



Campbell International Development Group Title Registration Form

Please complete this form to outline your proposal for a Campbell International Development Group systematic review. Email the completed form to Martina Vojtkova, Coordinator, Campbell International Development Group: mvojtкова@3ieimpact.org. Tel: +44 20 7958 8351.

Before completing this form:

- Make sure that your proposal falls within our scope, and that it has not already been covered in another Campbell or Cochrane review. Check existing registered titles at: www.campbellcollaboration.org/library.php and www.cochrane.org/reviews/en/topics.
- Authors are advised to use the Cochrane Handbook for Systematic Reviews of Interventions (see www.cochrane-handbook.org).
- Be aware that preparing a Campbell review requires a significant, long-term commitment. At least two authors are required before a title can be registered.

1. Title of review

Suggested format: [*intervention/s*] for [*outcome/s*] in [*problem/population*] in [*location/situation*]

Farmer Field Schools for improving farming practices and farmer outcomes in low- and middle-income countries: a systematic review

2. Background and objective(s) of review

Briefly describe the problem, the intervention(s), the relevance to policy and practice, and the objective(s) of the review, including important sub-questions. Is there potential for differences in relative effects between advantaged and disadvantaged populations?

Problem description:

Farmers comprise some of the poorest and most vulnerable people in the world and the most vulnerable to climate change. In 2002, three out of four poor people in developing countries lived in rural areas, with the majority of them relying, either directly or indirectly, on agriculture for their livelihoods (World Bank, 2007, p. 26). Agriculture is the main source of income for around 2.5 billion people in the developing world (FAO, 2003, p. 1).

Agricultural extension and advisory services (hereafter 'extension services') are thought to be important for agricultural development efforts. Extension services aim to improve farmer capacity and reduce technology and management gaps (Anderson and Feder, 2003) by providing those working in agriculture access to information on inputs, new technologies, crops, markets and prices, among others.

Over the years, the approaches to agricultural extension have moved from support to large landowners and plantations under colonial agriculture, to top-down approaches to delivering extension to wider range of farmers including small farmers, such as the Training and Visit System, and, finally, latterly to more participatory approaches. 'Top-down' extension was criticised for focusing on transfer of technology using a uni-directional approach, allocating a passive role to farmers, not factoring in the diversity of the socio-economic and institutional environments facing farmers, promoting unsustainable farming practices due to association with private agricultural input producers, and ultimately for failing to generate behaviour change (Chambers and Ghildyal, 1984; Birner et al., 2006). Participatory approaches to extension are based on the idea that they create spaces for farmer 'self-learning' and sharing and allow the agents also to learn from the farmers.

The intervention:

Farmer field schools (FFSs) have become a prominent participatory approach in the context of integrated pest management (IPM) and its more recent variants, including integrated production and pest management, integrated nutrient management and integrated crop management. Farmer field schools were first established in Indonesia to promote integrated pest management (IPM), in response to the problem of pests developing resistance in the context of overuse of pesticides. The approach is associated with the UN's Food and Agriculture Organisation (FAO) and has been implemented in over 80 countries worldwide (van den Berg, 2004).

Farmer field schools use intensive 'discovery learning' techniques to provide farmers with the skills and confidence to adopt different growing techniques and change the mix of inputs used on their farms. In the case of IPM, field school participants are instructed on how to move away from pesticides to more natural techniques of pest management. Objectives of the schools include increasing farm productivity, reducing negative environmental impacts and promoting farmer empowerment.

Relevance for policy and practice:

Since the 1980s there has been a decline or stagnation in public expenditure on agriculture in most developing countries (Akroyd and Smith, 2007). However, as noted in the World Development Report on Agriculture, "extension services, after a period of neglect, are now back on the development agenda... [but] More evaluation, learning, and knowledge sharing are required to capitalize on this renewed momentum" (World Bank, 2007, p. 175). The age old questions that remain include how to raise yields and farmer incomes in a sustainable manner, and how to bring extension services to the poorest people.

Objectives of the review:

The review systematically collects and synthesizes evidence from high quality impact evaluations of farmer field school interventions. Outcomes are synthesised along the causal chain, from intermediate outcomes such as knowledge acquisition and capacity building, through to technological adoption and diffusion and finally farmer outcomes such as agricultural yields and household income. The review aims to answer the following questions:

- 1) Do farmer field schools achieve their objectives in terms of capacity building, adoption of improved practices (i.e. reduced use of pesticides), increased yields and net revenues, and other factors such as farmer empowerment in low and middle income countries? and
- 2) Under which circumstances and why: what are the facilitators and barriers to FFS effectiveness and sustainability?

Potential for differences in relative effects between advantaged and disadvantaged populations:

Where data are available from primary studies, the review will examine differences in relative effects between different categories of disadvantage, including, but not limited to, socio-economic status and gender.

3. Existing reviews

Briefly describe any existing systematic reviews on the topic, and justify the need for this review if existing reviews exist or are in progress.

A number of recent reviews summarizing evidence on farmer field schools are available (Davis, 2006; Tripp et al., 2005; van den Berg, 2004; van den Berg and Jiggins, 2007; Feder et al., 2010). The reviews provide conflicting conclusions about the effectiveness of farmer field schools. In addition, none draws on a systematic search for literature, nor applies standard inclusion criteria, or critically appraises or synthesizes the literature. Moreover, most of them draw on studies that do not adequately control for confounding, selection bias, spillovers and contamination, and thus are liable to high risks of bias in evaluating impact.

In addition, a recent paper by Braun and Duveskog (2008) provides background and reports the findings of a global assessment of the FFS approach. However, the paper excludes one study that suggests limited effectiveness (Feder et al., 2004a). It is clear that a systematic review, which aims to provide a comprehensive and unbiased synthesis of the existing evidence on impact of farmer field schools, is needed.

4. Define the population

Who is included and who is excluded? Are disadvantaged populations included, defined across PROGRESS-Plus categories?¹

The review includes arable farmers, living in developing (low- or middle-income) countries at the time the intervention was carried out. For studies to be included, they need to collect and report on data at the farm or household level. Many of the included populations are by definition disadvantaged, but interventions targeting particular disadvantaged groups, or conducting analysis across disadvantaged groups, will be included in the review.

The review excludes livestock farmers and farmers based in high-income countries.

¹ Disadvantage can be measured across categories of social differentiation, using the mnemonic PROGRESS-Plus. PROGRESS is an acronym for Place of Residence, Race/Ethnicity, Occupation, Gender, Religion, Education, Socioeconomic Status, and Social Capital, and Plus represents additional categories such as Age, Disability, and Sexual Orientation.

5. Define the intervention(s)

What is given, by whom, to whom, and for how long? What are the comparison conditions (what is usually provided to control/comparison groups who don't receive the intervention)? Will you develop a logic model (theory of change) to illustrate the hypothesized mechanism of action (that is, how the intervention is expected to work)? Are interventions aimed at the disadvantaged?

The intervention:

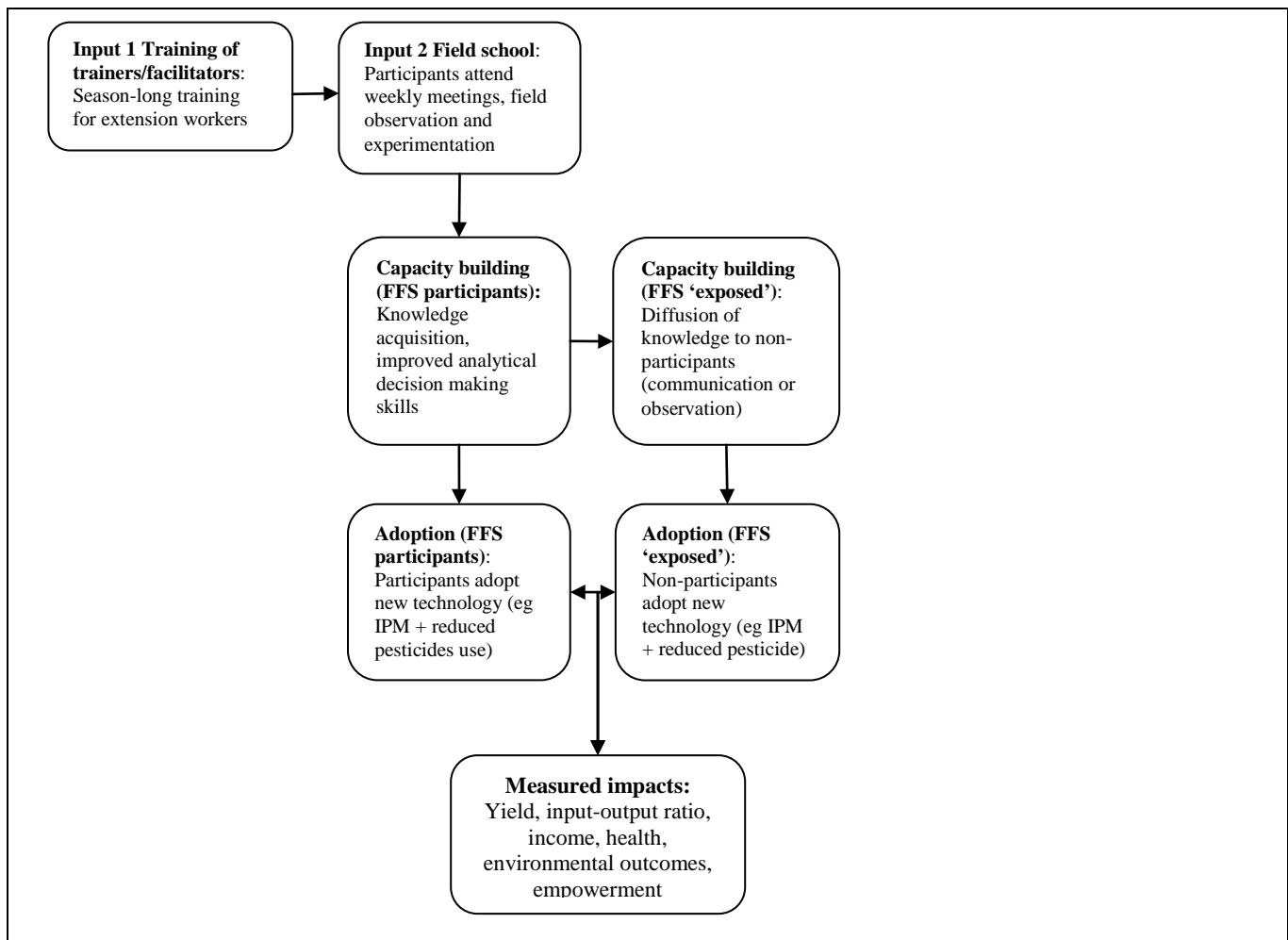
The FFS approach draws on participatory approaches to extension, both in terms of its bottom-up focus, with curriculum, such as on integrated pest management, drawing on priorities identified by farmers, and in terms of the focus on farmer experimentation and building problem solving capabilities. A typical FFS includes a field-based season-long training program delivered by a FFS facilitator, with weekly meetings nearby the plots of participating farmers (Pontius et al., 2002). Each FFS typically has from 25 to 30 participants, with farmers working together in groups of five. Facilitators can be either extension agents or selected graduates from previous FFSs, who undergo training tailored to equip them to facilitate field schools (Braun and Duveskog, 2008). The facilitators use experiential, participatory and learner-centred educational methods, including use of demonstration plots comparing farmers' existing practices with new practices promoted in the FFS (Pontius et al., 2002). Participants are encouraged to share their knowledge with non-participants in their local community as a way of promoting farmer-to-farmer diffusion.

The comparison:

If farmers in low and middle income countries do access agricultural extension services at all, it is usually through visits from public extension agents, through observation of public demonstration plots, or through extension provided by the private sector. Public extension may take the form of centralised or more decentralised systems (Birner et al., 2006). We will include studies which compare farmers receiving FFS to those who receive no, or other types of extension. We will collect relevant information on the extension modality received by control/comparison groups.

Theory of change:

The figure below presents a stylized causal chain linking farmer field school delivery inputs with final outcomes, via intermediate outcomes in terms of capacity building and technological adoption. Intermediate outcomes are shown for both field school participants and for indirect beneficiaries who are 'exposed' to the intervention, usually by living in close geographical proximity to field school participants or through their social networks. Key assumptions underlie each stage in the causal chain, and will be elucidated during the process of conducting this systematic review. Assumptions include the quality of the training of trainers or the appropriateness of the field school curriculum to beneficiaries, which will affect acquisition of knowledge. Community characteristics such as land- and asset-holdings, education and gender will affect the ability to reach appropriate beneficiaries including disadvantaged farmers such as women. The degree of social cohesion is likely to affect the diffusion of knowledge from field school graduates to 'exposed' farmers. Finally, contextual factors such as weather conditions, soil fertility and plant disease determine production and yields, while market prices and market access determine the values of inputs and outputs and therefore farmer incomes.



6. Outcome(s)

What are the intended effects of the intervention? What are the potential or unintended effects of the intervention? Primary and secondary (intermediate) outcomes for the review should all be mentioned, together with beneficial and, if applicable, adverse effects. Note relevant and important outcomes for the appropriate disadvantaged groups.

Final outcomes:

The review primarily looks at economic outcomes, including agricultural yields (production per unit of land), profits (revenues minus costs), household income/ expenditure/ poverty status, and empowerment. The review is interested in effects on two groups of beneficiaries: those participating directly in the field school and those living or working in close proximity to participants (so-called FFS 'exposed').

Intermediate outcomes:

Intermediate (process) outcomes include farmer knowledge and capacity, adoption of new approaches (including reduced pesticides use) and diffusion of new approaches to 'exposed' farmers who may live in the same communities as field school graduates, or interact with them at market.

We will also collect data on other outcomes measured including health and environmental outcomes.

7. Methodology

What types of studies are to be included and excluded: please describe eligible study designs, measures, and duration of follow-ups. Briefly describe proposed data sources, search strategies and methods of synthesis. Where the review aims to include quantitative and qualitative evidence, specify which of the review questions noted in section 2 will be addressed using each type of evidence.

Study design and method of analysis: Review question 1: Do farmer field schools achieve their objectives in terms of capacity building, adoption of improved practices (i.e. reduced use of pesticides), increased yields and net revenues, and other factors such as farmer empowerment in low and middle income countries? Studies eligible for inclusion in effectiveness synthesis include impact evaluations based on experimental design (where randomised assignment to the intervention is made at cluster level), quasi-experimental designs (including controlled before and after (CBA) studies with contemporaneous data collection and with two or more control and intervention sites, regression discontinuity designs and interrupted time series studies (ITSs)) and ex post observational studies with non-treated comparison groups and adequate control for confounding.

For quasi-experimental studies and observational designs with comparison groups, eligible studies must use adequate methods of analysis to match participants with non-participants, or statistical methods to account for confounding and sample selection bias. Appropriate methods of analysis to match participants and non-participants include propensity score matching (PSM) and covariate matching. Appropriate methods of analysis to control for confounding and selection bias include multivariate regression analysis using difference-in-differences (DID) estimation, instrumental variables (IV) or Heckman sample-selection correction (so-called 'switching regression') models.

Studies that do not control for confounding using these methods, such as those based on inter-temporal comparison groups (pre-test post-test with no non-intervention comparison group), will be excluded.

Study design and method of analysis: Review question 2: *Under which circumstances and why: what are the facilitators and barriers to FFS effectiveness and sustainability?*

Studies eligible for inclusion in the synthesis of evidence answering question 2 include any background programme/project documentation which we are able to obtain on the interventions evaluated in the effectiveness studies. We will also include project completion reports and process evaluations studying these interventions. Additionally we will also include studies which use quantitative, qualitative or mixed methods of analysis that:

- 1) report on FFS interventions implemented in the same context (country) as those studies included in the effectiveness synthesis
- 2) are based on primary data collected from clients, extension agents or experts
- 3) assess determinants of service delivery quality, knowledge acquisition, adoption of technological improvements, diffusion, or sustainability
- 4) report at least some information on all of the following: the research question, procedures for collecting data, sampling and recruitment, and at least two sample characteristics.

We will adopt a two-stage approach to inclusion of these studies, which, in addition to removing studies based on the usual relevance criteria (intervention, population, relevance to research question, study type and location), removes studies of particularly low quality in the first round (Thomas et al., 2003; Spencer et al., 2003). Assessments of quality are then made in the second round, which can then be used in sensitivity analysis of findings. We will develop a two-stage approach to quality appraisal for the review of qualitative studies.

Search method:

We will search AgEcon, CAB Abstracts, Social Science Citation Index, International Bibliography of Social Science, EconLit, US National Agricultural Library, JOLIS, BLDS and IDEAS. To ensure maximal coverage of unpublished literature, we will also search Google, Google Scholar, Networked Digital Library of Theses and Dissertations Index to Theses and the ProQuest dissertation database. We will screen the bibliographies of included studies and existing reviews for eligible studies. We will contact key researchers and implementing organizations for studies, including authors and implementing organizations of included studies for information on process and implementation.

Two independent review authors will screen the results against the inclusion criteria, and each author will extract the data. Discrepancies will be solved by consensus or by a third author if needed.

Critical appraisal:

We will assess the methodological quality of studies using appropriate tools, including the Cochrane Collaboration's Risk of Bias tool for randomized controlled trials (RCTs), the Cochrane Effective Practice and Organisation of Care (EPOC) group's tool for CBAs and ITSs, and will develop a tool to assess risk of bias in regression-based studies (PSM and covariate matching, DID, IV, Heckman). We will pay special attention to the methods that studies used to avoid potential confounders. We will develop an appropriate quality appraisal tool for studies included to answer question 2.

Methods of synthesis

The review synthesises quantitative data on effectiveness to assess whether the intervention works or not (objectives question 1), and mixed (quantitative and/or qualitative) data on process and implementation to explain why (objectives question 2).

For quantitative data on effectiveness, where available, we will compare dichotomous outcomes using the relative risk (RR) and continuous outcomes using the standardized mean difference (SMD). However, where sufficient data are not reported or obtainable from the study authors on continuous outcomes, we will report response ratios, which have the same interpretation as the RR. Where appropriate, we will pool outcomes using inverse-variance weighted random effects meta-analysis.

For the synthesis of evidence relating to question 2, we will use a thematic approach, where themes will be based on the links and assumptions in the theory of change model. We will analyse results using a combination of content analysis and narrative synthesis.

8. Review team	
List names of those who will be cited as authors on the final publication.	
Lead reviewer This is the person who develops and co-ordinates the review team, discusses and assigns roles for individual members of the review team, liaises with the editorial base and takes responsibility for the on-going updates of the review	Name: Hugh Waddington Title: Senior Evaluation Officer Affiliation: International Initiative for Impact Evaluation (3ie) Address: London International Development Centre, 36 Gordon Square, London Postal Code: N19 3JU Country: UK Phone: +44 207 958 8350/8351 Email: hwaddington@3ieimpact.org
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Co-author If applicable	Name: Dr Jock Anderson (Technical Adviser) Affiliation: Independent Country: USA

9. Roles and responsibilities	
Please give brief description of content and methodological expertise within the review team. It is recommended to have at least one person on the review team who has content expertise, at least one person who has methodological expertise and at least one person who has statistical expertise. It is also recommended to have one person with information retrieval expertise. Please note that this is the <i>recommended optimal</i> review team composition.	
Content:	Jock Anderson has over 40 years' experience in agricultural development research and policy, including positions as Professor of Agricultural Economics at the University of New England, Armidale, Australia and Evaluation Adviser at the World Bank. He has written extensively on agricultural extension, including a number of recent review articles (see, for example, Anderson, 2007).
Methodology:	Hugh Waddington, Birte Snilstveit and Howard White are co-authors of a previous systematic review and meta-analysis of water, sanitation and hygiene evaluations (Waddington et al., 2009). Hugh, Birte and Howard have provided peer review to over 30 systematic reviews funded by 3ie and the Department for International Development (DFID).
Statistics:	Hugh Waddington, Jorge Hombrados and Howard White have statistical expertise,

	including in effect size calculation and meta-analysis. Hugh was principal investigator of a previous review of effectiveness of water and sanitation interventions (Waddington et al., 2009).
Search:	Birte Snilstveit has expertise in search design, and has peer reviewed search strategies for systematic reviews funded by 3ie and DFID.

10. Potential conflicts of interest
For example, have any of the authors been involved in the development of relevant interventions, primary research, or prior published reviews on the topic?
The authors are not aware of any conflicts of interest arising from financial or researcher interests.

11. Support
Do you need support in any of these areas: methodology and causal inference, systematic searches, coding, statistical analysis (meta-analysis)?
N/A

12. Funding
Do you receive any financial support? If so, where from? If not, are you planning to apply for funding? Where?
3ie supports the authors' salaries.

13. Proposed deadlines	
Note, if the protocol or review are not submitted within 6 months and 18 months of title registration, respectively, the review area is opened up for other reviewers.	
Date you plan to submit a draft protocol:	30 September 2011
Date you plan to submit a draft review:	30 November 2011

14. Declaration
Authors' responsibilities
By completing this form, you accept responsibility for preparing, maintaining and updating the review in accordance with Campbell Collaboration policy. The Campbell International Development Group will provide as much support as possible to assist with the preparation of the review.
A draft protocol must be submitted to the Group within six months. If drafts are not submitted before the agreed deadlines, or if we are unable to contact you for an extended period, the Group has the right to de-register the title or transfer the title to alternative authors. The Group also has

the right to de-register or transfer the title if it does not meet the standards of the Group and/or the Campbell Collaboration.

You accept responsibility for maintaining the review in light of new evidence, comments and criticisms, and other developments, and updating the review at least once every three years, or, if requested, transferring responsibility for maintaining the review to others as agreed with the Group.

Publication in the Campbell Library

The support of the International Development Group in preparing your review is conditional upon your agreement to publish the protocol, finished review and subsequent updates in the Campbell Library. Concurrent publication in other journals is encouraged. However, a Campbell systematic review should be published either before, or at the same time as, its publication in other journals. Authors should not publish Campbell reviews in journals before they are ready for publication in CL. Authors should remember to include the statement: "This is a version of a Campbell review, which is available in The Campbell Library".

I understand the commitment required to undertake a Campbell review, and agree to publish in the Campbell Library. Signed on behalf of the authors:

Form completed by:
Hugh Waddington

Date:
21 June 2011

For Campbell use:

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Title registration approval date:	