Food and Agriculture Organization
of the United Nations

How can the farmer field school approach be used to support agroecological transitions in family farming in the Global South?

Recommendations for farmer field school facilitators, agricultural development project designers and managers

How can the farmer field school approach be used to support agroecological transitions in family farming in the Global South?

Recommendations for farmer field school facilitators, agricultural development project designers and managers

Teatske Bakker and Patrick Dugué
French Centre of Agricultural Research for Development,

Katia Roesch
Agronomes et vétérinaires sans frontières,
and
Suzanne Phillips and Anne-Sophie Poisot
Food and Agriculture Organization of the United Nations.

FOOD AND AGRICULTURE ORGANIZATION OF THE UNITED NATIONS
Rome, 2022

Required citation:
Bakker, T., Dugué, P., Roesch, K., Phillips, S. and Poisot, A.S. 2022. *How can the farmer field school approach be used to support agroecological transitions in family farming in the Global South? Recommendations for farmer field school facilitators, agricultural development project designers and managers.* Rome, FAO. https://doi.org/10.4060/cb9920en

ISBN 978-92-5-136134-4

Contents

Figures and boxes

FIGURES

BOXES

Abbreviations and acronyms

AESA	Agroecosystem analysis
AET	Agroecological transition
AVSF	Agronomists and Veterinarians Without Borders *(Agronomes et vétérinaires sans frontières)*
CIRAD	French Centre of Agricultural Research for Development
ESR	efficiency-substitution-redesign
FAO	Food and Agriculture Organization of the United Nations
FBS	farmer business school
FFS	farmer field school
ICT	Information and Communication Technology (ICT)
NGO	Non-governmental organization
FO	Farmers' organization

©AVFS

1.

1. Introduction

In response to the growing awareness of the negative impacts of conventional intensive agriculture on the environment and living conditions of farmers and rural families, alternative production systems based on agroecological principles have emerged. These transitions, which can be described using the generic term *agroecological transitions* (AET), imply a greater participation of farmers in the design and implementation of development programmes. Over the past few decades, new advisory approaches also have emerged, including farmer field schools (FFS), which have been rapidly implemented on all continents.

The FFS is a participatory approach to training and advice based on collective experimentation of innovative cropping systems. This approach has an ambitious objective of strengthening farmers' skills so that they can adapt their practices and move their farms towards more sustainable production systems. The implementation of FFS allows farmers to carry out activities (field training through observation of crops, soil and pests; experimentation; sharing of knowledge and know-how) that empower them to "solve problems on their own". This makes the approach particularly suited to supporting farmers in the ecologization of their practices.

The key to implementing FFS is thus to successfully launch an experimentation process based on collaboration between a group of farmers and a facilitator. The purpose of this document is to provide project managers, technicians and designers with practical information on how to use the FFS approach and adapt it to their context of intervention to support AET. It also will be useful for research staff, leaders of farmers' organizations (FOs), teachers and students interested in using this approach or better understand its benefits.

The findings and recommendations proposed in this document are the result of a partnership between three institutions working to support AET in the Global South: CIRAD (French Centre of Agricultural Research for Development), FAO (Food and Agriculture Organization of the United Nations) and the NGO AVSF (Agronomists and Veterinarians Without Borders).

This document has four sections:

- Definition of the FFS approach and its principles, and characterization of the advantages of this approach to supporting family farm AET in the Global South, particularly in sub-Saharan Africa.
- Presentation of several important points for a successful FFS, i.e. to strengthen farmers' skills to practically and collectively solve the problems they encounter. This second part is aimed specifically at development project managers and field practitioners and facilitators.
- Recommendations for project designers and managers for including FFS in development projects.
- Proposed ways in which FSS could evolve to better account for the needs of farmers and other actors engaged in AET.

2.

©FAO

2. Farmer field schools: a useful approach for agroecological transitions?

2.1 WHAT ARE AGROECOLOGICAL TRANSITIONS?

2.1.1 The challenges of transitions in food and agricultural systems

Conventional intensification of crop production systems relies mainly on pure cropping and the use of mineral fertilizers, pesticides and, if possible, mechanization and irrigation, combined with improved varieties that make good use of these inputs. This combination of intensification practices is costly and therefore risky for farmers. While these practices have led to some successes, such as significant increases in yield in initial stages, intensification has caused environmental, social and economic damage on every continent, including Africa where it is more frequently applied to certain market-oriented cropping systems (rice, cotton-cereal systems, vegetable gardening, cocoa growing, etc.). The extent of the damage has often been ignored by agriculture sector actors promoting this production model due to their use of pure cropping yields as the main assessment indicator.

The performance of this agricultural model depends on a regular supply of water to crops and access to fossil fuels, an absence of climatic variations and sustained market demand leading to sufficiently profitable prices. However, climate change is now a reality and fossil fuel reserves are set to run out in the long term. Moreover, the intensification of conventional agriculture leads to a loss of biodiversity, including in the soil, a decline in water and air quality and difficulties in the management of crop and livestock health (a source of zoonosis and pandemics). Finally, dependence on external inputs and agricultural commodity markets increases the vulnerability of farms in the Global South, as illustrated during the 2008 economic and food crisis and the crisis caused by the COVID-19 pandemic.

Some issues are region-specific. For example, with regard to the agri-environment in sub-Saharan Africa, the most pressing challenges are the degradation of natural resources (water, forests, rangelands, etc.), the loss of fertility of cultivated soils due to the choice of production practices, and above all population growth in rural areas. In cotton-growing basin regions in western Africa (the context of our study), pollution by agricultural inputs (particularly herbicides and insecticides) must be added to this list.

This region also faces considerable social and organizational challenges due to the increasing food needs of a growing urban population and the need to improve the nutritional quality of rural communities' diets. A good balance between export crops and food crops for self-consumption and local markets therefore needs to be found. The significant involvement of women in agricultural work and the increasing use of paid agricultural labourers also mean that their working conditions and pay must be taken into consideration.

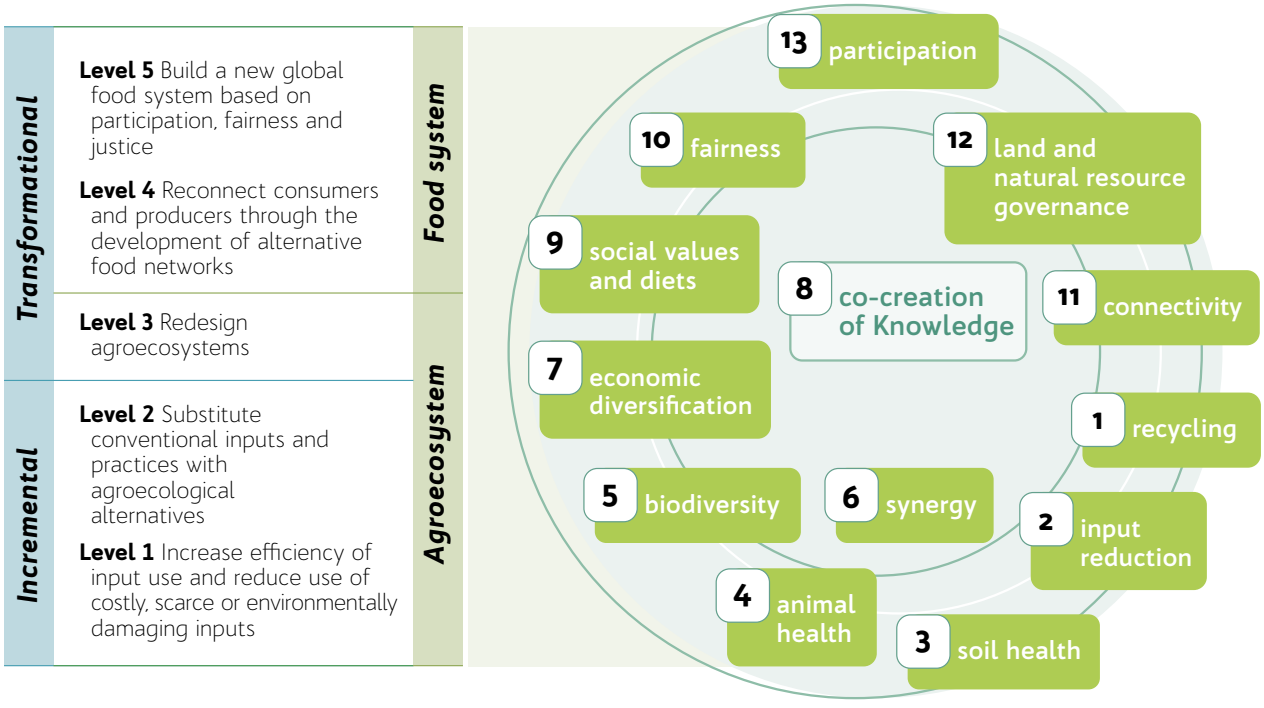
2.1.2 Definition of agroecology and its principles

Agroecology emerged as a reaction to conventional intensification of agriculture and the ensuing negative impacts. It is defined as "*the application of ecological concepts and principles to the design and management of sustainable agroecosystems*" (Altieri, 1995). This means that farmers no longer seek to control the natural environment by implementing standardized agricultural techniques, but rather to mobilize what nature provides beyond simply photosynthesis. Examples are nitrogen fixation by legumes, recycling of raw organic matter into humus and nutrients, control of insect pests by beneficial organisms, cover crops to limit run-off, etc. The **principles of the ecologization of farming practices** aim to improve the efficiency of cropping systems in terms of natural resource use, and to increase the resilience of farming systems.

However, agroecology is not limited to the extensive use of natural processes made possible by the ecologization of agricultural practices. It **also includes a social and economic component** calling for the reorganization of supply chains and marketing systems, the consideration of workers' health and the difficulty of tasks, and even the evolution of consumer behaviour in terms of product choices and dietary habits. This systemic definition of agroecology is leading decision makers and stakeholders in AET territories to take an increasing interest in the **food system**[1] as a whole (beyond agricultural production pratices alone) (HLPE, 2019; Wezel *et al.*, 2020). Figure 1 summarizes the **principles of agroecology**.

The AET of food and agricultural systems is an **ambitious objective**, involving multiple dimensions. These are agronomic, but also environmental and economic in terms of being viable and sustainable for individuals and communities as a whole (social dimension) and for all members (including women and youth in particular). **This multidimensional objective requires rethinking how an entire agricultural and food system functions in a gradual move towards agroecological systems**.

Figure 1. The 13 principles of agroecology and the five levels of transition to sustainable food systems



Source: **HLPE** 2019. Agroecological and other innovative approaches for sustainable agriculture and food systems that enhance food security and nutrition. A report by the High Level Panel of Experts on Food Security and Nutrition of the Committee on World Food Security, Rome.

1 *A food system is a network comprising multiple actors which links producers, processors, distributors and consumers, at a distance or in close proximity. Its functioning (modes of organisation, rules, technologies and practices) defines a diversity of modes of production, processing, packaging, storage, distribution, consumption and waste management of food goods.*

2.1.3 Agroecological transitions: going beyond input substitution

Agroecology, and in particular the use of natural processes, is based on **general elements and principles that should be adapted to local conditions** (HLPE 2019; Barrios *et al.*, 2020), which requires farmers to precisely identify the constraints and opportunities which they face. There are no universal "recipes" to adopt (although they are proposed and sometimes imposed by development officers based on work undertaken elsewhere). Throughout the world, **the transition to agroecological food and agricultural systems does not happen overnight, it is a gradual process, which is why we speak of "agroecological transitions"**. The idea of transition emphasizes the fact that farmers make incremental changes, from one season to the next, to adapt their practices and evolve their production system. Similarly, AET for a food system involves discussions among stakeholders and incremental shifts with regard to environmental, economic and social aspects of these systems.

Moreover, AET takes into account the fact that **incremental changes in systems take place at different intensities.** At the farm level, AET is therefore often conceptualized using the efficiency-substitution-redesign (ESR) framework (Hill and MacRae, 1996; Tittonell, 2014). The ESR framework was established to describe a transition from conventional to sustainable agriculture following three key steps:

- increased **efficiency** and optimization of the use of already used resources (water, inputs, etc.);
- **substitution**, or the replacement of conventional inputs by mechanical techniques or biological or organic inputs;
- **redesign**, or the transformation of the cropping system or the entire farm based on ecological principles.

The ESR framework is useful for ranking practices implemented by farmers on their farms. It makes it possible to differentiate the intensity of change, distinguishing between farmers who have reduced their mineral fertilizer doses from those who have completely overhauled their way of producing (choice of crops in rotation or intercropped, cover crops), recycling a large part of biomass into compost, reintroducing livestock into their farms and/or trees into their fields, etc. This analytical framework makes it possible to highlight the disproportionate importance often given to the substitution of chemical inputs by biological inputs, to the detriment of the process of redesigning a system as a whole. The substitution of inputs does not call into question:

- dependence on external "organic" inputs that must continue to be purchased and sometimes imported (e.g. *Bacillus thuringiensis*-based insecticides and other biopesticides, organic fertilizer pellets, etc.);
- the lack of functional biodiversity in a system.

While this simple substitution already constitutes progress in terms of reducing agricultural pollution, it does not make it possible to consider solutions to the socioeconomic and ecological problems encountered in the intensive agricultural model (for this, the redesign and transformation of systems are necessary). Supporting farmers to achieve AET means being able to **encourage the reorganization of a cropping system (redesigning a system)** and strengthening the experimentation and progressive adaptation skills that farmers will require.

2.2 FARMER FIELD SCHOOLS CAN SUPPORT AGROECOLOGICAL TRANSITIONS

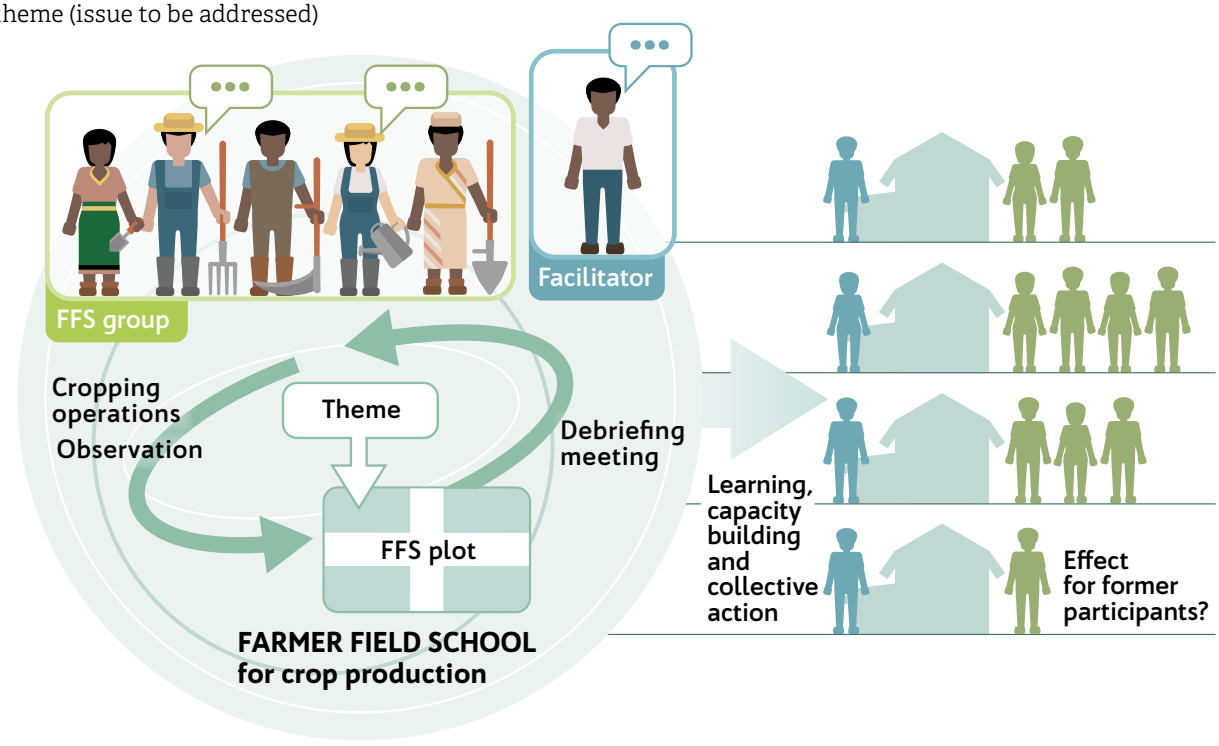
2.2.1 Principles of FFS and benefits for supporting AET

An FFS consists of a group of male and female farmers from the same locality who are guided by a facilitator (technician or farmer facilitator) and work together on an experimentation and observation FFS plot (see

Figure 2). The definition of a key topic (problem to be solved on one or several targeted crops) leads the group to set up comparative studies on the FFS plot. Over the duration of a production cycle[2] (of crops, livestock, etc.), the group and the facilitator meet at regular intervals to carry out cropping operations, observe the agroecosystem and discuss how the various test plots should be managed. At the end of the season, harvests are weighed and a debriefing meeting is held to discuss yields and gross margins, as well as other farmer-specific assessment indicators (e.g. cash flow requirements, labour requirements, peak workloads, degree of drudgery). The different technical options are compared and the conclusions are discussed.

The choice of a theme for the FFS is discussed by the facilitator and the farmers in the group during the participatory diagnostic before to the start of the production cycle (e.g. before planting crops). **The participatory diagnostic encourages farmers to propose technical options** or "solutions", and to share and discuss their experiences. The challenge at this stage is to choose the **technical options to be tested in the FFS, options that seem compatible with the farmers' constraints and needs**. Scientific research and advice cannot realistically develop all the technical options needed to respond to the wide variety of situations encountered by farmers. It is therefore up to farmers to use the knowledge and options from the FFS to choose what is right for them (Box 1).

Figure 2. Diagram of the elements of an FFS: a group of farmers, a facilitator, and FFS plots on a jointly identified theme (issue to be addressed)



Source: Bakker, T. 2021. Effets des démarches participatives sur les changements de pratiques agricoles : cas des champs-écoles en Afrique de l'Ouest. Thèse de doctorat en agronomie. Université de Montpellier, Montpellier.

2 *FFS often focus on crops, but there are FFS on livestock, agro-pastoral and agro-sylvo-pastoral systems. To promote AET, FFS are encouraged to address mixed farming systems (not monocrops) and agriculture-livestock integration.*

Box 1

How do farmer field schools, experimental plots and demonstration plots differ?

FFS emerged in 1989 in Indonesia as a result of discussions between researchers, FAO entomologists, educators from the NGO World Education and farmers on how to manage the brown planthopper. Observations of rice plants at different stages of growth and the crops' agroecosystem (soil, weeds, plot edges) were made using on experimental plots to show farmers that the systematic and massive spraying of insecticides was making this pest problem worse by killing all of insects indiscriminately, including the ones that were beneficial for the crop. This approach gave birth to the FFS approach and was later formalized by the FAO and taken up by many institutions (World Bank, Japan International Cooperation Agency (JICA), International Fund for Agricultural Development (IFAD), etc.) developing integrated pest management (IPM) projects.

The FFS approach is an innovative training and advisory method based on adult learning and experiential learning (learning by doing) principles. The main objective of FFS is not to disseminate new technical knowledge to farmers, but to strengthen their capacity to observe their agroecosystems, identify a problem and seek and test solutions in order to adapt their practices. By relying on exchanges within a group of peers, FFS also seek to strengthen collective action.

The FFS is not a demonstration plot nor an experimental plot. An **experimental plot** is used to carry out an scientific study in a controlled environment (experimental station) or under farmers' conditions. To do this, each technical option is replicated several times and precise measurements are made one or several times (yield, soil moisture, soil cover by weeds or cover crops, etc.). By generating scientific data to understand biological processes, the main objective is the production of knowledge by researchers, not the provision of direct advice to farmers. When farmers are consulted, it is to provide researchers data, but not necessarily to give farmers concrete answers in return.

A **demonstration plot** seeks to show the value of a technique to farmers. The techniques are not chosen by the farmers (they emerged from research or were chosen by the project leaders or an FO, for example), but the farmers can discuss among themselves the results that can be observed in the plot. The objective is the transfer and dissemination of techniques, which is managed by the advisers.

These various tools, as well as FFS, are used at different stages of research-development and advisory processes. The type of tools must be chosen based on the objectives of the project and the complexity of the technical problems to be solved. Demonstration plots can be useful for introducing new varieties to farmers, for example. Experimental plots are used to obtain specific references on a technique or variety, or to study how and why a technique may be relevant to farmers. FFS are used to empower farmers to find solutions to their problems, and in this case, the facilitator does not provide lectures or a recipe to follow. In FFS, the emphasis is on regular observation (called agroecosystem analysis (AESA)) and participatory monitoring by farmers of the plots set up, as well as practical activities enabling them to understand the mechanisms of the agroecosystem (such as observing for weeks the natural food webs between pest insects and their natural enemies and the natural capacity of plants to compensate for the damage inflicted by pests).

Source: Bakker T. 2022. Unpublished.

FFS are built around five principles which are detailed in Box 2. Collective experimentation plays an important role in farmers' learning:

- Production in the FFS is the responsibility of the group, so this collective space and investment provides an **opportunity to test riskier options**. If the options tried in the FFS fail, this will not affect the participants' individual farms.
- FFS help each member of the group to better **cope with the social pressure** inherent to any change in a rural environment (the judgment of neighbours). The collective FFS plots and group dynamics can lead to retesting a practice that had been rejected the first time it was tried.
- By placing farmers in the position of **"farmer-researcher"**, the FFS approach allows them to take a

Box 2

The five basic principles of the FFS approach

1. FFS focus on **experiential learning**, or "learning by doing", meaning the application of innovative technical options and observations of the agroecosystem in the FFS plots are key.
2. FFS recognize that an innovation does not only consist of adopting a new technique that was tried and tested elsewhere, but also involves a more or less **long design process undertaken by a farmer** (or group of farmers) of a new practice that may require organizational (on the farm, in the village) and **social changes.** This is why the success of an FFS relies on discussions within the farmers' groups regarding technical issues, but also collective actions.
3. FFS value farmers' know-how, acquired through their daily experience and empirical knowledge. This is why the third principle consists of encouraging the sharing of experiences between farmers and considering the **endogenous innovations** that some of them have already implemented.
4. Research will never be able to propose solutions for the full range of situations encountered by farmers, which is why the fourth principle of FFS is to focus on the **priorities chosen by farmers**, and to aim to propose innovative systems adapted to farmers' local conditions.
5. Lastly, the fifth principle is to adopt a **systemic view.** This is why FFS organize activities to put integrated agroecosystem management into practice. It is also for this reason that FFS do not simply substitute one input for another, but seek to improve the functioning of the entire production system by gradually adapting practices. To do this, FFS include activities to discuss the mechanisms behind production (e.g. What is soil health? What is photosynthesis? How do food webs work, in other words, "Who eats whom"?, etc.) .

Source: FAO. 2016. Farmer field school guidance document. Implementing quality programmes. Rome, FAO.

step back from their daily lives and the demands of their immediate environment. It gives meaning to their work as farmers by strengthening their skills and their ability to solve problems individually and collectively.

Given these five principles (box 2), which seek to strengthen farmers' capacities to "solve problems by themselves", the approach is theoretically well suited to accompanying farmers in the ecologization of their practices. But to support AET, **FFS cannot be limited to facilitating the transfer of more environmentally friendly practices** (meaning the transfer of 'technological packages'), or even simply to improving the efficiency of existing practices or substituting chemical inputs with organic ones. The task involves

© AVSF

working with farmers to **redesign their cropping systems (or livestock system, agroforestry system, etc.)**, the relations between the various production units and even the farm as a whole. **The key to the successful implementation of FFS is therefore to succeed in initiating a truly participatory process of observation, experimentation and design of solutions useful to local agriculture by mobilizing** all members of the farmers' group and the facilitator (and, if necessary, resource persons for targeted support).

2.2.2 Farmer field schools with different objectives and approaches

The FFS approach has been formalized in various methodological guidelines, notably by the FAO (2016) and AVSF (Bakker, 2017), and has involved a wide variety of actors, including farm advisory agents, NGOs and FO actors. FFS are currently implemented in over 90 countries, mainly in Asia, Africa and Latin America. In some Asian countries (such as Indonesia), but also in Africa (Uganda, Cameroon, Burkina Faso, etc.), the FFS approach has been more or less institutionalized and integrated into national farm advisory programmes.

However, as the approach has become popular around the world, FFS have been implemented in very **different ways** (Bakker *et al.*, 2020). As the development of FFS has expanded globally, its core themes have been adapted to different food and cash crops, sometimes integrating other elements of the production systems (livestock, aquaculture, forestry, etc.). In parallel with the diversification of the topics addressed, the way in which they are implemented also has varied. Over the years, the FFS approach has sometimes drifted away from its basic principles (Box 2). **FFS are indeed often implemented based on the objectives of decision makers and actors involved in an intervention** (development or research and development project, sector/crop focused programme, etc.) **rather than on the expectations and needs of the farmers concerned**. Two main types of FFS can be distinguished:

- FFS used for the purpose of **transferring or disseminating a technique or a technological package to farmers** *(technology transfer FFS,* in which farmers are assigned a consultative role).
- FFS that aim **to build functional skills and knowledge based on farmer-to-farmer collaboration** with the help of a facilitator. The goal is for farmers to "find their own solutions" to their own questions *(collaborative FFS).*

In the case of FFS oriented towards 'technology transfer', the mechanism is more like a demonstration plot (Box 1), **using farmer participation as a method** to facilitate the acceptance or dissemination of new practices, **but this disconnects the approach from its basic principles, in particular that of strengthening individual and collective skills**. In collaborative FFS, the aim is to create dynamics of transformation and innovation at the local level and to put farmers at the forefront in this process.

Given this diversity of FFS, the characteristics of FFS and their observed effects on a sample of farms were studied as part of a partnership between CIRAD, FAO and AVSF[3]. The results of this study, which was conducted in Burkina Faso and Togo, made it possible, to identify the conditions required for FFS to successfully support farmers in the AET of their farms.

3 *This recommendation paper for implementing FFS is based on a field study in Togo and Burkina Faso. Between 2018 and 2021, T. Bakker completed a thesis entitled "Effects of participatory approaches on change in farming practices: the case of farmer field schools in West Africa", in collaboration with AVSF, CIRAD and the FAO (Bakker, 2021).*

2.3 CASE STUDIES CONDUCTED IN BURKINA FASO AND TOGO

The study on which this document is based focused specifically on the **analysis of changes in agricultural practices over several years, before, during and after participation in an FFS**, with the aim of understanding how FFS can have a positive effect on a farm's functioning and results/performance, and under what conditions. This evaluation was carried out taking into account the context of the projects examined and the way in which the FFS were set up, facilitated and implemented. It was based primarily on a field survey in the villages where two development projects had been implemented (presented in Box 3).

The evaluation method used in the study was based on interviews with former participants in **rainy season** (cotton, maize, sorghum, soybean, cowpea, groundnut, mucuna) and **vegetable** (tomato and onion) **FFS**, and aimed to understand the changes in practices that they were able to achieve (see Box 4).

The results of the study (detailed in Box 5) show that **the way in which FFS are implemented influences the changes in practices carried out by participating farmers:**

- In the case of Burkina Faso, **the changes in practices observed after participation in a consultative FFS mostly have been limited**; they only involve an increase in the use of cattle manure on rainy season crops. The top-down implementation of these FFS (standardized curriculum predefined by experts, technical proposals poorly adapted to the context and priorities of the FFS groups) partly explains the weak effects of these consultative FFS.
- In the case of Togo, **the collaborative FFS** have led to **longer and more diversified trajectories of changes in practices** than in the case of farms that participated in a consultative FFS. Participation in the collaborative FFS has resulted in a **variety of changes** for compost production and the inclusion of legumes in the cropping system grown pure or intercropped, and in some cases through crop rotation. For vegetable gardening FFS, the trajectories of changes in practices also have been long and diverse, and the changes in practices concern the use of compost and biopesticides, diversification and crop rotation.

The diversity of the trajectories of changes in practices, and the fact that farmers have implemented innovative practices that had not been experimented within the FFS, demonstrate that **collaborative FFS achieve the objective of strengthening farmers' skills: they are able to experiment on their own to find solutions adapted to their own situations.** The processes operating in collaborative FFS and the way they were implemented are similar to co-designing new cropping systems adapted to local conditions.

The results of the study indicate that there is **a need to focus on collaborative participation and to change the way advisers relate to FFS groups**. These results led to a collective discussion between the institutions involved in the projects (FAO and AVSF), which generated the recommendations presented in sections 3, 4 and 5.

Box 3

Presentation of the two FFS case studies in Burkina Faso and Togo

The field study was conducted in two cotton-growing regions of West Africa: northern Togo (Savannah region), and **western Burkina Faso** (Tuy and Houet provinces). The soil and climate conditions and the production systems of these two regions are fairly similar, with mixed crop-livestock farms. The rainy season cropping system is based on cereals (mainly maize and sorghum), cotton and legumes (cowpeas and soybeans). Irrigated dry season vegetable gardening is mostly practised across northern Togo; in western Burkina Faso, it is only present on the outskirts of cities or areas with established irrigation schemes. These areas are facing the challenge of reduced yields due to a decrease in organic matter and soil erosion. Farmers have tried to compensate for the decrease in available land per worker and the decline in yields by intensifying inputs and labour, and seeking off-farm sources of income. The use of external inputs has negative economic (high cash flow burden, exclusion of certain categories of farmers, dependence on supplier credit) and environmental effects (likely contamination of water by pesticides and fertilizers, loss of biodiversity, decrease in beneficial insect populations leading to increased dependence on insecticides). There also are significant social and organizational challenges due to the seasonal and permanent migration of young people, a growing urban population that needs to be fed, the health impacts of pesticides, and inequalities between men and women, rich and poor. The national research and advisory systems in the two countries have most often favoured a top-down vision of innovation in agriculture, with little recognition of farmers' knowledge, know-how and actual expectations and objectives.

The two development projects studied that had used the FFS approach are:

- the "**Sustainability and Resilience of Family Farming**" project in northern Togo implemented from 2014 to 2017 by AVSF and the NGO RAFIA (Research support and training for self-development initiatives) with the local FO UROPC-S (Union régionale des organisations de producteurs de céréales - Savanes), in partnership with ICAT (Farm Advisory Institute of Togo).
- the **"Good Agricultural Practices"** initiative implemented between 2009 and 2016 by the FAO, INERA (Environment and Agricultural Research Institute of Burkina Faso) and the Ministry of Agriculture with the FO Union Nationale des Producteurs de Coton du Burkina (UNPCB)

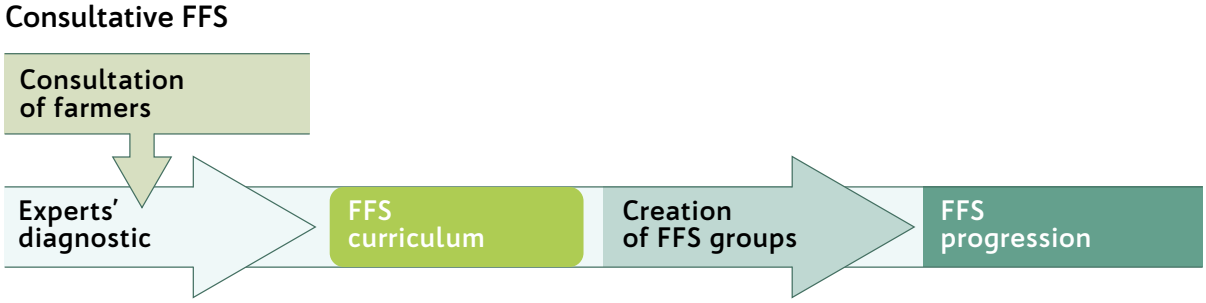
In both cases, surveying farmers, facilitators and former project managers made it possible to collect information on the implementation of the FFS and to evaluate the effects of these FFS based on the analysis of changes in farmers' practices. The FFS in these two projects were implemented in different ways.

In Burkina Faso, the FFS studied are described as **"consultative"** (see the description of their process in Figure 3):

- the crops targeted by the FFS (cotton, maize and mucuna) were defined during the project design stage;
- at the start of the project, the curriculum was developed by experts (INERA researchers);
- the facilitators were then trained on how to use this curriculum in the FFS with farmer groups;
- after the FFS groups were formed, the curriculum was implemented in a standardized way by the facilitators for several FFS cycles without any significant adjustments.

Box 3

Figure 3. Process of the consultative FFS studied in Burkina Faso

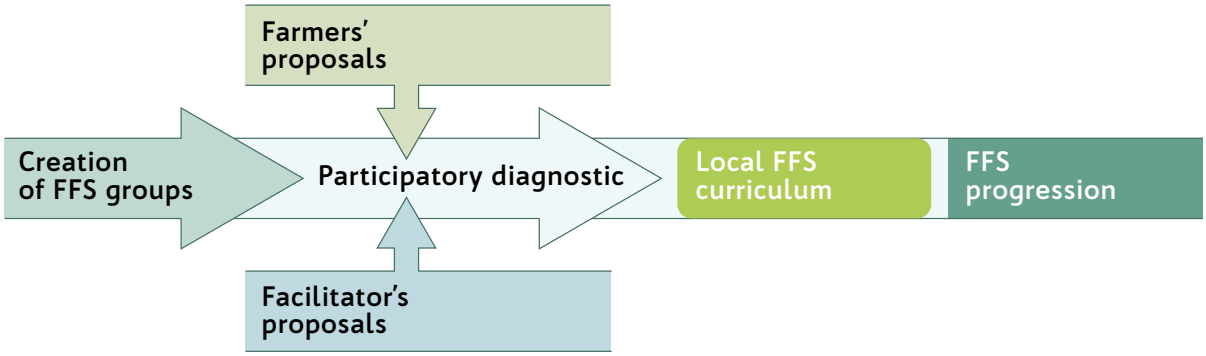


Source: *Bakker, T.* 2021. Effets des démarches participatives sur les changements de pratiques agricoles : cas des champs-écoles en Afrique de l'Ouest. Thèse de doctorat en agronomie. Université de Montpellier, Montpellier.

In contrast, the FFS in Togo are described as "collaborative" (see the presentation of its process in Figure 4):

- during the project design stage, the content of the FFS and the target crops were not yet defined;
- the curriculum was determined for each group during a participatory diagnostic during which the farmers and facilitators discussed and decided together the theme of the FFS and the technical options to be tested and evaluated collectively. The curriculum was therefore adapted to each group.

Figure 4. Process of the collaborative FFS studied in Togo



Source: Bakker, T. 2021. Effets des démarches participatives sur les changements de pratiques agricoles : cas des champs-écoles en Afrique de l'Ouest. Thèse de doctorat en agronomie. Université de Montpellier, Montpellier.

The participatory diagnostic method used with the FFS group is presented in paragraph 3.3.

Source: Bakker, T. 2021. Effets des démarches participatives sur les changements de pratiques agricoles : cas des champs-écoles en Afrique de l'Ouest. Thèse de doctorat en agronomie. Université de Montpellier, Montpellier.

Box 4

Methodology for the survey of former FFS participants

Three semi-structured interviews were conducted with each former FFS participants, each lasting approximately two hours. The first interview aimed to describe the farm, understand how it works and put it into context. During the second interview, the interviewer asked the former participant to describe the changes in practices in the cropping system targeted by the FFS that he or she followed (rainy season crops or vegetable gardening FFS). The objective of the third interview was to specify the changes in other farm units (in particular livestock and the production of organic fertilizer). The entire evaluation method used is presented in a dedicated operational document which has been published separately (Bakker et al., 2022).

The interviews were conducted with a sample of 39 farmers for rainy season crop FFS (22 in Togo, 17 in Burkina Faso) and 21 for vegetable FFS, all in Togo. The interviews were conducted in 2019, between two and seven years after the end of the FFS to which interviewed farmers participated.

Source: Bakker T, Dugué P, Roesch K, Phillips S. 2022. Methodological recommendations to better evaluate the effects of farmer field schools mobilized to support agroecological transitions. Rome, FAO.

©T. Bakker

Box 5

Detailed results of the study

For **consultative rainy season crop FFS, the intensity of changes in practices was limited**. Farmers have mainly sought to (i) make better use of traditional cattle manure by collecting all of the heaps on their farms (Figure 5), and (ii) use it to complement mineral fertilizers on rainy season crops. There has been little change with regard to the inclusion of legumes in cropping systems or the use of biopesticides for cotton[4].

In contrast, for **collaborative** rainy season crop FFS, there has been an increase in the **production and use of compost** (from the fermentation of a mixture of plant waste and livestock manure) in the participants' farms, as well as **the inclusion of legumes, grown pure or intercropped, in cereal-based systems** (Figure 6). **Farmers have chosen highly diverse practices.**

- For compost production, the project provided support for digging of one pit on each farm, but some farmers have gone further, increasing the quantities produced (by digging several pits, or by composting in heaps).
- For the cultivation of leguminous crops, this has involved intercropping (often corn-soybeans) with various patterns (in alternating rows or in alternating seed holes). Some farmers also have increased the share of legumes in pure cropping, and/or started crop rotation.

Starting from technical options tested on the FFS plot, **11 out of 22 farmers have innovated further.** This demonstrates that the **skills acquired during the FFS allowed farmers to adapt and experiment** with practices even after the end of the project, and therefore on their own initiative.

Figure 5. Cattle and cattle manure

Figure 6. Emptying a compost pit, and maize-soybean intercropping in alternating rows

4 *A small number of actors (notably the cotton companies) have a tight technical, economic and social lock on the cotton sector, which also limits the changes made by farmers. These elements are detailed in the PhD thesis (Bakker, 2021). For farmers to change their practices, the advisory approach alone is not enough, an environment favouring innovation is needed. We describe in detail some options to pursue in the remainder of this document.*

Box 5

Following participation in the collaborative vegetable gardening FFS, **changes in practices were also diversified** and farmers have innovated using the techniques tested in the FFS in 17 out of 21 cases (Figure 7). Participating vegetable farmers fertilized their crops (mainly tomatoes and onions) with compost, with or without mineral fertilizer. Some have **diversified their crops** (chilli, cabbage) and started **rotations** (notably due to nematodes in tomatoes). Finally, vegetable farmers started using a variety of **biopesticides** (based on onion, garlic, chilli and neem) that they prepare alone or in groups.

These changes in practice were also reflected at farm level, in particular to promote manure production by improving livestock husbandry practices.

The emergence of **collective actions following FFS was also identified as a significant result of collaborative FFS.** These actions involved the joint production of biopesticides and compost, the application of biopesticides on the same day on all of the vegetable plots in the same lowland area, and the management of staggered tomato transplantation and therefore of tomato production (detailed in section 3.5).

Source: Bakker, T. 2021. Effets des démarches participatives sur les changements de pratiques agricoles : cas des champs-écoles en Afrique de l'Ouest. Thèse de doctorat en agronomie. Université de Montpellier, Montpellier.

Figure 7. Exchange visit in a vegetable (onion) FFS

©T. Bakker

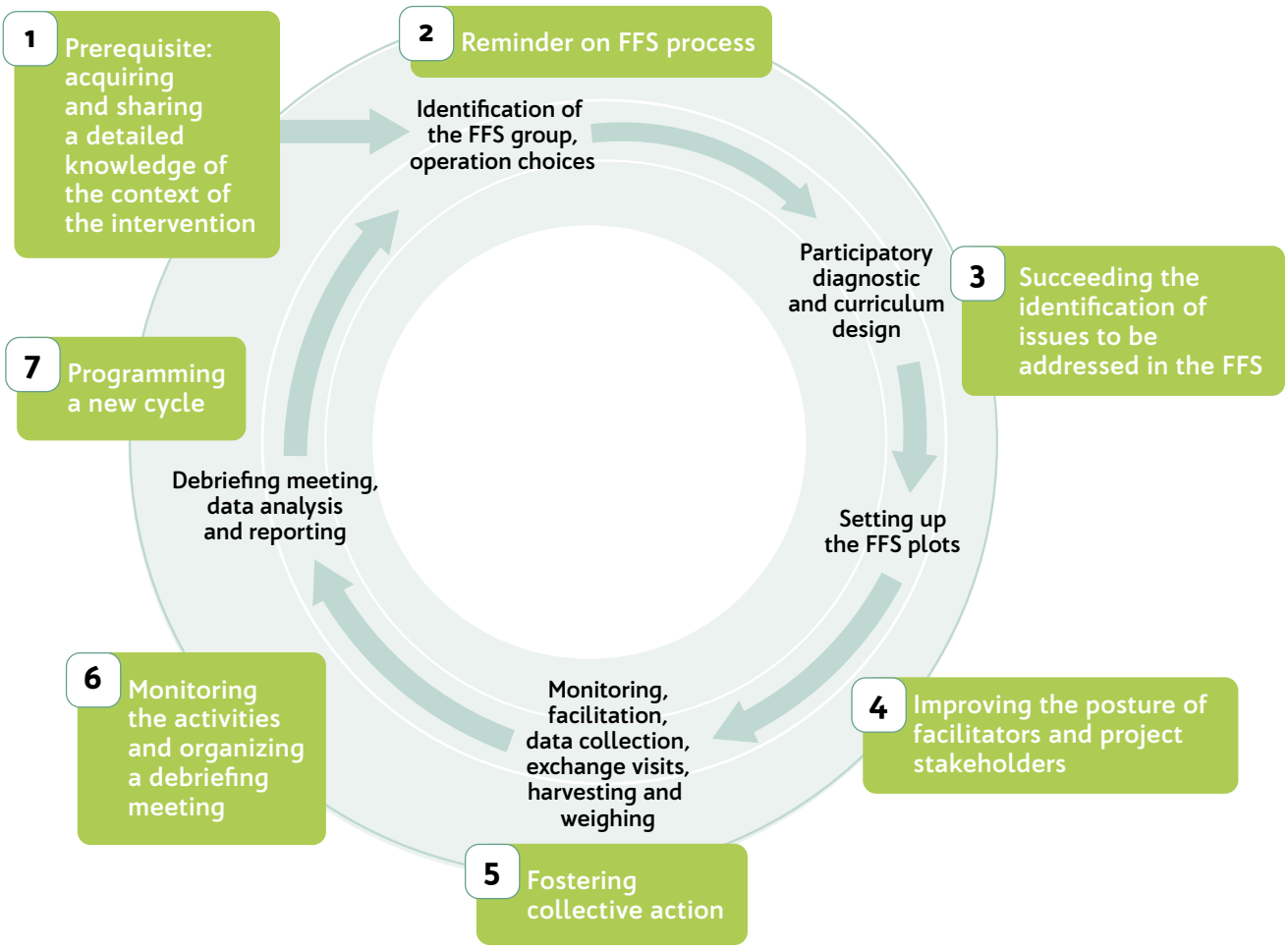
3.

© AVSF

3. How can FFS support AET successfully? Recommendations for field officers and project managers using the FFS approach

This section presents recommendations for field officers and project managers using the FFS approach in projects seeking to support AET at a local scale. To do this, we have considered the FFS cycle (Figure 8) and identified seven important points for the success of FFS in accompanying AET. These seven points are presented in the following subsections.

Figure 8. The FFS cycle and corresponding sections of the document



Source: Bakker T. 2022. Unpublished.

3.1 A KEY PREREQUISITE FOR PROJECT STAKEHOLDERS: ACQUIRING AND SHARING PRECISE KNOWLEDGE OF THE CONTEXT OF THE INTERVENTION

Thorough knowledge of the entire project intervention area is necessary before setting up FFS. This initial phase of the project consists of carrying out a diagnostic of the territorial agricultural system[5] that is both comprehensive and participatory, meaning the results are debated and validated with project stakeholders and partners, particularly the farmers concerned by the project. As an example, we use the **diagnostic of a territorial agricultural system** (Box 6), which allows to explain past and current dynamics of an agricultural system from ecological, economic and social perspectives. By combining different scales of analysis and mobilizing different disciplines (agronomy, geography, economics, history, etc.), the objective is to identify the elements that influence the evolution of agricultural systems, and to be able to anticipate the impacts of a development project that is being designed or deployed in this territory.

The method for doing a diagnostic of a territorial agricultural system is more in-depth than focus group discussions, and requires the mobilization of students or a multidisciplinary team over a relatively long period of time (between 4 and 6 months). If no diagnostic is planned or has been done recently, some elements may be available in reports or studies on the project area. These data can be obtained from institutions in the area (Ministry of Agriculture, research institutes, NGOs, etc.) or through a literature review. In all cases, **information on the project intervention area is necessary to become familiar with the existing agricultural systems and farm characteristics** (Ferraton and Touzard, 2009).

During the agricultural system diagnostic at the territorial level, the **analysis of agricultural systems and of farm diversity (typology)** makes it possible to identify ideas for the content of the FFS and the other activities of the project (see section 4.2.). For example, a territorial diagnostic makes it possible to:

- know whether the project should focus on production issues in the FFS or whether activities should also be programmed to support product processing and marketing (in case of bottlenecks in marketing production);
- understand the role of women and youth in family farms and their main activities to enable them to be involved more effectively in activities;
- understand the institutional, social and economic constraints to certain innovations, and the specific constraints of the poorest farmers to avoid proposing technical options that exclude them.

In this way, this diagnostic can be used to design projects with FFS activities that make sense for AET by including relevant issues, such as the condition of natural resources, the use of external inputs and/or local organic inputs, the situation of the agricultural workforce (wages, working conditions of men, women and young people, etc.), local territorial dynamics and opportunities for the marketing of agroecological products, etc.

A **clear understanding of the project area is essential** for the implementation of FFS and complementary activities. The results should not be filed away as reports that only a few people may read. They must be **shared and discussed with the stakeholders in the project area** and the participants' representatives (leaders of representative FOs, traditional authorities, farmers recognized for their knowledge, and so on).

5 *We distinguish between the **diagnostic of a territorial agricultural system** (at the scale of a project's intervention area or a small agricultural region) (presented in point 3.1.) and the participatory **diagnostic done with the FFS group** (on the local scale of an FFS group or village scale) (presented in point 3.3.).*

Box 6

Carrying out a diagnostic of the agricultural system at territorial level

Doing a diagnostic of a territorial agricultural system can be broken down into several steps to collect the following key information:

- **Contextualization:** gathering information on the history, economics and agriculture of the subregion and country (particularly useful for actors from other countries).
- **Landscape reading:** observation and analysis of the landscape to have a broad understanding of the area and its elements (terrain, plant guilds, infrastructure, types of crops and livestock, etc.). This step is based on direct field observations, as well as maps, satellite images and photographs.
- **Historical analysis** of the region: surveys with elderly farmers in the area, and reconstruction of the succession of agricultural systems over time to understand how agriculture has changed.
- **Technical characterization of production systems:** survey (using semi-structured interviews) based on purposive sampling of farmers to characterize the history of each farm, make an inventory of its resources and technical choices (cropping plan, crop rotations and intercropping, fertility management, feeding, herd reproduction and care, etc.). The analysis of these surveys leads to a **typology** and a **characterization of the technical functioning** of the different production systems identified.
- **The economic characterization of the production systems:** also addressed in the farm surveys, by calculating the economic performance of the crop and livestock systems for a normal year (based on production sold and self-consumed, quantity of inputs, hired labour, equipment, etc.).
- **The analysis, modelling and comparison of economic performance** make it possible to compare the different farms that were surveyed (i.e. by calculating farm income per family worker based on the area cultivated per family worker). The income obtained by family workers can be compared with the survival threshold, which corresponds to the minimum income required to satisfy the basic needs of a "typical" family in the study area.

To complete the diagnostic, an institutional analysis should be carried out to identify the actors who perform advisory support functions and who influence the circulation of technical information in the agricultural sector. This enables the identification of opportunities or obstacles to innovation and the adaptation of practices by farmers.

Source: Ferraton and Touzard. 2009. Comprendre l'agriculture familiale. Diagnostic des systèmes de production. Quae CTA. Presses agronomiques de Gembloux.

3.2 A REMINDER OF THE FFS PROCESS

Based on the general principles of FFS (section 2.2.1), the standard format of an FFS consists of a curriculum for one cropping season (or production cycle) organized around regular meetings (weekly for annual crops, monthly for trees, etc.) between the group and the facilitator. Several methodological guidelines exist that provide an overview of how to implement an FFS (Bakker, 2017; FAO, 2016). Here we provide a reminder of how FFS are implemented using the example of the collaborative FFS studied in Togo (Box 7).

Box 7

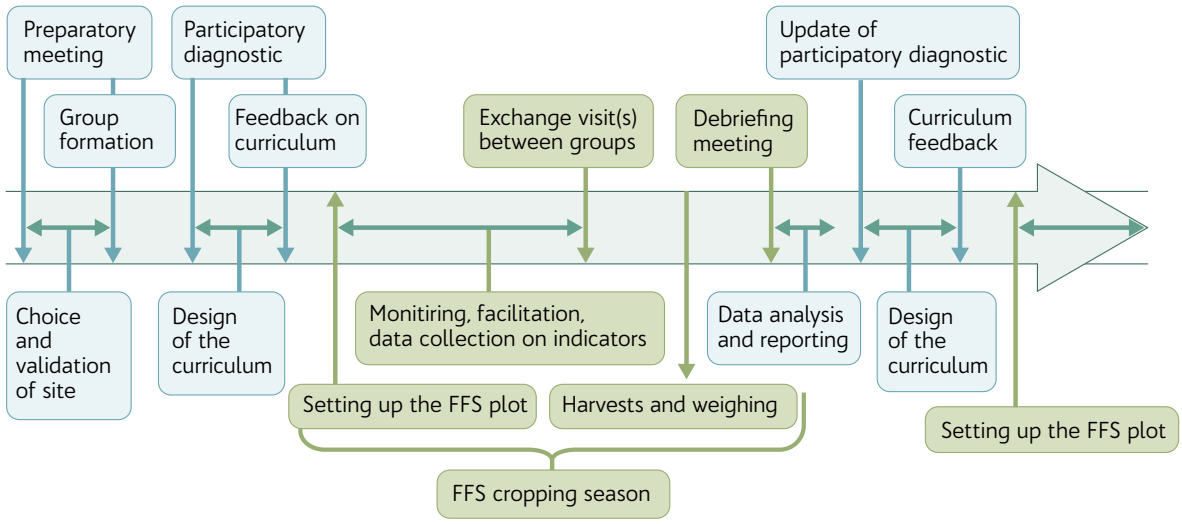
Implementation of the collaborative FFS studied in northern Togo

At the start of the project activities in northern Togo, preliminary meetings introduced the FFS approach to farmers in the area. Next, plots for the FFS were identified and FFS groups were established. For each FFS, a participatory diagnostic was conducted (see section 3.3), which determined the content (crops planted, issue addressed, technical options tested, work schedule) for each FFS group.

Each FFS group consisted of 20 to 30 farmers and met weekly on the FFS plot throughout the production period. An adviser, technician, or farmer facilitator (a participant from a previous FFS, selected and trained in FFS facilitation) guided the process. The representation of the FFS process is linear (Figure 9) but in reality the process is cyclical and starts again at the beginning of each production season (see section 3.7).

During the cropping season, FFS activities proceeded as planned, with regular sessions to carry out cultivation operations and observe the crops (often called in "agroecosystem analysis" in methodological guides). This means that the participants not only observed the development of the crops, but also of pests and beneficial organisms, competition between crops or with weeds, soil cover and traces of water circulation on the plot, etc. These interactions were at times presented in the form of pictures. The curriculum for training and activities, centred on the FFS plot and the FFS group, was complemented by exchange visits with other nearby FFS groups and "open days" where participants presented FFS studies and their outcomes to their neighbours. These are important moments for the dissemination of FFS experiences to a wider community.

Figure 9. Implementation of activities over a cropping season in the collaborative FFS studied in northern Togo



Source: Bakker, T. 2021. Effets des démarches participatives sur les changements de pratiques agricoles : cas des champs-écoles en Afrique de l'Ouest. Thèse de doctorat en agronomie. Université de Montpellier, Montpellier.

3.3 SUCCESSFULLY IDENTIFYING THE ISSUES TO BE ADDRESSED IN THE FFS

Once the FFS group has been established and the FFS plot has been identified[6], the members of the FFS group, with the support of the facilitator, carry out a localized diagnostic focusing on the area where group members carry out their farming activities (most often a village). This **localized and participatory diagnostic with each FFS group** is the first step and the starting point of the FFS process (Box 8). It plays an essential role in the success of the FFS in accompanying the AET of the farms involved in this process.

The participatory diagnostic makes it **possible to work on the problems identified by the farmers because it is conducted specifically in their area of activity and sometimes on a crop system that they wish to address as a priority.** During the diagnostic, farmers frequently express their concerns in non-agronomic terms (often socioeconomic, such as the drop in yields, a longer lean season, the drudgery of work, etc.), but these concerns can often be translated into agronomic problems. By starting with the problems as they are expressed by the farmers, farmer involvement deepens over the course of the FFS, facilitating the appropriation of the solutions tested.

The next step is to collectively find solutions to test and respond to the problems identified by the farmers. This work of identifying the issues to be addressed and the technical options to be experimented with in the FFS can be facilitated by identifying technical alternatives already used by a few innovative farmers (in the village or in the project intervention area), which is known as **innovation tracking** (Box 9). This involves surveying and studying alternative, original, non-standard practices implemented by farmers in the project area. This method can be used to produce resources for the design of novel alternatives, for example for the identification of technical options to be discussed with a group of experimenters.

The facilitator leads the participatory diagnostic steps with each FFS group and must use this opportunity to **include a range of viewpoints** in defining the theme and technical options to be explored in the FFS. The facilitator should give everyone a voice, keeping in mind that each participant is in a different situation. The challenge is to **include women and young people** in defining the problem and the solutions to be explored (see section 3.3). It is often a question of ensuring that farmers with the most financial and social resources do not monopolize the discussions, so that the solutions discussed also are accessible to farmers who are less well off.

6 The recommendations on the criteria for choosing an FFS plot are detailed in the methodological guidelines (Bakker, 2017; FAO, 2016).

Box 8

Steps of the participatory diagnostic with FFS groups

1. A localized and participatory diagnostic of cropping systems and practices

- **A survey of the village territory and landscape** and the identification of the FFS location: how does the area selected for the FFS fit into the layout of the village territory? (for example, placing the FFS plot in the lowlands to the west of the village, an area through which villagers frequently pass, allows the FFS plot to be seen, known and visited more often by third parties, etc.)
- An exercise to **characterize the potential of the plot selected for the FFS:** what is its soil type? How deep is it? What are the strong and weak points of this type of plot? For which crops would this plot be suitable? (for example, rainfed rice can be grown in a flood zone while sorghum cannot).
- **A characterization of current agricultural practices in this village**, taking into account the individual situations of the participants (level of resources, male or female, young or farm head). Some questions lead to a more precise description of practices: are the practices described those that would be used in an ideal scenario ("*if I had enough money, I would put X bags of fertilizer, etc.*") or actual practices? Does everyone do this like that; if not, what are the differences? How do the poorest farmers do it? What are the problems encountered with these practices? What are the tasks of men and women? Are the problems encountered the same for everyone (men, women, youth, different resource levels, etc.)?

By combining the results of these three steps (which can be conducted in subgroups), **issues can be prioritized: what issues does the group feel are most important/top priorities to address in the FFS? Why?** The discussion to answer this question **leads to the identification of the crops/cropping system** that will be implemented in the FFS and of the **issues to be addressed (problems to be solved)**.

2. Identification of technical options to be tested to address the problems identified

Based on the cropping systems and issues that have been collectively identified and validated, the group of farmers discusses the reasoning and technical options that are generally used to deal with the constraints identified:

- What do you usually do to remedy this/these problem(s)?
- Who tried something else? Did it work or not, and why?
- Has anyone heard of other technical options? What are the strengths and constraints of these options?

A facilitator can also propose technical options based on his or her knowledge, but only after letting the farmers speak first. The technical options can also be derived from tracking existing innovations in the area (Box 9).

By the end of this second step, a reasonable number of technical solutions have been identified that the group would like to test and compare in the FFS plots for the cropping system they have targeted.

The participatory diagnostic thus allows the identification of **technical options that seem compatible with farmers' constraints** and their assessment criteria, and which will be tested in the FFS plot.

Source: Bakker. 2017. Démarches d'accompagnement pour la co-construction d'innovations paysannes: guide méthodologique des champs-écoles dans la région des Savanes au Togo. AVSF.

Figure 10. Participatory diagnostic session of a rainy season crop FFS

© T. Bakker

Box 9

Tracking on-farm innovations

Generally speaking, there are three essential steps in innovation tracking (Salembier et al., 2016):

(i) characterization of current practices in the study area,

(ii) identification of farmers implementing so-called atypical or innovative practices that are significantly different from common practices,

(iii) characterization of these practices and identification of the underlying agronomic logic.

For example, Blanchard *et al.* (2017) study atypical organic manure management practices in Burkina Faso, such as paddocking contracts, access to large quantities of biomass or the commodification of organic manure (these practices may be common in other areas but they are innovative for this study area). The study concludes that the atypical practices (identified during the tracking) do not break with the dominant system (the functioning of other farms in the area), but allow farmers to achieve new objectives through progressive adaptations of practices. Périnelle *et al.*, (2021) use innovation tracking to identify technical options that respect local conditions for access to resources before setting up collective trials with farmers, such as farmers who have succeeded in increasing or diversifying legume production in a cotton-growing area where the majority of farmers practice cotton-cereal rotations.

Source: Salembier, Elverdin and Meynard. 2016. *Tracking on-farm innovations to unearth alternatives to the dominant soybean-based system in the Argentinean Pampa.* Agronomy for Sustainable Development 36: https://doi.org/10.1007/s13593-015-0343-9

Blanchard, M., Vall, É., Tingueri Loumbana, B. & Meynard, J.-M. 2017. Identification, caractérisation et évaluation des pratiques atypiques de gestion des fumures organiques au Burkina Faso : sources d'innovation ? *Autrepart*, 81(1): 115. https://doi.org/10.3917/autr.081.0115

Périnelle, A., Meynard, J.-M. & Scopel, E. 2021. Combining on-farm innovation tracking and participatory prototyping trials to develop legume-based cropping systems in West Africa. *Agricultural Systems*, 187: 102978. https://doi.org/10.1016/j.agsy.2020.102978

3.4 IMPROVING THE ATTITUDE OF FFS FACILITATORS AND OTHER PROJECT STAFF

With their focus on experiential learning and farmer participation, FFS have great potential to improve the skills that farmers need to engage in an AET successfully. However, FFS also can drift away from their basic principles and become more like a demonstration plot where farmers are consulted superficially or not at all on the choice of practices to be tested (see section 2.2.2). We explained in section 3.3 that farmer participation in the participatory diagnostic stage is crucial for the selection of relevant technical options to be tested. **The success of this diagnostic stage, and of all the exchanges that follow, is highly dependent on the attitude of the project facilitators.**

It is indeed common for advisory systems to **consider that a group of farmers must be guided, using a defined plan and well-known method, by an adviser who holds knowledge** (knowledge most often developed by agronomists and project trainers). Advisers are often trained according to this model, where the choice of solutions to be tested is identified in advance by project leaders, researchers or facilitators-advisers, and their goal becomes to disseminate technical sheets or practices known or identified by a project. With this mindset, it is assumed that nothing new can come from a group of farmers. On the contrary, the experience of field agents (advisers, development officers, etc.) and researchers with strong connections to the field shows that **farmers regularly innovate on their own, without necessarily relying on the results of scientific research disseminated by farm advisers.**

Box 10

An alternative way of supporting farmers

The FFS approach and the relationship between the group of farmers and the facilitator is intended at **co-designing** solutions and innovative cropping systems. The FFS facilitator is meant to **listen and reformulate what is said** to facilitate discussions in the group. Of course, each FFS needs a technically competent facilitator to guide farmers in setting up experiments, carrying out unfamiliar cropping operations, field observations and measurements that they have decided to make throughout the crop cycle. But the role of the FFS facilitator is above all to accompany, propose, question, organize, facilitate, regulate and synthesize.

Accompanying a group of farmers to solve problems consists first of all in "*giving them the means to speak differently in order to act differently*" (Darré, 2006; Bakker, 2017). This implies that FFS facilitators should not allow themselves or the group to focus on obvious, standardized opinions, or technical prescriptions on the use of inputs, but instead think outside the box to broaden the range of solutions (rather than pushing towards a predefined technique).

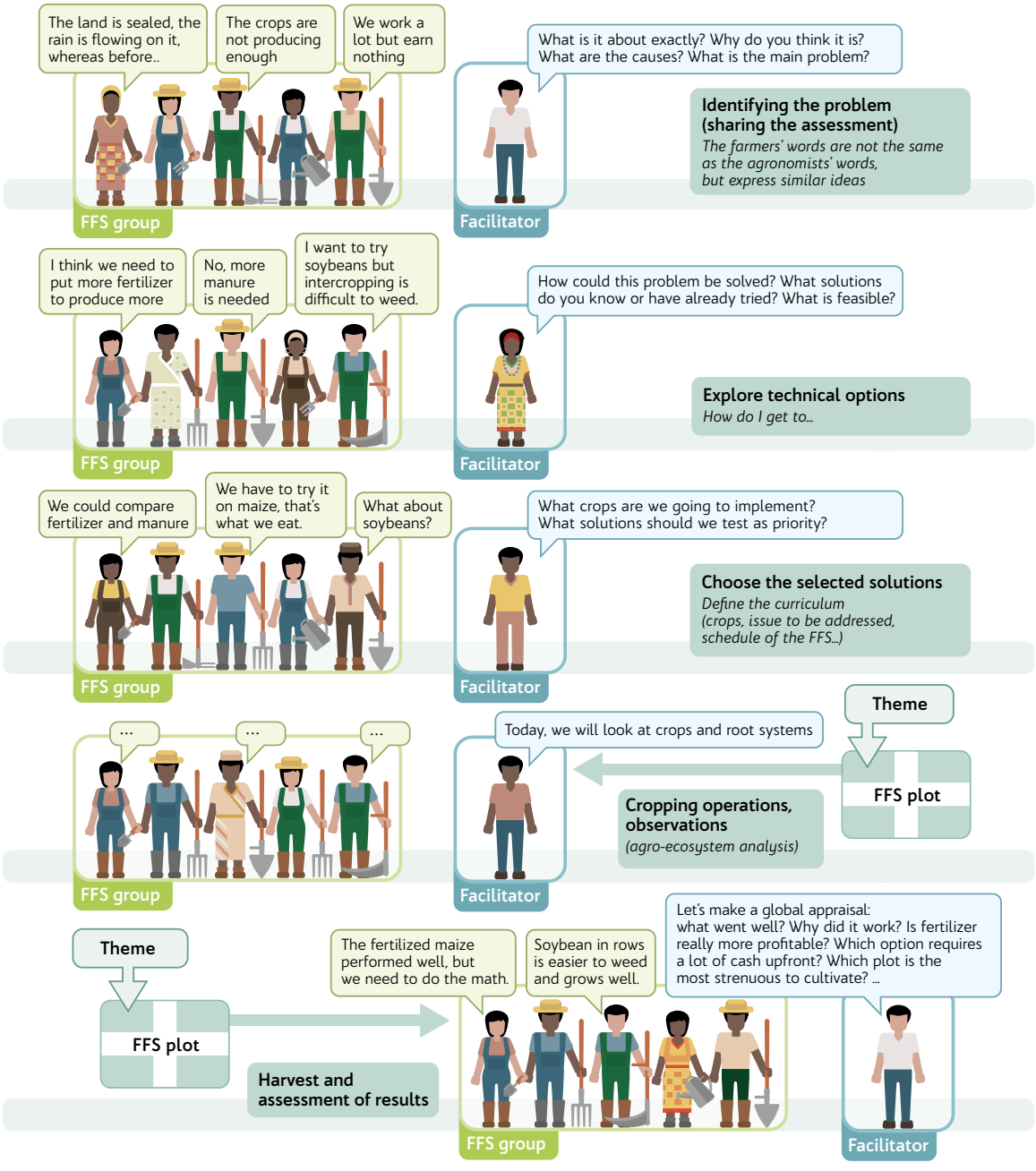
The facilitator:

- encourages questions and debate to help **articulate the problem (the statement)**
- then helps the group to define the solutions to be explored and choose the technical options to be tested in the FFS, without imposing a predefined solution. The challenge is to **transform a statement into a question leading to action** ("how can we...?").

Box 10

The facilitator must ensure that everyone has an equal opportunity to express themselves. For this, **a lot of time and dialogue are required**; in return, the effects are more sustainable than with a simple contribution of external knowledge and know-how and logistics (inputs, equipment, etc.). The empowerment of farmers in terms of conducting experiments and changes in practices can be seen after several years, but the human resources to be mobilized (facilitators, trainers, agronomists and project managers) are significant, as these changes in perspective and questioning take time.

The steps in the discussion between the FFS group and the facilitator in the case of a rainy season crop FFS



Source: Bakker T. 2022. Unpublished.

Thus, with the FFS, technicians and advisers are encouraged to **question and improve their standard methods of intervention,** which often consist of disseminating (or 'demonstrating') to farmers knowledge and crop management sequences derived from the work of researchers and acquired during their past training or presented in technical sheets or manuals. **The role of the FFS facilitator** (Box 10) is not to give lectures, but rather, by integrating knowledge on farming practices and their determinants, to help farmers adapt these in a changing context (climatic, demographic, economic, etc. context). **Ensuring adequate training of facilitators for projects using FFS is therefore crucial.** This change of attitude must be addressed in the **initial training** of advisers, but the possibility of updating the skills of advisers in this regard through **in-service training** also must be offered. Development and education structures and ministries of agriculture, environment and livestock are concerned by these training needs of advisers. In some instances, it is also a question **of readapting agricultural support services as a whole by encouraging government services, research bodies and private operators to reconsider the acceptability and relevance of agroecological options** (for example, by closely involving them in running and monitoring the results of the FFS, conducting action research with local researchers, organizing technical training for decision makers and researchers and exchange visits of successful agroecological approaches in comparable production systems elsewhere, and supporting the development of profitable markets for agroecological products).

The FFS approach values the experiences and knowledge of farmers, and places them at the centre of the innovation process. This change can be **confusing for project staff** because it challenges the power of the knowledge holder (or perceived knowledge holder), the person who has been to school or who regularly rubs shoulders with senior managers, experts and researchers. This involves reconsidering the technician-farmer relationship (towards an *"I know something, you know something"* relationship), and the relationship between the facilitator and the group of farmers (as well as questioning the place of researchers in such a process). This change in attitude may also be surprising for farmers, who are accustomed to solutions coming from projects and to being shown which recipes to apply. The "successful" implementation of an FFS is therefore **more demanding in terms of time and dialogue** than a conventional (vertical) extension approach (for example, through the setup of demonstration plots).

As to apply the basic principles of the FFS approach (Box 2) and ensure its success, **support for facilitators at key stages of the FFS process must be planned by projects and national advisory support structures. This goes well beyond the initial training of facilitators before setting up the FFS.** This support can take the form of sharing experiences with other facilitators, workshops for exchanging and capitalising on the results of the FFS of a project or region, and/or coaching by experienced facilitators moving from one FFS to another during an FFS season. A further option is to create a forum (for example, a WhatsApp group) to exchange information with facilitators during the course of the FFS about their difficulties or support needs. At the end of a cropping season, it is useful to plan a time to discuss with the project facilitators what they have learned and what improvements could be made (to the system and to their support, possible training needs).

Lastly, beyond the training of FFS facilitators, **another challenge lies in the training and support of other project staff. In particular, there are project managers and technical managers**, for whom it is important to ensure that the objectives of the FFS and the means to achieve them are well understood (that is what this document is for!).

Similarly, the **team in charge of monitoring and evaluation** must also be trained in the FFS approach and able to capture its effects, because **the results of FFS are not limited to the achievement of quantified objectives** such as numbers of FFS plots or participants, but specifically involve strengthening farmers' experimentation skills and

collective dynamics (Bakker *et al.*, 2022). This is why discussions on the quality of the implementation and on the processes under way in the groups are indispensable. Monitoring and evaluation officers are particularly well placed to collect information on the quality of FFS implementation. It is therefore important that **all of these actors are involved in designing and preparing the implementation of FFS** (in the field). If FFS are not well understood by staff within the organizations employing facilitators, this can lead to a loss in their quality.

3.5 ENCOURAGING COLLECTIVE ACTION WITHIN THE FFS GROUP TO FACILITATE CHANGES IN PRACTICES

In many agricultural situations, **AET can only be successful if there is effective coordination among rural stakeholders**. The general principles of FFS recognize the importance of group dynamics and seek to encourage collective action. In the case of the collaborative FFS in northern Togo, the farmer groups went on to set up new forms of collective action presented in Box 11. These initiatives facilitated changes in farmers' practices, and also made it possible to reach other farmers who had not participated in the FFS.

As with the definition of the content of the FFS, the facilitator should not impose collective solutions. He or she can **encourage groups to find collective solutions and even to develop new ways of organizing.** For example, the facilitator can discuss with them opportunities for collective action to facilitate individual changes in practices. Organizing exchange visits with local farmers who did not participate in the FFS is another key event for the group and can help identify other farmers who are interested in joining collective initiatives.

However, collective organization also can be difficult. Experience shows that the groups with clearly defined responsibilities and internal rules are the most diligent and successful. The organization of the group can be discussed during the participatory diagnostic, with a minimum of intervention by the facilitator (mainly to lay out the different possible options), as this also reinforces the autonomy of the groups. These points are discussed in detail in the AVSF methodological guidelines (Bakker, 2017).

3.6 MONITORING ACTIVITIES AND ORGANIZING AN ANNUAL DEBRIEFING MEETING TO DISCUSS THE RESULTS OF THE FFS

3.6.1 Monitoring activities carried out in the FFS

Monitoring the FFS test plots (and thus monitoring the technical options tested) should be anticipated when designing the FFS curriculum with the farmer group (before the start of the season). On the one hand, FFS members need to collectively define and monitor certain standard agronomic (density and size of plants, for example) and technical-economic (yield, margin, etc.) indicators that they will monitor during their weekly meetings. On the other hand, it is very important to **include some farmer-specific evaluation criteria** to evaluate the practical features of the technical options tested. Examples are the time and effort required for the practice, production costs and possibly the type of equipment required. The choice of indicators to be collected is therefore based on several criteria:

- relevance for comparing technical options,
- relevance of the indicators for the participants (in relation to the chosen theme),
- practical feasibility of collecting the data on these indicators, meaning the simplicity of data collection, analysis and interpretation.

Box 11

Examples of collective initiatives identified in northern Togo in vegetable gardening FFS

- **Coordinated management of insecticide treatments for vegetable plots:** The vegetable gardening FFS in Togo addressed the production and use of biopesticides based on onion, garlic, neem leaves and seeds and chilli pepper. Some FFS participants took the initiative of preparing these biopesticides together, with two objectives in mind. First, to benefit from economies of scale in the preparation of biopesticides (collecting the ingredients, crushing, macerating and filtering). Second, farmers had noticed that because biopesticides are primarily repellent, an untreated plot in a lowland area could serve as a reservoir for pests which could quickly reinfest other vegetable plots. The group agreed to treat all plots in the same lowland area on the same day to avoid this situation and to improve treatment efficiency. In several lowland areas where this type of collective action has been developed (Figure 11), other vegetable farmers who were not members of an FFS group also have learned and begun to use biopesticides for their vegetable plots, and have been able to join the collective producing this local input.
- **Collective production of compost for women who have limited access to manure on their farms:** Some women participating in the vegetable gardening FFS learned how to produce and use compost for vegetable gardening. However, women only have limited access to organic fertilizer on their farms, as organic fertilizer (manure or compost) is mainly used to fertilize rainy season household crops. These women took the initiative to pool the small amounts of manure that they could access and began to produce compost in heaps in the lowlands where they grow vegetables (Figure 12). By doing so, they had access to greater amounts of higher quality organic fertilizer (from crop residues incorporated into the compost).
- **Negotiations in lowland areas to stagger the transplanting of tomato plants:** Tomato growers who participated in the vegetable gardening FFS agreed to stagger the transplanting of tomato plants in the lowland areas where they are cultivated (cultivation of tomatoes in several cycles transplanted a few weeks apart). By doing so, they limit peaks in production, which gives them greater bargaining power with tomato buyers from Lomé (Figure 13). Previously, vegetable farmers were forced to accept very low prices when their tomatoes ripened at the peak of production for fear of ending up with the entire crop rotting on the vines.

Figure 11. Collective preparation of biopesticides based on macerated neem, onion, garlic and pepper

Figure 12. Compost produced in vegetable gardening lowlands

Figure 13. Tomato harvest negotiations

Source: Bakker. 2021. Effets des démarches participatives sur les changements de pratiques agricoles : cas des champs-écoles en Afrique de l'Ouest. Thèse de doctorat en agronomie, Université de Montpellier.

From the perspective of supporting the AET, it would be inappropriate to rely only on the performance and profitability indicators usually highlighted by projects. It is important to also include in the discussions:

- Indicators related to the **ecological sustainability** of cropping systems and ecosystem health: for example, estimation of environmental and human risks related to pesticide use, water pollution, agro-biodiversity of agricultural systems.
- Indicators related to the **socioeconomic viability** of the technical options: for example, work time and drudgery, work schedule, loss of income for certain household workers, etc..
- **Technical and economic indicators**: for example, cash flow requirements of a technical management sequence or organoleptic qualities..

Data collection should be discussed between the facilitator and the FFS farmers so that the latter can participate, if possible, in data collection, and take ownership of the FFS results (e.g., during the AESA and regular animations). For complex indicators, only a **qualitative estimate or the farmers' perception** of the FFS (for example regarding insect diversity or human health risks) may be involved. The important point is to engage in a conversation about these sometimes forgotten environmental and socioeconomic dimensions (such as water quality, division of labour...).

It is also very important to **include diverse perspectives, including those of women, youth and resource-poor farmers** in the analysis of results, as they will not necessarily focus on the same indicators as the wealthy farm heads.

It is better to monitor a few indicators properly in carefully selected FFS plots than to try to undertake a large number of surveys that are not very accurate, not related to the issues selected by the group, and difficult to interpret and analyse.

Indeed, it is common for project actors to collect a lot of information during the course of the FFS, mobilizing resources even though these indicators are not relevant for the farmers and are often not used in the project documents. FFS are not experimental plots (Box 1); they are not expected to produce scientific and statistically significant results. Examples of quantitative and qualitative indicators are provided in the AVSF methodological guidelines (Bakker, 2017). **Taking notes on how the FFS process is running**, either by the facilitator or an FFS participant (depending on the type of indicator and the frequency with which it is monitored), is also important. The notes should cover discussion points and observations in the plots, as well as indicators used by the farmers (for example, drudgery of work, cash flow needs, etc.). These notes provide an account of how FFS are implemented (consultative or collaborative), but also provide inputs for programming a new round of activities the following year and for preparing the final project evaluation.

These recommendations also are valid for the **monitoring and evaluation of the FFS by the project**, which should not be limited to numerical indicators on participation in activities or indicators of yield and gross margin for the crops planted. There is a need to **train those responsible for monitoring and evaluation**, who will be able to document the FFS implementation process as well as monitoring the indicators for evaluating it during and after the project. It is therefore essential that these agents understand that the FFS approach aims not only to transfer technologies, but also to build capacities for observation and decision-making, and that this can take time and requires appropriate monitoring and evaluation indicators (Bakker *et al.*, 2022).

3.6.2 An annual debriefing meeting to discuss the FFS, its results and next steps

When the time comes to harvest, the facilitator and the group evaluate the overall performance of the different FFS plots, then harvest, weigh and dry the different crops present. They can also evaluate the quality of the products (size of the grain, ears, etc.), the state of the soil and weeds, the ease of harvest (for example for crop combinations). During the debriefing meeting, which takes place a few days/weeks after the harvest, the facilitator leads discussions between participants on the following points:

- review of the yields obtained after drying and weighing,
- summary of the observations made on the FFS plots during the crop cycle,
- calculation of gross margins,
- socio-environmental assessment based on other relevant indicators (see previous point 3.6.1).

During the debriefing meeting allows for a discussion on the advantages and disadvantages of the different technical options tested, and to propose adjustments to the current system or new themes to work on in the following FFS season.

At this debriefing meeting, the evaluation should not focus on technical-economic performance alone, but also on other environmental and socioeconomic indicators. Here again, the discussion should **involve women and young people** and explore their views, for example whether there has been an increase in work time or loss of income for these workers as a result of the use of certain AET-related innovations by the farm head. To compare with farmers' current practices, it is important to **avoid setting up a "farmer practice" plot that is cartoonishly simple or that only represents a minority of farmers** with the same level of resources. Another option is for the facilitator to monitor a few farmers' plots in the vicinity of the FFS plot to compare them to the FFS plots during the debriefing meeting (see detailed explanations in the AVSF methodological guidelines p. 24 (Bakker, 2017).

Finally, keeping in mind the learning and empowerment of the group, the meeting should end with the farmers' evaluation of their participation in the FFS:

- What did they like, what did they learn?
- What did they implement, what constraints did they face in implementation?
- What experiments, sharing of experience and collective actions can be envisaged?

3.7 SCHEDULING A NEW CYCLE OF CAPACITY BUILDING AND EXPERIMENTATION

After the first cropping season and based on the conclusions of the debriefing meeting, the FFS group can embark on **a new cycle of capacity building and experimentation**, with or without the support of the facilitator (depending on the duration of the support provided by the project and the capacity of the farmers who participated in the first FFS cycle). The debriefing meeting provides the starting point for the choice of crops and themes to be addressed during the following season in continuity (or not) with what was undertaken previously. A meeting to plan and launch the activities of the FFS should be scheduled a few months before the new season. This kick-off meeting takes up elements of the participatory diagnostic of the first season, including the discussion of current practices and problems encountered. The technical options discussed can also be enriched by **feedback from farmers** who have made changes in their farming practices. At the kick-off meeting, it also is a good idea to discuss the composition of the group and its functioning, to see if any changes need to be made.

Monitoring and evaluation can also be used to improve the way FFS operate from one year to the next. It is advisable to leave open the possibility of changing the way the FFS are conducted from year to year, based on feedback from the field (debriefing meeting, facilitators' assessment) and the first monitoring and evaluation indicators. Indeed, adjustments are needed to adapt to the reality on the ground, and possibly adapt to the varying conditions in different parts of the project intervention area. These improvements may involve:

- **the content, meaning the relevance of the theme addressed**, and its adaptation to different types of participants (e.g. women, youth, poor) in a group, the feasibility of the options tested, the complexity of the number of FFS test plots or the indicators for monitoring the plots, etc.
- **but also the "container"**, meaning the facilitation methods used, ensuring equal participation of all members, the satisfaction of the participants, the timing and modalities of meetings, the access to the FFS plot, etc. (Bakker, 2017).

Successive FFS cycles are not only intended to support changes in practices, but also to create learning networks and to enable farmers to plan and carry out FFS more independently. It may therefore be possible **to transfer responsibility for FFS management from the project/facilitator to the FFS group** (for example, to plan cropping operations) after one or more cycles, always in consultation with the facilitator and the project team.

© Olivier Asselin

4.

© FAO

4. How to design and integrate FFS in an AET support project? Recommendations to designers and project managers

This section is aimed at project designers and managers, again with a view to guiding them in implementing FFS that support the AET. It aims to place FFS within the broader context of a development intervention, starting with the design of the project, throughout implementation of activities and up to its possible continuation.

4.1 INVOLVE FARMERS AND OTHER STAKEHOLDERS IN DEFINING THE OBJECTIVES AND CONTENT OF THE PROJECT AND THE FFS

When the objective is to strengthen farmers' capacities to experiment and adapt their practices, it is not appropriate to propose "ready-made" solutions or to transfer a technological package or a cropping system that were designed elsewhere. The results of the study (section 2.3.) showed that in the majority of cases, **farmers adapt the practices tested in the FFS to their own situations**. In addition, farmers do not change their entire system all at once (too risky and complex), but make gradual adjustments in their practices and crop management (demonstrated by the progressive trajectories of changes in practices).

Likewise, for collaborative FFS to be successful, **the technical options tested in the FFS should not be chosen by outsiders on the basis of their a priori agronomic relevance**[7]. The practices tested must be chosen based on a diagnostic of the farmers' needs and priorities (territorial agricultural system diagnostic (Box 6), participatory diagnostic with the FFS group (Box 8).

There are two main ways to do so:

- The first is to **formulate the objectives of the development project without specifying the content**[8] and without foreseeing the formulation of a standardized curriculum by experts (for example, researchers or consultants). In this case, the project plans to first **set up the farmer groups participating in the FFS**, and then hold a **participatory diagnostic workshop** (as presented in section 3.3.) with each group to identify the crop and technical options to be tested in the FFS. Another possibility is to include an **"innovation tracking"** step in the project design stage, i.e. a survey of innovative farmers in the area, to suggest that the farmers experiment with technical options that already are used in the area (see Box 9). These two approaches (participatory diagnostic workshop and innovation tracking) can also be used in a complementary manner.

- The second way, for a project that needs to specify the FFS theme at the design stage, is to adopt a **"basket of options"** (Ronner et al., 2021) approach when setting up the FFS. In this case, although farmers cannot influence the choice of FFS theme (for example, growing legumes), the facilitator seeks to provide different technical options in the FFS so **that farmers can pick and choose the options** that suit their situation. Ideally, the proposed mix is enriched by **farmers' proposals** or their feedback for the second year.

7 *In other words, based on data gathered prior to the start of the project, only on a theoretical basis and without discussion with the beneficiaries concerned.*

8 *This option should be negotiated wherever possible with the donors concerned. This may involve specifying the content in a very general way (e.g. working with agro-pastoralists, or farms interested in vegetable crops) so that it is less restrictive than specifying very precise themes or specific crops.*

In order to ensure that the subjects addressed in the FFS are not defined in advance (a priori), it would be useful to **ensure that all of the actors have the same understanding of the "farmer field school" approach**. For this, it is necessary to:

- clearly discuss with the **stakeholders involved in the design and management of the project** the objectives of the FFS and the underlying assumptions (e.g., *Where does this innovation come from? What is the role of research, facilitators and farmers in the process?*)
- distinguish between the objective of "disseminating a technique" (*"technology transfer"* FFS) and **an objective of "collaborative" farmer participation** (involving farmers in decisions to strengthen skills) (see section 2.2.2):
- ask **who participates, and at what stages of the process and why** (legitimization of the intervention or delegation of real decision-making power to the farmers?)
- be clear about **what is meant by "farmer participation"** in the pre-FFS stages: is it local "leaders" or members of an FO, for example?
- anticipate the **training of facilitators and project agents** (technical managers, monitoring and evaluation officers, etc.) (see section 3.4.).

4.2 CONSIDER FFS AS COMPLEMENTARY TO OTHER PROJECT ACTIVITIES

Knowing about the functioning of the farms and the typology of the farms (through the diagnostic of the agricultural systems, see section 3.1.) is useful to **define the additional activities of a project** that has already planned to set up FFS. In Togo, for example, activities have been implemented to facilitate the production and transport of organic fertilizer. These activities are complementary to the knowledge acquisition that the FFS enabled on the compost making process and its use for crops (Box 12).

These examples show that **an FFS must not be viewed as an isolated process that operates independently of other forms of support to farmers** and achieves impacts regardless of the context. To facilitate changes in farmers' practices, activities can also involve:

- support for farms or small groups to access **equipment specific** to agroecological practices (transport, direct seeding, pit digging tools, ultra-low volume battery-operated sprayer) or **specific inputs** (service plant seeds, ingredients of natural preparations, etc.).
- support for **marketing** if the project aims to promote new crops that are not known in the area or to increase production (for example, for soybeans and vegetables that are rapidly overproduced), or even support for certification or alternative verification systems (participatory guarantee systems, etc.) for agroecological and organic products.
- support for **conservation, processing** and linking with quality and healthy farm household diets.

From the perspective of supporting farmers' AET, it would be interesting to complement the FFS with initiatives on a **larger spatial scale** (village, watershed, territory). For example, at the village level, compromises must be sought between biomass users (livestock breeders, farmers, foresters, processors) to encourage the use of available biomass for agroecological practices (mulching the soil in the dry season with crop residues, massive production of compost with crop residues, leaving pruned field tree branches on the ground to decompose, etc.) without creating tensions between the categories of users. These trade-offs can lead to negative effects in terms of crop nitrogen balance (nitrogen taken up by soil microorganisms degrading the biomass) or forage self-sufficiency. In these cases, complementary activities (advisory support, mediation, governance) must involve the entire village territory (and not just the FFS group's farms) by including a diversity of farms and their relationships of dependence and competition.

Box 12

Thinking of FFS as complementary to other project activities

Under the 'Sustainability and Resilience' project in northern Togo, the production of good quality compost and its use for rainy season and vegetable gardening crops (to be combined with mineral fertilizer depending on the needs of the crops) were discussed during the FFS and during training sessions in the villages. To alleviate constraints on the production and use of organic fertilizer, the project also launched two complementary activities: support for the digging of compost pits, and support for the provision of donkey carts for transport.

- Farmers were given **support to demarcate and dig a compost pit on their farms**, including equipment (pickaxes, measuring tape, stakes, etc.) supplied to village FOs and assistance in marking out a pit on each volunteer farm. This initial support has enabled some to reproduce the pit's dimensions and dig several pits to intensify compost production on their farms (Figure 14).
- Transporting crop residues and organic fertilizer (manure or compost) from the farm to the field (away from the farm) is a constraint to its use for rainy season crops, as these crops require large amounts of manure. This task is often left to women (carrying it on their heads or using a bicycle), as the poorest farms cannot afford to buy or rent a cart. Within the framework of the project, small groups of women living near each other received **support to equip themselves with donkey carts** (Figure 15). The project ordered good quality carts from local artisans, purchased donkeys, and funded half of the cost of the cart plus the donkey kit. Project advisers identified neighbourhood groups (primarily of women) consisting of 3-5 people who covered the remaining cost of the kit. The beneficiary groups were accompanied and monitored in setting up collective management rules to ensure the maintenance and renewal of the equipment. This activity has reduced the burden of transport for household chores (water) and cultivation, but also improved the profitability of women's economic activities [an unanticipated but very important effect (AVSF, 2017)].

These two activities have facilitated the production and transport of organic fertilizer, and they also complement the knowledge acquisition enabled by the FFS on the compost making process and its use for crops.

Figure 14. Photo of an emptied compost pit (mature compost pile under the trees) ready to be filled with crop residues and manure

Figure 15. Transporting crop residues with a donkey cart

Source: Bakker. 2021. Effets des démarches participatives sur les changements de pratiques agricoles : cas des champs-écoles en Afrique de l'Ouest. Thèse de doctorat en agronomie, Université de Montpellier.

It would be unrealistic to assume that the other processes necessary for the AET of a territory will take place by themselves once a small number of farmers (from the FFS group) are willing to change their production techniques to more ecological practices. All of the actors engaged in **supporting an innovation process** are involved in the AET at the local, regional and even national level. A project mobilizing FFS must be connected with all of the actors working in the territory to support AET (farmers and FO representatives, researchers, development agents, advisers from state agricultural services, etc.), as to **coordinate the actions and objectives sought to make AET a success at the territorial level.** Ideally, farmers and other actors should each innovate in their own field of expertise (processing, marketing, input supply, etc.) but in a coordinated way and to achieve the same goal, that of successful AET. There may be some differences of opinion between these actors or between categories of farmers. However, for change to occur (locally and especially on a large scale), they need to find compromises and work together within an environment favourable to AET (public policies).

A first possible solution for integrating FFS into local innovation systems is the parallel setup of an **innovation platform** to try to overcome bottlenecks farmers cannot resolve alone. For example, for FFS targeting cotton-growing, the inclusion of cotton stakeholders in such platforms is essential to inform them and discuss possible options. Nevertheless, in this case the stakeholders in this sector (FOs, cotton companies, research institutes) need to be willing to change and consider that it is important to co-design an AET of cotton-based systems.

A second possible solution lies in **designing coupled innovations**. In other words, when designing innovations for agriculture and food systems, consider components of both systems together rather than separately. For example, coupled innovation could make it possible to remove some of the obstacles to the development of leguminous crops in cropping systems, particularly for species such as Mucuna, by acting on the suppliers of suitable inputs (particularly seeds) and the buyers of the final product (seed and/or fodder) or the ways in which this product is used (processing). Similarly, technical and organizational land management innovations need to be introduced when there is competition over forage crop residues between livestock and land cover. Without new agreements between farmers and livestock owners, or robust and affordable field fencing techniques, it would be difficult to sustainably establish long-cycle or multi-annual forage crops. As FFS aim to promote the exchange of knowledge and experience between farmers, it would be possible to associate FFS with an intervention for the design of coupled innovations, with the aim of promoting a "collective exploration of innovative solutions" for new ways of managing natural spaces and resources.

4.3 DEFINE A STRATEGY FOR TARGETING PARTICIPANTS

Social organization in the project area must be considered when targeting FFS participants to avoid excluding certain categories of the rural population or project activities being captured by elites. The profile of the participants influences the effects observed. Two types of project targeting strategies can be distinguished (Phillips *et al.*, 2014):

- a farmer targeting strategy focused on **"equity"** (targeting the most disadvantaged or those farmers considered a priority by project managers);
- a strategy focused on **"effectiveness"**, meaning project managers assume that by reaching farmers with more resources, education or capacity to act or invest, the project (and its FFS) can maximize the effectiveness of the intervention and increase its impacts.

However, while projects using the “effectiveness” strategy have no difficulty in achieving their objective of reaching the farmers with the most resources, “equity” targeting is much more difficult to

achieve because **inclusion criteria and mechanisms continue to favour (voluntarily or involuntarily) elites, local people and male farm heads**. In practice, the wealthiest farmers are often the beneficiaries of FFS, whether this is the objective of the targeting strategy ("effectiveness") or not ("equity").

In our study in Togo and Burkina Faso, the two projects did not have a specific targeting strategy. The only criterion used by both projects was that farmers belong to a partner FO (to ensure the sustainability of the actions even after the end of the projects). This criterion may have led to an indirect selection of beneficiaries (for example, very poor farmers may be unable to pay an FO membership fee). In Togo, however, communications prior to setting up the FFS **explicitly encouraged the participation of women,** which is reflected in the FFS membership. Conversely, in Burkina Faso, the choice of cotton-growing for the FFS, a crop usually managed by men, has effectively discouraged women's participation in the FFS.

Literature shows that without a clearly defined targeting strategy and method, FFS are often captured by local elites and/or wealthier farmers. However, even with a targeting strategy and method, **the risk of capture by elites remains high**. This is why, at the start of the activities, this question must be discussed, and **project stakeholders** (partner FOs, public services, technical and financial partners, etc.) must be aware of this tendency (voluntary or not) **to favour the elites to the detriment of underprivileged populations** (the poorest, women, young people). Arrangements must then be made to ensure that the **presence of underprivileged farmers at meetings** is really possible (e.g. adapting the schedule and/or the duration, ensuring a means of contact for people without a cell phone, etc.). Access to arable land is also an aspect to consider when accompanying particularly vulnerable farmers (activities should be included in projects to facilitate access to land, for example with community gardens).

4.4 HOW CAN WE MAKE FFS MORE SUSTAINABLE AT A SCALE?

4.4.1. More autonomous and sustainable FFS groups

FFS groups are not intended to necessarily last beyond the duration of the project itself. The future for FFS groups after the end of project activities is open. If the support of the facilitators stops, an option for the groups may be to become a **collective cropping group** (and stop testing technical options in the FFS plot in favour of one or two larger collective crop plots). But even in this case, this group can **remain a space for discussion** of each other's problems and experiences. Project stakeholders can prepare this next step with the FFS group by, for example, proposing a preliminary planning activity during the last meetings with the FFS facilitator, or training some FFS members to become farmer facilitators. Discussions should focus on the collective actions that the group wishes to carry out (collective plot, biopesticide or compost preparation group, group purchase of inputs or equipment, etc.) and how to obtain and manage the necessary funds.
There also are many examples of groups of former FFS participants that are organized to varying degrees. These groups carry out a variety of actions that often resemble those of management committees (for a vegetable garden area, a portion of a watershed, etc.) or village FOs. The continuation of the FFS, when desired by the group, raises **questions of organization** (what objectives?), **governance** (land, sharing of production) and possibly **external support**, and therefore of its financing and/or institutionalization.

There are several advantages to the **institutionalization of FFS:**

- Their continuation allows the action to be pursued and further strengthen farmers' skills and ability to innovate independently.
- Their recognition by public institutions and thus, the recognition of farmers' capability to experiment. This recognition can also lead to the sustainable financing of the FFS, which would then be autonomous and require only limited support.
- The integration of the FFS approach into training curricula and national advisory systems. It is then possible for this type of mechanism to cover a large territory and reach a large population.

However, the major drawback of institutionalization is the **risk of misusing the name "farmer field schools" for technology transfer initiatives** (demonstration plots, limited consultation of farmers, standardized curricula), as has been the case, for example, in Cameroon and in some FFS in Burkina Faso.

The FFS approach can only change scale and lead to dynamic, innovative groups of farmers committed to AET if institutions (public and private, such as FOs) and public policies evolve and become compatible with the basic principles of FFS. In many cases, scaling up leads to a return to standardized approaches to extension and technology transfer, retaining only the methodological principle of working with groups of farmers using experiential learning. In these situations, farmers' participation is then limited to being a **method to manage so-called 'farmer field schools', becoming an approach intended to facilitate the acceptance or dissemination of new practices** and legitimize the intervention, with varying degrees of deviation from FFS principles. These activities do not achieve the **objective of strengthening the individual and collective skills of rural communities**. This also has been the case in Indonesia where, after two decades of FFS, the people who introduced the approach have left the advisory services and have not been replaced by people who share their vision (van den Berg *et al.* 2020).

The strengthening of FOs and their empowerment in implementing collaborative FFS is also a potential way of making FFS sustainable, but this again requires a **favourable institutional context**, first and foremost the renewed support of public policies for their basic operations.

4.4.2. Change of scale and cost/benefit balance

Implementing FFS on a large scale is a complicated process. How can an intervention that has led to interesting effects for farms in a few villages (six communes in Togo), promote change in a large number of farms and villages? The promotion of FFS as a "ready to use" approach is attractive to donors who often have quantitative regional and national development goals. However, **the challenge of implementing FFS is to transfer a process (of questioning practices and of collaborative experimentation), not results (or techniques deemed more relevant).** Therefore, despite the benefits of a large-scale project that reaches a wide population, there is a significant risk of simplification and deviation from the basic principles of FFS.

Nevertheless, a few avenues can be explored:

- **Carrying out participatory diagnostic with each FFS group remains fundamental** (to ensure that a need is met). If the project covers a large area, it may then be possible to gather together, after the participatory diagnostic, the groups that have chosen the same themes or the same crops to offer them **curricula with similar contents.**
- Furthermore, it should not be forgotten that, whatever the cropping system chosen, a certain number of themes are in any case **transversal** and apply in a majority of farming situations. For example, the production of organic fertilizer and its use in combination with mineral manure, the benefits of integrating legumes as pure crops or intercropped (whether from the point of view of economic benefits, diversification, controlling Striga, etc.), crop rotation (both rainy season and vegetable gardening), the dangers of pesticides applied without precautions (herbicides, cotton, vegetable gardening), etc.
- The focus should be on the **quality of the projects** and therefore it is important that all projects and AET actors draw on their experiences and discuss them in workshops, innovation platforms and through digital tools (videos presenting results, WhatsApp groups, webinars, etc.). Innovative farmers, and especially FFS groups involved in AET, must have a place in these sharing mechanisms.

5.

© AVSF

5. Prospects for the evolution of the farmer field school approach to support agroecological transitions

Given the challenges faced by family farming in the countries of the Global South (climate change, food security, human health and ecosystems, etc.), **the FFS approach must continue to evolve to enable an effective approach to supporting farmers who are engaging in AET in rural territories**. In this section, we present possible developments and challenges that the FFS approach must manage in the future.

Better inclusion of gender in the design and implementation of FFS

Women sometimes face difficulties in accessing farm advisory services, although the participation of women in these activities is encouraged by the majority of institutions, particularly because of the importance of women's work in agriculture (production, processing, marketing, transport, etc.). The involvement of women in projects can bring results in terms of empowerment and improvement of their individual activities, but also facilitate the application of innovative practices in collective fields and improve farm and household management.

For this, it is first necessary to think about **including women in the FFS targeting strategy** (see section 4.3) and to ensure that this strategy is applied (because of exclusion mechanisms that also affect young people and the poorest farmers). One also should bear in mind that **women are not a homogeneous group** (with, for example, great differences between the constraints of a married woman and a widowed woman who is the head of the farm or who can mobilize part of the working time of her teenage children or young adults). Finally, **favourable conditions must be created to enable them to speak out** if they wish to do so. This should be taken into account in FFS activities, especially during the definition of the technical options to be tested (during the participatory diagnostic with the FFS group) and during the debriefing meeting.

When women participate in FFS, the following questions can be asked to **maximize the effects of their participation:** *After participating in an FFS, how do women share the knowledge they have gained with other members of their household, such as their husbands or sons who are in charge of managing the family's productive activities? How do they negotiate changes in practice? Do they face constraints to change in their own plots? What flexibility do they have in the division of labour between husband and wife (wives), for example?* The answers can come from the diagnostic of the territorial agricultural system and discussions with the participants. In some cases, it may be necessary to undertake specific studies, or at a minimum to include these issues in the evaluation of the FFS, and thus to find the resources needed to do so. The answers obtained will allow the FFS activities to be more relevant to the entire family, especially in the choice of technical options tested. Similarly, including the age and/or status of farmers in the criteria for choosing technical options may enrich the options tested in the FFS.

Taking into better account the complexity of family farms

In connection with the previous point on the inclusion of gender in the programming and implementation of FFS, it is also relevant to **integrate elements related to how family farms operate**. This raises the question of how individual rainy season plots fit into the technical options proposed in the FFS. Indeed, the various members of a household (husband, wife/wives, adult sons and daughters, and sometimes other members of the household such as elderly parents) often cultivate a small plot. What are the objectives of the FFS for these plots, and how can advice be provided that would also be suitable for these individual crops? It also is important to consider **how livestock are managed and how access to organic fertilizer varies among** household members (for example, access to organic fertilizer is often limited for women in family farms).

Integrate labour and mechanization into FFS and their assessments

AET raises questions about labour in agriculture, including in West African family farms, because **it may require more labour for operations** that are based most often on human energy (production and use of organic fertilizer, protection and guarding of reforested areas and soil cover biomass, preparation of on-farm biopesticides, etc). Governments also are seeking to modernize their agricultural sectors through the **mechanization of cultivation and crop processing operations** in order to meet various objectives, such as the need to increase agricultural production, meet the challenges of resilience, sustainability and adaptability of family farms, and encourage young people, who are put off by manual work, to take up farming. It is clear that this issue of labour is rarely discussed in FFS. Indeed, at the scale of the FFS plot, which generally covers only a few acres and often not more than 0.5 ha, the work can be carried out manually or with the tools already present on the farm (animal traction tools, wheelbarrow, pickaxe, basket, etc.). There is therefore a need to explore **the extent to which labour-related constraints (distribution of tasks among the active members of a household, nature, arduousness, distribution in the cultural calendar, etc.) can be taken into account in the implementation of FFS:** *what are the possible improvements of the FFS to respond to farmers' labour constraints, how to limit the negative effects of the changes in practices on the labour and well-being of each worker, including young people and women?* Elements of a response may be found in sections 3 and 4 of this document.

However, it appears particularly important to include these labour-related criteria in the evaluation of the technical options tested in the FFS, and to include the opinion of different types of farmers (less well-off and poorly equipped, young people, women, etc.) in the co-design of agroecological practices.

Examine adaptations of FFS around integrated production systems

New forms of FFS have emerged, notably agropastoral or agro-sylvo-pastoral FFS, as well as other more or less similar training and advisory support approaches (such as family farm advisory services (FFAS) and farmer business schools (FBS)). There also are Junior FFS targeting rural school children, and by extension, farm households. Other examples are FFS on agroforestry, "natural agriculture" (with intensive mixed farming, agroforestry and tree cover) in Andhra Pradesh (India), and kitchen gardens (with a focus on nutrition), and so on.

These approaches to strengthening farmers' capacities are based on different notions and concepts (for example, management, coordination, synergy between species in the case of mixed farming systems). However, they all share the same main target, namely the people managing a farm (farm heads, household workers, etc.), and view the farm as a system. FBS focus on the economic and financial management of a farm, while agropastoral FFS concentrate on the technical and economic management of the different units of a farm and their synergy. With a view to supporting farmers in AET, agropastoral and agro-sylvo-pastoral FFS are examining new avenues and are no longer limited to the single cropping system targeted in the original FFS approach (whether these cropping systems are perennial, vegetable gardening or rainy season, for self-consumption or intended for the local market or for export) (FAO, 2016).

These approaches promoted by the FAO are not unlike the family farm advisory services approach (Faure *et al.*, 2007). Even in the case of production systems with a main crop (for example, a cash crop), it is possible to propose the introduction of useful intercrops in the FFS. A number of FFS initiatives (Kenya, India, Ecuador, Burundi, etc.) also have emphasized an integrated approach to improving soil health and water cycles.

All of these approaches are complementary, and development projects and programmes will need to find best combinations based on the areas targeted, the issues to be addressed, and the needs of the farmers involved. The effects of these approaches have not yet been studied in-depth, but they could be interesting. For example, agro-sylvo-pastoral FFS, by placing themselves at the interface between cropping systems, livestock systems, natural resource management (the role of trees on farms) and the production of organic fertilizers, are by their very nature more likely to bring about systemic changes in the overall functioning of the farm and even in the state of natural resources in a village territory. These changes are often the basis for the design of AET. Several methodological issues are raised by this type of FFS, including the complexity of their implementation, the adaptation of the parameters to be monitored during observations and AESA, and the practical experiments to be set up to promote the study and understanding of biological mechanisms and synergies.

However, these initiatives face the same challenges involved in the effective application of FFS principles (presented in section 2.2.2), namely the tendency to fall back on technology transfer approaches that are still very much anchored in the ways of institutions (whether research and development or consultancy) and in the practices of the advisers involved.

Consider combining FFS and information and communication technology (ICT)

The increasing use of mobile phones by many farmers, and other more advanced ICTs by some of them (and project staff as well), raises questions about forms of advice, and in particular about FFS: *can FFS be enriched by the use of ICTs, and if so, how?* Attempts to digitalize FFS have been made, particularly in health crisis contexts such as Ebola (Witteveen et al 2017: use of non-Internet-connected tablets with software and videos, and ability to reach advisers remotely). However, according to studies carried out in West Africa, one should remain cautious in this regard, as for the moment **these tools are still mainly used to disseminate standardized knowledge** rather than allow exchanges between farmers or between advisers and farmers. This is the case, for example, in Burkina Faso, where ICTs are mainly used by projects to transfer standardized information to farmers, or to obtain information quickly on the basis of data collection by agricultural advisers.
While in theory digital tools can lead to a transformation of the advisory approach (as observed with WhatsApp groups of literate farmers, videos presenting practices applied elsewhere, etc.), in practice **ICTs tend to lead to reinforced monitoring and supervision of farmers** more than to a better coaching approach to strengthen their skills. In most cases where ICTs are used, these technologies alone do not allow for the creation of more interactive advisory services adapted to localized agricultural situations. There is thus still a long way to go before we can use ICTs successfully in a participatory advisory approach like FFS. Additional issues concern the potential exclusion of farmers who do not have access to these technologies, for example the poorest and women for cell phones, and a large number of farmers for smartphones (including all non-literate people). Finally, another challenge is linked to how partner FOs can maintain the digital advisory services platforms set up and use them in the best way in their activities.

References

Altieri, M.A., ed. 1995. *Agroecology: the science of sustainable agriculture*. 2nd edition edition. Boulder, Colorado, Westview Press.

AVSF. 2017. *Guide méthodologique pour l'équipement de petits groupes de producteurs en charrettes asines. Une stratégie pour catalyser la mise en oeuvre de pratiques agroécologiques dans la région des Savanes au Togo.* AVSF. https://www.ssl.avsf.org/public/posts/2136/avsf_guide_charettes_asines_togo.pdf.

Bakker, T. 2017. *Démarches d'accompagnement pour la co-construction d'innovations paysannes: guide méthodologique des champs-écoles dans la région des Savanes au Togo.* AVSF. https://www.avsf.org/fr/posts/2093/full/guide-methodologique-des-champs-ecoles-de-la-region-des-savanes-au-togo

Bakker, T. 2021. *Effets des démarches participatives sur les changements de pratiques agricoles : cas des champs-écoles en Afrique de l'Ouest*. Montpellier, France, Université de Montpellier. (thèse de doctorat en agronomie)

Bakker, T., Blundo Canto, G., Dugué, P. & de Tourdonnet, S. 2020. To what extent is the diversity of farmer field Schools reflected in their assessment? A literature review. *The Journal of Agricultural Education and Extension*: 1–21. https://doi.org/10.1080/1389224X.2020.1858890

Bakker, T., Dugué, P., Roesch, K. & Phillips, S. 2022. *Methodological recommendations to better assess the effects of Farmer Field Schools mobilized to support agroecological transitions*. FAO, Rome.

Barrios, E., Gemmill-Herren, B., Bicksler, A., Siliprandi, E., Brathwaite, R., Moller, S., Batello, C. *et al.* 2020. The 10 Elements of Agroecology: enabling transitions towards sustainable agriculture and food systems through visual narratives. *Ecosystems and People*, 16(1): 230–247. https://doi.org/10.1080/26395916.2020.1808705

van den Berg, H., Ketelaar, J.W., Dicke, M. & Fredrix, M. 2020. Is the farmer field school still relevant? Case studies from Malawi and Indonesia. NJAS - *Wageningen Journal of Life Sciences*, 92: 100329. https://doi.org/10.1016/j.njas.2020.100329

Blanchard, M., Vall, É., Tingueri Loumbana, B. & Meynard, J.-M. 2017. Identification, caractérisation et évaluation des pratiques atypiques de gestion des fumures organiques au Burkina Faso : sources d'innovation ? *Autrepart*, 81(1): 115. https://doi.org/10.3917/autr.081.0115

Darré, J.-P. 2006. *La recherche co-active de solutions entre agents de développement et agriculteurs*. Etudes et travaux. Editions GRET.

FAO. 2016. *Farmer Field School Guidance Document. Planning for quality programmes*. FAO, Rome.

Faure, G., Dugué, P. & Beauval, V. 2007. Conseil aux exploitations familiales. In M. Gafsi, P. Dugué, J.-Y. Jamin & J. Brossier, eds. *Exploitations agricoles familiales en Afrique de l'Ouest et du Centre*, pp. 369–402. Editions Quae.

Ferraton, N. & Touzard, I. 2009. *Comprendre l'agriculture familiale. Diagnostic des systèmes de production*. Quae CTA Presses agronomiques de Gembloux.

Hill, S.B. & MacRae, R.J. 1996. Conceptual Framework for the Transition from Conventional to Sustainable Agriculture. *Journal of Sustainable Agriculture*, 7(1): 81–87. https://doi.org/10.1300/J064v07n01_07

HLPE. 2019. *Agroecological and other innovative approaches for sustainable agriculture and food systems that enhance food security and nutrition*. A report by the High Level Panel of Experts on Food Security and Nutrition of the Committee on World Food Security, Rome.

Périnelle, A., Meynard, J.-M. & Scopel, E. 2021. Combining on-farm innovation tracking and participatory prototyping trials to develop legume-based cropping systems in West Africa. *Agricultural Systems*, 187: 102978. https://doi.org/10.1016/j.agsy.2020.102978

Phillips, D., Waddington, H. & White, H. 2014. Better targeting of farmers as a channel for poverty reduction: a systematic review of Farmer Field Schools targeting. *Development Studies Research*, 1(1): 113–136. https://doi.org/10.1080/21665095.2014.924841

Ronner, E., Sumberg, J., Glover, D., Descheemaeker, K., Almekinders, C., Haussmann, B., Kuyper, T. *et al.* 2021. Basket of options: Unpacking the concept. *Outlook on Agriculture*: 003072702110194. https://doi.org/10.1177/00307270211019427

Salembier, C., Elverdin, J.H. & Meynard, J.-M. 2016. Tracking on-farm innovations to unearth alternatives to the dominant soybean-based system in the Argentinean Pampa. *Agronomy for Sustainable Development*, 36(1). https://doi.org/10.1007/s13593-015-0343-9

Tittonell, P. 2014. Ecological intensification of agriculture—sustainable by nature. *Current Opinion in Environmental Sustainability*, 8: 53–61. https://doi.org/10.1016/j.cosust.2014.08.006

Wezel, A., Herren, B.G., Kerr, R.B., Barrios, E., Gonçalves, A.L.R. & Sinclair, F. 2020. Agroecological principles and elements and their implications for transitioning to sustainable food systems. A review. *Agronomy for Sustainable Development*, 40(6): 40. https://doi.org/10.1007/s13593-020-00646-z

Plant Production and Protection Division
Natural Resources and Sustainable Production
Food and Agriculture Organization of the United Nations
Rome, Italy

The Global farmer field school Platform
Farmer-Field-Schools@fao.org
fieldschools@dgroups.org
www.fao.org/farmer-field-schools

ISBN 978-92-5-136134-4
CB9920EN/1/05.22