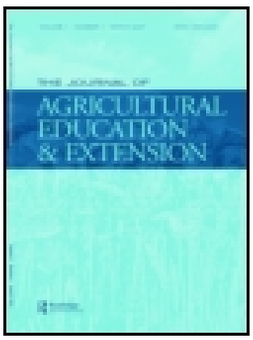

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Leading issues in implementation of farmer field schools: a global survey

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ABSTRACT

Purpose: The Farmer Field School (FFS) has been used to enable farmers to adapt their farming decisions according to the field situation. This paper explores the methodological state, challenges and lessons learned, of the FFS around the World.

Design/methodology/approach: We used a 52-item questionnaire to capture issues of design, implementation and evaluation of the FFS. Completed questionnaires were received from 57 ongoing or recent FFS programmes. Data were analysed using descriptive statistics.

Findings: FFS programmes have diversified, including multiple crops and livestock. Farmer involvement in the design and planning of interventions was found to be critical. FFS programmes increasingly relied on farmers as FFS facilitators. Short training duration for FFS facilitators raised concern about FFS quality. Even though mechanisms for monitoring and evaluation were mostly in place, capacity for data analysis and data utilization were a concern.

Practical implications: Results highlight strengths and shortcomings in design, implementation and evaluation of the FFS. The information acquired can be used to support the quality of ongoing and future programmes.

Theoretical implications: This research contributed to understanding that the educational foundations of the FFS should be reflected in programme design and evaluation.

Originality/value: Many studies of the FFS exist, but this is the first global overview on how farmer field school programmes are carried out, with various lessons learned.

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Farmer field school; adult education; rural development; monitoring and evaluation; impact assessment; crop production

Introduction

The Farmer Field School (FFS) is an educational approach to enable farmers to make decisions suitable to the actual field situation, based on their understanding of agroecological systems and processes (Pontius, Dilts, and Bartlett 2002); it was developed as alternative paradigm to the 'transfer of technology' approach (Röling 2002). The FFS

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was intended to create an environment conducive to group learning, by using field exercises, critical analysis and group discussions carried out at regular intervals during a full production cycle (FAO 2016). The approach has been founded on educational concepts, including the experiential learning cycle (Kolb 1984), the learner-centred approach for adult education (Rogers 1969), and the framework for the technical, practical and emancipatory domains of learning (Freire 1968; Habermas 1971). With these educational foundations, a process of continued learning, action and empowerment by its participants was envisaged (Friis-Hansen and Duveskog 2012; Pontius, Dilts, and Bartlett 2002).

Since its conception in 1989 in Indonesia, the FFS has been adopted for use in various situations, and the FFS spread from Asia to over 90 countries world-wide (Braun et al. 2006; Waddington et al. 2014). The Food and Agriculture Organization (FAO) has actively promoted the FFS in the context of strategies seeking to improve food security, farmer income, climate change adaptation and agricultural sustainability. A range of farmer organizations, local and national governments, ngo's, and bilateral and international agencies have adopted the FFS model in their rural development programmes (FAO 2016).

By 2008, a rough estimation was made that a cumulative number of 10–20 million farmers had graduated from the FFS globally (Braun and Duveskog 2008). In 2012, an independent study estimated a total of 10–12 million FFS graduates, with FFS implemented in 90 countries (Waddington et al. 2014). These reports acknowledged that the figures provided lower bound estimates, given that only a proportion of FFS initiatives could be captured: actual numbers would likely be higher. No estimates are available for the period after 2012.

Over the years, concerns have been raised about deficiencies in quality assurance of FFS programmes. The FFS-brand name became popular among farmers, governments and donors alike, but this popularity made that the brand name was sometimes applied for approaches which resembled 'transfer of technology' rather than group-based learning processes (Guo et al. 2015; Mataia et al. 2015; Nederlof and Odonkor 2006; Sherwood, Schut, and Leeuwis 2012).

The methods of implementation of the FFS remain largely unknown, because this information is mostly concealed within the grey literature at programme (including project) level. The objective of our study was to answer the following questions: how are FFS methods are locally designed, what is the extent of field support provided, how are monitoring, evaluation and impact assessment conducted, and what are challenges and lessons learned? To answer these questions, we conducted the first global-level survey of the FFS – which serves as baseline for future surveys. The results could assist in providing support for quality assurance and impact assessment.

Materials and methods

A 52-item questionnaire, with multiple-choice questions, open questions, and spaces for comments, was prepared covering aspects of implementation, monitoring and evaluation, impact assessment, programme design, and policy (Supplemental File 1). The questionnaire was translated from English into French and Spanish, and sent as an editable Word® document by e-mail attachment to all 71 focal points of regional and national FFS programmes (or projects) that were available through FAO's network on

the FFS. Each focal point was requested to consult with other staff or partner organizations to obtain the requested data and information. All focal points were conversant in at least one of the three languages used for the questionnaire, but it is possible that language restrictions among other staff or partner organizations limited the responses from certain countries or regions. Focal points for FFS programmes outside of this network were not accessible for study.

The data from completed questionnaires were entered in an electronic spreadsheet for analysis using descriptive statistics. Quantitative data were pooled across responses by region. Countries were allocated to regional groups according to the United Nations Regional Groups of Member States (UN 2020). The unit of analysis was the programme. No weighting according to factors such as programme size was done because we were interested in implementation of small or start-up programmes as much as that of large or long-established programmes. This consideration is in accordance with the objectives of the study and the purpose to contribute to improvement of quality assurance and impact assessment of individual programmes.

Qualitative, narrative responses to open questions, and respondent's comments, were evaluated for their contribution to understanding the issues at hand. In-depth analysis of responses on a per-programme basis was beyond the scope of the study.

Results

Some 58 responses were received out of 71 focal points, one of which was discarded because of lack of information provided. Out of the 57 remaining responses, 36 (63%) were from Africa, 16 (28%) from Asia, 3 (5%) from the Middle East and Europe, and 2 (4%) from Latin America (Supplemental file 2).

All responses were from programmes that were ongoing, or were as recent as 2013, except one programme which was stopped after 2008. The reported programme duration varied from one year to more than ten years; most programmes had a duration of three to six years. Several responses mentioned that their programme was a continuation of a previous programme.

FFS design and curriculum development

In most programmes, a benchmark survey had been conducted before starting the FFS programme in a new area, for example to find out about local problems, practices and

Table 1. Results on programme design, as explained in the text, showing the percentage of positive responses by region.

	Region							
	Africa		Asia		Other		All	
Item	%	(n)	%	(n)	%	(n)	%	(n)
Baseline survey conducted	94	(34)	88	(16)	100	(4)	93	(54)
Farmers consulted prior to programme	97	(32)	86	(14)	75	(4)	92	(50)
Farmers involved in curriculum development	70	(33)	69	(16)	25	(4)	66	(53)
Farmers identifying problems at start of FFS	100	(35)	94	(16)	50	(4)	95	(55)
FFS selection criteria used	90	(31)	93	(15)	100	(4)	92	(50)
Clustering of FFS used	57	(30)	77	(13)	75	(4)	64	(47)

socio-economics (Table 1). Several responses explained that such information was used for the general design of the FFS programme and its curriculum, or for evaluation purposes. In most cases, farmers had been consulted at the time of programme design to obtain their opinions on what is needed or what was acceptable (Table 1). It was less common for programmes to involve farmer representatives in the process of FFS curriculum development (Table 1). Most programmes indicated that problem identification was normally conducted by FFS participants at the onset of an FFS (Table 1). As lessons learned in good programme design, respondents mentioned the need to devote adequate time and effort to the preparatory phase, involving farmers from the start, paying attention to gender aspects, and engaging with a range of stakeholders in the design of interventions (Supplemental File 3). Such actions reportedly increased the relevance and outcomes of the intervention.

Most programmes reported using special criteria for selecting a location and a group for starting a new FFS (Table 1). For selection of a location, accessibility, and local availability of a facilitator were important criteria. Other criteria varied from being a potential production area, and having market access, to being prone to droughts, floods, or pests, depending on the scope and objectives of the programme.

In part of the responses, the FFS groups were intentionally clustered within the same area (Table 1). Clustering of FFS groups within a geographic area, referred to as the 'foci model', has been recommended as a planning tool to ensure proximity between FFS groups, seeking to reinforce the outcomes and impacts of the FFS (FAO 2016; Witt, Pemsl, and Waibel 2008). In Malawi, the foci model was considered useful in tackling the area-wide challenge of environmental degradation (Supplemental File 3).

There were no major regional differences in programme design and curriculum development, except that FFS clustering was least common in Africa (Table 1).

Human resources and field operations

On average, programmes had 54 regular facilitators (those paid as staff), 360 farmer facilitators (volunteers) and 16 master trainers (supervisors or facilitators). Consequently, farmer facilitators outnumbered regular facilitators by a factor of six or seven. One large FFS programme in Rwanda purposely depended only on farmers as facilitators (Supplemental file 3). Out of 57 responses, 13 (23%) mentioned that their programmes depended on government staff as facilitators; 14 (25%) reported that their programme depended on non-government facilitators (which included farmer facilitators and ngo staff); and 30 (53%) reported a mix of government and non-government facilitators.

Some 46 respondents reported on the scale of operations for the period 2014-2017. On average, a programme completed 261 FFS per year (median 81 FFS), or, by region, 185, 432 and 36 FFS per year in Africa, Asia and other regions, respectively. Hence, FFS programmes were largest in Asia. On average, 5,727 farmers graduated per programme per year; with a large range from 31 farmers to 50,000 farmers trained per programme per year (median 1,589). The average number of graduates per FFS was 26 in Africa, 19 in Asia and 20 in other regions, indicating that FFS groups were largest in Africa. In total, the 46 responding programmes trained around 260,000 farmers per year. In thirteen programmes, more than 5,000 farmers were trained per programme per year.

Some 84% of programmes (46 out of 55) included multiple crops, or crops plus livestock, whilst the remaining programmes concentrated on single crops. This suggests that the majority of FFS programmes had an extended scope. Moreover, 62% of programmes (35 out of 56) included a commercial or financial component, which could be in the form of a commercial plot to raise income of the farmer group, a savings group, a storage facility, or entrepreneurship. In Africa, 75% of programmes has a commercial or financial component. In one programme, the diversity and scope of the curriculum was reported to have compromised the outcomes (Supplemental file 3).

Input provision to FFS groups through micro-credit, for example for seed or fertilizers, was considered essential in settings with resource-poor farmers or for land rehabilitation, but it was noted that FFS methods must prioritize the learning process and not the receipt of inputs (Supplemental File 3). Several respondents mentioned that high opportunity costs for farmers to participate in the FFS were considered a challenge in their programmes (Supplemental File 3).

FFS facilitation and support

Three models of training of FFS facilitators have been known (FAO 2016): (i) continuous season-long full-time training, which covers the entire duration of the activity, usually 3 or 4 months; (ii) sequential season-long training, which give participants breaks in between, for example, with a few weeks on and a few weeks off; and (iii) short-intensive training, varying between 2 and 4 weeks. The most common model of training FFS facilitators among the respondents was the sequential season-long training (67%; 38 out of 57), followed by intensive training before the season (39%; 22 out of 57), and the season-long fulltime training (25%; 14 out of 57). Hence, the model with longest training duration was least common. Several responses mentioned more than one model used.

The average reported duration of facilitator training was 48 days for regular facilitators (n=51 responses); by region, training duration was 47 days in Africa (n=34), 58 days in Asia (n=13) and 29 days in other regions (n=4). Some 37% of responses reported that the training duration was 20 days or less. Short training duration and high turnover of facilitators was considered a weakness in some programmes (Supplemental File 3). For farmer facilitators, the average training duration was 22 days (n=47), but this duration excluded the time these farmers had previously spent as participants in an FFS.

Field support in the form of mentoring visits were reportedly provided to regular facilitators and farmer facilitators at least once per FFS season in most programmes (Table 2). Moreover, refresher courses were provided at least once per year in the majority of programmes (Table 2). Consequently, a minority of programmes did not provide mentoring

Table 2. Frequency of field support provided to regular facilitators and farmer facilitators.

		Frequency per season			
Type of support	Type of facilitators	None	1x	>1x	n
Mentoring visits	Regular facilitators	12%	4%	85%	52
	Farmer facilitators	13%	4%	83%	48
Refresher course	Regular facilitators	21%	38%	40%	52
	Farmer facilitators	23%	26%	51%	47

visits or refresher courses to their facilitators. No major regional differences were found regarding mentoring visits and refresher courses.

Support for follow-up activities after the FFS was reportedly provided by 49 out of 56 responses (88%), which is encouraging because such support could enhance FFS benefits at field level. Of the 49 responses, 42 specified the types of follow-up activities (Table 3), mostly more than one type of activity per response. Most commonly reported follow-up activities were farmer-to-farmer training, networking between groups, and a second FFS cycle on a different theme. Other activities included support for group organization, marketing of produce, field experimentation, savings and credit, and exchange visits. Farmer-to-farmer training, savings & credit, and income-generating activities were most common in Africa, whilst networking was most common in Asia (Table 3). Some respondents disclosed that the FFS alone was not enough, but follow-up support was required to make farmers confident and self-reliant (Supplemental File 3).

Monitoring and evaluation (M&E)

In most programmes across regions, a dedicated M&E officer or team, and a monitoring plan were in place, and data on FFS implementation were being managed in a database at national or programme level (Table 4). Furthermore, most responses across regions stated that the key issues highlighted by M&E were discussed at least once per year at

Table 3. Support provided for specific follow-up activities of the FFS, as the percentage of programmes by region.

	Region			
Follow-up activity	Africa (n=27)	Asia (n=12)	Other (n=3)	All (n=42)
Farmer-to-farmer training	37	25	0	31
Networking between groups	26	50	0	31
Second FFS cycle on different theme	22	33	67	29
Organization of groups	15	33	67	24
Marketing of produce	11	25	33	17
Field experimentation	11	33	0	17
Savings and credit	15	0	0	10
Exchange visits	7	0	33	7
Income-generating activities	19	0	0	12
Micro-project development	4	8	0	5

Table 4. Elements of the system of monitoring and evaluation, showing the percentage of positive responses by region.

	Region							
	Africa		Asia		Other		All	
Item	%	(n)	%	(n)	%	(n)	%	(n)
M&E officer in place	81	(36)	69	(16)	75	(4)	77	(56)
Monitoring plan present	91	(33)	94	(16)	100	(4)	92	(53)
Database at national or programme level	77	(35)	73	(15)	67	(3)	75	(53)
M&E data discussed with programme management	91	(34)	94	(16)	100	(4)	93	(54)
Mitigation measures presented to the field	97	(32)	100	(14)	100	(4)	98	(50)

programme management level, and that mitigation measures were presented to the field (Table 4).

Four responses stated that, as mitigation measures, components of the FFS curriculum were re-designed to better address the challenges. Other responses mentioned as mitigation measures: the introduction of record keeping by farmers, capacity building of facilitators on identified themes, literacy training for female facilitators, and modification of the intervention package for conservation agriculture.

Some 64% of responses (36 out of 56) stated that participatory evaluation normally took place whereby farmer participants reflected on the FFS and on the facilitator's performance as a way to provide direct feedback for improvement of FFS implementation. Several types of M&E data were commonly transmitted to the M&E team, namely, records on FFS implementation and attendance, reports or photos of open days, the FFS start-up reports, and the reports from monitoring or supervisory visits.

Narrative responses regarding the use of other methods for M&E revealed several novel tools. An ngo mentioned the use of a participatory performance tracker in several countries (CARE 2015). In Uganda, a qualitative impact questionnaire was administered monthly to a sample of FFS-graduated farmers to capture direct and indirect benefits and impacts as a routine evaluation tool. In a programme on climate-change adaptation in Malawi, geo-referenced hotspot mapping served as an evaluation tool to assess changes in the affected landscape over time. These novel tools may have potential for use by other FFS programmes.

Several programme responses indicated that insufficient staff, training and financial resources were available for M&E. Respondents expounded difficulties in deciding what to monitor and which methods to use, and shortages in human competencies for analysing and managing substantial volumes of complex data (Supplemental File 3). These statements highlight the challenges faced in M&E of the FFS.

Impact assessment

Some 62% of responses (35 out of 57) reported that one or more studies had been conducted to assess the impacts of the programme, suggesting a fair level of impact assessment. However, several programmes pointed out the shortage of competent technical support for impact assessment. Other suggested that impact assessment should be an integral part of a programme's design rather than an add-on at the later stage (Supplemental File 3).

Respondents provided further details for a total of 64 impact studies that have been conducted. Thirty-two impact studies (50%) were internal studies conducted by the programme itself or by its participant farmers, whilst 39 studies (61%) were external studies conducted by independent agencies; nine studies were reported as a combination of internal and external. Two respondents observed that those involved in planning an external study did not fully understand the principles and process of the FFS, which could be a disadvantage of external studies. Open-ended in-depth interviews or focus group discussions were included in 91% of studies (58 out of 64), suggesting that most impact studies included qualitative information sources. Some 69% of studies (44 out of 64) included a control group, and 73% (47 out of

64) included a baseline prior to the FFS intervention, which are important attributes for methodical impact assessment.

Policy and institutional factors

In 51% of responses (29 out of 57), it was reported that the text of the national or sub-national agricultural policy or rural development strategy referred to the phrase 'Farmer Field School', indicating recognition of the FFS at policy level. In programmes where FFS facilitators were government staff, 33% of respondents (14 out of 43) stated that the job descriptions of FFS facilitators referred to the phrase 'Farmer Field School', indicative of institutionalization of the FFS.

The lead implementing agency of FFS programmes were government agencies (52%; 28 out of 54 responses); FAO (30%); and ngo's (28%). A few responses indicated that implementation was by government and FAO combined. Sources of funding of FFS programmes were from bilateral donors (44%; 23 out of 52 responses), followed by international institutions other than FAO (25%), private foundations (17%), governments (13%), FAO (13%), and self-funded (6%). This suggests that a minority of programmes were financed from local sources.

In 63% of programmes (36 out of 57), researchers were reported to play an active role as stakeholder. Some respondents stated that researchers worked side-by-side with farmers to tackle local problems, whilst other respondents indicated that researchers failed to engage effectively with the FFS (Supplemental File 3).

Discussion

This study provides a contemporary overview of the methodological state and the operational scale of the FFS. The basic quality indicators regarding design of interventions, field support, and monitoring and evaluation were in place in most programmes, but several remaining challenges were encountered.

Implementation hinges to a large degree on having facilitators who are competent in technical matters and, equally important, who can guide farmer participants through their learning process (Braun and Duveskog 2008). Adequate investment in training of FFS facilitators has long been emphasized (Pontius, Dilts, and Bartlett 2002). The presented results demonstrated a large variability in the training duration as a proxy for training quality of FFS facilitators. Programmes with short-duration training courses were common. This raises concern about the competencies of facilitators, not only for technical aspects of the curriculum but particularly for fostering the educational principles of the FFS. Training duration was shortest in regions outside of Asia, which are the regions of most recent expansion of the FFS. Hence, training quality is an issue warranting urgent attention.

Another concern is monitoring and evaluation. Despite that the essential components of a M&E system were mostly in place, there were clear signs that human competencies for selection of indicators, data management, data analysis and utilization of results were often inadequate. This suggests that M&E was not optimally used for learning, adaptation and programme management. Hence, guidance and training on monitoring, evaluation and learning should be developed in support of FFS programmes. Moreover, a recent

review concluded that impact assessment of the FFS has been focused on the natural domain, largely neglecting the human, social and financial domains (van den Berg et al. 2020).

An important lesson learned from the responses is that a comprehensive and inclusive process of problem identification, design and curriculum development is vital for an effective and locally relevant FFS programme, that emphasizes farmer-driven initiatives, and that can produce meaningful outcomes and impacts. Particularly, farmer involvement in the development of FFS curricula is an element deserving further attention. Evidently, the FFS has diversified across Africa and Asia, with individual programmes tackling a range of crops, often in combination with livestock. Incorporating these diverse components enables the programme or FFS participants to make selections, for example, about the type of crops or problems to address, but puts additional demands on the capabilities for curriculum development, training and field support. This calls for competent and creative facilitators and emphasizes the importance of quality training for facilitators.

It is noteworthy that farmer facilitators greatly outnumbered the regular facilitators. An earlier review up till 2012 estimated there had been equal numbers of farmer facilitators and regular facilitators (Waddington et al. 2014). This suggests an increasing trend in reliance on farmers as FFS facilitators among FFS programmes. In addition, farmer-to-farmer training was a common follow-up activity in the responding programmes. This suggests that the approach to learning and empowerment has over the years been extended to farmers becoming FFS facilitators. Arguably, farmers are better positioned than government staff or ngo staff to facilitate FFS activities, because of their experience and their residential location, and lead to reduced operational cost (Braun and Duveskog 2008; Gallagher 2003). Moreover, the emphasis on farmer facilitators could stimulate the emergence of farmer-driven programmes and local institutions (Dilts 1998). However, in certain settings, farmers may lack the necessary technical background education.

The scale of FFS operations in this survey was 260,000 farmers trained annually, but the actual global scale is likely to be larger. Anecdotal evidence obtained from regional and national focal points suggested that many FFS initiatives not covered by this survey, including the offshoots of earlier programmes, have been operated by local government and local ngo's in countries. Moreover, the ngo CARE provided questionnaire responses for three of their larger FFS programmes for our survey, but reportedly have 136 other projects that also use the FFS model. Hence, we concur with previous global estimates of 0.4-1 million farmers trained per year (Braun and Duveskog 2008; Waddington et al. 2014). Consequently, the FFS continues to be used on a considerable scale as an instrument in rural development, but there is no evidence that the FFS has become more mainstream in recent years.

With respect to the sustainability of the FFS, it is encouraging that a gradual transfer of leadership of FFS programmes has taken place. In the early days of the FFS, leadership was mostly by FAO, but currently, government agencies are the most common leader of FFS programmes. And even though the majority of FFS programmes still rely on external sources of funding, some programmes are funded through government budget allocation or are self-funded. Also, there is evidence of FFS groups that continued learning and developing many years after graduation (FAO 2020; Pontius, Dilts, and Bartlett 2002; van den Berg et al. 2020). Further study is needed on the scale and financial sustainability of offshoots of earlier programmes and on the complementary effect of the FFS on local and national rural advisory systems.

Our findings have direct relevance for policy and practice. The FFS model has greatly evolved – through expansion from Asia into other regions, adaptation to new settings and diverse topics, and with increased reliance on farmers as FFS facilitators. These developments demonstrate that the open-ended process of learning has continued in the technical, practical and emancipatory domain. The expansion of a popular model also has risks, for example, through a compromised training of facilitators, a loss of focus in curricula, or a degraded educational process. There are recent signs of 'FFS' programmes in which the original educational methods have been replaced with lecturing and demonstrations (van den Berg et al. 2020). Hence, it is critical that M&E systems and impact assessment are strengthened to guard and improve the quality of the FFS, from the design stage to follow-up activities.

The questionnaire provided relevant information on many issues but did not elucidate to what extent the individual programmes have fostered, or adhered to, the educational principles of the FFS. This is a remaining issue that demands more in-depth study and observations. Another limitation of this study was the risk of reporting bias by the selective revealing or hiding of information by respondents, or by certain programmes being more inclined to respond than other programmes. Moreover, the method of sampling through FAO's network is likely to have led to under-representation from FFS programmes in countries where focal points were not conversant in one of the languages used in the questionnaire, or where focal points were not connected to the FAO network. Because of their relative isolation these programmes may have lacked access to existing guidance materials and technical support, with possible implications for the quality of implementation.

Conclusion

Globally, an estimated 0.4-1 million farmers graduate from Farmer Field Schools every year, preparing them to adapt their decisions according to the field situation. A transfer of leadership of FFS programmes has taken place from FAO to other agencies. Funding for FFS programmes was largely derived from external sources, but some programmes were supported by governments or local funds. FFS programmes have increasingly emphasized the diversification of agricultural commodities and income sources. Moreover, FFS programmes rely mostly on farmers as FFS facilitators, which supports the sustainable implementation at field level.

Most FFS programmes reported that they have the basic quality indicators in place regarding design of interventions, frequency and type of field support, and a system of monitoring and evaluation. Farmer involvement in the design and planning of the FFS is critical to the effectiveness of the intervention and deserves increased attention in future programmes. Also, the quality and duration of training of FFS facilitators are an area of concern. Most programmes had mechanisms in place for M&E and impact assessment, but human and technical resources to manage, analyse and utilize the data were often inadequate, resulting in staff being overwhelmed by the amount and complexity of the data collected.

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Disclosure statement

HvdB and MD declare that they have no conflict of interest. SP, ASP and MF are employed by the Food and Agriculture Organization of the United Nations, an organization which has developed and promoted the Farmer Field School method.

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Data availability

The anonymized data set is available upon request.

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