use in combination with 4-14% better yields. Typically, FFS graduates reduced their pesticide applications from 1-3 to 0-2 per season in rice, and from 3-7 to 1-3 applications per season in vegetables and cotton.

One controversial study showed no effect of the FFS on pesticide expenditure and yield[2] causing a debate on their effectiveness. However, the validity of this study has been questioned due to weakness of the control group used[3].

## Empowerment effects

However, the effect of the FFS goes beyond a reduction in pesticide use and increase in yield. The FFS curriculum emphasises the development of critical analytic and communication skills. This has triggered further development of field experimentation by farmers, collective action, leadership, planning and organization. Reports from Indonesia have described how the FFS, assisted by post-FFS activities, have resulted in local initiatives which have produced new structures, networks and policy change[4].

Other reports have described how the FFS has prompted farmer initiative[5]. In Indonesia multi-tiered associations were formed with other groups, with individuals serving as key points within a communications network, aiming to sustain a local IPM movement among farmers. These farmer alumni associations emerged in almost every sub-district of the programme.

The empowered and organized FFS alumni were relatively small in number but were elected to new leadership positions in local organisations, such as water user associations, while others became FFS trainers, or field experimenters. Consequently, they influenced policies, funding support, and media, which in many cases amplified the impact. Future impact studies need to give greater emphasis to such developmental impacts of the FFS.

## Extension or education?

The FFS should perhaps not be viewed as a model for extension but rather as an educational instrument with the specific purpose of tackling some of the shortcomings of agricultural modernization. The complex problems and priorities of farmers, caused by diverse and variable agricultural systems and market opportunities, indicate the need for a bottom-up educational approach through which farmers enhance their analytical and problem-solving abilities. This is provided through the FFS, and distinguishes the FFS from extension campaigns that aim to achieve quick and widespread coverage of generally applicable solutions to common problems. Farmer group education is labour-intensive and can be costly, but costs may be quickly recovered at the farm-level through reduced input costs and increased yield.

The diffusion effect in relation to the spread and coverage of FFS programmes has received much attention. It is generally accepted that the learning, skills, and information obtained from education do not readily diffuse. However, these outcomes can generate social and economic multiplier effects that deliver positive public and private benefits. Clearly, skills and expertise have to be acquired through experiential learning and the application of knowledge. Many farm-level problems go beyond insect control to crop husbandry, organization and marketing. This requires an educational investment such as that provided by FFS.

*Indonesian farmers taking observations of the rice ecosystem* *Photo: Henk van den Berg*

## FFS costs

Based on observations in Indonesia and the Philippines the ability of sector-bound extension departments to sustain FFS programmes beyond the pilot stage in order to achieve a significant coverage of farms has been questioned[6]. Indeed, extension departments are generally restricted to small budgets and narrowly-defined objectives.

The available information indicates that the cost of the FFS per graduated farmer is highly variable. Costs are highest in a project's pilot stage due to high start-up costs and reduce after up-scaling and consolidation into mainstream programmes. However, the bulk of the available data on costs refer to pilot projects. Also, the recurrent costs of implementing the FFS are likely to decline after project managers learn to increase efficiency and reduce incentives and expenses.

Initial costs in Indonesia and the Philippines were estimated at US$62 and US$48 per participant, respectively. Other studies report substantially lower costs, or sharp reductions in costs as activities were scheduled within service organisations and the proportion of farmer-led field schools increased. In a review of 14 countries a range in the per-unit cost of the FFS (not per participant) of US$150-1300 was reported (roughly US$8.65 per participant)[7]. Studies are ongoing in East Africa on how external sponsorship of FFS programmes can be reduced. Moreover, there are examples of self-funded and partially self-funded FFSs

An EU inter-country cotton IPM project reached break-even benefits within five years from project inception, despite high start-up costs in anticipation of a second project phase[8]. This is the most comprehensive cost-benefit analysis of the FFS to date, with calculations based on start-up, recurrent and

opportunity costs, production efficiency and health benefits.

Hence, the FFS can be considered a public service with a potentially high economic rate of return due to private field-level benefits and public multiplier effects. The recognition of these impacts at the field level and in the social and political domains would justify increased investment in the approach as well as a broadening of its institutional basis by involving other sectors in FFS-type educational programmes.

## Externalities

Regarding the discussion on costs associated with FFS programmes, the financial calculation needs to be more comprehensive by incorporating the costs of the 'public bads' of pesticide use. The importance of the impact of IPM on the externalities of pesticide use in terms of harm to human health and the environment is increasingly being recognized[9]. These costs are currently borne by farmers, other citizens and other industries, such as drinking water suppliers, instead of those accountable.

Even though the number of studies is few, the relationship between pesticide use and the acute effects of occupational poisoning has been well established. However, empirical work on the impact of the FFS on the environment in general is lacking.

## Scaling-up

The coverage FFS programmes have achieved in Asian countries has been only 1-5% of all farmer households, but in focal areas the coverage has been considerably larger. In general, two strategies to reach substantially more farmers with FFSs can be distinguished. The first strategy is to scale up the number of FFS offered (for example, targeted according to vulnerability or productivity criteria), with increased support from public services or donors. This could be achieved by formal institutionalisation of IPM and by involving other relevant ministries and organizations. In this strategy, farmer-led FFS (and (partial) self-funded FFSs) are seen as a low-cost means of expanding a national programme.

The second strategy is through so-called Community IPM. This aims to institutionalise IPM locally by adding value to the initial FFS investments and to the developmental impact in terms of social and organisational structures. This approach regards farmer-trainers and farmer-led FFS as vital elements in the emergence of farmer-driven programmes and local institutions. Additional activities to extend and amplify impact need further exploration and study.

It is critical to the sustainability of IPM-FFS programmes and their impacts to construct a policy environment at the national and international level that favours a tighter control over pesticides, and is more responsive to the specificity of farmers' needs. The potential of the FFS to act as a driver for such policy changes needs further exploration.

*FFS participants presenting their analysis of field observations* *Photo: Henk van den Berg*

## FFS in perspective

The FFS concept has moved well beyond IPM and to all regions of the world. Experiential learning curricula for instance have been implemented on food security, marketing, chicken and egg production, a range of vegetables and fruits, production for export, livestock, goats, HIV-AIDS, malaria and livelihoods[10]. Its design has been adjusted to encompass the longer time scales of plantation crops and for cassava, and to complement various collaborative activities with rural schools and young AIDS orphans. And the FFS has been implemented successfully in the context of the spread of the Western Corn Rootworm in Central and Eastern Europe [p8, this issue][11]. As it moves to different institutional and social contexts and is adapted for specific purposes it takes on a protean character that makes it harder to classify; but the central focus remains on adult learning principles, practical experiential learning, experimentation, observation and measurement, group review and peer assessment. In these regards it clearly belongs to the well-established category of farmers' study clubs (The Netherlands) and 4-H clubs in the USA.

FFSs cannot solve all problems; their effectiveness remains vulnerable to the quality of the facilitation process and the curriculum design. Shortcuts rapidly degrade the FFS to group demonstrations and instruction. As an educational investment FFS do not generate wide diffusion of outputs; there are more cost-effective processes and instruments than the FFS for spreading simple messages, skills and technologies. Nor can FFSs help small farmers generate worthwhile incomes from, for instance, participation in global supply chains if the supply contracts are unfavourable to small farmers' interest. Yet both the World Development Report on Agriculture (2007) and the International Assessment of Agricultural Science and Technology for Development reports[12] conclude that market-oriented small farm development is impeded severely in the absence of learning and education opportunities of the kind that the FFS provides.

*This report is based on a paper by the same authors in World Development 35: 663-686.*

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