



Food and Agriculture
Organization of the
United Nations

**Evaluation of FAO's contributions to
Sustainable Development Goal 2**
*"End hunger, achieve food security and improved
nutrition and promote sustainable agriculture"*

2
ZERO
HUNGER



Farmer field schools and their derivatives

About this document

Studies and reports on the farmer field school approach show that it develops the skills and knowledge of farmers, allowing them to create more efficient and sustainable production systems and, thus, contribute to the achievement of the Sustainable Development Goals (SDGs). As far as SDG 2 is concerned, while there is an indirect link to targets 2.1 and 2.2, the largest farmer field school contributions are to be found in relation to targets 2.3 and 2.4, which focus on increasing agricultural productivity and income, and sustainable production systems and agricultural practices, respectively. The main objective of this review was to inform the SDG 2 Evaluation on the relevance and contribution of the farmer field school approach to the SDG 2 targets and the principles of

the 2030 Agenda. It found that in addition to developing the methodology at the heart of the approach and exporting it to countries and regions to support small-scale farmers, FAO achieved significant results and brought about substantial change on various levels. The review concluded that farmer field schools went beyond the mere sharing of information and focused more on knowledge discovery through direct experience and community co-creation. The review recommends that FAO continue its work to support national governments in scaling up the approach while ensuring the quality of the methods. FAO should also ensure that the benefits to farmers' empowerment continue and contribute to greater coordination and monitoring of results and progress made.

SDGs



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Abbreviations and acronyms

CSA	<i>Climate-smart agriculture</i>
FAO	<i>Food and Agriculture Organization of the United Nations</i>
FFS	<i>Farmer field school</i>
IPM	<i>Integrated pest management</i>
M&E	<i>Monitoring and evaluation</i>
MEL	<i>Monitoring, evaluation and learning</i>
NGO	<i>Non-governmental organization</i>
NSP	<i>FAO Plant Production and Protection Division</i>
SDG	<i>Sustainable Development Goal</i>
VSLA	<i>Village Savings and Loans Association</i>

1. Introduction

This document is a brief review of the Food and Agriculture Organization of the United Nations (FAO) farmer field school (FFS) approach, conducted as part of the Office of Evaluation's (OED) Evaluation of FAO's contributions to Sustainable Development Goal 2 (SDG 2). Its main objective was to inform the SDG 2 evaluation on the relevance and contribution of the FFS approach to the SDG 2 targets and the principles of the 2030 Agenda.

The report was compiled using two key data-collection methods: i) a review of literature and documents produced by FAO and other actors, including previous evaluations, assessments, research papers and publications collecting evidence on FFS results; and ii) interviews with FAO personnel at headquarters and in regional and country offices. A list of the stakeholders interviewed can be found in Appendix 1 to this report, while the documents reviewed can be found in the bibliography.

1.1 History of the farmer field school approach

An FFS is a group of up to 25 producers that meets regularly to identify common problems and develop collective solutions to local agricultural production issues. The first FFS were part of an FAO programme in Indonesia in the late 1980s to introduce new integrated pest management (IPM) approaches to groups of rice farmers. FAO originally developed the approach to give Asian rice farmers a better understanding of complex systems and agroecological processes, as well as how to adapt their IPM decisions based on the situation in the field, rather than merely follow the standard protocols of input-intensive crop production that came with green revolution technologies.

In the 30 years since, the FFS approach has then been introduced to a large number of countries and applied to different aspects of agriculture, pastoralism and livestock rearing, climate change, fisheries, agricultural marketing and life skills.

FFS have adapted to different agroecological zones, from irrigated systems to rain-fed and arid zones, and to a wide range of farming systems, from crop-based to agropastoral systems. Currently, more than 90 countries in Asia, Africa, the Near East, Latin America and Europe use the FFS approach. Every year, between 400 000 and 1 million farmers participate in an FFS, with an estimated 20 million farmers taking part since their inception (FAO, 2019b).

The FFS methodology can be easily adapted to numerous topics, as long as it blends a technical focus with the development of farmers' capacity to learn through their own observations, exchange with peers and develop soft skills, so they can become more empowered.

FAO has been heavily involved in the incubation, development and spread of FFS from the outset. From its birthplace of Indonesia, the approach spread to other parts of Asia during the early 1990s, to Africa in the mid-1990s and then to other parts of the world. Over the years, the FFS approach has been recognized as dynamic and promising to interact with farmers and managing complex systems.

FAO has played a leading role in advocating for and supporting FFS to governments and other development actors. FAO programmes commonly use the concept, facilitating the sharing of knowledge and experience for a large and diverse community of practitioners.

Box 1. The farmer field school

A full production cycle¹ defines the duration of an FFS learning programme. In a typical FFS, a group of farmers, herders or fishers meets regularly in a local field setting under the guidance of a trained facilitator. They make observations on the local production system, focusing on the topic of study, and examine and compare the effects of two or more alternative practices aimed at addressing the problem – one following local practice, the other testing “promising practices”.

Participants discuss and take decisions based on observations and analysis of the location and the issue being studied using agroecosystem analysis. At the end of the season, the FFS group holds a field day to share findings with local authorities, agricultural workers and other farmers. Exchange visits with other FFS are also encouraged. Post- FFS activities enhance community development. An essential element of good quality FFS programmes is the training of facilitators to support the process. FFS “master trainers” prepare facilitators in season-long field-based programmes, complementing practice with theory. Facilitators typically include non-governmental organizations (NGOs) and public extension workers, the staff of farmers' organizations and farmers.

Source: FAO (n.d.)

1.2 Key values of the farmer field school approach

The FFS approach is based on proven non-formal adult education foundations that seek to empower learners/farmers to make improved agricultural decisions adapted to diverse and variable field conditions. At its core are ecological learning, systems analysis and experimentation for groups of farmers that meet routinely with a trained facilitator in practical, field-based sessions over an entire production cycle to learn how to make adaptive management decisions, find local solutions and work and learn together as a group.

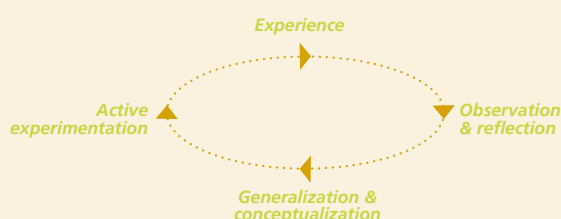
Learning as a group is a key aspect of FFS and aims to provide farmers with key skills to improve their livelihoods, such as adapting technological innovations to their context, setting up a group, undertaking joint purchases and solving collective problems. FFS also aim to help bring about behavioural change by empowering individuals to make changes together, rather than merely doing

¹ In agropastoral field schools, it is also common to combine two cycles (such as livestock, then crops) to work on the integration of livestock and cropping activities.

things as they have always been done.² In FFS, farmers share their experiences, knowledge and ideas, so that they learn from each other as well as from the facilitator and by observing and experimenting together. Shared experiences boost farmers' confidence to take up innovations and new initiatives. FFS help create a local support system for farmers and strengthen community cohesion.

Box 2. Kolb's learning cycle at the heart of the farmer field school approach

All FFS learning activities use Kolb's learning cycle (FAO, 2002). For example, in a rice IPM FFS, the agroecosystem observation and analysis activity begins with the observation of a rice-field agroecosystem. Participants collect data in the field (experience) and return to the meeting place to analyse the data (reflection). The participants make use of their data to prepare a presentation on field conditions and propose decision-making actions in relation to the rice field, for example, to apply fertilizer or not to apply insecticides (generalization and conceptualization leading to a hypothesis). The decision is then implemented over the following week (experimentation) and the cycle begins again.



Source: FAO (2002)

FFS facilitators and extension agents have the fundamental role of listening carefully to farmers, enhancing their experience and taking into consideration their knowledge and priorities. They also need to explore how farmer-selected innovations can be optimized for local needs and most effectively communicated, promoted and combined with other technologies, for example, methodologies developed through research.

Through FFS, farmers have the opportunity to improve not only their knowledge and skills base, but also to change their self-perception. They are considered a source of knowledge and, at the same time, leaders of transformation of their farming systems and environments, with a view to improving their food and nutrition security, as well as their ecological security.

As an educational investment, FFS aim to enable farmers to make better agricultural decisions and to bring about a process of continued learning and action in rural development. Accordingly, FFS aim to have diverse and long-term effects on farmers, their communities and their environment – effects that go beyond those

of linear extension services (Van den Berg et al., 2020a). FFS can introduce their members to profitable new ideas and help farmers work out what to produce in their own locations, how to produce it and how to get it to market.

1.3 Different forms of implementation

The key guiding principle of FFS is to be specific to location and situation. The methodology, therefore, must be adaptable to a wide range of issues. Flexibility allows practitioners to modify the FFS to meet the needs and challenges of the environment in question (communities, policy frameworks, development issues, natural environment, etc). Thus, the FFS community can create responsive programmes to ensure that the schools thrive in changing environments, contribute to the development of the rural economy, effectively address food security and nutrition issues and leverage globalized markets in the face of myriad challenges (such as disasters, climate change and associated risks).

Over the past 30 years, to address the needs of communities and small-scale family farmers,³ in particular, FFS have been adapted to different rural production sectors.

In the agriculture sector, the focus of FFS has shifted, from primarily rice IPM to myriad other areas, including vegetables and fruit, cotton, potatoes, rice, maize, tree crops (such as cocoa) and mixed systems, with crops and livestock-related activities. Seed, breeding and plant genetic resource conservation FFS are also being implemented in several countries. Furthermore, agroecology FFS have recently been emerging through the integration of agro-sylvo-pastoral aspects (such as polycultures with trees, plants and animals).

Because of their flexibility and wide range of applications, FFS provide the ideal environment for testing, evaluating, validating and implementing agricultural measures and tackling issues that are not tied to a specific crop, such as soil fertility management, land and water management, conservation agriculture, land degradation and other effects of climate change. Examples are FFS with curricula on climate-smart agriculture (CSA), testing of new varieties, participatory plant breeding, intercropping, home gardening, crop diversification, coastal shrimp farming, mangrove forest restoration and watershed management. Climate field schools, climate-resilient field schools and other FFS adaptations focusing on conservation agriculture and CSA, seek to help farmers adapt their livelihood strategies to cope with the challenges posed by climate change, such as unpredictable seasons and frequent extreme weather events, under specific local conditions.

In the livestock sector, FFS target all types of small-scale livestock producers, including smallholders, pastoralists and agropastoralists and small-scale, intensive livestock producers. Livestock FFS include pastoral field schools, agropastoral field schools, any field schools covering small livestock (such as poultry, goats or guinea pigs) and ruminant field schools, including fodder production. Smallholder mixed-farming systems, in addition to addressing a farmer's main livelihood activity, also touch on interactions between crop and livestock production and provide basic knowledge on agricultural

² The impact of FFS on behavioural change (particularly on equity in household gender relations) was studied in Kenya (Hansen et al., 2012). The study concluded that FFS had gender impacts, not only because they empowered women, but as they also provided opportunities for men to change their views on and behaviour towards women. This suggests that equity in household gender relations may be improved through the active engagement of both women and men in non-formal adult education within mixed collective organizations. The approach offers an alternative to the widespread strategies of aid agencies that seek to enhance the standing of women by targeting them as individuals.

³ Small-scale family farmers include smallholder agriculturalists, indigenous peoples, pastoralists, fishers and other groups involved in agricultural production.

economics and management. In dealing with small-scale intensive livestock systems, FFS curricula often focus on issues such as improving nutrition and feeding, biosecure housing and sanitary standards, breeding management, good manufacturing and storage practices, and marketing. Livestock FFS create opportunities to add value to products, reduce negative environmental impacts and improve financial management. Pastoralists and agro-pastoralists often live in conditions of high environmental uncertainty. Accordingly, many pastoral field schools and agropastoral field schools focus on enhancing the resilience of these vulnerable populations. Learning activities relate to reducing exposure to hazards, lessening pastoralist vulnerability, improving pasture, watershed and range management, introducing strategies for conflict resolution, increasing livelihood diversification and improving preparedness and early warning for adverse events.

In the forestry sector, farm forestry field schools and agroforestry field schools (for example, for cocoa and coffee production) provide hands-on training on better integrating trees into normal farming activities. Through experimentation, groups identify which tree varieties to grow and which could be economically viable and not interfere with the growth of other crops, all in the context of their particular environment, climatic conditions, soil types, etc.

Aquaculture field schools are being piloted in the fisheries sector. They cover a swathe of fish-farming methods and fish-culture technology, such as the culture and seed production of carp, catfish, air-breathing fish, ornamental fish, seaweed, etc. Another application of the FFS methodology led to the development of rice-fish FFS (in Guyana and Suriname in Asia and in Burundi, Ethiopia and Rwanda in Africa),⁴ seaweed FFS (in the Philippines), fisheries field schools in open sea (in Kenya) and farmer water schools. The latter, an adaptation of FFS for improved water management, are a platform to bolster the capacity of farming communities on the supply and demand dynamics of water and empower them to negotiate appropriate water releases at minor irrigation-canal level.

1.4 Relevant partners

Although top-down extension and direct teaching (“telling farmers what to do”) are very popular in many countries and far more common than FFS, FFS are among the longest-running and most widely adopted models for promoting farmer learning, primarily due to their participatory, farmer-led, adult-learning approach.

FAO continues to support FFS around the world, through expertise, networking and funding. A range of other organizations and agencies, such as farmer organizations, local and national governments, NGOs and bilateral and international agencies, have adopted and funded FFS methods to advance the cause of rural development, for example:

- i. Governmental extension services: A number of countries have (at least formally) integrated the approach into their government extension service policy (countries as diverse as Burundi, Burkina Faso, the United Republic of Tanzania, Haiti and India, to name a few).
- ii. NGOs (international and national) integrate FFS into their programmes, both small- and large-scale.⁵
- iii. Community-based organizations participating in and implementing FFS programmes: For example, in Indonesia and Pakistan, associations formed as part of FAO FFS projects continue to operate without FAO support.⁶
- iv. Resource partners promoting FFS in their programmes, such as the European Union, the International Fund for Agricultural Development (IFAD) and the World Bank, fund agricultural development programmes with significant FFS components in different regions.

The principle of enabling farmers to drive innovation enriches the FFS programmes. A number of institutions and organizations actively integrate FFS into their activities with a view to making it a local learning platform. Furthermore, FFS allow farmers and scientists to work together to co-produce vital knowledge and localized solutions to problems. Thus, the recognition and strengthening of vital partnerships with local research by FFS programmes is pursued as a matter of principle. Still, this synergy between farmers and scientists is also a notable gap in the FFS community, and practitioners should seize the opportunity to strengthen bonds between farmers and scientists.

An interesting example of actors other than FAO adopting the FFS approach is to be found in Cambodia (FAO, 2018g). FAO initiated FFS in Cambodia in the early 1990s as a key means of introducing, sharing and disseminating technology on IPM. FFS have been particularly useful in increasing agricultural productivity where access to information and modern technology is limited. The IPM programme has produced trainers, who are available to the government, donors and NGO-funded projects. The FFS approach continues to be used by other agencies and NGOs, adapted to suit their purposes. For instance, projects funded by IFAD and the Asian Development Bank have used a FFS approach for farmer education on sustainable rice production, seed production and integrated farming systems. Currently, FAO is applying the FFS approach to dozens of projects, such as the Global Environment Facility (GEF)-funded Life and Nature project to support capacity development in CSA techniques, the Swedish-funded Pesticide Risk Reduction project, multiple GEF-funded projects on climate change adaptation (CCA) and a European Union-funded project implementing rice intensification system action research activities within the context of the national IPM programme.

⁴ TCP/SFE/3804, active as of 4 December 2020, uses the FFS approach to introduce integrated fish-rice production systems in Burundi, Ethiopia and Rwanda.

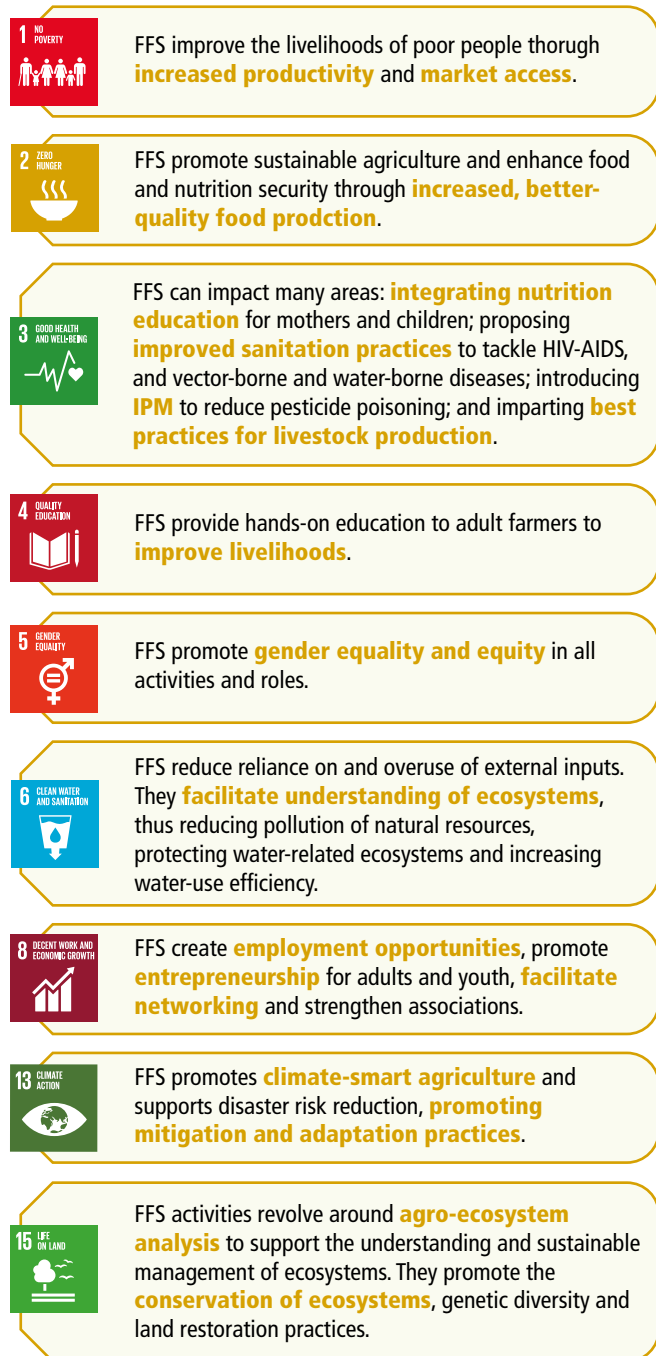
⁵ For example, CARE implements more than 130 projects and programmes with a FFS component, all with a strong emphasis on women’s empowerment (CARE USA, n.d.a).

⁶ The Indonesian IPM Farmers Association, formed in the early 2000s by farmers graduating from FFS on rice IPM, has 1.2 million members, organizes regular events and advocates for farmers’ rights. The Society of Facilitators and Trainers (SOFT) Pakistan was set up in 2009 by FFS facilitators and links 43 organizations of smallholder farmers graduating from FFS programmes. It provides training to new facilitators in a wide range of programmes and continues to create new FFS and networks.

2. Farmer field school relevance to the Sustainable Development Goals and 2030 Agenda

Several studies and reports produced on the approach, show how FFS develop the skills and knowledge of producers, allowing them to create more efficient and sustainable production systems and thus contribute to the achievement of all the SDGs. Figure 1 presents a snapshot of how FFS contribute to each of the SDGs.

Figure 1: Farmer field school contributions to the SDGs



Source: FAO (2019b).

The SDG framework probably references the FFS model most directly in target 2.a, which mentions extension services, and target 4.7, which cites “knowledge and skills to promote sustainable development, including, among others, through education for sustainable development and sustainable lifestyles, human rights, gender equality, promotion of a culture of peace and non-violence, global citizenship and appreciation of cultural diversity and of culture’s contribution to sustainable development.”

2.1 Specific SDG 2 targets addressed by farmer field schools

By their very nature, their fields of application and the core principles they promote, FFS have clear linkages to SDG 2 targets, in particular. The relevance and contribution of the FFS methodology vary from target to target, as we explain in the following paragraphs. Overall, however, while there is an indirect link to targets 2.1 and 2.2, the largest FFS contributions can be found in relation to targets 2.3 and 2.4, which focus on increasing agricultural productivity and income, and sustainable production systems and agricultural practices, respectively.

Target 2.1: The increased production and diversification brought about by farmer field schools contribute to greater food and nutrition security.

The FFS approach promotes practices to boost agricultural production, but also the production of affordable and nutritious food (for example, by combining crop and livestock farming activities), which could, ultimately and indirectly, contribute to greater food and nutrition security. FAO and other agencies have been actively promoting FFS as a tool for capacity-building at farmer level, also by promoting strategies to improve food security through farmer income. In the Democratic Republic of the Congo, Malawi and the United Republic of Tanzania, for example, nutrition and nutrition-sensitive agriculture are among the topics covered by certain FFS. In some cases, a nutrition component is included in the FFS curriculum.⁷ The Evaluation of the Strategy and Vision for FAO’s Work in Nutrition (2012–2018) recommended that FAO should build on the few excellent documents it had already produced on the topic to develop and disseminate extension modules devoted to the production of diverse, nutrient-dense foods and complementary feeding advice (FAO, 2019g). These modules could be used to promote nutrition education more systematically within FAO’s own FFS programmes, as well as in national extension services.

Target 2.2: Farmer field school nutrition education modules contribute to ending all forms of malnutrition (though this is still limited in terms of geographical coverage).

In some countries, under the umbrella of the FFS concept, care groups on health and nutrition have been established in collaboration with the health and education sectors for women of childbearing age (such as in Malawi and Burundi). A number of programmes have used the FFS programme as a channel for nutritional education. For example, in Cambodia, the FFS approach

⁷ FAO has also implemented FFS aimed at increasing nutrition (for example, in Senegal and Burundi, where FFS have been combined with kitchen gardens and maternal nutrition security programmes), as has Oxfam (for example, the “sowing diversity = harvesting security” programme, which focuses mainly on using FFS to increase food and nutrition security – <https://www.sdhsprogram.org/>).

has helped to improve understanding of the importance of farming diversification, with a greater variety of nutritious foods (FAO, 2018g). In the Niger and Rwanda, FFS have also been used to provide nutrition education.

Target 2.3: Farmer field schools lead to greater productivity across the agriculture, livestock, fisheries and forestry sectors, while introducing social components and modules adds to and complements their technical aspects.

As mentioned, one of the core aspects of FFS is to empower rural communities to define local actions to transform current production systems by driving change towards more sustainable and profitable agricultural practices. This is why, to address the needs of communities and, in particular, of small-scale family farmers,⁸ FFS have been gradually adapted to different rural production sectors (as we will discuss).

Furthermore, FFS can be adapted to indigenous communities to preserve farmers' cultural identity and traditional production dynamics for self-consumption. The Evaluation team found two examples: one in Colombia, where FAO was involved in setting up FFS with small and medium-sized indigenous and Afro-descendant farmers with a view to preserving farmers' cultural identity and traditional production dynamics for self-consumption, and one in Uganda, where an NGO set up a FFS with displaced Batwa communities. There were also cases where the creation of a FFS paid scant attention to neighbouring indigenous communities, which were not specifically targeted, despite their presence in the intervention areas (for example, in Burundi).

An interesting example of the integration of social and technical components was found in Kenya, where FAO implemented a number of pastoral field schools, providing a platform for the development of locally relevant, community-driven techniques and solutions in response to livestock production and management issues. Beyond offering a potentially effective method of long-term resilience building, the model was found to be cost effective, with the potential for scalability. An additional benefit of the Pastoral Field School approach is its potential to positively influence community building and conflict resolution, as it encourages dialogue and productive exchange between communities. This is of particular importance in the region, where human security is a growing challenge (FAO, 2018d). The Evaluation of FAO's Contribution to the Republic of Kenya observed that pastoral and FFS had mixed to positive outcomes when they were correctly implemented. In some villages, farmers learned various coping techniques, including how to rehabilitate pasture and how to create bench terracing in hilly areas, allowing them to harvest grass to make nutrition blocks for their animals and for sale. However, some pastoral field schools were not successful. One group even stopped the training mid-course as participants migrated in search of pasture from the village where the school was being held (FAO, 2018d).

FFS have proved able to promote empowerment beyond the field, as well as to foster social capital-building at community level. Consequently, more and more topics outside the agricultural field have been added to FFS curricula, such as socially focused components to complement the technical and sectoral components of a given context. The following are some examples.

Farmer business schools offer a more business-oriented approach to developing entrepreneurial skills and are implemented concurrently with FFS to give participants the skills they need to make better management decisions on their farms.

Examples of farmer business schools were found in Lebanon, where each school targeted 10–15 farmers and provided training modules on financial literacy, orchard management, record keeping, farm business planning and topics related to agricultural production, such as drip irrigation, pruning and fruit thinning. Beneficiaries of project OSRO/LEB/602/NET expressed their satisfaction with the farmer business school model, stating that it was instrumental in building their business management skills, as well as improving their agricultural techniques and linking them to nurseries and soil-test laboratories (FAO, 2020a). The Evaluation of FAO's country programme in Lebanon 2016–2019 concluded that the FAO FFS programme had brought about changes in individual mindset, attitude and behaviour. It recommended that farmer business schools be replicated and upscaled once experiences had been collated and implementation lessons had been analysed (FAO, 2020a).

Women's empowerment farmer business schools strengthen the capacities of rural men and women farmers to create profitable enterprises and transform gender relations in the household, community and markets. Going one step beyond the farmer business school concept, they focus on how male and female farmers can together contribute to improve farm management outcomes through gender equality and women's empowerment. FAO, with the support of the Royal Tropical Institute (KIT) and CARE, developed a guide and toolkit for women's empowerment farmer business schools, but no evidence was available on the results or the contribution of this approach.

Farmer field and business schools are a product of the CARE Pathways programme and integrate multiple components – including sustainable agriculture practices, market engagement, gender and equity, food and nutrition security, group empowerment, and monitoring and evaluation (M&E) – to build the knowledge, skills and practices of women farmers. Integration also strengthens results across the spectrum of food and nutrition security work.

Similar to other types of FFS, the training cycle follows the seasonal cycle (before, during and after), ensuring that learning and other activities are done in real time and do not require extra commitment from already time-constrained women farmers. Farmers can then translate this learning and adapt it in their own fields, creating ownership and sustainability of adoption. This model builds on existing groups, such as Village Savings and Loans Associations (VSLAs), producer groups and self-help groups, that have established social capital and governance mechanisms. Moreover, M&E is built into the farmer field and business schools, enabling farmers to track progress, costs, profits and losses and to use this information to make decisions based on their specific circumstances.

Farmer market schools, inspired by the original FFS principles and piloted by the Adventist Development and Relief Agency (ADRA),⁹ enable farmers to learn about market dynamics and how to connect to value-chain actors. This is not done through conventional

⁸ Small-scale family farmers include smallholder agriculturalists, indigenous peoples, pastoralists, fishers and other groups involved in agricultural production.

⁹ The farmer market school concept was developed and piloted by ADRA in Malawi and Zimbabwe in 2015–2018, drawing on its experience with a market-linkage programme in Kenya. The approach builds on a tradition among practitioners that it is important to “find the market first and then produce to satisfy market demand”. See ADRA (2018) for more information on pilots in Malawi and Zimbabwe.

teaching, but by encouraging farmers to explore the market and its actors by themselves. Through experiential learning, farmer market school participants get a better understanding of how the market functions and thus become better at taking decisions on, for example, which value chains to specialize in, how to interact with value-chain actors and what is expected of them as producers. This autonomous practical interaction with value-chain actors is part of the learning process.

Farmer market schools emphasize individual members' capacity to analyse market opportunities and foster individual agency to act on this analysis. After completing the farmer market school, the individual members decide how to collaborate within the farmer market school group and disseminate their enhanced market knowledge within their parent organizations and the wider local community. Unlike the other FFS, the farmer market school concept does not prescribe how farmers should organize collective marketing or facilitate farmers' access to finance for investing in agricultural production, processing or marketing, other than promoting VSLAs as a model for internal savings. For instance, while the market section in the farmer business school curriculum is limited to visiting the nearest marketplaces, in farmer market schools, this is extended to visiting the entire value chains. The farmers meet actors all along the value chain and communicate with them to get the information they need to make their own production decisions.

Junior farmer field and life schools provide technical, business and life skills, while also offering constructive activities to get junior farmers started in income-generating enterprises to help support them and their families into the future. Junior farmer field and life schools teach vulnerable children and young people more than farming; they can focus on a variety of topics, such as social tools, problem solving and self-confidence. Farming is promoted as a business so as to make agriculture more attractive to young people.

A recent evaluation of project GCP/RAF/489/VEN reported that FFS and junior farmer field and life school approaches had empowered youth, giving them opportunities to invest in agriculture and strengthen their entrepreneurial capacity, through learning, the adoption of newly acquired knowledge and the dissemination of technologies (FAO, 2020d). The evaluation noted, for example, that in Nigeria and the United Republic of Tanzania, the adoption of new agriculture practices resulted in a doubling and, in some cases, a tripling of rice yields. In the United Republic of Tanzania, in particular, the success of junior farmer field and life schools has shown the value of the approach. Though the project did not study, develop or propose advisory models for the rice sector, the results obtained by implementing FFS and junior farmer field and life schools showed the need for countries to integrate the approach into their advisory systems to improve producer learning and technology uptake. The evaluation also concluded that key strengths of the approach were the involvement of producers in constructive and participatory assessments of technologies and good practices, and its low-cost dissemination to peers with the support of governmental and non-governmental agricultural advisers (FAO, 2020d).

In the United Republic of Tanzania, many young people started income-generating activities other than rice farming, including building houses for rent, hairdressing salons, motorcycle taxi businesses and livestock keeping. Rice production in project areas has doubled and improved the incomes and livelihoods of youth

farmers and their families, who have been able to build better houses, pay school fees for children and afford health insurance (FAO, 2020d).

In Senegal, facilitators were recruited among young dynamic farmers in the community and trained by agricultural advisers and FFS master trainers. The project further strengthened their capacity on the integrated management of rice systems. Interviewed farmers showed great interest in the FFS approach and said they hoped that FAO and its partners would continue to pursue it to consolidate and spread achievements to other villages and municipalities (FAO, 2020d).

Junior farmer field and life schools have also been used to promote progressive attitudes, including gender equality. In Upper Egypt (project GCP/EGY/024/ITA, evaluated as part of the Evaluation of FAO's Contribution to the Arab Republic of Egypt 2012–2017), for example, despite sociocultural constraints on mixed groups of participants, FAO took the initiative through a junior farmer field and life school to disseminate good agricultural practices, establishing a farm and life school for women in one village where the men had abandoned farming and sought employment elsewhere (FAO, 2018h).

Listening groups (such as Dimitra Clubs) are a community-driven approach used to empower and engage rural women, men, youth and leaders in dialogue to address issues related to post-emergency, disaster-risk reduction, discrimination, household conflict and other issues and to assist communities in reaching their full potential.

There are about 2 000 Dimitra Clubs active in Burundi, the Democratic Republic of the Congo, Ghana, Mali, the Niger and Senegal, with an estimated 60 000 members, of which 60 percent are women. Dimitra discussion clubs are another useful channel for disseminating nutrition education messages. In the Democratic Republic of the Congo, for example, Dimitra Clubs were instrumental in reducing the influence of food taboos, in some communities resulting in greater consumption of alternative high-protein foods by women (FAO, 2019g). In several countries, such as the Democratic Republic of the Congo and Senegal, Dimitra Clubs and FFS are established together in the same village for mutual reinforcement. The innovations tested in FFS are shared with a broader audience through the Dimitra Clubs, where non-agricultural topics of community concern can also be addressed.

In the Niger, through the Joint Programme on Rural Women's Economic Empowerment, using the Dimitra Clubs approach, FAO has helped to give voice and agency to women and improve their position within the community (FAO, 2019h).

VSLAs, within the FFS group, offer members, particularly women, a safe way to save money and access loans, enabling them to borrow money to buy agricultural inputs, for example, or to make investments.

Complementary activities, such as income-generating enterprises and savings mechanisms, are often introduced alongside the initial learning cycle; however, the FFS methodology recognizes that it is crucial to avoid overwhelming the farmers with too many activities at the expense of intended skills development and empowerment process.

Based on its experience of implementing FFS, VSLAs and listening groups, FAO has combined the three into one approach, called

Caisses de Résilience (CdR). CdR is an innovative community-centred approach with three simultaneous and complementary dimensions: i) a productive/technical dimension (sustainable agricultural practices); ii) an economic/financial dimension (access to credit); and iii) a social dimension (strengthening social cohesion through farmers' groups and women's associations).

The technical component, through FFS and agropastoral field schools, allows participants to improve their production in a sustainable way through the use of good practices in managing natural resources, post-harvest conservation and processing. The financial component facilitates access to a secure and fair credit system, enabling farmers to increase and diversify their income on a regular basis (or even to create contingency or social funds). The social component, through the Dimitra Clubs, is primarily about strengthening solidarity within groups, social cohesion and community responsibility. In terms of knowledge and individual skills, the participation of members in regular meetings specific to each of the three components induces a profound transformation of their representation and their capacity to understand and act. The FFS ensure a notable development of analytical capacity, the VSLAs engender a sense of rigour and entrepreneurial spirit and the listening groups help to boost self-confidence and improve interpersonal skills.

CdR aims to assist food-insecure smallholder farmers and pastoralists who are particularly vulnerable to shocks and crises by increasing and diversifying key assets and knowledge to bolster the resilience of their livelihoods, provide them with a broad range of opportunities and strengthen their preparedness for complex shocks and crises. It helps to empower the groups and households, while promoting social integration and an economic development dynamic based on the more profitable and sustainable management of natural resources.

FAO has deployed the CdR model in a wide variety of environments and contexts since 2007 (Honduras, Malawi, Guatemala, Burkina Faso, Mali, Liberia, the Central African Republic, Chad, Uganda and Burundi) by systematically adapting its core principles to the constraints encountered and the opportunities presented. Evidence of positive CdR results were found in Burundi (FAO, 2019f, particularly through the Pro-resilience Action [ProAct] projects funded by the European Union), Honduras (FAO, 2017b), Mali and Burkina Faso (FAO, 2020e).

Target 2.4: Farmer field schools focus on sustainable and resilient production systems, from plant protection to climate change resilience in different sectors.

The FFS method of operation is intrinsically "ecology-compliant" (FAO, 2016b) to help farmers face the wave of disasters and variations in climate that are having a rapid and severe impact on nature. The FFS approach aims to move towards sustainable production systems that optimize ecosystem processes and services to provide food for future rural and urban populations. For instance, a fundamental of the FFS learning cycle is that participants learn how to conduct agroecosystem analysis with a view to sharing traditional and local knowledge on resilient practices. Examples of how FFS can help to meet this target include:

- i. IPM was the first area in which the FFS approach was used. Since the 1990s, a variety of projects globally have implemented FFS to train farmers and communities on IPM and pesticide risk reduction, including support for better pesticide policies and legislation to reduce reliance on pesticides. They have also improved farmers' understanding of alternative pest management. Countries including Indonesia, Malawi, Cambodia and Viet Nam offer a variety of examples and lessons on IPM FFS, especially their impact on pesticide use (significantly reduced) and the net profit of farmers (variable depending on context, but often higher). Reduced pesticide use and IPM have proved invaluable in preventing and managing pest outbreaks, and FFS are largely responsible for bringing IPM to farmer level.
- ii. Indonesia also offers interesting examples of the use of the FFS approach to address the consequences of climate change, through : i) climate change field schools, which help farmers adapt their livelihood strategies to cope with the challenges posed by climate change and ii) science field shops, whereby selected farmers from a number of locations in a district are trained as rainfall observers, who also undertake agroecosystem observations and keep records, to give advice to farmers in their own communities on what and when to plant, for example.
- iii. In southern Africa, FFS have proved highly relevant and effective in helping farmers to be better prepared and more resilient to climate change and natural disasters by promoting CSA and CCA practices. For example, in response to the El Niño-induced drought in Lesotho, Malawi and Zimbabwe, FFS emphasized the importance of building farmers' resilience by strengthening social networks and group dynamics by promoting CSA, including soil and water conservation techniques. This incentive (farmer groups as a base layer) was found to be essential to the uptake of CCA in cases where farmers raised concerns about mulching and where minimum tillage impeded uptake.
- iv. Across Africa's arid and semiarid lands, FFS and agropastoral field schools have helped build resilience against drought and land degradation. A number of GEF-funded projects on integrating climate resilience into agricultural and agropastoral production for food security promote the adoption and respect of good agricultural and agropastoral practices, leading to a considerable improvement in yields and productivity in animal and plant species usually subject to the consequences of climate change.
- v. In Angola, the agropastoral field school approach contributed to the introduction of new community work methods, resulting in clear evidence of improved agricultural techniques, animal production and community livelihoods. The project introduced innovative methods that were well received and taken up by the community. The agropastoral field school approach enabled the rehabilitation of rangelands based on the ecosystem and participatory management, established rangeland reserve areas and rehabilitated water points. At community level, the project increased knowledge and contributed to the adoption of more sustainable agricultural and livestock farming practices, including land management. The methodology was well received by public institutions and communities. Several communities are already implementing integrated natural resource management techniques, including soil and water conservation, fertilization, seeding, herd handling and forage production measures.
- vi. The Emergency Food Security Programme in Myanmar is a further example of FFS promoting sustainable land and

other natural resource management practices. There was a documented increase in income, for instance, thanks to practices espoused by FFS. These training sessions promoted better water utilization and management, the use of better and more appropriate seeds, more sophisticated agricultural techniques, improved cropping strategies and crop diversification. The use of better-quality and drought-tolerant seeds, together with crop diversification, will reduce farmers' vulnerability to weather and climate change.

- vii. Furthermore, agroecology principles are also being introduced in FFS (for example, in India, Senegal and Mozambique). In India, for instance, since 2018, the State Government of Andhra Pradesh and FAO have used FFS to train field trainers and farmers on a regenerative farming approach through which farmers discover the mechanisms of soil health, improving soil food webs and structure, and preventing pest and disease outbreaks. The programme ("Andhra Pradesh Community Managed Natural Farming") has also adapted FFS for polycropping and agroforestry systems.

Target 2a: Demonstrate direct relevance through farmer field school institutionalization and the Global Farmer Field School Platform.

In several countries, governments have adopted the FFS as a tool for rural development, in some cases filling the gap left by weakened extension services. Peru, Burundi, Indonesia and Malawi, for instance, have adopted the FFS approach as a national or local extension strategy, while others are treading the path towards greater FFS institutionalization.

- i. The long-standing IPM programme in Cambodia has incorporated the FFS methodology as a core component. Consequently, FFS have gained considerable traction in Cambodia, have been used in various projects and have been taken on board by the General Directorate of Agriculture of the Ministry of Agriculture, Forestry and Fisheries as an integral part of the country's agricultural extension service. FFS training has become the standard method for capacity development of farmers and has been used effectively in other projects. While there have been strong results, however, this review still found limited understanding of CSA concepts and practices among provincial and district government personnel, despite the development of a CSA curriculum.
- ii. In Lebanon, the FAO programme brought about changes in the mindset, attitude and behaviour of individuals through education (such as technical and vocational training and farm business schools) and economic incentives (such as reducing pollution for economic reasons). It also catalysed change at an institutional level (for example, in planning and systems/procedural development). To mitigate risks associated with political instability in the region, FAO has built up human capital in the field, especially at community level, while continuously identifying and engaging self-motivated personnel and agents of change within the national institutions.

FFS can also be seen as a means of South–South cooperation and research. Together with a network of organizations, FAO has developed the Global Farmer Field School Platform (FAO, n.d.) to facilitate the sharing of knowledge and expertise related to FFS and their implementation. It includes an online discussion group (currently with more than 1 378 members from 127 countries) and

a website listing 290 key FFS experts and 480 useful documents. Through daily exchanges and regular updates on global FFS projects, the FFS community is continuously improving services and working to reach an increasing number of producers and community members.

2.2 Links with the key principles of the 2030 Agenda

2.2.1 Holistic views and interconnectedness

FFS are a platform for holistic learning, so they should address issues and aspects that directly or indirectly contribute to the performance of the local farming system as a whole, even if those issues are not entirely agriculture based. The community is directly involved in the design and development of the learning programme, for example, through situational analyses to identify local challenges and risks and to find local solutions. FFS start with agricultural production but also look at the needs of the community at large, shifting the focus more to the importance of human capital.

An analysis of FFS contributions to the various SDG 2 targets suggests that there may be a potential trade-off between the focus on increasing productivity and incomes (towards target 2.3) and the endorsement of sustainable agricultural practices (target 2.4). Discussions with key informants underscored the fact that while FFS in Asia were initially more geared towards the sustainability of production (through IPM), in Africa, they were focused more on food security, livelihoods and resilience. As mentioned, FFS started out on IPM, which is more directly related to sustainable agriculture; this also has a profitability dimension (less costly pesticides make for better margins), but it is not the main goal. Extension services and governments, in contrast, are historically geared towards target 2.3 (productivity) than 2.4 (sustainability). Now, however, sustainability is becoming predominant, particularly in the context of large investment programmes agreed with governments around the world (such as those funded by the World Bank).

In Malawi and Indonesia, FFS are now used to address both production increases (also through the diversification of income generation) and sustainable farming systems by promoting agricultural practices adapted to climate change and the communal management of natural resources for greater environmental sustainability.

In Malawi, in particular, the FFS approach is systematically used to boost both productivity and incomes, as well as to promote sustainable agricultural practices as a means of achieving the objectives of zero hunger and ending poverty. At the same time, the approach has also been used to help farming communities adapt to climate change and to shifts resulting from the adoption of sustainable agricultural production practices as a path to sustainably increasing agricultural productivity and achieving food security, nutrition security and increased household incomes.

Consequently, and thanks to its flexibility and adaptability, FFS have proved comprehensive and capable of addressing problems affecting multiple issues that influence people's livelihoods, while also contributing to the three pillars of sustainability:

- i. Environmental sustainability: Based on the ecosystems approach, FFS encourage good ecosystem practices and promote sustainable management of the environment in which

production and economic activities are conducted. These include:

- the adoption of good agricultural practices;
 - the reduced use of chemical pesticides and fertilizers and related risks;
 - greater biodiversity, including the conservation of natural enemies and the promotion of lower-risk alternatives, such as biopesticides that have no environmental impact; and
 - an increase in the resilience of production systems by raising awareness on natural resource management and diversification.
- ii. Economic sustainability: While the FFS approach leads to better agronomic and livestock husbandry skills for increased crop and livestock productivity and production, it can also help to diversify livelihoods and improve socioeconomic welfare in the form of better household food security, nutrition and resilience. Mozambique, for example, developed and implemented a large variety of FFS, with curricula tailored to and focused on cotton, animal production (such as poultry), nutritional education, meteorology (allowing farmers to mitigate meteorological changes) and VSLAs to improve household food security and income.
- iii. Social sustainability: FFS facilitate self-learning and interactions between farmers, as well as their organizations, clubs and associations, by promoting cohesion among groups. This applies not just to men, but also to women farmers, who, through FFS, gain more confidence, an ability to negotiate and, hence, express themselves and participate in social dialogue more easily. Such social cohesion makes members more organized, strong, active and able to work collectively to address their food, nutrition and income security objectives.

2.2.2 Acting at scale and related challenges

The FFS is recognized as a methodology developed by FAO and placed at the service of public and private institutions as a public good. However, unless institutions and policy frameworks are compatible with the FFS and its higher-level principles, the model cannot be scaled up in a substantial way.

Despite the unique ability of the FFS to foster learning and action among farmers, there is still some resistance from both the public and private sectors, as well as from research institutions, to its adoption and integration into national advisory services. This may be out of fear of increased farmer autonomy and empowerment. The FFS is seen as a key participatory approach for reaching local-level producers. While it also involves extension agents, some people believe the model cannot be used for extension work. Furthermore, institutional competition has forced the discovery-based methods of the FFS to make way for the dominant institutional paradigm of technology transfer.

It is, therefore, clear that a focus on the links between institutions and extension workers at field level is key to the sustainability and potential scalability of FFS. If government extension workers understand the approach, uptake and upscaling are more likely. When the bulk of extension workers are trained, FFS can continue. High-level advocacy is sometimes lacking in FFS programmes, which can be a weakness when it comes to scaling up. In the case of

Indonesia, for instance, a few experienced field officers have been promoted to senior level, but not to national policy level, so can only exercise influence within their province.

In Malawi, the FFS approach is recognized in the National Agriculture Policy and National Agriculture Investment Plan as an approach for attaining sustainable agricultural production and productivity. FAO, therefore, with funding from the Government of Flanders, the European Union and the Department for International Development of the United Kingdom of Great Britain and Northern Ireland, is currently supporting the Ministry of Agriculture and Food Security in scaling up the approach in most districts. This medium-term arrangement is to help the Department of Agricultural Extension Services strengthen FFS programming across the country in a three-pronged strategy of institutionalization, quality assurance and capacity development within the framework of the FFS guidelines for developing quality FFS programmes. FAO has maintained its collaboration with the Ministry of Agriculture and Food Security through various technical departments and other non-state actors, including NGOs and CGIAR centres. Consequently, FFS programmes benefit from emerging innovation, research products, empowerment and the increased knowledge of partners on the FFS approach. The Department of Agricultural Extension Services plays a regulatory role in terms of quality assurance, while all other technical departments, such as crops, livestock and research, play a crucial role in ensuring Malawi maintains a thriving FFS programme.

In some countries, FFS projects have helped transform institutions by encouraging them to adopt a participatory approach to working with farmers, leading to the incorporation of the FFS approach into national policy and national agricultural strategies (Burundi, Malawi, Kenya and Mozambique, for instance). In others, FFS activities on a meaningful scale could not be sustained without external project funding, so cost-benefit ratios should also be enhanced. In Zimbabwe, for instance, the uptake of FFS is lagging, especially on the government side. FFS are only implemented on a project basis, so the government extension service works on it while the project is running, but reverts to its traditional extension work when it is over. FFS end when the projects end.

A country's policy and institutional environment, including its agricultural extension system and local culture, can pose a major challenge and have a direct impact on the quality, acceptability, scope and scale of the FFS in helping farmers improve their livelihood assets and obtain equitable access to services and competitive markets. Indeed, quality assurance and the cost implications of FFS remain among the biggest challenges in the scale-up and adaptation of the approach. Such issues could be overcome by developing and putting in place the necessary capacity and/or human resources.

Governments can, for example, take on board the FFS framework and integrate it into their extension services strategy and educational framework. Working through the formal education sector (for instance, by integrating FFS into university curricula) could develop human capital (students) and a future workforce to be employed by the government and its partners as extension workers. There are examples of FFS being institutionalized in eastern Africa by training the staff of higher learning institutions (such as agricultural universities) as FFS master trainers, to strengthen the capacity of the universities to train a critical mass of FFS facilitators and implement the model at scale.

Kenya and Uganda offer good examples of how FFS can be integrated into education and agriculture, through facilitators, networks, NGOs and government officers. Both countries have moved from individual FFS to FFS networks. Kenya appreciates FAO's work on implementing FFS, presenting an opportunity for FAO to play a strong strategic role in supporting the institutionalization process and ensuring that FFS are implanted in the extension system at country level. Uganda is aiming to create a central training facility for extension training for students from different universities on FFS methodology (rather than having a complete facility in each university).

In eastern Africa, a sub-regional Technical Cooperation Programme (TCP) is being implemented to institutionalize FFS in universities through their curricula, as well as to enhance social sustainability by convening different fields of interest within the faculty group (lecturers present and manage the same courses to students in different sectors, share their experiences within their own and larger teams and learn the value of sharing). The project team is also developing an instructional video that highlights the experiences of the three countries in the TCP and shows the full institutionalization pathway to share with others around the globe who may be interested in institutionalizing FFS, but need more information on how to do so.

Malawi invested in training and building capacity to a critical mass over a five-year period (government extension workers trained as FFS master trainers and lead farmers became community-based facilitators). These personnel provide extensive support to FFS groups under the mentorship and backstopping of the master trainers in their respective extension planning areas. Similar examples can be found in Peru, where the government is piloting a project¹⁰ to provide state certification to Peruvian FFS facilitators. In particular, public institutions have identified a number of rural individuals (farmers' leaders) with the potential to offer (or which have offered) technical assistance, through their work with diverse public and private initiatives. The government, in partnership with the Rural Productive Development Programme (AGRO RURAL) and the Evaluation, Accreditation and Certification of Educational Quality (SINEACE) initiative, evaluate and certify the skills of FFS facilitators and grant them a certificate on behalf of the government. These institutions will analyse the possibility of replicating this methodology as a model of technical assistance and rural extension, using and training rural talent as a way of offering rural extension in the country.

A more bottom-up approach is also possible. Once they are more productive and organized, farmers can choose a cooperative approach and the FFS can progressively become a more structured group. This could be enhanced by integrating the FFS model with other approaches (such as the farmer business school or other market-oriented services), enabling farmers to grow together, develop their markets together and increase market linkages. A review of relevant literature turned up examples from Rwanda, Malawi, Oman and Sri Lanka. However, this approach also risks moving the FFS group away from grassroots level to a higher level of complexity for which members have insufficient education to build minimum production capacity.

2.2.3 Social inclusion and the principle of leaving no-one behind

FFS aim to create conducive learning environments through an inclusive approach to improved community-wide agricultural productivity and profitability. The core goal of FFS is to make farmers better decision makers on their farms and to allow them to experience the benefits of working as a group.

As learning generally takes place in the field, efforts are made to create a favourable learning environment through the institutional setup at FFS level. To make the FFS accessible to all: i) the learning site should be within the shortest possible walking distance for all FFS members; ii) learning periods and times should be set at dates and times deemed convenient to all members; iii) the selection of learning topics should be based on what is relevant and appealing to all members of the FFS, with potential solutions to common problems at community level; and iv) the specific context should be considered to ensure full participation of targeted groups, for instance, the inclusion of women will depend on how the FFS is facilitated and arranged (for example, training women facilitators; choosing the right time of day, so training does not coincide with women's activities, such as family care or market days; and selecting the crops/enterprises that are managed by women).

In Mozambique, for example, projects are implemented in remote rural localities with high rates of poverty and malnutrition. In such circumstances, FFS present a major opportunity and embrace the principle of inclusion of the vulnerable population.

The FFS approach aims to build a critical mass of agents of change that can further disseminate locally adapted messages and technologies to their respective communities, ensuring collective progress among wider community members. This allows other community members who did not have an opportunity to be part of FFS groups to benefit from proven technologies and be part of the change process. This approach also speeds up technology use throughout the targeted communities. In this regard, FFS groups in Malawi conduct community outreach activities through field days, open days or by reaching out to individual farmers that are not members to the FFS groups to share specific proven technologies learned in FFS.

The FFS may be perceived as a socially inclusive approach because of its focus on smallholder farmers, who are often among the more vulnerable. However, even in the context of rural communities and smallholders, social inclusion and exclusion needs to be carefully considered, analysed and translated into an appropriate FFS programme and setting. In some cases, FFS targeting did not seem confined to the neediest, who, in most cases, had no title to land. Indeed, FFS cannot work effectively with landless people, except with pastoralists, so other approaches may be needed. One alternative might be to hold FFS in community gardens (specifically for vegetables).

Excluded farmers interested in participating can still attend the sessions as observers, especially as the schools are held outdoors (FAO, 2018h). Still, to address such exclusionary risks before starting the learning cycle, FFS work with local communities to

¹⁰ The institutions participating in this project are FAO, AGRO RURAL through the Sierra Selva Alta Project and the Cooperation Fund for Social Development through the Haku Wiñay project.

assess not only the biophysical and socioeconomic conditions of the prospective target areas, but also the cultural practices that might hinder or facilitate technology uptake and/or the participation of certain gender, ethnic or other minority groups.

There is country-based evidence that the FFS approach strengthens social cohesion among communities by supporting them in finding solutions to common problems, including food insecurity, malnutrition and poverty. The examples cited earlier on the social component of FFS and the conflict resolution brought about by listening groups show that communities that originally struggled to communicate eventually started to work as a team through participation in a FFS (see examples from Kenya or the CdR approach). In this respect, radio information broadcasts and strong collaboration with Dimitra Clubs can be critical. In Burundi, for instance, FAO used radio programmes (conducted by FAO personnel or external experts) to stimulate discussion on social topics (such as conflicts in the household and/or between women and men) within communities. In India, FFS participants said that the schools improved community cohesion, as farmers worked together despite caste, religious and gender barriers.

The approach focuses both on collective action and individual learning by collectively creating and building trust in working together. This includes, for example, rotational leadership, which gives everyone a chance to speak and feel trusted. Farmers, extension services and government officers all develop their capacity to communicate and to interact with other actors through the FFS. At the same time, they gain more self-respect and know-how and feel respected by other stakeholders, who believe in what they are doing or explaining. Such self-confidence and respect from others leads to empowerment, which is key in FFS, helping to make participants feel included in the group and not left behind.

The big advantage of the FFS is that it can easily reach people with no education. Not being able to read or write can make people feel excluded. FFS work around the issue by using participatory approaches and “learning by doing”, building people’s confidence by making them feel part of a group and community.

Women, in particular, can benefit from this empowerment. In some cases, it can lead to a change in power relations in the household, as well as in the community. As, also reported in the Evaluation of FAO’s Work on Gender (FAO, 2019h), when women are empowered (by having skills, assets or businesses), they find it easier to voice their needs, so are likely to become more active in their community and in politics.

In Burundi, there are examples of mixed FFS and women’s FFS that enabled women to make better decisions. Also, in Angola, a project establishing agropastoral field schools provided equal opportunities to women and men to participate in project activities. However, the number of women trained as master trainers and the number of female facilitators remain limited in both countries.

In Egypt, a FFS focusing on “nutrition kitchens” and food processing provided support to women’s groups through capacity-building and the extension of microcredits to launch income-generating schemes and establish small businesses. Despite the unfavourable sociocultural context, the project facilitated the travel of young girls and women from villages to the towns where the training took place. Rural norms and customs limit such travel, particularly by young girls, if unaccompanied by their male guardians. The girls and women were initially accompanied by several male relatives until

trust was established in the project and its interventions. In such cases, measures to avert conjugal conflict were taken, otherwise the project might unwittingly have contributed to an increased domestic strife. Husbands, for instance, had to be made aware of what the additional income to be earned by their wives might entail, while the project also looked for and recommended labour-saving tools and practices to reduce pre-existing workloads.

2.2.4 Use of innovation and digital technologies

General interest in information and communications technology (ICT) creates a conducive policy space for the greater use of innovative tools and methods, including digital technologies. Indeed, virtual learning has interesting development potential, but little has been done in this regard up to now. Still, the creation of the Global Farmer Field School Knowledge Platform in 2017 was a step forward in the use of up-to-date communication tools for integrating and facilitating the sharing of knowledge and expertise of FFS practitioners worldwide. As part of such a global movement for information and knowledge sharing, there is plenty of room for innovation in the collection of data to inform results. FAO could explore more in terms of ICT coordination with other actors and institutions.

A workshop on how to integrate ICT into FFS, particularly with regard to supporting monitoring, evaluation and learning (MEL), interactive learning, access to information and the further networking of FFS actors, was held at FAO headquarters in December 2019. The workshop reviewed and collated the experiences of key experts and actors into a report (FAO, 2019d) and the topic is now a priority for the FAO Global Farmer Field School Platform team in the upcoming biennium. In 2020, the team increased the use of participatory videos to support interactive learning in FFS, including for facilitator training, and started to expand the content of FFS beyond the schools themselves (to reach more people). Moreover, following the publication of the MEL toolkit, an open-source KoBo data-management toolkit will be developed to support better MEL of FFS activities and programmes.

The FFS approach is benefiting from the expansion of internet connectivity and the use of smartphones, which allow flexible networking and the sharing of resource materials between actors. FFS facilitators are now able to access a repository of resource materials on different topics relevant to farmer group learning. Technology has also helped to speed up the information flow from sources (researchers or extension agents) to farmers, mostly via facilitators, and made climate and market information more available to farmers to inform production and marketing decisions. However, farmers still have little direct access to information and text messages seem more promising than web applications (apps).

Although FFS have often used radio broadcasts to disseminate best practices or farmer innovations in certain contexts, the farmer FFS approach has yet to benefit from the wider use of video for extension messaging due to farmers’ lack of access to the necessary equipment. In addition, there is a need to develop well-illustrated information, education and communication (IEC) materials in local languages as reference materials for individual farmers, to complement their learning from FFS activities.

The need for ICT and IEC materials has become even more important for sustaining farmers’ skills development through FFS, particularly in the context of the COVID-19 pandemic. Several

modules on how to use ICT to support FFS in the face of COVID-19 have been developed and collated in a publication, entitled “Running farmer field schools in times of COVID-19: A resource handbook” (FAO, 2020f).

In the FFS context, ICT (particularly mobile phones) is currently being used for M&E purposes, but not for learning. In Malawi, Senegal and Pakistan, however, the digitalization of FFS M&E is starting in partnership with Oxfam, CARE and other actors. For instance, in Malawi and other countries, fall armyworm FFS are exchanging experience and documentation through WhatsApp groups. However, some countries are still struggling to get full access to reliable and strong internet connections. Servers are untrustworthy or apps are too heavy to be used (for instance, the use of an ICT system for fall armyworm monitoring in Ethiopia was a major challenge). Recent restrictions on movement due to COVID-19 were a true test for practitioners, with the increased use of tablets and other tools to collect information during lockdown.

The various pros and cons of FFS aside, it is important to note their major benefit, that the learning environment relies on face-to-face interaction and human relationships, without which FFS might lose their added value.

2.2.5 Challenges

The main challenges to scaling up the FFS approach are time and costs. As we saw, adult education is a true investment, which barely makes an impact in the short term. Reaching out to people in person, developing their capacity to analyse, observe, discuss with others and create the overall knowledge they need to be independent and think for themselves is expensive and time consuming.

Safeguarding the quality of FFS is another big issue in the context of scaling up the approach. Over time, we have witnessed a proliferation of FFS activities run, for instance, by NGOs, governments and other partners, which do not necessarily follow the basic principles of the FFS. One way to address this challenge could be to monitor the FFS implemented in a given area for coverage and quality.

Although monitoring used to be strong, it is now deemed too weak in many contexts and poses a challenge in many countries. This is potentially due to a certain level of competition between development partners, which may use the FFS name for other methods or activities and do not want to be restricted. Indeed, while FAO provides open access data on the FFS it implements, other actors may not be willing to share information on their versions. One potential solution to this lack of coordination could lie in the institutionalization and ownership of the approach at national level, whereby national governments are placed in the best position to centralize and coordinate a functional monitoring and quality assurance mechanism for all implementing actors. Efforts in this regard are currently being made in Burundi and the Niger (among other countries), where FAO’s Plant Production and Protection Division (NSP) is strongly encouraging countries to identify where FFS are located and to improve their quality. However, close monitoring and support by FAO is only possible if governments are willing and prepared to make the financial investment involved.

FAO’s FFS M&E evidence tends to be mostly anecdotal and results are largely reported against the global picture rather than in terms of specific aspects that may be of interest for learning. To

address this lack of formal monitoring, NSP’s Global Farmer Field School Platform, in collaboration with several FAO field offices and partners, is currently developing an M&E framework and toolbox, while assisting country teams in the digitalization of FFS. Furthermore, to underpin the quality of FFS, FAO is trying to establish or strengthen regional and sub-regional focal points. As in eastern Africa, for example, it has supported FFS sub-regional networks in southern, western and central Africa, as well as in other regions).

Box 3. Farmer field school MEL framework in eastern Africa

The global review of FFS (Van den Berg et al., 2020c) concluded that assuring the quality of FFS in line with proven educational principles was vital to harnessing their full potential. Programmes should establish MEL systems in an effort to improve the quality of interventions. Future evaluations of FFS impacts should improve the balance of indicators in the human, social, natural and financial domains.

FAO headquarters has, therefore, developed a MEL framework and toolkit to improve data collection, analysis and utilization across the human, social, natural and financial capital domains. FAO aims to share the MEL toolkit with governments and partners, so they can put it into practice.

Building on this, the FAO Subregional Office for Eastern Africa (SFE) has approximated the MEL framework from global to subregional level, with the aim of promoting the integration of the framework at country level to ensure the quality of FFS interventions. Some 30 participants from 12 countries, representing government, academia, NGOs and FAO, met on 19–21 November 2019 in Addis Ababa to discuss the importance of, develop indicators and to set out an action plan for the national adaptation of the FFS MEL framework.

SFE aims to continue the initiative, which builds on previous efforts to improve the quality of FFS in the subregion. Along with government and organizational partners in eastern Africa, SFE wants to develop and implement a contextualized, mainstreamed toolkit based on the MEL framework. Its activities are aimed at providing and instilling a sense of sharing and the collection of best practices, as development partners sometimes modify and adjust the approach. The promotion of best practices should help to improve the quality of FFS that may not use the core principles or said monitoring tools.

Sustainability of FFS at country level may also be an issue. As many FFS are project-driven, they should be built into other approaches appropriate to the country in question to improve their effectiveness. For example, there should be other advisory service approaches that could continue to support FFS beyond the duration of the projects. Still, some countries, despite receiving support to increase the number of extension workers and master trainers, had no strategy to keep these trained people in the field. A solid plan

encouraging trained and knowledgeable personnel to remain in the field or introducing the approach to the educational system would resolve this issue. For instance, trainers could introduce the methodology in schools (especially in rural schools) with the aim of bringing transformational change through education and, thus, support the region. There is a need for a steady stream of young graduates leaving colleges of agriculture with certified training in the FFS methodology, both in theory and practice, to join the public and private sector. Such an approach was used in universities in Kenya, where FFS curricula were developed, suggesting the experience could be exported to other places.

Recently there has been a push to make FFS more profit-oriented, with the addition of modules on marketing and business subjects. Business field schools have also been created, but there is ongoing debate over whether the empowerment aspect of FFS might conflict with efforts to commercialize them, leading to a loss of simplicity and inclusivity. Although financial sustainability could be pursued by moving to an economic basis and including topics on financial management, some practitioners fear that if FFS were to go down the market-oriented route, their key principles might be lost.

Sometimes, FFS alignment with participatory learning approaches may be limited. Key informants said the way that some FFS are implemented is not always in tune with the participatory learning approach. In some cases, for instance, the FFS sessions are designed to promote linear technology transfer and do not look at the demand side or identify farmers' problems in a holistic way. This can lead to sessions that are designed around specific issues of a project or initiative, ignoring some of the most important concerns of farmers. For example, sessions have been held at the start of the planting season, which have focused on planting and input applications without due consideration for the outlook over the rest of the season (such as climate conditions) and marketing opportunities. Other sessions have focused primarily on production-related aspects and paid less attention to the environmental and social dimensions of sustainability, which require strong farmer participation.

In Malawi, efforts are being made to support technology combinations as integral components of problem-driven activities in the FFS learning process. Research centres have become involved in hosting residential master trainer courses to demonstrate their technology combinations alongside FFS activities, so that the course has both the traditional assortment of FFS experiments and validation studies and the various technological combinations established by the research community. Participants are thus able to use agroecosystem analysis to evaluate the different technological combinations, but can also address the various production challenges affecting the farming system. This requires, however, that the research community appreciate the underlying educational goal of the FFS and extend its goodwill accordingly. It has been challenging to communicate the benefits of this different approach compared with the linear technological transfer approach that characterizes traditional extension.

2.3 Potential opportunities

FFS are one of FAO's flagship programmes for making a contribution to SDG 2 and, indeed, other SDGs. However, there are shortcomings in how its work is organized. FAO needs to create a stronger FFS structure, especially at subregional level. The team in NSP has been very good at maintaining overall control, but it has limited resources to pursue the approach outside specific projects. Currently, there are no non-personnel-related Regular Programme resources for FFS. They are mainly implemented through TCPs and Government Cooperative Programmes (GCPs), while the role of the donor at national level is often crucial to getting the buy-in of government. FAO has an extension division, however, which has never hosted the FFS. Also, at decentralized level, while SFE has dedicated one person to FFS, this is not the case in the other subregions (be it in Africa or elsewhere).

FAO has created or had a hand in most of the current capacity for FFS (for example, CARE and other actors implement FFS using FAO-trained master trainers) and capacity-building is the best way to institutionalize the approach. Institutionalization and upscaling can come from government, but also through producer organizations. Although this has been done in many locations, there is a need to work more closely with farmers' organizations, to improve outreach and call for partnerships with all relevant actors nationally. Farmers' cooperatives, associations and groups are important in order to make a difference and it is crucial that FFS provide capacity to create leaders with the mindset and skills to lead and train others.

To ensure the quality of the approach, some countries have established a "cadre de concertation" (national consultation framework on FFS). Within such structures, FAO could influence the quality of FFS by producing guidance materials, for instance, by galvanizing regional networks through focal points or by mobilizing more funding for FFS at country level. Still, the country, itself, should remain in the driving seat.

The quality of FFS is also down to the quality of the facilitators. It is important to develop far stronger coaching systems to assist and organize refresher courses for facilitators and to build rigorous and regular feedback loops between facilitators and programme management to identify recurring problems and how to solve them. Participating farmers (who often become facilitators) should also attend regular review meetings.

A global FFS network and platform has been established to make people feel part of a wider community, including master trainers, facilitators and FFS members and project personnel. Subregional networks have been created in a number of subregions, mainly made up of key experts and master trainers, though funding for their work is proving hard to find and many of them are not that active. Also, the creation of national FFS practitioner networks is to be encouraged, though funding remains a challenge.

However, there is still a need for a global georeferenced database of FFS to map communities and villages where schools are being implemented. If governments agree to adopt FFS as an approach, monitoring and mapping may be easier. Furthermore, apart from FAO's projects, no comprehensive information exists on how many people have been trained.

¹¹ In Rwanda, the Ministry of Agriculture and Animal Resources, together with the Belgian Development Agency, is taking a robust network approach to scaling up FFS success by liaising with all Rwandan master trainers, FFS facilitators (organized into FFS facilitator cooperatives) and farmers to establish a proper FFS national network.

3. Conclusions and recommendations

FFS contribute to all the SDGs. The way in which they are structured allows implementers to constantly add new modules, though the methodology is key and should be followed rigorously.¹² FFS are an important tool in bringing about transformational change, investing in the next generation in a way that makes a difference in terms of knowledge, human capital and human capacity. FFS go beyond the mere sharing of information and focus more on knowledge discovery through direct experience and community co-creation.

In addition to developing the methodology at the heart of the approach and exporting it to countries and regions in support of small-scale farmers, FAO has achieved a number of significant results and changes at different levels. It should, therefore, continue its work to support national governments in scaling up the approach while ensuring the quality of the methods. FAO should also ensure that the benefits to farmers' empowerment continue and contribute to the greater coordination and monitoring of results and progress made at various levels. The NSP team has carried out tremendous work in providing advice and support, and in establishing partnerships with various technical departments using the FFS approach. However, this needs to be done in a more systematic and consistent manner, for which core FAO resources are needed.

¹² The conditions in which FFS remain true to their core principles are: i) focusing on the empowerment of farmers; ii) learning by doing; iii) enabling farmers to take a scientific approach; and iv) following participatory learning cycles. The conditions in which FFS diverge from the core principles are: i) technical demonstrations; ii) training farmers by lecturing and teaching; iii) technology transfers; and iv) disseminating technical information through the media.

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Appendix 1. People interviewed

Surname	Name	Organization/Division	Position
Abang	Mathew	FAO-SFS	Plant Production and Protection Officer
Ameny	Thomas	FAO Malawi	International FFS Specialist
Chuluunbaatar	Delgermaa	FAO-OINR	Agricultural Extension Officer
De Besi	Giacomo	FAO-NSAG	Livestock Development Specialist
Duveskog	Deborah	FAO Kenya (RTEA)	Agricultural Officer
El Khoury	Wafaa	FAO-CFIC	Chief
Macamo	Eugenio	FAO Mozambique	Programme Officer
Maminimini	Obert	FAO Zimbabwe	National Crops Specialist
Mascaretti	Alberta	FAO-CFIA	Chief
Mondovi	Stefano	FAO-NSP	Agricultural Officer
Ochoa Jacome	Maximo	FAO Mozambique	International FFS Specialist
Okoth	James	FAO Malawi	Deputy FAO Representative
Pereira	Claudia	FAO Mozambique	Assistant FAO Representative Programme
Phillipps	Suzanne	FAO-NSP	FFS and Climate Resilience Consultant
Pratt	Orry	FAO-SFE	Agricultural Officer
Ramasamy	Selvaraju	FAO-OINR	Head, Research and Extension Unit
Sidik	Aubrey	FAO Malawi	Programme Officer
Sosa	Orlando	FAO-SFE	Agricultural Officer
Taber	Andrew	FAO-NFO	Senior Forestry Officer
Tanyongana	Ronia	FAO-SFE	Plant Production and Protection
Tinarwo	Rutendo	FAO-SFS	Programme Assistant
Van de Pol	Jaap	FAO-CFIA	Agricultural Specialist
Yang	Puyun	FAO-OINR	Agricultural Officer
Zaqueu	Flavio	FAO Mozambique	Hub Coordinator

Evaluation of FAO's contributions to Sustainable Development Goal 2

"End hunger, achieve food security and improved nutrition and promote sustainable agriculture"

Signature Product 1: Legal and parliamentary work on food and nutrition security

Signature Product 2: Nutrition education

Signature Product 3: Support to value chain development

Signature Product 4: Support to secure tenure of natural resources through VGGTs and other guidelines

Signature Product 5: Farmer field schools and their derivatives

Signature Product 6: Control of transboundary plant diseases and pests

Signature Product 7: Agroecology

Signature Product 8: Protection and fair share of genetic resources for food and agriculture

Signature Product 9: South-South and triangular cooperation

Signature Product 10: Support to agricultural investment

Signature Product 11: Support to fair and informed commodity markets and international trade in agriculture

Signature Product 12: Rural women's empowerment

Signature Product 13: Food for the cities and urban agriculture

Signature Product 14: Aquaculture promotion and Blue Growth

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