Income Intervention Quick Scan: Farmer Field Schools

Farmer Income Lab Intervention Quick Scan

Cecile Kusters

WAGENINGEN
UNIVERSITY & RESEARCH

Income Intervention Quick Scan: Farmer Field Schools

Farmer Income Lab Intervention Quick Scan

Cecile Kusters

Wageningen Centre for Development Innovation
Wageningen, September 2018

Report WCDI-18-028

WAGENINGEN
UNIVERSITY & RESEARCH

Cecile Kusters, 2018. *Income Intervention Quick Scan: Farmer Field Schools; Farmer Income Lab Intervention Quick Scan.* Wageningen Centre for Development Innovation, Wageningen University & Research. Report WCDI-18-028. Wageningen.

Abstract UK This quick scan, commissioned by the Farmer Income Lab, is part of a wider research effort looking at, “What are the most effective actions that lead buyers can take to enable smallholder farmers in global supply chains to meaningfully increase their incomes?”. The quick scan provides an overview of the publicly available evidence on the impact of farmer field schools have had on raising farmer income. Such subsidies have had little positive effect on farmer income, are not notably beneficial for women nor is this effect long-term. They have been applied at large scale. This quick scan is part of a series of 16, contributing to a synthesis report “What Works to Raise Farmer’s Income: a Landscape Review”.

Keywords: farmers’ income, intervention, agriculture, smallholders, farmer field schools, participatory learning, integrated pest management, integrated production and pest management

This report can be downloaded free of charge from www.wur.eu/cdi (“publications”) or using the following link: www.wur.eu/wcdi-publications.

Report WCDI-18-028

Photo cover: Photo source: WCDI photo archive

Contents

List of abbreviations and acronyms

DID	Difference-in-differences
FAO	Food and Agriculture Organization
FFS	Farmer Field Schools
IFAD	International Fund for Agricultural Development
IPM	Integrated Pest Management
IPPM	Integrated production and pest management
ITS	Interrupted Time Series
PSM	Propensity Score Matching
RCT	Randomised Controlled Trials
RDD	Regression Discontinuity Design
WCDI	Wageningen Centre for Development Innovation, Wageningen University & Research
WUR	Wageningen University & Research

1 Introduction

1.1 Definition

Participatory learning approach for improved agricultural outcomes and empowerment
Farmer Field Schools (FFS) is an interactive and participatory learning by doing approach, that aims to empower farmers and improve agricultural outcomes. Participants enhance their understanding of agro-ecosystems, which leads to production systems that are more resilient in local conditions and optimize the use of available resources. FFS aim to improve farmers' livelihoods and recognize their role as innovators and guardians of natural environments. FFS offer farmers, pastoralists, fisherfolks, foresters and their communities a place where they can meet, discuss and make practical experiments (Based on: FAO FFS Factsheet, downloaded 20180522; Systematic review, 2014).

FFS projects have three stages:

- In the inception phase, facilitators are trained, a curriculum is developed and farmer groups are formed.
- In the training phase, farmers attend weekly sessions in a nearby field, preferably with a control plot, where an FFS facilitator oversees curriculum implementation.
- Finally, many FFS projects aim to disseminate knowledge to the wider community, through informal communication or formal methods such as training of farmer trainers.

According to FAO guidelines, there is plenty of room for variation in FFS, as long as it results in a learner- centred, participatory process that relies on an experiential learning approach.

1.2 Theory of change

The overarching objective of FFS programmes is to provide skills to improve agricultural (yield and net farm income), health and environmental outcomes, and empower farmers. These skills are developed through training suitable facilitators, targeting appropriate farmers to attend the full training schedule and undertaking activities to promote dissemination and diffusion.

The figure below provides a visual of the Theory of Change for FFS. Ultimately, FFS programs aim to contribute towards agriculture, health and environmental outcomes and empower farmers. This is done by implementing **4 key interventions**:

1. Inception: Initially, facilitators are identified, recruited and trained during planting seasons. This training involves not only technical training, but also facilitation training. The curriculum for training farmers will be developed, partially by farmers, so as to ensure it is based on local needs. During this phase, financial and monitoring systems will be set up.
2. Targeting: farmer groups are formed as this will facilitate group learning. Also effective targeting mechanisms are developed. Only those farmers that are aware of the programme and willing and able to engage will be selected.
3. Farmer training: the selected farmers are trained by the trained facilitators on how to improved agricultural practices. This training is done in regular meetings during a planting season. The facilitators apply discovery-based group learning methods and approaches, so that farmers learn by doing in their own context.
4. Dissemination: whilst the training is focused on farmers groups, community-wide diffusion to non-participant neighbour farmers is also promoted, by organising field days and exchange visits; supporting existing networks or building platforms; and by training farmer trainers.

Outcomes
The above-mentioned interventions are expected to build capacity of farmers in terms of improved knowledge on agricultural production techniques and technologies and improved analytical decision-making skills. To enhance adoption of the new techniques and farm management practices, farmers compare the benefits of new practices in experimental FFS plots with the conventional farming approaches on farmer practice plots. The dissemination activities as well as having farmers practising improved agricultural practices are expected to lead to diffusion of the knowledge and practices neighbours of farmers that are engaged in the FFS.

Impact
Adoption of improved agricultural practices can then lead to higher yields and net farm income. The adoption of in particular Integrated Pest Management (IPM) techniques, will have positive effects on the health of the farmer and the environment. By engaging farmers in group activities, stimulating collective action and skills development, empowerment takes place of those farmers engaged in the FFS. These changes are expected to stimulate farmers and their neighbours to continue applying improved agricultural practices and adapt to new challenges, also when the practices are diffused to neighbouring community members.

Assumptions
Each step in the theory of change is based on assumptions, grouped into three categories: design; implementation; and context and local characteristics.

- Design

The curriculum should be relevant to local needs. This requires FFS facilitators not to provide lectures, but to facilitate the learning process. It is assumed that this bottom-up participatory approach to learning, with a focus on helping farmers identify appropriate methods and build their problem-solving capabilities, ensures that they internalise the message through learning by doing.

- Implementation

It is assumed that the target farmers know of the FFS programme and are willing and able to take part in the training throughout the season and able to implement FFS practices in their own fields. To develop skills, farmers must attend sufficient meetings with a skilled facili tator over the planting season. To adopt the new techniques, farmers compare the benefits of new practices in experimental FFS plots with the conventional farming approaches on farmer practice plots. The techniques need to be appropriate to farmers' resources, including labour, and should improve yields and incomes.
For FFS to lead to improved knowledge and skills, facilitators should be adequately trained, involving season-long theoretical and practical training. It is vital that they – and traditional extension agents in particular – become familiar with, and adopt, a more participatory, learner-centred approach.

Also, the context and local characteristics need to be conducive to the local situation, see also the section on 'success factors'.

1.3 Geography and focus

Since the Food and Agriculture Organization (FAO) first introduced them in Indonesia in 1989, FFS have reached over 12 million farmers in 90 countries (Figure 1).

Around 60 per cent of beneficiaries have been in Asia, including many rice and cotton farmers. However, over half of all FFS projects have been in Africa, starting with the FAO's Gezira Scheme in Sudan in 1993. African FFS projects cover staples, vegetables and tree crops (cocoa and tea). The International Potato Center first introduced FFS in Latin America in 1999.

Although FFS projects have evolved, and many focus their training on different soil management or production techniques, pest management remains the focus of the large majority of FFS projects, with variations reflecting regional priorities and contexts. Over half (54 per cent) of the FFS projects focused on IPM. Integrated production and pest management (IPPM) projects implemented in Africa –

such as the IFAD-FAO FFS projects in Kenya, Tanzania and Uganda – comprise nine per cent of all FFS programmes worldwide. Techniques such as IPM (4 per cent of all FFS programmes) and IPPM (2 per cent) have been primarily implemented in Africa and Latin America.

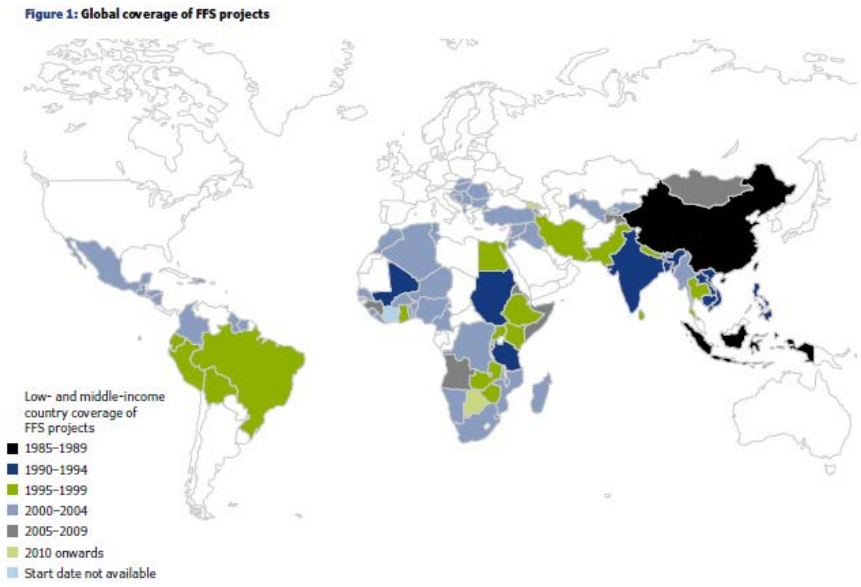

Figure 1 *Global coverage of Farmer Field Schools projects.*

1.4 Role of actors

FAO and IFAD

UN organisations with a special interest in agriculture, the Food and Agriculture Organization (FAO) and the International Fund for Agricultural Development (IFAD), have led the way in the expansion of FFS: 31 per cent of projects were funded by FAO and 19 per cent by IFAD. Figure 2 shows other organisations that have provided funding and been involved in project implementation. Host governments implemented over half the projects in the portfolio, followed by non- governmental organisations (NGOs) with 40 per cent. International research institutes with a specific interest in FFS projects have also played a significant role in project implementation or coordination. One example is the International Potato Center's programmes in Peru, Bolivia and Ecuador, which led the way in managing late blight and other diseases in potatoes.

The private sector has funded 4% of the projects and has implemented 15% of the projects. There is no specific indication on the role (e.g. funding or implementation) that the private sector played in FFS.

Types of participants

FFS participants mostly include farmers growing arable crops, but can also include livestock farmers. Through diffusion interventions also neighbours of the trained farmers are targeted.

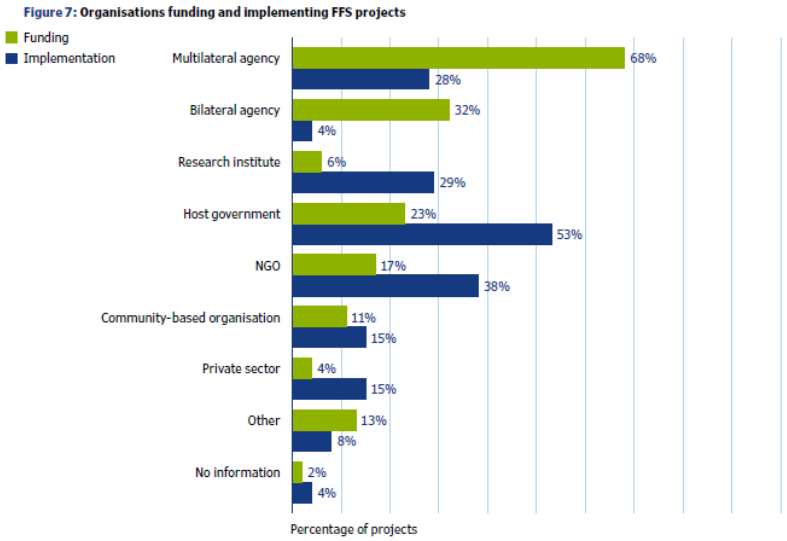

Figure 2 *Organisations funding and implementing Farm Field Schools projects.*

2 Summary and justification of assessment

Strength of outcome		
Assessment criterion	**WUR score**	**Rationale for score**
Scale: Size of the population intervention could impact and potential to scale to other contexts (i.e., geographies, value chains)	High	• Farmer Field Schools have been run in 90 countries, with an estimated 12 million farmers. Widespread application of the model is therefore demonstrated. • The evidence of positive effects on agricultural outcomes (yields; net revenue = profitable unit of land) is largely limited to short-term evaluations of pilot programmes. In the few examples where FFS have been scaled up, the evidence does not suggest they have been effective in improving agricultural outcomes (yield and net farm income) among participating farmers or neighbouring non-participants. Leading authors from the literature have therefore noted that FFS are unlikely to be a solution to problems of extension delivery, and only scalable under certain circumstances o Braun et al., 2006; Davis, 2006; Waddington et al, 2014
Impact: degree of increase in incomes	Medium	• "FFS may increase net revenues (profits per unit of land) of FFS participants by an average of 19% relative to comparison group". This is based on 2 studies and 488 participants o Waddington et al, 2014 • Projects in Africa, Asia and Latin America reported positive impacts. The impact on net revenues was greater than yields because input costs also fell as farmers used less pesticide. The effects on net revenues were particularly strong for field schools covering cash crops which also provided complementary inputs (such as access to finance, access to improved seeds and other inputs) and/or marketing components / assistance in marketing cash/commercial crops. However, these positive impacts were only found in smaller scale programmes. The two evaluations of national programmes found no impact on agricultural outcomes. o Waddington et al, 2014
Sustainability: ability of farmer income increase to endure independent of ongoing external support	Low	• The evidence of positive effects on agricultural outcomes is largely limited to short-term evaluations of pilot programmes. o Waddington et al, summary, 2014 • Since FFS particularly intensive interventions, with high costs in terms of both facilitation and opportunity costs of beneficiaries' time, FFS are unlikely to be a solution to problems of extension delivery, and only scalable under certain circumstances o Braun et al., 2006; Davis, 2006 • The cost per farmer is likely to be high compared with agricultural extension approaches and there is a low rate of informal diffusion from direct beneficiaries of the schools to neighbours. • There is lack of fiscal sustainability as a generic problem affecting large-scale public extension services: FFS face the same issues as other approaches o Quizon et al., 2001

		• While pilot projects might indicate the viability of the FFS approach in certain circumstances, the issue of fiscal sustainability becomes particularly relevant when scaling up. o Waddington et al, 2014 • Important factors for the sustainability of FFS groups following graduation include: consistent membership participation, leadership, collective goals and activities and group support and validation, including back-stopping from researchers and extension workers. All of these help to build graduates' confidence in FFS practices.
Gender: Potential of intervention to positively impact women	Low	• Whilst six studies suggest that FFS contributed to women's personal empowerment, generally programmes had mixed success in reaching women and the evidence on empowerment is inconclusive. o Waddington et al, 2014
Strength of evidence		
Assessment criterion	**WUR score**	**Rationale for score**
Breadth: amount of rigorous literature that exists on the impact of the intervention, as defined by the minimum quality of evidence for this paper	High	• Conclusions are drawn from a systematic review, that included 195 relevant studies, along with 337 FFS project documents. o Waddington et al, 2014 • There are no previous systematic reviews of the evidence regarding farmer field schools, and also no additional systematic reviews on FFS have been found.
Consistency: Degree to which the studies reviewed are in agreement on the direction of impact (i.e., positive or negative)	High	• >75% of all studies reviewed include the income impact range identified: 19 per cent increase in net revenues (profits per unit of land). Projects in Africa, Asia and Latin America reported positive impacts. However, these positive impacts were only found in smaller scale programmes. The two evaluations of national programmes found no impact on agricultural outcomes (yield and net revenue).

3 Methodology

The findings described in this document on FFS are based on a systematic review[1] of over 500 documents to assess the effectiveness of farmer field schools. There are no previous systematic reviews of the evidence regarding farmer field schools.

The systematic review approach
A systematic review collects and synthesises all available high-quality evidence, appraises it and uses transparent synthesis methods to draw conclusions for policy and practice.

The summary of the systematic review has been used as the main source of information

In this systematic review, nearly 500 (460) potentially relevant studies were reviewed in detail; 195 of which were included in the systematic review, along with 337 FFS project documents.

The systematic review included farmers growing arable crops ("temporary" crops including food and cash crops) and permanent crops (such as cocoa, coffee and tea), living in developing (low- or middle-income) countries, as defined by the World Bank, at the time the intervention was carried out. Studies were included which collected and reported on data at the farm or household level. The review excluded programmes for livestock farmers, who received different types of training than crop farmers, and those for farmers based in high-income countries where the challenges faced in terms of poverty, land size, crops, and agro- ecological and environmental contexts are usually very different.

The systematic review researchers examined effects on two groups of beneficiaries: the farmers who participated directly in the farmer field school and non-participating neighbour farmers who lived in the same communities as field school graduates and may have been exposed to the approach through their interactions with FFS-trained farmers (spillover effects) or more formal dissemination methods. effects for FFS farmers and neighbour farmers were analysed separately.

The summary report (referred to herein as the report) is based on the following four reviews:
1. a global portfolio review including studies and evaluations of FFS projects and project documents
2. a review of FFS targeting objectives, mechanisms and outcomes
3. an effectiveness review and statistical meta -analysis of quantitative studies on the impacts of FFS projects
4. a qualitative review of the barriers and enablers for FFS projects

In addition to the above, data on cost-effectiveness from projects included in the review of effectiveness were also analysed.

Types of comparisons undertaken for the systematic review
Waddington et al (2014) included studies which compared farmers receiving FFS education with comparison groups who received no intervention, or agricultural extension services from another source, including IPM (or equivalent) training. They collected relevant information on the intervention received by comparison groups, and where possible calculated FFS effects across appropriate groups.

Many studies reviewed did not report sampling procedures in sufficient detail to assess the geographic separation of groups. Thus, the reviewers included separate and non-separate comparisons, and assessed the likelihood of spillover effects in risk of bias analysis. They also conducted sensitivity

[1] Waddington, H, Snilstveit, B, Hombrados, J, Vojtkova, M, Phillips, D, Davies, P and White, H. Farmer Field Schools for Improving Farming Practices and Farmer Outcomes: A Systematic Review Campbell Systematic Reviews 2014:6 DOI: 10.4073/csr.2014.6
Summary: Waddington, H and White, H, 2014. Farmer field schools: from agricultural extension to adult education, 3ie Systematic Review Summary 1. London: International Initiative for Impact Evaluation (3ie).

analysis for potential spillover effects (contamination).

Study design and methods of analysis used in the systematic review

Review question (1): What are the effects of farmer field schools on intermediate and final outcomes, for FFS participants and neighbour farmers?

Studies eligible for inclusion in the quantitative synthesis used experimental or quasi- experimental study designs. Study designs which collected longitudinal data at baseline and endline and those using cross-sectional (endline) data only were included. In addition, data needed to be collected at the farm or household level contemporaneously in both groups. Studies that used the following methods of allocating FFS to participants were eligible:

- allocation rules based on prospective randomised or quasi-randomised (e.g. alternate) assignment (randomised controlled trials or RCTs, and quasi-RCTs);
- assignment based on other known allocation rules, including a threshold on a continuous variable (regression discontinuity designs or RDDs) or exogenous variation in the treatment allocation ("natural experiments");
- assignment based on other rules, including self-selection by programme planners or participants, provided data were collected contemporaneously in a comparison group (non-equivalent comparison group design), or where at least three data points were collected for FFS participants both before and after a discrete intervention (six- period interrupted time series or ITS).

The researchers included studies which used statistical matching (e.g. propensity score matching or PSM, or covariate matching), regression adjustment (e.g. difference-in-differences or DID, and single difference regression analysis, instrumental variables or IV, estimation and Heckman selection models), as well as other cross-sectional or longitudinal designs which used less rigorous approaches. Given the breadth of designs included, the researchers conducted rigorous assessment of internal validity based on risk of bias categories.

Excluded studies are those which did not use a comparison group design, or employed less than a six-period ITS design.

The researchers included qualitative studies and studies using descriptive statistics. WA two-stage approach to inclusion of the qualitative studies was adopted, which, in addition to removing studies based on the usual relevance criteria (intervention, population, relevance to research question, study type and location), removed studies of particularly low quality in the first round (Thomas et al., 2003; Spencer et al., 2003), using explicit criteria. The researchers then assessed the quality of the included studies using a detailed quality appraisal checklist in the second round.

Given the limited reporting of programme and contextual characteristics in the impact and qualitative evaluation literature, in the final stages of the review the researchers systematically searched for implementation documentation (see Appendix A for details), collecting data on project, programme and implementation characteristics which they linked to the impact evaluations in order to conduct more in-depth analysis of moderators. This analysis was conducted a posteriori.

Data gaps & methodological issues

The systematic review focused on quantitative studies and has less evidence from qualitative studies, that included for example issues like 'empowerment'.

As an approach that has reportedly reached an estimated 12 million farmers in over 90 countries, it was an important review to undertake. Since FFS projects were introduced in Indonesia in the late 1980s, there has been much debate among academics, scholars and policymakers regarding the approach. As a development approach, FFS has been used – and abused – in many ways. Some people see FFS as a type of agricultural extension, some see it solely as an adult education approach, and others see it as an attractive way to dress up transfer of technology.

In reality, FFS has a very particular philosophy and methodology that is based on (among other things) discovery-based experiential learning and group approaches. It is a rather special approach that uses elements of pedagogy and social capital to influence agricultural practices, and includes a growing emphasis on empowerment. For these reasons, FFS projects are quite difficult to evaluate, simply because they are difficult to define.

Few studies report on the subjective views and experiences of FFS facilitators. This is a weakness of the existing evidence base; future studies should include facilitators and agricultural extension workers, which will support stronger causal chain analysis.

Designing evaluations

Despite the high commitment to evaluation demonstrated by the FFS community of practice, few of the large number of FFS programme evaluations that we reviewed were sufficiently rigorous to make recommendations for policy. Eighty per cent of studies were found to have a high risk of bias. No studies included in the review used random assignment, although such an approach is very feasible for FFS. High risk of bias results in the systematic overestimation of impact for all outcomes.

There is a need for more studies that use rigorous counterfactuals, particularly those based on prospective assignment (randomised or otherwise). These should have clear protocols for outcome measurement and reporting, be allocated at cluster level to measure community-wide spillovers, and include long-term follow-ups to determine sustainability.

4 Impact

4.1 Impact on income

FFS projects are effective in improving intermediate and final outcomes for participating farmers. These beneficial impacts have been recorded across the different types of field school curricula. Impacts on agricultural outcomes are large: a 13 per cent increase in yields and 19 per cent increase in net revenues (profits per unit of land), though there is notable variation across populations and contexts (Figure 3). Projects in Africa, Asia and Latin America reported positive impacts. The impact on net revenues was greater than yields because input costs also fell as farmers used less pesticide. These effects were found in IPM field schools in China and Pakistan, IPPM schools in Kenya and Tanzania, and field schools promoting other curricula in Ethiopia. The effects on net revenues were particularly strong for field schools covering cash crops which also provided complementary inputs (such as access to finance, access to improved seeds and other inputs) and/or marketing components/ assistance in marketing cash/commercial crops. However, these positive impacts were only found in smaller scale programmes. The two evaluations of national programmes found no impact on agricultural outcomes.

Summary of Findings Table 1: Effectiveness studies (review question 1)

Outcomes	Summary of findings: No. of studies (participants)	Relative effect size (95% CI)	Percentage change compared with control group	Quality assessment[3]	Statement
Final outcomes – all farmer field school participants (review question 1a)					
Yields (primary outcome)	11 (3,198)	1.13 RR[1] (1.04, 1.22)	13% increase in yields of FFS participants on average relative to comparison group (4%, 22%)	++oo Low Moderate risk of bias and publication bias strongly suspected	FFS may increase yields of FFS participants by an average of 13% relative to comparison group, though there is notable variation across populations and contexts
Net revenues (primary outcome)	2 (488)	1.19 RR (1.11, 1.27)	19% increase in net revenue of FFS participants on average relative to comparison group (11%, 27%)	++oo Low Moderate risk of bias and small number of studies	FFS may increase net revenues (profits) of FFS participants by an average of 19% relative to comparison group
Empowerment	1 (200)	2.13 RR (1.46, 3.12)	FFS participants 1.13 more likely to report positive empowerment outcomes relative to comparison group (0.46, 2.12)	+ooo Very low Moderate risk of bias, serious indirectness and very serious imprecision	The evidence on the impact of FFS on empowerment for FFS participants is inconclusive
Environmental outcomes (environmental impact quotient)	3 (1,149)	0.61 RR (0.48, 0.77)	39% reduction in environmental impact quotient of FFS participants on average relative to comparison group (52%, 23%)	++oo Low Moderate risk of bias and small number of studies	FFS may reduce the environmental impact quotient by 39% on average relative to comparison group

Figure 3 *Summary of findings on the effectiveness of Farmer Field Schools*

4.2 Intermediate and other outcomes

Intermediate and final outcomes in the short run and for smaller scale projects

For larger programmes implemented at national scale over longer periods, there is no evidence of positive effects. The only two national IPM programmes that have been evaluated (in Indonesia and Vietnam) found no significant positive impact, because adoption was not sustained. FFS projects are effective in improving intermediate and final outcomes for participating farmers. Farmers participating in FFS projects typically benefit from improved outcomes along the causal chain, including knowledge and adoption of beneficial practices, agricultural production and profits. These beneficial impacts have been recorded across the different types of field school curricula. Positive impacts on agricultural outcomes were generally found in the short run – that is, two years or less after a FFS was implemented – and for relatively small-scale projects

Improved knowledge of farming technology, but no benefit from diffusion of knowledge to non-participant farmers

Participating in FFS improves farmers' knowledge of farming technology. Knowledge outcomes improved for all FFS curricula, and for IPM FFS graduates in particular. Participants had, on average, 41 per cent more knowledge.

Neighboring farmers who do not participate in FFS projects do not benefit from diffusion of knowledge about IPM from trained farmers. The experience-based nature of the training and the importance of observing advantages over conventional farmer practices prevent diffusion to neighbors.

Inadequate evidence for other knowledge and skills

There is insufficient evidence to support or refute the notion that participatory, dialogical learning affects capacity development of farmers one way or the other.

Adoption of new practices in smaller scale projects

FFS participants in IPM projects in China, the Philippines and Pakistan used 23 per cent less pesticide than neighbouring non-participants. Studies of these projects also reported an increase in other beneficial practices, including IPM in Pakistan, participatory forest management practices in Ethiopia and ICM practices in Peru. However, these positive effects were strongest for cotton crops in Asia, and for pilot projects or effects measured over shorter periods.

Reduction of pesticide use, leading to a reduction in environmental impact

Reducing pesticide use resulted in a **39 per cent average reduction in the environmental impact quotient**, an indirect measure of human and environmental costs based on estimates of pesticide use. Beneficial effects on the quotient were found in projects in Pakistan, Thailand and Ecuador. There was **no reliable evidence on health outcomes** resulting from lower pesticide use.

Improved agricultural outcomes (yields), in smaller scale projects

Impacts on agricultural outcomes are large: a 13 per cent increase in yields. However, this evidence mostly comes from smaller-scale pilots. For larger FFS programmes implemented at national scale over longer periods there is no evidence of positive effects.

No diffusion of integrated pest management practices to neighbouring farmers

There is no convincing evidence that IPM field schools offer sustained diffusion to neighbouring, non-participating farmers who live in the same communities as field school graduates. Non-participating farmers did not adopt new agricultural practices or report any change in pesticide use. No increase in yields or income was reported, either. This was true for both kinds of projects: those that supported diffusion through processes, such as community institutionalisation in India and Pakistan and training of farmer trainers in Indonesia and China, or those that left diffusion to happen by word of mouth and observation, as in Nicaragua. This lack of diffusion is an important weakness of FFS implementation approaches thus far.

Mixed findings on effect of FFS on (women) empowerment
Whilst there is little quantitative evidence regarding achievements in farmer empowerment objectives, some qualitative studies do report positive impacts, particularly in terms of increased self-confidence and women empowerment. However, other studies suggested that traditional gender roles within the household remained the same, without any improvement in economic and other decision making powers.

4.3 Applicability of impact

FFS will not solve the problems of large-scale extension from the past.
The highly intensive nature of the training programme, the relative successes in targeting more educated farmers rather than disadvantaged groups, and the failure to diffuse IPM practices all suggest that the approach is not cost-effective compared to agricultural extension in many contexts. The exception is where existing farming practices are particularly damaging to the environment. So FFS should be used selectively.

Focus on IPM
Over half (54 per cent) of the FFS projects focused on IPM. Although FFS projects have evolved, and many focus their training on different soil management or production techniques, pest management remains the focus of the large majority of FFS projects

Crops and livestock
While the early FFS projects targeted rice farmers, as the approach has spread to other regions it has been adapted to a wide variety of crops and livestock. The majority of projects reviewed (92 per cent) target specific crops, in particular cotton, cereal crops such as maize, root crops such as potatoes, vegetables, tree crops (cocoa, tea or coffee) and fruit. Over a third of the projects have supported livestock farming – mainly poultry, cattle and sheep and goats.

Reaching better-off target groups; mixed success in reaching disadvantaged groups, including women
While efficiency targeting of better -off farmers appears to have been successful, equity targeting (programmes designed to be inclusive of, or aimed solely at, the poor) did not always successfully reach target groups, and there were mixed successes with reaching women. This was either because targeting mechanisms favoured elites or because target groups' characteristics made it difficult for them to participate. Many programmes' inclusion criteria target better-off, literate farmers, or those with access to land. Over half of the projects used pro-poor targeting/targeting disadvantaged groups. But even when FFS programmes target the less well-off, the process may exclude them in the end. While some pro-poor programmes successfully targeted resource-poor or socially marginalised groups, in other cases these groups were excluded; in particular, women, people without access to resources, including land (such as day labourers), the poorest farmers, illiterate and uneducated farmers, young people and those in poor health. Also, household and childcare commitments made it difficult for women to participate, whilst in some cases husbands failed to give their wives permission to participate in the FFS. Where implementors proactively encouraged women participation, there was more success.

Targeting farmers of particular crops
95 per cent of programmes targeted farmers of particular crops, those experiencing pest or crop disease problems, or those who were over-reliant on chemical pesticides.

4.4 Enhancing the intervention

The increase in profits per unit of land (19%, mainly smaller scale programmes) was particularly large when FFS projects were implemented alongside complementary upstream or downstream interventions, such as access to seeds and other inputs and assistance in marketing cash crops.

5 Key success factors

Enabling environment

Improve the policy environment and coordinate stakeholder activities

- **The policy environment should be conducive to impacts being achieved**, which means input prices and other incentives should not discourage farmers from adopting FFS-promoted practices. Where production is for market, there should be reasonable market access.
- **Subsidised input schemes, trickle-down messages and off -the-shelf technology promotion can counteract the efforts of FFS projects.** In some cases, other programmes, donors and private companies can subvert the successful implementation of FFS programmes. The power of the pesticide industry and its continued links with the extension system can also act as a barrier to adoption. Also other institutions may be promoting conflicting messages. In Uganda and Cambodia, the national governments were 'disconnected from the IPM-FFS initiative, acting only as a "rubber stamp" for international aid organisation decisions'. In other cases, it is clear that the institutional legacy of traditional agricultural extension can inhibit participatory FFS practices, as has been suggested in Uganda, India and Indonesia.
- **Stronger policies and regulatory measures** may be **necessary to counteract the activities of the pesticide industry**, including extension workers promoting and selling pesticides. New policies may also be necessary **to facilitate participatory agricultural extension approaches** and replace earlier extension policies aimed at promoting off -the-shelf technologies and input packages.

Implementation

Potential beneficiaries drop out at various stages in the causal chain. Critical points in the FFS causal chain include:

- Planned or de facto targeting mechanisms, including group formation, which exclude women and vulnerable groups even if they are targeted by the project;
- Drop out and non-attendance on account of poor training; failure to demonstrate the value of the technique being promoted; and lack of complementary inputs;
- Failure of non-participants to benefit in nearly all cases, even when platforms are created to facilitate this diffusion; and
- Most importantly, the difficulty of identifying and training suitable facilit ators on the scale necessary to move beyond pilot programmes.

These and other factors are further described below.

Use different targeting approaches

- Planned or de facto targeting mechanisms, including group formation, can exclude women and vulnerable groups even if they are targeted by the project. Different objectives of FFS are best met through different targeting approaches. Targeting better -off farmers is more conducive to agricultural impacts, since they are better able to adopt the practices. Empowerment goals may be better met by targeting disadvantaged farmers, although there is very little evidence on empowerment outcomes of FFS.
- Barriers to effective targeting include inappropriate selection criteria and targeting procedures and structural barriers to participation such as sex, poverty and cultural norms. Without a considered approach to targeting, farmers may end up participating for inappropriate reasons and ultimately dropping out. Alternatively, participants may not have sufficient education levels or access to land and resources (including time) to be able to attend the full training and implement the practices learned.

Ensure adequate training

- Training needs to be done regularly and cover all the topics that are part of the FFS curriculum. Also, the facilitators need to have the *tools and technical expertise* to facilitate

sessions on these topics. Furthermore, **adequate financial incentives for facilitators** are needed so as to be able to spend enough time at the field school and on farm visits. Inappropriate **site selection** (e.g. remote site with limited irrigation and poor soil fertility) has been an impediment to some IPM FFS projects. While FFS projects are oriented to a specific technology, they are also meant to include the local community in developing the learning process.

- **Local involvement in curriculum development** has helped ensure relevance. The curriculum and crops covered in FFS should also be adapted according to local agricultural circumstances and tastes. It should balance comprehensiveness with the ability to cover all issues in sufficient depth. However, the complexity of the IPM curriculum made it difficult for some farmers to implement all practices on their crops. Participating farmers either perceived some of the analytical tools as taking too much time, energy and resources, or these tools were not communicated in a way that farmers understood.
- FFS should be delivered according to a **participatory and discovery-based approach to learning,** including opportunities for farmers to experiment and observe new practices. This is most obviously the case where skills development and other forms of farmer empowerment are the primary objectives. In addition, farmers need to be convinced of IPM and IPPM approaches, which are best done through active participation and having a business-as-usual control plot.

Demonstrate benefits

- **Observability** is important to build trust in the new technology and encourage farmers to adopt the practices promoted in FFS projects. Where facilitators did not **demonstrate observable benefits,** however, farmers were less likely to adopt FFS practices. When trials found higher revenues or yields in the IPM plot relative to the conventional plot, farmers were more likely to adopt the IPM practices included in the curriculum. There were times when the technology simply did not work.

Integrate complementary interventions

- Complementary interventions – access to finance and inputs such as improved seeds and assistance with marketing – may improve FFS effectiveness in terms of agricultural profits (net revenues) for commercial crops.

Enhance dissemination and diffusion

- Several characteristics of FFS projects explain why the practices they promote do not diffuse to farmers who have not participated in training. The **experience-based nature of FFS learning** acts as a barrier to diffusion. Even where there is high awareness of IPM among non-participants, it is difficult to convey through verbal communication.
- **Community cohesion** may also influence the diffusion of FFS knowledge and practices. Examples showed that low levels of social cohesion, and socio-economic differences between FFS participants and non-participants that impeded diffusion, whilst high levels of social capital, particularly among farmers with kinship ties, facilitated the sharing of IPM concepts with non-participants.
- **Targeting** more educated farmers as early adopters is a strategy that may backfire when it comes to diffusion. While some spontaneous diffusion may be possible, there is a need for careful targeting of farmers with the appropriate characteristics.
- **Observability** is important for convincing non-FFS farmers to adopt FFS practices. This needs to take place on the plot, so that non-participant producers can see what is done, since trained farmers may not have the time or skills to teach them.
- Training a small number of farmers in each village to maximise geographical coverage is unlikely to be the best strategy to achieve maximum impact. A more **gradual approach to scaling up programmes** across villages may be more successful.
- **Formal support and encouragement of FFS alumni**, including technical assistance and back-stopping from agricultural researchers and extension workers, can help prevent diffusion, support farmers to continue developing local practices, and hereby support the sustainability of FFS practices and related activities. Working with FFS groups to support common goals, good leadership and high attendance rates might facilitate sustainability of

FFS activities after the end of the training. In the case of IPM, targeting areas known for overuse of pesticides – and therefore clearer benefits from adoption – are likely to favour sustained impacts.

- **Complementary interventions**, such as mass media campaigns, are likely to improve diffusion to non - participating neighbor farmers for only simple IPM messages, such as a 'no early spray' campaign. Given the skills-based nature of the practices promoted in FFS projects, there may be a need for formal community-building activities to ensure diffusion into the wider community. These could draw on existing social networks and attempt to institutionalise the approach whereby FFS graduates are encouraged to train other farmers. However, there needs to be more evidence to assess the success of these approaches. Implementers should consider a more gradual approach to scale-up, favouring depth of coverage within FFS communities over breadth of geographical coverage.

Improve selection, training and backstopping of facilitators

- The selection and training of facilitators was crucial in determining the quality of FFS training. The difficulty of identifying and training suitable facilitators on the scale necessary to move beyond pilot programmes, has been the most important factor. Problems in recruiting and training appropriate facilitators and a lack of back-stopping and support for community-based approaches have impeded scaled-up programmes.
- Given the important role and participatory skills required, it is important to identify FFS facilitators and train them well. This is particularly the case if existing extension workers become FFS facilitators; they are likely to be in scaled-up programmes, and institutional inertia can support the continuation of old practices.
- A minority of programmes used formal methods to **institutionalise** FFS at the community level through farmer clubs, and support activities to encourage sustainable adoption and diffusion. In the absence of formal activities to provide ongoing support, FFS training alone is unlikely to be sufficient to enable farmers to continue with FFS practices, deal with any new challenges and encourage others to do the same.
- **Recruitment of facilitators** should take into account the characteristics of successful trainers, including: personal attitude, maturity, literacy, leadership skills, knowledge of local language and experience in farming. The facilitator's sex should be carefully considered, taking account of the target group and cultural context.
- **Training for facilitators** should provide sufficient substantive expertise in IPM or other relevant practices appropriate to the local context. The training should also focus on participatory techniques and facilitation skills, emphasizing the need to use language and concepts that are familiar to farmers.
- Facilitators should also have **access to ongoing support and back-stopping** from supervisors and technical experts connected to local research centres.
- **Efficient monitoring and evaluation systems** should be put in place alongside FFS implementation, to ensure adequate and timely delivery of resources and follow-up activities, and to ensure that sites selected for FFS are appropriate.

Individual farmer

- Farmers are supposed to attend weekly classes over the course of a growing season in order to be able to internalise the FFS approach. However, FFS programmes have had significant problems with attendance and drop out. The most common reasons for low attendance and drop out were that participants did not receive **anticipated loans, cash or payments** in kind for their attendance. In around a third of the studies that examined reasons for participation, participants felt that the FFS sessions were too time-consuming or they had other commitments that made attending all sessions difficult (**opportunity costs**). Also the **lack of access to complementary inputs** needed to adopt FFS practices, are common problems which prevented farmers from participating in projects. These complementary inputs include: tools, land, labour, capital, (other) inputs, an inability to accept the opportunity costs of participation, and a lack of social power. Furthermore, having a **tradition of collective action or stimulating group formation** can encourage participation in FFS and a willingness to learn and succeed with the training. On average, projects that facilitated group formation were successful in reducing pesticide use (28 per cent reduction), whereas those

that did not reported no impact on adoption of pesticide use practices. Other reasons for low attendance and dropout included poor accessibility and low relevance of FFS sessions, weak programme implementation (including training approach) and problems retaining trainers.

- Important factors for the **sustainability of FFS groups** following graduation include: consistent membership participation, leadership, collective goals and activities and group support and validation, including back-stopping from researchers and extension workers. All of these help to build graduates' confidence in FFS practices.

6 Barriers addressed

The FFS approach mainly focuses on training trainers, developing a curriculum, forming and training farmers groups, and disseminating knowledge to the wider community. However, as indicated in the previous chapter, there are many factors that influence the effectiveness of FFS. Part of these can be addressed by improving the design of the FFS projects. This includes, for example, improving targeting, selection and training of facilitators. Some FFS projects have integrated complementary interventions, by improving access to finance and inputs such as improved seeds and assistance with marketing. This may improve FFS effectiveness in terms of agricultural profits (net revenues) for commercial crops. The systematic review report did not mention how other, more systemic barriers have been addressed, including addressing policy issues, contradictory actions by other stakeholders (e.g. the pesticide industry), et cetera.

7 Questions for further research

Gender and empowerment:

- How can gender and empowerment be enhanced?

So far results are mixed.

Scaling:

- How to reach scale?
- Which complementary interventions can help reach results at scale long-term?

So far there has been only success with agricultural outcomes (yield, profit) for short-term, smaller scale projects. “Impact evaluations therefore need to interrogate the causal chain more consistently, by collecting and reporting data on all intermediate and end-point outcomes, and incorporating qualitative assessment of implementation processes where possible”. “More studies are needed which evaluate programmes implemented at scale, assess whether FFS projects have heterogeneous effects across different groups of farmer beneficiaries, such as women”.

References

Waddington, H, Snilstveit, B, Hombrados, J, Vojtkova, M, Phillips, D, Davies, P and White, H. Farmer Field Schools for Improving Farming Practices and Farmer Outcomes: A Systematic Review Campbell Systematic Reviews 2014:6 DOI: 10.4073/csr.2014.6

Wageningen Centre for Development Innovation
Wageningen University & Research
P.O. Box 88
6700 AB Wageningen
The Netherlands
T +31 (0)317 48 68 00
www.wur.eu/cdi

Report WCDI-18-028

To explore the potential of nature to improve the quality of life

Wageningen Centre for Development Innovation,
Wageningen University & Research
P.O. Box 88
6700 AB Wageningen
The Netherlands
www.wur.eu/cdi

Report WCDI-18-028

The Centre for Development Innovation works on processes of innovation and change in the areas of food and nutrition security, adaptive agriculture, sustainable markets, ecosystem governance, and conflict, disaster and reconstruction. It is an interdisciplinary and internationally focused unit of Wageningen UR within the Social Sciences Group. Our work fosters collaboration between citizens, governments, businesses, NGOs, and the scientific community. Our worldwide network of partners and clients links with us to help facilitate innovation, create capacities for change and broker knowledge.

The mission of Wageningen UR (University & Research centre) is 'To explore the potential of nature to improve the quality of life'. Within Wageningen UR, nine specialised research institutes of the DLO Foundation have joined forces with Wageningen University to help answer the most important questions in the domain of healthy food and living environment. With approximately 30 locations, 6,000 members of staff and 9,000 students, Wageningen UR is one of the leading organisations in its domain worldwide. The integral approach to problems and the cooperation between the various disciplines are at the heart of the unique Wageningen Approach.