HOW TO IMPROVE NUTRITION WITH LOCAL PLANT DIVERSITY?

Strategy, context and evaluation of our work

SD=HS Sowing Diversity = Harvesting Security

ESAFF

COMMUNITY TECHNOLOGY DEVELOPMENT TRUST

LI-BIRD

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Colophon

How to improve nutrition with local plant diversity? Strategy, context and evaluation of our work.

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Acronyms

ASOCUCH	Asociación de Organizaciones de los Cuchumatanes
CTDT	Community Technology Development Trust
ESAFF	Eastern and Southern Africa Small Scale Farmers' Forum
FFS	Farmer Field School
FOVIDA	Fomento de la Vida
HDDS	Household Dietary Diversity Score
HFIAS	Household Food Insecurity Access Scale
IPSHF	Indigenous Peoples and Smallholder Farmers
Li-Bird	Local Initiatives for Biodiversity, Research and Development
NAFRI	National Agricultural and Forestry Research Institute
NUS	Neglected and Underutilized Species
PELUM	Participatory Ecological Land Use Management
SD=HS	Sowing Diversity = Harvesting Security
ToT	Training of Trainers

Foreword

This publication was produced as part of the work on Local Food Plants for Nutrition, implemented during the second phase of the Sowing Diversity = Harvesting Security (hereafter, SD=HS) program (2019-2023). SD=HS was a global program, implemented by Oxfam Country Offices and partner organisations in eight countries, coordinated by Oxfam Novib, and funded by the Swedish Development Cooperation (Sida). The overall objective of the SD=HS program was *to empower Indigenous peoples and smallholder farmers (IPSHF) to uphold, strengthen and mainstream their rights and build technical capacities to better manage agricultural biodiversity to achieve food and nutrition security in the context of climate change*. The work on Local Food Plants for Nutrition aimed at promoting and strengthening the consumption and management of local food plants for healthy and affordable diets and reducing the length of the food scarcity period of IPSHF. Farmer Field Schools (FFS) were a central instrument in our activities.

SD=HS´s work on Local Food Plants for Nutrition took place Laos, Nepal, Guatemala, Uganda, Zambia, Zimbabwe and Peru. The implementing partners in these seven countries were the National Agricultural and Forestry Research Institute (NAFRI) in Laos, Local Initiatives for Biodiversity, Research and Development (Li Bird) in Nepal, Asociación de Organizaciones de los Cuchumatanes (ASOCUCH) in Guatemala, Participatory Ecological Land Use Management (PELUM) and Eastern and Southern Africa Small Scale Farmers' Forum (ESAFF) in Uganda, Community Technology Development Trust (CTDT) in Zambia and Zimbabwe, and Fomento de la Vida (FOVIDA) in Peru, respectively.

We would like to share our valuable experiences through this publication. In order to make our experiences optimally replicable in other regions or countries in the world, we detailed the strategy, explained the context, and presented the evaluation of our FFS work. We also included the links to all our global resources and tools, which could be used in and adjusted to new contexts, improved and replicated.

The targeted audience are farm management advisors, rural extension service staff, local health and nutrition staff, farmer organizations, rural youth and women networks, and farmers' organisations.

I hope this publication is helpful for those who are interested to help improve the nutrition of IPSHF around the globe.

Gisella S. Cruz-Garcia

The Netherlands, 2025

Summary for Policy Makers

Context and Problem

Globally, over 700 million people suffer from undernutrition, and billions lack essential micronutrients. Food and nutrition insecurity disproportionately affects Indigenous peoples and smallholder farmers (IPSHF), particularly women and children. In response to these challenges, the Sowing Diversity = Harvesting Security (SD=HS) program (2019–2023), coordinated by Oxfam Novib and funded by Sida, implemented an innovative strategy across seven countries (Laos, Nepal, Guatemala, Uganda, Zambia, Zimbabwe, and Peru) to promote local food plants through farmer field schools (FFS).

Objectives and Strategy

The initiative aimed to reduce food scarcity periods and improve nutrition by enhancing the use, management, and knowledge of local and underutilized food plant species. Central to the strategy was the FFS model, which focused on participatory learning, gender inclusion, and experiential education. It included a structured implementation process: inception workshops, baseline studies, training of trainers, FFS rollout, and ongoing evaluation (the strategy is detailed in this document). The approximate average cost of implementing one FFS in the field was 1300 Euros per year, ranging from 655 to 2300 Euros[1]. Activities such as seed germination, cooking demonstrations, seed fairs, and sustainable harvesting were designed with an empowering approach.

Key Results

Local food plants are a vital, underutilized asset in combating malnutrition. The SD=HS experience demonstrates how locally rooted, gender-sensitive strategies can build resilient, nutritious food systems for vulnerable populations. The mid-term evaluation of our FFS work on Local Food Plants for Nutrition – conducted with a sample of 668 FFS participants from Guatemala, Zambia, Zimbabwe, Uganda and Peru – and the final evaluation of our work - which captured the views of more than 1000 FFS participants from Uganda, Zimbabwe, Zambia and Guatemala – highlighted the success of our approach for achieving the program objectives. When comparing the mid-term evaluation results and the final evaluation, it was evident that our success was built over the years of implementation. The following paragraphs summarize the main outcomes and key achievements of our work.

Main program outcomes:

- **Food scarcity reduction**: By the end of the SD=HS program, over 80% of FFS participants in Uganda, Zambia, and Zimbabwe who contributed to the end of program evaluation (more than 1000 farmers), reported a reduction in the length of the food scarcity period [2].
- **Improved nutrition**: 91% of FFS participants in Uganda, Zambia, and Zimbabwe, observed an improvement in the nutrition of their families.
- **Capacity building**: About 500 master trainers and facilitators (of whom >50% women) were trained for FFS on local food plants for nutrition.

[1] The value was calculated taking into account the information from four project countries. In the sub-section operational lines and costs of our FFS work, it is indicated what budget lines were included for the calculation, and what costs were excluded.

[2] While there was no data available for the mid-term and final evaluations for the other SD=HS countries, participants in the final national-level evaluation workshops highlighted that there was a decrease in the food scarcity period and nutrition improved as product of the SD=HS work.

- **Reach and engagement**: 342 FFS were implemented with 21,000+ participants. Over 230 local food plants were promoted. Dissemination activities extended knowledge to thousands more.

FFS as effective empowerment approach: The FFS cultivated agency among farmers through hands-on learning and decision-making. It increased farmer's confidence and capacity to analyse their main problems and make informed decisions. It strengthened leadership and enhanced farmers' capacity to innovate. It built farmer's technical and organizational skills through participatory learning. In particular, women gained knowledge and visibility through the program.

Champion local food plants to improve nutrition: Our "One hundred local food plants for improving nutrition" book presented a compilation of hundred local food plants that have the potential to tackle main nutritional deficiencies and to help reduce the length and severity of the food scarcity season. We named champions to a selection of local food plant species that can play an essential role in addressing micronutrient deficiencies, given their high content of particular nutrients. Additionally, we named champions those food plants that are available during food scarcity periods, as well as some highly nutritious species that are available throughout the year.

Changes in knowledge and practices: The FFS evaluation showed major changes in knowledge and practices among most FFS participants. For instance, more than 80% of men and women participating in FFS in Guatemala and Zambia learned about plant management and food preparation. Likewise, about 90% or more farmers in Guatemala, Zambia and Uganda learned about nutrition. Regarding the consumption and knowledge of local food plants, more than 65% of FFS participants in the sampled FFS in Zimbabwe, Zambia and Uganda (n=49 FFS) eat more frequently local food plants and know more local food plants than before joining the FFS, and introduced new plants to their diets. With respect to food preparation, preservation and cooking, 87% "or more" farmers acquired new knowledge and skills, and 78% or more are applying them in their households. Likewise, 90% or more farmers acquired new knowledge that helped them to improve the nutrition of their families, and 85% or more are applying this knowledge at home. Regarding local food plant management, 88% "or more" farmers acquired new skills or knowledge, and 82% or more are applying them. In addition, 66% of FFS participants in Uganda, 69% in Zambia, and 69% in Zimbabwe indicated that they are exchanging more seeds or planting material of local food plants with other farmers than before joining the program.

FFS activity satisfaction: FFS participants were greatly satisfied with the activities, and most of them found the activities useful. For example, more than 90% of the farmers that participated in the FFS activities seed storage and cooking demonstrations across the four sampled countries, found then useful. FFS participants also indicated the main points of improvement for the FFS work to consider in the future. For instance, it is important to consider that the study site is accessible for all participants, ensure adequate tools or equipment, and provide timely backstopping. Our results also highlighted that the impact of the FFS work also had an influence in the wider community, thanks to the implementation of dissemination activities.

Importance of diverse environments: The results showed that any strategies that aim at strengthening the role of local food plants for nutrition, should also take into account the conservation and diversification of the agroecosystems and habitats where these species grow (including agricultural fields, forests, home gardens, among others). Healthy and nutritious diets should be promoted together with the conservation of biodiversity at genetic, species and ecosystem levels, and the recognition of local knowledge and cultures.

Replicability of our FFS work: The FFS on Local Food Plants for Nutrition showed to be an effective approach for inclusive, wide-scale improvement of dietary diversity, nutrition and agroecological knowledge. Our approach demonstrated flexibility to serve diverse agroecological zones, and

adaptability to different cultures and socio-political contexts. The SD=HS program's global publications, including the "One hundred local food plants for improving nutrition" book, online course and illustrated FFS facilitator's field guides (among others, see knowledge hub section), could be effectively adjusted and used to replicate our work in other regions in the world.

Improved farmer's resilience during crisis: The SD=HS work on Local Food Plants for Nutrition proved to be crucial for ensuring the food and nutritional security of Indigenous peoples and smallholder farmers during the pandemic. This highlights the role local food plants play as rural safety net ensuring the resilience of family farmers while preserving biodiversity in times of crisis.

Integrated Policy Recommendations

Our FFS approach has demonstrated relevance and impact in diverse agroecological and socio-political settings. Its proven capacity to foster sustainable practices, conserve biodiversity, empower communities, and improve nutrition makes it a vital tool for governments committed to inclusive, resilient, and equitable rural development. It is necessary to institutionalize, invest in, and scale up the FFS model as a central pillar of agricultural, health and nutrition policy.

Agriculture: Policy actions

- Institutionalize FFS on local food plants for nutrition as part of national extension services.
- Fund community-based seed systems to support the conservation and scaling of nutrient-rich, underutilized crops through FFS.
- Encourage the cultivation of local crops as part of diversified agroecological systems, and promote market access for smallholder farmers, especially women and Indigenous peoples.

Health and nutrition: Policy actions

- Increase dietary diversity by including local food plants in national food and nutrition security policies, food baskets, and social protection programs.
- Address micronutrient deficiencies ("hidden hunger") through food-based approaches prioritizing traditional, diverse diets and local plant sources.
- Support community-based nutrition education by funding FFS activities such as cooking demonstrations, peer education, and mother-led training on food preparation with local food plants.
- Integrate nutrition and agrobiodiversity into health services by training community health workers on the use of local plants in healthy diets.
- Recognize food as medicine by encouraging the use of local food plants and traditional food practices in health promotion and disease prevention strategies.
- Improve maternal and child nutrition with the consumption of nutrient rich local food plants.
- Promote the use of local food plants as part of school feeding programs, in collaboration with FFS on nutrition.

Finally, it is certainly necessary to advocate for cross-sectoral policy coherence. For instance, mobilizing public and donor funding toward programs that connect nutrition and health outcomes with agrobiodiversity conservation.

This framework aligns with global calls for food systems transformation, and positions local food plants and agroecological knowledge as strategic tools for building resilient, empowered and healthy communities.

Introduction

This chapter explains the main concepts of malnutrition and food scarcity, followed by a discussion of the importance of local food plants within this context, and finalizes with the presentation of the objectives of our Sowing Diversity = Harvesting Security (SD=HS) work on local food plants for nutrition.

Malnutrition and Food Scarcity

Despite concerted worldwide efforts to reduce hunger, 729 million people approximately are currently undernourished. Billions of people lack access to nutritious, sufficient and safe food[3]. More than half of the world's population consumes inadequate levels of essential micronutrients, caused by diets that are lacking essential vitamins and minerals required for proper growth and development, such as calcium, iron, and vitamins C and E [4]. Micronutrient deficiency is a major problem in the developing world. For example, approximately 98 million preschool-aged children in sub-Saharan Africa and 99 million in South Asia suffer from one or more micronutrient deficiencies[5]. During the 2009 World Summit on Food Security, it was clearly stated that food security cannot be achieved without adequate nutritional value[6] in terms of protein, energy, vitamins and minerals for all household members at all times.[7] The concept of food security was changed into the concept of food and nutrition security.

Malnutrition remains one of the greatest global health challenges, and women and children are its most visible and vulnerable victims. Malnutrition is a broad term commonly used as an alternative to undernutrition but technically it also refers to overnutrition. People are malnourished if: (a) their diet does not provide adequate calories and protein for their growth and maintenance, (b) they are unable to fully utilize the food they eat due to illness, or (c) they consume too many calories (overnutrition). In all cases, malnutrition is closely linked to disease – as both cause and effect.

Poor health has major impacts on agricultural labour and, therefore, productivity. Ill health affects the rural household economy, not only due to a reduction of the income resulting from decreased yields, but also due to increased expenditures related to medical care or hiring of additional labour. Poor health also impacts on farmers' ability to innovate and develop new farming systems, which might be necessary for adapting to climate change. These trends particularly affect women, who are often both the primary producers and primary caretakers, and who suffer more often from malnutrition.

For many people in the world the availability of food is driven by seasonal cycles, and access to food is worsening particularly in the pre-harvest months. Usually, during food scarcity periods household food stocks from the last harvest have begun to dwindle. This may coincide with food shortages within the local market, meaning that the food that is still available is sold at an inflated price. As a consequence, during this period the nutrition security of the family is most at stake. Rural households are forced to resort to several coping strategies to deal with food scarcity, such as reducing the diversity and quantity of their meals, which influences macro- and micronutrient deficiencies. Other strategies such as mortgaging or selling the land and other household assets often result in further spiralling into poverty.

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[3] FAO, WFP and IFAD. (2024). *The State of Food Insecurity in the World 2024*. Rome: FAO.

[4] Passarelli *et al.* (2024). Global estimation of dietary micronutrient inadequacies: a modelling analysis. The Lancet Global Health. Volume 12, Issue 10.

[5] Stevens *et al.* (2022). Micronutrient deficiencies among preschool-aged children and women of reproductive age worldwide: a pooled analysis of individual-level data from population-representative surveys. The Lancet Global Health. Volume 10, Issue 11.

[6] FAO. (2009) *Declaration of the World Summit on Food Security.* Rome, Italy: FAO.

[7] Quisumbing, A.R., Brown, L.R., Feldstein H.S., Haddad, L. and Peña, C. (1995) *Women: the key to food security.* Washington DC, USA: IFPRI.

The challenges experienced during food scarcity periods result in seasonal patterns of hunger and undernutrition, which can be aggravated by effects of climate change. The psychological effects of these challenges are intense, as all family members often experience high levels of anxiety and stress during this period. Women are especially affected, as their responsibilities often comprise both food production, income-generating activities and care for other household members (including food preparation). Given these major negative effects, it is remarkable that seasonal hunger tends to be overlooked by policy makers or may only get attention during natural or human-made calamities.

Local Food Plants

From a total of more than 7,000 known species of edible plants, only 417 are considered food crops[8], and nowadays only 30 crops account for 95% of human food energy intake, four of which (rice, wheat, maize and potato) cover 60% of our caloric needs[9]. However, our plant kingdom hosts plenty of edible plant species with a high potential to diversify the diets, address main nutritional requirements and shortcomings, provide food during food scarcity periods, mitigate risks in agricultural production, and provide rural households with additional income from their commercialization, while strengthening the cultural identity of farmers.

Local food plants are plants known and/or used by local communities as food. Local food plants include a wide range of species, ranging from domesticates (both staples and minor crops) to semi-domesticated species and wild food plants. Local food plants not only grow in agricultural fields (where they can grow as crops or weeds), but also in alternative environments such as home gardens, roadsides, aquatic ecosystems and forests. The availability of local food plants may play a key role in diversifying the diet and the consumption of a wide array of nutrients for rural households. The knowledge of local food plants is held by Indigenous peoples and smallholder farmers (IPSHF), and is to a large extent related to the biodiversity of their surrounding environments.

Local food plants are an important component of agrobiodiversity or agricultural biodiversity. Agrobiodiversity is a broader concept, which – according to the Food and Agriculture Organization of the United Nations (FAO,1998 definition) and the Convention on Biological Diversity (CBD, COP 5 Decision V5) – not only includes local food plants and animals consumed as food, but also non-harvested species in the farming systems and surrounding environments that support the production of food (e.g. soil microbiota and pollinators).

Neglected and underutilized species (NUS) are a key component of local food plants. In particular, NUS have been defined as useful plant species that consist of a large group of domesticated, semi-domesticated and wild edible species, which are “marginalized, if not entirely ignored by researchers, breeders and policy makers”, according to the NUS expert Stefano Padulosi[10].

[8] Antonelli, A., et al. (2020). *State of the World’s Plants and Fungi*. Royal Botanic Gardens Kew.
[9] FAO. Plant genetic resources. Use them or lose them. Available at: https://www.fao.org/fileadmin/templates/nr/documents/CGRFA/factsheets_plant_en.pdf
[10] Padulosi, S., et al. (2013). *Fighting poverty, hunger and malnutrition with neglected and underutilized species: needs, challenges and the way forward*. Bioversity International.

Objectives of our Work on Local Food Plants for Nutrition

SD=HS´s work on Local Food Plants for Nutrition aimed at strengthening the strategies that households have available to cope with food scarcity and malnutrition by increasing the intake of nutritious food obtained from local biodiversity. The work also aimed at improving the management of local food plants, particularly NUS.

The heart of our work was formed by the farmer field schools (FFS) on Local Food Plants for Nutrition, where community empowerment, experiential participatory learning and action research were central to our activities. The FFS approach is based on the capacity of community members to learn from each other and increase their self-confidence and self-reliance. The FFS work integrates local, technical and scientific knowledge, applying participatory approaches with a gender approach.

The scope of the work on nutrition and local food plants could be potentially very wide. Nutrition is a broad concept and not all aspects associated to nutrition were covered in this program, where major attention was given to the diversity of the local diet. Likewise, not all aspects related to local food plants were covered in our work, which highlighted knowledge, consumption and management of food species, in particular during the food scarcity period.

Strategy for Improving Nutrition Using Local Food Plants

The strategy for the implementation of the work on local food plants for nutrition included the following components, in chronological order: inception and methodological workshop, baseline study, FFS work, and end-of=program evaluation. This chapter also includes a section about the operational lines and costs of the FFS work and finalizes by presenting the knowledge hub that includes links to all global resources.

Inception and Methodological Workshop

The second phase of the SD=HS program started in 2019. The first activity towards an initial understanding of the development theory of the local food plants for nutrition work took place at the Inception and Methodological Workshop organized at the global level. During this workshop representatives from all country partner organizations involved in the program discussed the framework, objectives, principles and implementing approaches, and how to adapt these at the national level.

Baseline Study

The first national activity was a baseline study. The main objective of describing the baseline was to establish the local and regional context in the communities where the FFS on Nutrition and Local Food Plants would be implemented. The baseline had two components:

- A household baseline, which contained a household and dietary survey, conducted twice, during both the food scarcity and food affluency seasons. The first survey round took place between 2019 and 2000. The second survey round took place in 2021 (these surveys were delayed because of the COVID-19 pandemic).
- A local food plant baseline, which captured the local knowledge not only of the most common species, but also of the species that may be crucial to the food scarcity period. This baseline also included a nutritional evaluation of those species prioritized by each country.

The baseline tool is detailed in the document Baseline tool on Nutrition and Local Food Plants. The results of the baseline study were detailed in eight briefing notes (one per country, except for Zambia with two). All briefing notes are freely accessible, and their links are included in Appendix 1.

Farmer Field Schools

In order to improve and ensure food and nutrition security, a FFS curriculum on Nutrition and Local Food Plants was established as central activity. The FFS aimed at helping farmers to take a closer look at their diets and at the multiple links between nutrition, local food plants and gender, thereby contributing in particular to the empowerment of women, and the conservation and sustainable use of a wide diversity of plant genetic resources.

Our FFS approach required both master trainers and FFS facilitators. Local experts on the topics of nutrition and agrobiodiversity were recruited and trained during an online course to become master trainers. Then, master trainers trained FFS facilitators (during the Training of Trainers or ToT), who were locally based persons who guided the implementation of the activities in the field.

Development of FFS Field Guide and Facilitators' Guides

The first step was the development of the Farmer Field School Field Guide on Nutrition and Local Food Plants, which was intended to be used by master trainers. This guide was largely based on the experiences of the NUS work documented during the first phase of the SD=HS program (2014-2018), which took place in Zimbabwe, Vietnam, Myanmar and Peru.

The guide explains the two components of the FFS implementation process:

- the preparatory work and capacity building at the level of the implementing organization.
- the FFS implementation at the community level, which encompasses the organization, preparation and implementation of activities in the community fields.

Additionally, a series of five Facilitators' Guides for FFS on Local Food Plants for Nutrition were prepared to be used directly by FFS facilitators at community level. In contrast with the Field Guide, the Facilitators' Guides were illustrated and written in summary language (find the links to the Facilitator's Guides in the section Knowledge hub).

Training of Master Trainers

The second step consisted of the Online Course for Farmer Field Schools on Nutrition and Local Food Plants, which took place in 2020 and aimed at training local experts to become master trainers. This activity was conducted online because of the travel and meeting restrictions in force during the COVID-19 pandemic.

The course explains the contents and delivery methodology elaborated in the FFS Field Guide in six modules:

1. Introduction to nutrition, local food plants and FFS work
2. Diagnostic phase
3. FFS activities related to the management of local food plants
4. FFS activities related to improving nutrition
5. Planning and evaluation
6. Special topics

The lessons learned during the online training of master trainers were shared in the briefing note "Re-inventing agricultural trainings in times of COVID-19".

Figure 1. *Keys for success to build a first generation of FFS trainers.*

Training of Trainers (FFS facilitators)

The third step was formed by the ToT, which took place immediately after the online course (see Figure 1). The objective of the ToT was to create the core group of FFS facilitators or trainers, trained by master trainers, to guide the FFS on Local Food Plants for Nutrition activities at the community level. ToTs were organized at national or regional levels, building a network of trainers, with one or two local trainers facilitating regular meetings of farmer groups in their communities.

During the ToT, not only the guidelines for the FFS activities were discussed, but also the learning process among FFS participants. For instance, the importance of empowering the team, ensuring everybody participates in sub-group discussions, paying attention to gender group dynamics, and involving youth. Additionally, it was included in the ToT program the monitoring and evaluation of FFS work, documentation and reporting. During the ToT, the FFS national curriculum was defined, by adjusting and contextualizing the existing FFS Field Guide. More information on the setup of the ToT may be found in the FFS Field Guide and Online Course.

FFS Implementation at the Community Level

The fourth step consisted of the actual FFS work at the community level, where each FFS group was guided by one or two FFS facilitators. The FFS were established in 2020 immediately after the ToT took place. The FFS activities largely focused on tackling the major bottlenecks restraining the consumption and management of local food plants, as identified by farmers. As a result of this approach, a wide range of activities emerged, not only including agronomic ones (e.g. germination plots, seed storage), but also those strengthening cultural components (e.g. cooking demonstrations). Furthermore, the FFS included activities such as organizing seed and food fairs, establishing diverse home gardens and school gardens, and building community seed banks, among others.

At the end of each FFS cycle, emphasis was given to farmer's own evaluation of the activities, reflection on the knowledge gained, changes in practices and progress to achieve the local FFS goals. The FFS evaluation at FFS level provided valuable feedback that informed the next cycle of activities.

The FFS is an experiential approach consistent with formal and non-formal adult education elements. It begins and builds on farmers' local knowledge, and further supports farmers' learning processes. Consistent with the experiential learning cycle, experience has a central role in the learning process: local facts (concrete experiences) are the basis for observation and reflection, and findings (abstract concepts) are transformed into experimentation and further actions (see Figure 2). The FFS allows farmers to experiment, observe and analyse the experimental findings and outcomes, which are the basis of farmer's decisions and actions. New and/or additional knowledge is produced through transformation of experiences.

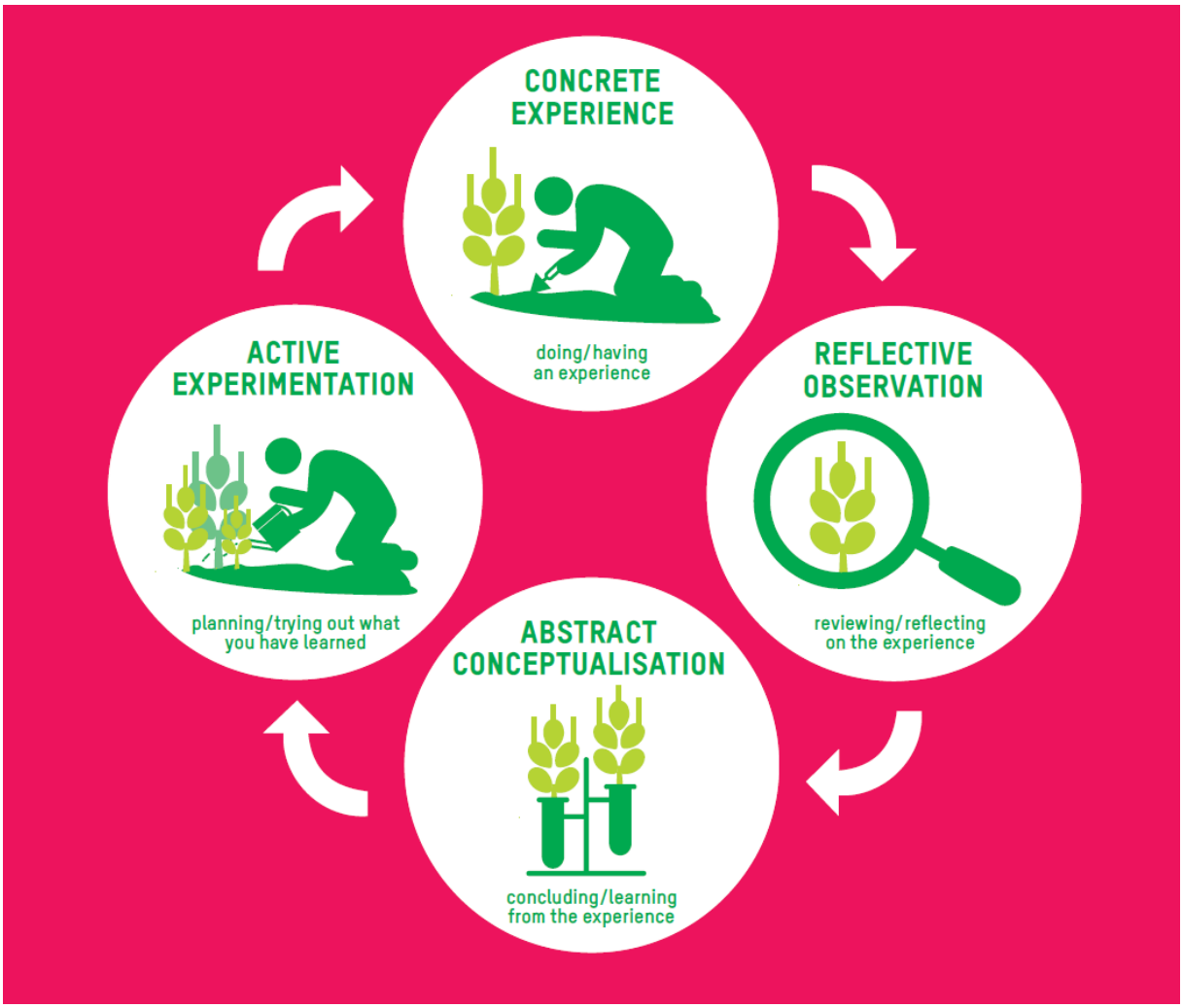


Figure 2. *Kolb's learning styles.*

Through experiments based on new ideas and/or existing local practices, experiential learning, and FFS group discussions, farmers were assisted to collectively identify approaches to deal with their local challenges. In addition to enabling farmers to adapt their food consumption patterns and their use and management of local food plants, farmers' participation in the FFS led to the establishment of farmers' networks.

It was necessary to establish relevant collaborations and alliances with local and national stakeholders, such as schools, local chefs, health and nutrition centres, research institutes, seed banks, universities, government departments, extension services, non-governmental organizations, herbariums, among others. This was essential to create a broader approach and impact. It was also highly encouraged to link the FFS work to policy advocacy and institutionalization of the FFS approach at national and global levels.

FFS Regional and/or National Level Evaluation

The fifth step was the FFS regional or national level evaluation, which allowed FFS facilitators to come together to share experiences, learn from each other, discuss the main bottlenecks faced during implementation, think creatively on new ways to improve ongoing FFS work, and provide feedback for associated national level activities. The national level evaluation was led by master trainers and took place once a year from 2021 onwards.

ToT Refresher Courses

The sixth step was the organization of the ToT refresher courses, which was an opportunity for training new FFS facilitators. These were organized at both regional or national levels.

End-of Program-Evaluation

The last step was the end-of-program evaluation, which included an assessment of the five-year program (2019-2023) at national level, including the following:

- Evaluation of lessons learned.
- Discussions on the long-term sustainability of the program.
- Reflections on the major contributions of the activities to achieve the wider program objectives, including major changes in farmer's knowledge and practices, influence of the FFS work in the wider community and dissemination of results.

Operational Lines and Costs of our FFS Work

The approximate average cost of implementing one FFS in the field was 1300 Euros per year (the value was calculated taking into account the information from four project countries across the continents for the year 2022), ranging from 655 to 2300 Euros. The cost of FFS implementation included the following operational lines in the budgets of country partner organizations:

- Monitoring visits to the field
- Materials for trainings and dissemination
- Trainings, including ToT refreshers
- End-of-season evaluations at FFS and national levels
- Costs of FFS implementation (e.g. establishment of home gardens, cooking demonstrations)
- Seed and food fairs

Some additional operational lines, which were only included by some countries, were:

- Establishment of community seed banks
- Establishment of exchange networks

- Establishment of exchange forums
- FFS field days
- Local institutionalization of the FFS work

The cost of implementing one FFS in the field excludes the costs of Oxfam Novib, and the costs of consultancies, equipment, human resources, office and traveling as part of the budgets of country partner organizations. It also excludes the initial activities conducted during the establishment of the program (e.g. implementation of the baseline survey).

Knowledge Hub

This section presents the main FFS course resources that have been produced during the implementation of our work across Africa, Asia and Latin America. All resources are freely accessible online. These tools may have to be adjusted to different contexts and countries for the implementation of programs on local food plants for nutrition. Most resources are available in both English and Spanish. Additionally, at the end of this section there are links for accessing some country level resources.

Baseline tool on Nutrition and Local Food Plants. This document aims at providing a guideline for the implementation of a baseline survey to capture information on nutrition and local food plants before and at the start of the FFS. This is a dual baseline tool, which includes household and dietary surveys on the one hand, and an assessment of local food plants on the other hand. Please click here for the English version, and here for the Spanish version.

Farmer Field School Field Guide on Nutrition and Local Food Plants. This document starts with an explanation of the FFS approach, followed by an introduction to the main concepts and topics related to nutrition, local food plants and gender. Then, the preparatory work and capacity building at the level of the implementing organization, and the FFS implementation at the community level are explained. The guide offers a basket of activities that can be implemented, from which trainers and FFS participants may select the most relevant and attractive ones. Please click here for the English version, and here for the Spanish version.

Online course for Farmer Field Schools on Nutrition and Local Food Plants. This course aims at guiding potential master trainers to prepare and conduct ToTs for FFS on nutrition and local food plants. The target audience includes farm management advisors, rural extension service staff, staff from non-governmental organizations, local health and nutrition staff, farmer organizations, rural youth and women networks, and farmers. The course is divided in 35 topics, which are distributed over six modules, and includes a series of video presentations corresponding to the different chapters of the FFS Field Guide. Please click here for the English version, and here for the Spanish version. The English version includes 4 hours and 16 minutes of video presentations, and the Spanish version 4 hours and 43 minutes of video presentations.

Briefing note "Re-inventing agricultural trainings in times of COVID-19". In this publication we provide recommendations and share the lessons learned during the online course (i.e. pros and cons of going virtual, power shift due to the COVID-19 crisis, empowering through cross-country learning). Please click here to access the publication in English.

Gender journey module. The aim of this gender journey exercise is to increase equaty between men and women in the FFS work. This guide is for FFS facilitators and aims at helping them to gain the skills to enable meaningful discussions and reflections on gender roles and inequalities during the FFS process. Please click here to access the publication in English.

Facilitators' Guides for Farmer Field Schools on Local Food Plants for Nutrition. This is a series of five illustrated guides designed to help facilitators to undertake FFS.

- Diagnostic phase, please click here for the English version, and here for the Spanish version.
- Improving nutrition, please click here for the English version, and here for the Spanish version.
- Managing local food plants, please click here for the English version, and here for the Spanish version.
- End of cycle evaluation, please click here for the English version, and here for the Spanish version.
- Special topics, please click here for the English version, and here for the Spanish version.

Briefing note "Plant biodiversity is key to ensuring farmers' food and nutrition security in response to the COVID-19 crisis". This publication presents some examples of how family farmers from China, Nepal, Uganda, Zambia and Guatemala, increased their self-sufficiency by using edible plants growing in their surroundings during the COVID-19 crisis. Please click here for the English version, and here for the Spanish version.

Book "One hundred local food plants for improving nutrition". This book presents a compilation of hundred local food plants that have the potential to tackle main nutritional deficiencies and to help reduce the length and severity of the food scarcity season. The book describes the botany, local knowledge and nutritional qualities of these plants. It also explains the species' tolerance to conditions of environmental stress, which suggests the potential role they might play for nutrition in the context of climate change. Please click here to access the book (in English).

Briefing notes series. Improving diets and reducing food scarcity with the help of local food plants. This is a series of eight briefing notes presenting and discussing the results of the baseline and FFS diagnostic phase for each one of the seven countries where our work was implemented. The links to the country briefing notes are provided in Appendix 1.

Links to some country level resources (more could be found in the SD=HS newsletter):

The power lies in the hands of the small-scale farmers (Uganda)

Adapting to climate change by promoting local food plants: Margaret Masudio's story (Uganda)

Recipe book from Uganda collects local knowledge

Case Studies from Laos

Farmers integrate SD=HS efforts by selecting varieties of local food plants in Zimbabwe

Compilation of recipes with neglected and underutilized species in the Sierra de los Cuchumatanes, Guatemala

Diagnostic Assessment of Underutilized Species in Guatemala

The Context of our Work

SD=HS´s work on Local Food Plants for Nutrition took place in Zimbabwe, Uganda, Zambia, Laos, Nepal, Peru and Guatemala (see Figure 3). Appendix 1 presents the maps with the location of our work in each country.

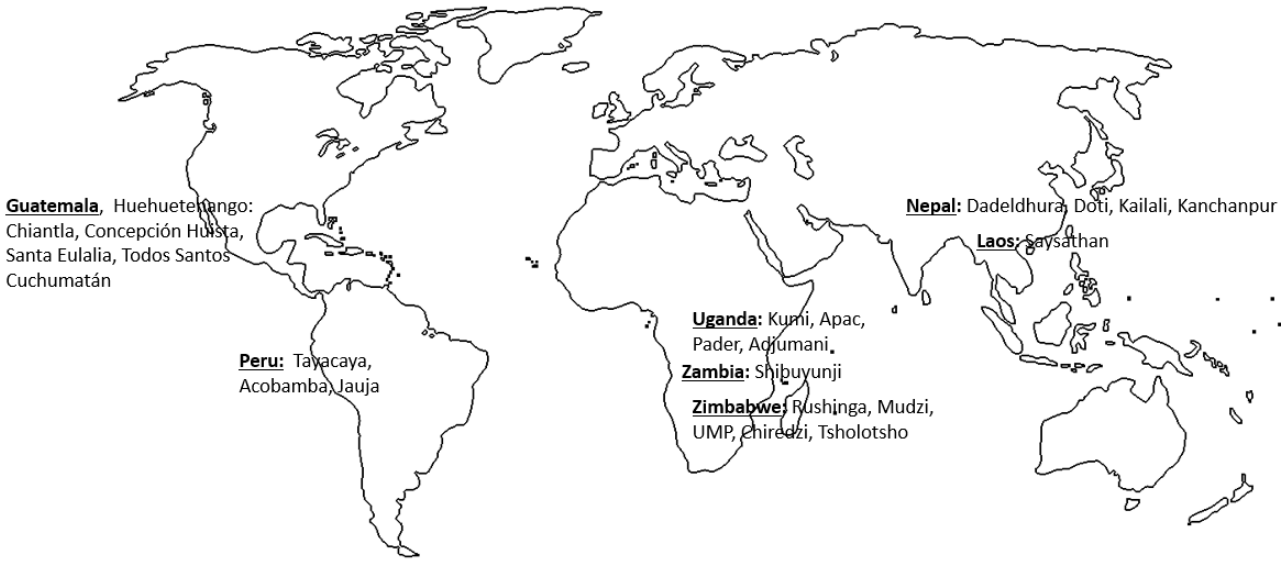


Figure 3. *World map indicating the location of our work on Local Food Plants for Nutrition.*

This chapter briefly presents some highlights from the analysis of the household surveys and the botanical assessments, which correspond to the baseline studies. The first round of the household survey took place in 2019 and 2020, and the second round in 2021. A total of 2954 households were interviewed in both rounds. Each round covered either the food scarcity season or the sufficiency season. The identification of the key local food plant species included a selection of plants listed by men and women in the household surveys, followed by their botanical and ethno-botanical characterization, and nutritional analysis. The exact dates when the survey took place in each country, the number of households that participated in the study and the survey methodology, are provided in Appendix 2.

This chapter starts with a short socio-demographic description of the IPSHF in the various project sites. This is followed by cross-country[11] comparisons regarding food scarcity periods, dietary diversity, food insecurity, and the roles of men and women for acquiring local food plants. This chapter also presents a list of the most important local food plant species identified by this study. Appendix 1 includes the links to the briefing notes published for each country, where all results of the household survey are detailed and explained.

[11] The analysis includes the results of all countries, except Laos for the smaller sample size.

Indigenous Peoples and Smallholder Farmers in the SD=HS Program

This section presents the main socio-demographic description of the IPSHF in each country where the program took place[12].

Zambia

The work on Local Food Plants for Nutrition took place in four districts of the Central, Southern, and Lusaka provinces of Zambia. The districts of Chikankata and Chirundu are located in Southern Province, Rufunsa district is in Lusaka Province, and Shibuyunji is a district of Central Province. The surveyed communities mostly rely on maize, groundnut, pumpkin and sweet potato farming to sustain their livelihoods. However, Chirundu, due to its different and drier agroecology, mainly relies on sorghum, pearl millet, cowpea and groundnut. In the program sites, more than 90% of these crops are cultivated for household consumption. The majority of the households investigated had an average size of nearly six household members. The most common ethnic group in Chikankata is *Tonga*, in Shibuyunji the most prevalent ethnic groups are *Sala* and *Ila*, and in Rufunsa is *Soli*. Male household heads were present in just over 70% of the households interviewed, indicating the gender disparity in household dynamics. The educational level and literacy rates of the surveyed households showed that 59% of household heads have completed primary education, although 66% do not know how to read or write. Almost 10% of the household heads have never attended formal education, while only 34% have completed secondary education.

Zimbabwe

The work on Local Food Plants for Nutrition took place in five districts of the Mashonaland Central, Mashonaland East, Masvingo, and Matabeleland North provinces of Zimbabwe. These populations rely on maize farming, groundnut and sorghum to sustain their livelihoods. They cultivate more than 90% of these crops for the purpose of home consumption. The mean household size was 5.3 household members, with a standard deviation of 1.9. Male household heads were present in more than 70% of the households interviewed, indicating a gender disparity in household dynamics. The educational level and literacy rates of the surveyed households showed that 87% of household heads had completed at least primary education, while 13% do not know how to read or write.

Uganda

The work on Local Food Plants for Nutrition took place in the Northern and the Eastern regions of Uganda. The surveyed communities mostly rely on cassava farming, maize, groundnut and bean to sustain their livelihoods. More than 90% of these crops are cultivated for home consumption. The majority of the households investigated had an average size of almost seven household members and belonged to the ethnic group *Luo*. Male household heads were present in almost 80% of the households interviewed, indicating the gender disparity in household dynamics. The educational level and literacy rates of the surveyed households showed that 73% of household heads had at least completed primary education, while 22% do not know how to read or write. Almost 30% of the household heads had never received formal education, while 15% had completed higher education. There was a strong divergence in literacy and formal education levels within and between communities.

[12] This information was extracted from the briefing notes series "Improving diets and reducing food scarcity with the help of local food plants", prepared by Konstantina Maria Togka, Gisella Cruz-Garcia, Hilton Mbozi and Bert Visser. Please find the links to the briefing notes with the complete analysis for each country in Appendix 1.

Guatemala

The work on Local Food Plants for Nutrition took place in the following districts of the Huehuetenango province: Todos Santos Cuchumatán, Concepción Huista, Santa Eulalia, Chiantla and Petatan. The surveyed communities mostly rely on maize and beans farming to sustain their livelihoods. The majority of the households investigated had an average size of almost six household members. The most common ethnic group was *Popti'* (46%), followed by *Q'anjob'al* (29%) and *Mam* (22%). Male household heads were present in almost 80% of the households interviewed, indicating the gender disparity in household dynamics. The educational level and literacy rates of the surveyed households showed that 80% of household heads had never attended formal education, although 52% of them can read and write. Almost 20% of the household heads had attended primary education. The results point out a strong divergence in literacy and formal education levels within and between these communities.

Peru

The work on Local Food Plants for Nutrition took place in the Huancavelica and Junín regions of Peru. The surveyed communities mostly rely on potato farming to sustain their livelihoods, and 97% of the potato harvest is for the purpose of home consumption. The households investigated had an average size of almost four household members. The majority of households were male-headed (70%), indicating the gender disparity in household dynamics. The educational level and literacy rates of the surveyed households showed that 30% of household heads had never attended formal education, and 16% do not know how to read or write. Almost 38% of the household heads had attended primary education.

Nepal

The work on Local Food Plants for Nutrition in Nepal took place in the following rural municipalities of the Sudurpaschim province: Jorayal, Ganyapdhura, Joshipur, Laljhadi, Gauriganga and KailarI. The surveyed communities mostly rely on wheat, rice, potato and mustard farming to sustain their livelihoods. More than 90% of wheat is cultivated for home consumption. The majority of the households investigated had an average size of five household members and belong to various indigenous tribes (56%). Male household heads were present in more than 80% of the households interviewed, indicating that female-headed households are a minority. The educational level and literacy rates of the surveyed households showed that 39% of household heads had completed primary education, whereas 27% do not know how to read or write. Almost 39% of the household heads had never attended formal education, while 16% have completed secondary education.

Laos

The work on Local Food Plants for Nutrition took place in four villages in the Sayaboury province of Laos. The surveyed communities mostly rely on upland rice and maize farming to sustain their livelihoods, which are mainly cultivated for consumption. The households investigated belong to the *Prai* ethnic group, and had an average size of five household members and the majority of them were male-headed (87%), indicating the gender disparity in household dynamics. Almost 90% of the household heads work on-farm as their main occupation, and their average age was 43 years old. The educational level and literacy rates of the surveyed households showed that 32% of household heads had never attended formal education, while 37% did not know how to read or write. Thirty five percent of the household heads had attended primary education.

Nutrition Related Indicators in the Program Countries

The following paragraphs present some of the results of the household survey in relation to food scarcity, dietary diversity, and food insecurity[13].

Food Scarcity

In almost all countries, except for Guatemala, more than half of the surveyed households experienced a food scarcity period. Almost all interviewed households in Peru, Laos, Uganda and Zambia suffered from scarcity, followed by Zimbabwe with slightly less families that suffered from scarcity. The mean length of the scarcity period varies from two to five months (see Table 1). Table 2 indicates in which months of the year the food scarcity took place for each country.

Table 1. *Percentage of households that suffer from food scarcity in each project country[1] (n=2954)*

	Guatemala	Laos	Nepal	Peru	Uganda	Zambia	Zimbabwe
% households that suffer from food scarcity	35%	98%	56%	98%	96%	98%	83%
mean length of the food scarcity season	2,3	4,2	2,8	3	3,1	2,8	4,5
SD[2] length of the food scarcity season	1,5	1,9	1,6	1,2	1,6	2,1	3,4

[1] The results highlighted in red indicate when more than 80% of surveyed households suffer from food scarcity in the country.

[2] Standard deviation.

Table 2. *Percentage of households that suffered from food scarcity during distinct months of the year[1, 2] (n=2954)*

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Guatemala	4%	10%	100%	72%	33%	2%	1%	1%	1%	1%	1%	1%
Laos	11%	3%	2%	3%	13%	29%	35%	60%	73%	78%	70%	37%
Nepal	19%	19%	60%	55%	8%	10%	29%	35%	28%	9%	7%	10%
Peru	51%	49%	39%	26%	23%	24%	26%	23%	11%	7%	4%	16%
Uganda	14%	17%	23%	30%	54%	81%	51%	19%	7%	6%	5%	4%
Zambia	11%	7%	3%	4%	7%	9%	9%	17%	25%	35%	52%	68%
Zimbabwe	47%	35%	21%	13%	14%	17%	21%	32%	50%	69%	77%	51%

[1] The percentages are calculated based on the total number of households that reported suffering from food scarcity in that period.

[2] The results highlighted in red indicate cases where more than 50% of surveyed households suffered from food scarcity. Pink highlights the months when only 25% to 50% of households reported to suffer from scarcity.

Dietary Diversity

The Household Dietary Diversity Score (HDDS) measured dietary diversity. The HDDS assesses a household's economic access to food (i.e. its ability to produce, purchase or otherwise secure food for

[13] For Laos, data was not sufficient to calculate dietary diversity and food insecurity.

consumption by all household members), scoring from 0-12 (the higher the score, the more diverse the diet).

In the food scarcity season, Zimbabwe presented the lowest HDDS (HDDS = 4,3), followed by Uganda (HDDS=5,4), Nepal (HDDS=5,9) and Zambia (HDDS=6,2). In the food sufficiency period, Nepal (HDDS=4,4), followed by Zimbabwe (HDDS=4,9) presented the lowest HDDS. In both seasons, Peru (HDDS=7,6 and 8,8 in the food scarcity and sufficiency periods, respectively) was among the countries with higher dietary diversity (see Figures 4 and 5).

In Nepal, which presented the highest seasonal differences, the HDDS was higher in the food scarcity season in comparison to the food sufficiency period. While the availability of the staple food (i.e. such as rice, wheat, potato and corn) decreased in times of food scarcity, the consumption of fruits, tubers and roots increased. In Uganda, the range between the minimum and the maximum HDDS values was higher than in the other countries, which indicates more differences among households regarding access to food diversity. In contrast with Nepal, in Uganda, cereals, tubers and roots, vegetables and legumes were almost equally the most consumed food groups during both the scarcity and sufficiency seasons.

Regarding Zimbabwe, cereals and vegetables were the most consumed food groups during both the scarcity and sufficiency seasons. While food availability was lower during the scarcity period, cereals, fruits, sweets, and spices were consumed significantly more frequently during this season. In Zambia, cereals and vegetables were the most consumed food groups during both the scarcity and sufficiency seasons, while fruits were consumed slightly more frequently during the scarcity season.

In Guatemala, cereals, vegetables, legumes, nuts and seeds, sweets and spices were the most consumed food groups during both the scarcity and sufficiency seasons, with all being consumed slightly higher during the sufficiency season. Regarding Peru, cereals, white tubers and vegetables were the most consumed food groups during both the scarcity and sufficiency seasons, together with oils or fats, sweets and condiments. Interestingly, fruits and legumes, nuts or seeds were two of the least consumed food groups, during both seasons.

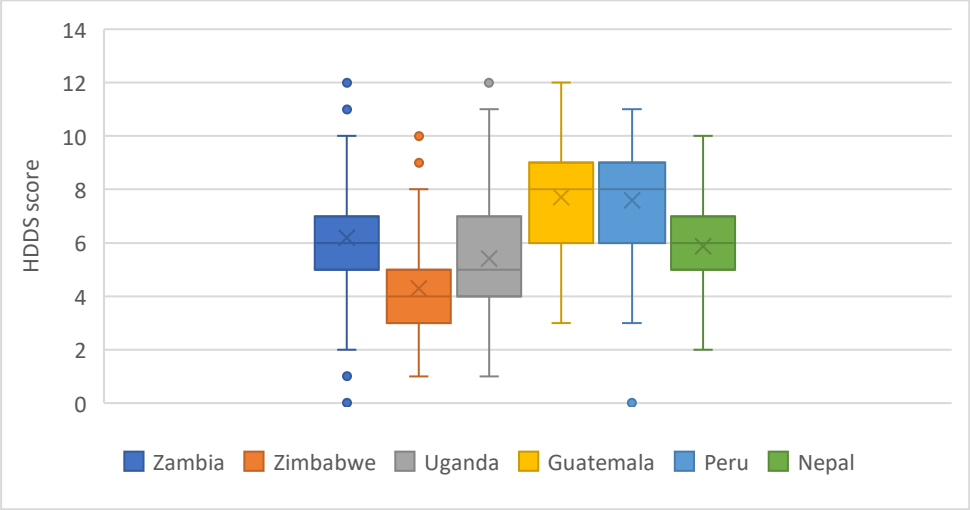


Figure 4. *HDDS in the food scarcity season across project countries (n=2954).*

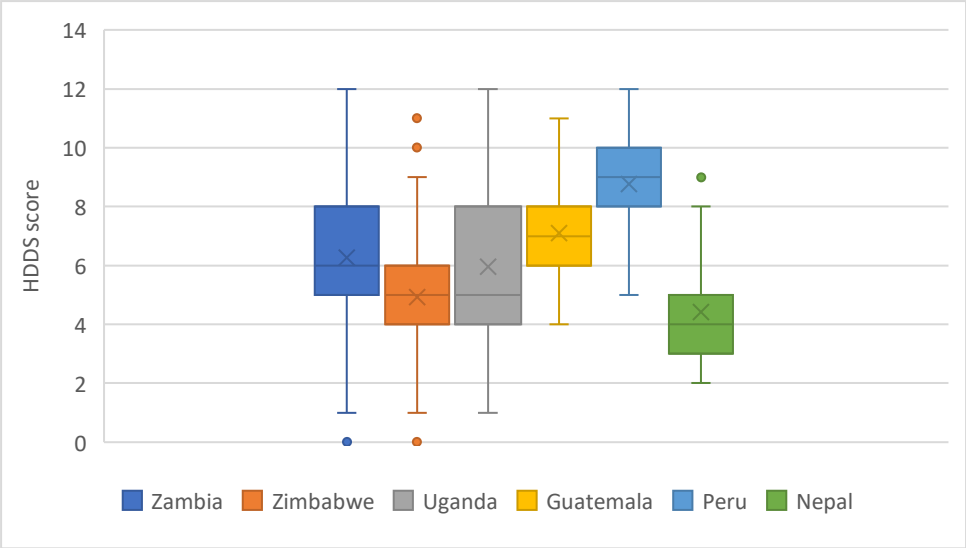


Figure 5. *HDDS in the food sufficiency season across project countries (n=2954).*

Food Insecurity

The Household Food Insecurity Access Scale (HFIAS) measured food insecurity. The HFIAS measures the severity of household food insecurity during the past four weeks. It ranges from 0 to 27, indicating the degree of insecure food access. Food insecurity not only takes into account whether households had enough to eat, but also how they coped when food was scarce. For instance, food insecure households may compromise food quality or reduce food quantity when the access to food is reduced.

Households in all countries, except Nepal, were more food insecure during the food scarcity period. This demonstrates the crucial negative impact that lean periods, linked to growing seasons, have on household food security. Uganda was among the countries with the highest food insecurity during both seasons (HFIAS = 13,2 and 9,6 in the food scarcity and sufficiency periods, respectively). Zimbabwe also presented a high food insecurity in the food scarcity season (HFIAS=14). Surveyed households from Guatemala were among the most food secure, with HFIAS equivalent to 2,9 and 0 in the food scarcity and sufficiency seasons, respectively (see Figures 6 and 7).

Households in Nepal were more food secure in the sufficiency season (HFIAS=11), which is also the period when they had more diverse diets. As mentioned before, while the scarcity season in Nepal was related to the decrease of the staple crop, local food plants played a key role to ensure the food and nutrition security of households when the staple was scarce.

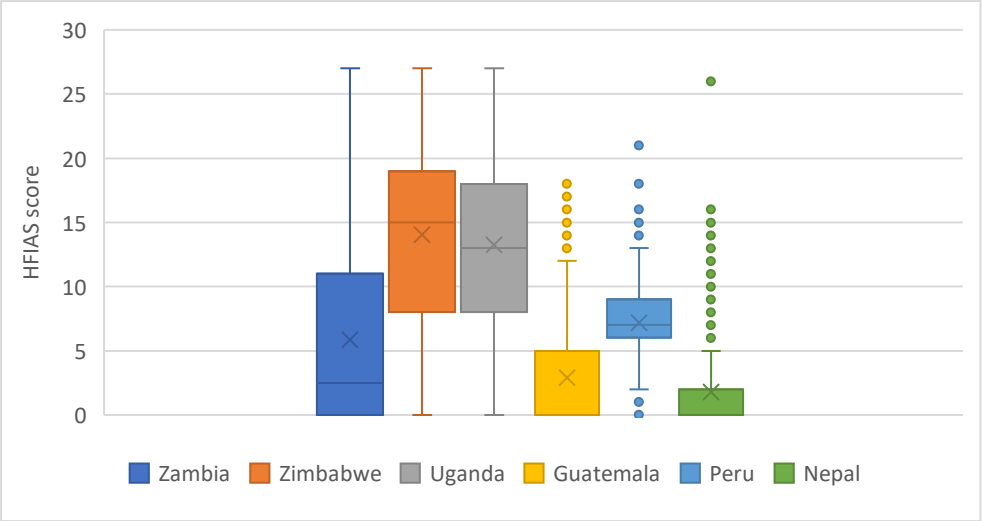


Figure 6. *HFIAS in the food scarcity season across project countries (n=2954).*

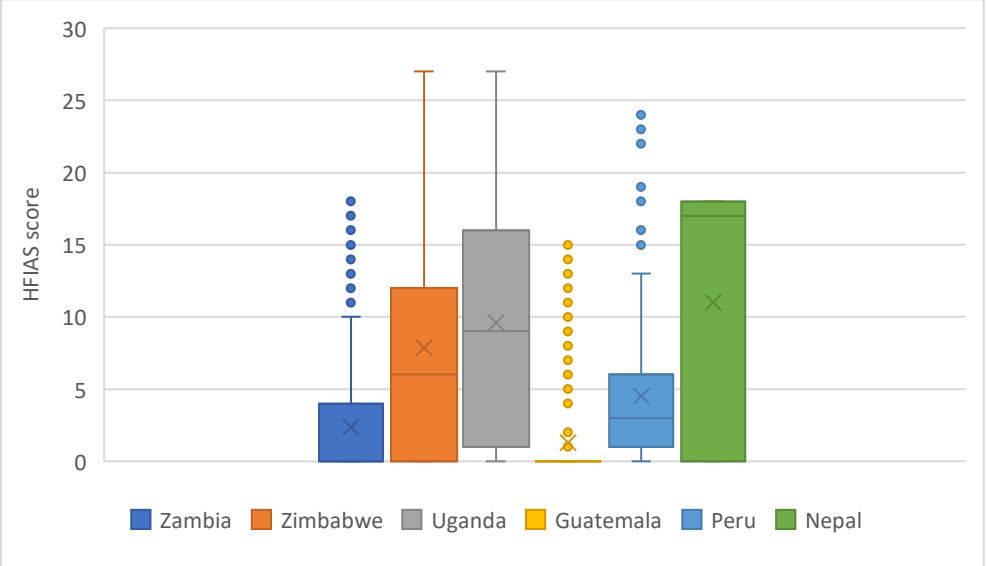


Figure 7. *HFIAS in the food sufficiency season across project countries (n=2954).*

Men and Women's Roles in Local Food Plant Acquisition

The results of the study showed that in all countries in both food scarcity and sufficiency seasons, except for Nepal in the food sufficiency period, women brought home more botanical species for food consumption than men (see Figures 8 and 9). Families sourced local food plants from multiple environments, including agricultural fields, home gardens, forests, river sides, road sides and other public spaces. Markets also played an important role in the acquisition of food plants. Women and men specialized either in specific groups of species, or some environments.

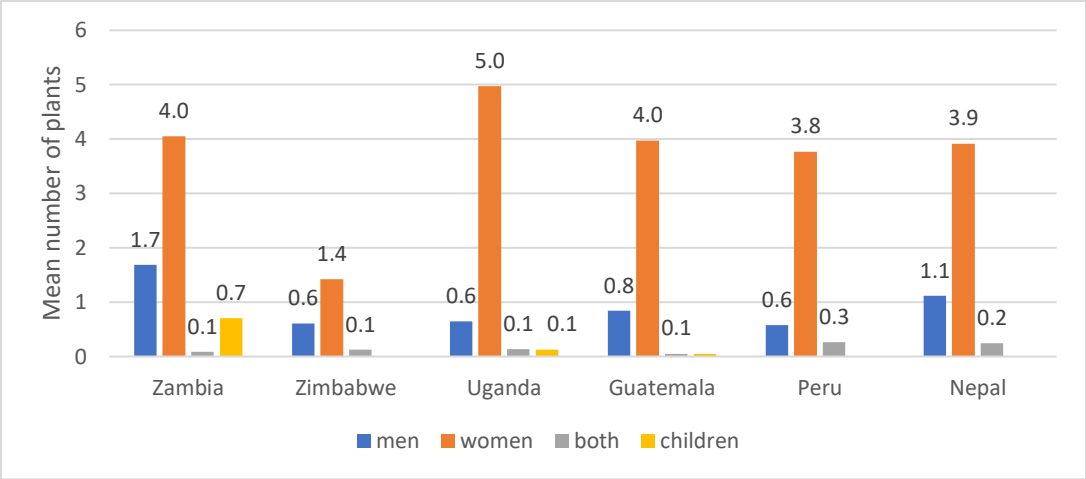


Figure 8. *Mean number of food plant species sourced by family members in the food scarcity season (n=2954).*

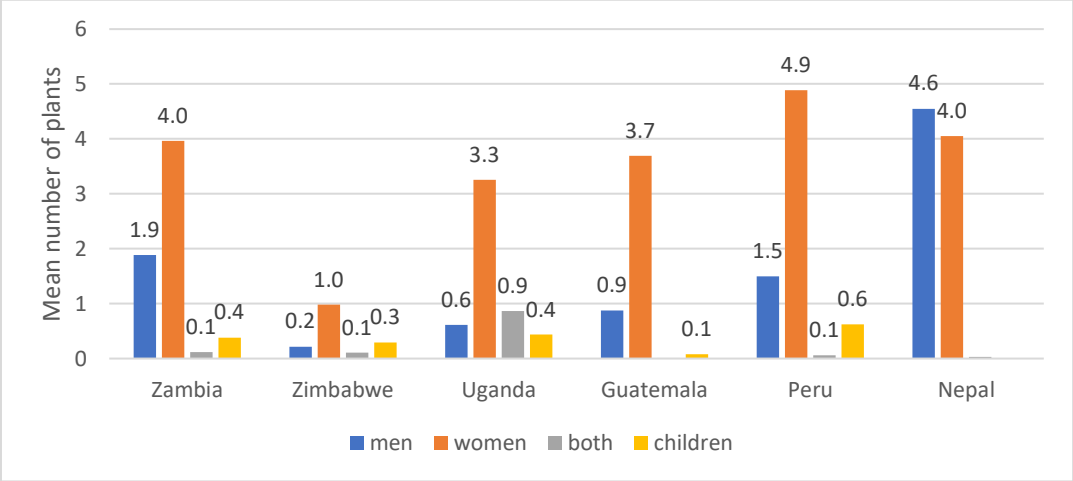


Figure 9. *Mean number of food plant species sourced by family members in the food sufficiency season (n=2954).*

Champion Species

We named champions those local food plant species that can play an essential role in addressing micronutrient deficiencies, given their high content of particular nutrients. In addition, we named champions those food plants that are available during food scarcity periods, as well as some highly nutritious species that are available throughout the year. Champion species may be popular among farmers in some regions, but less widely known by farmers in other places in the world. Table 3 indicates the most nutritious champion species across the program countries, their nutrition score based on their number of nutrient claims, and their role during food scarcity periods. Please, refer to the book "One hundred local food plants for improving nutrition" for detailed information about each of these species, and for more information on the nutrition claims and the role in food scarcity.

Table 3. *Most nutritious champion species across the program countries*

Scientific name	English name	Countries	Nutrition score[1]	Role in Food Scarcity
Abelmoschus esculentus (L.) Moench	Okra	Zambia, Uganda	2	extremely important (Uganda), important (Zambia)
Adansonia digitata L.	Baobab	Zimbabwe	1	extremely important
Amaranthus caudatus L.	Grain amaranth	Peru	2	(unknown)
Amaranthus cruentus L.	African spinach	Zambia	4	less important
Amaranthus thunbergii Moq.	Pigweed	Zimbabwe	1	very important
Amaranthus tortuosus Hornem.	Spleen amaranth, wild spinach	Uganda	2	important
Avena sativa L.	Oats	Peru	3	less important
Cajanus cajan (L.) Millsp.	Pigeon pea	Uganda	4	very important
Capsicum frutescens L.	Chilli	Lao	2	less important
Centella asiatica (L.) Urb.	Asiatic pennywort	Lao	1	important
Chenopodium pallidicaule Aellen	Kaniwa	Peru	2	(unknown)
Chenopodium quinoa Willd.	Quinoa	Peru	2	very important
Cleome gynandra L.	Spider flower, cat's whiskers	Zambia, Uganda, Zimbabwe	2	extremely important (Uganda, Zimbabwe)
Crotalaria retusa L.	Devil bean, wedge-leaf rattlepod	Uganda	2	less important
Diplazium esculentum (Retz.) Sw.	Edible fern, vegetable fern	Lao	1	important
Eleusine coracana Gaertn.	Finger millet	Uganda, Zimbabwe, Nepal	2	extremely important (Zimbabwe, Nepal), very important (Uganda)
Equisetum arvense L.	Field horsetail	Peru	4	less important
Hibiscus sabdariffa L.	Roselle, hibiscus	Zambia, Uganda, Nepal	1	extremely important (Nepal)
Lathyrus oleraceus Lam.	Pea	Uganda, Peru	2	extremely important (Peru), important (Uganda)
Lepidium sativum L.	Garden cress	Nepal	1	(unknown)
Lupinus mutabilis Sweet	Andean lupin	Peru	2	very important

Manihot esculenta Crantz	Cassava, tapioca	Zambia, Uganda, Lao	2	quite important (Uganda), important (Zambia, Lao)
Perilla frutescens (L.) Britton	Perilla	Nepal	2	(unknown)
Phaseolus coccineus L.	Runner bean	Guatemala	1	very important
Psidium guajava L.	Guava	Zambia	1	important
Sesamum indicum L.	Sesame	Lao	3	less important
Setaria italica (L.) P.Beauv.	Foxtail Millet	Nepal	2	important
Solanum nigrescens M.Martens & Galeotti	Divine nightshade, slender nightshade	Guatemala	1	extremely important
Taraxacum officinale F.H.Wigg.	Dandelion	Peru	3	less important
Vigna unguiculata (L) Walp.	Cowpea	Zambia, Uganda, Lao	1	extremely important (Zambia, Uganda)

[1]Nutrition score was based on the number of nutrition claims each food plant had after the nutritional evaluation, indicating: 4= most nutritious, and 1= least nutritious. Please, refer to the book "One hundred local food plants for improving nutrition" for more information on the nutrition claims and the role in food scarcity.

The champion species above encompass both globally cultivated species and species only known regionally, as well as NUS. The composition of the list shows how species with diverse status can contribute to improved nutrition. Remarkably, several of these species are both highly nutritious and important in times of scarcity.

Farmer Field School Evaluation

This chapter presents the key results of the mid-term and final evaluations of the FFS work at field level. The results show the views and perspectives of farmers who participated in FFS activities.

Mid-term Evaluation of the FFS Work

The mid-term evaluation was conducted after the first year of the FFS work. A sample of 668 FFS participants were interviewed during the second round of the baseline survey, which took place in the first three quarters of 2021 (please see Appendix 2 for more information on the methodology). In total, 116 farmers were interviewed in Guatemala, 191 in Zambia, 138 in Zimbabwe, 149 in Uganda and 74 in Peru. This evaluation captured information on the perceived progress of the FFS work for helping farmers to cope with the food scarcity period and improving their nutrition, and changes in practices, allowing for feedback to improve FFS activities.

Contribution to Reduce the Food Scarcity Period

The results of the mid-term evaluation indicated that more than half of the respondents (58%) stated that there was a reduction in the length of the food scarcity period, with three fourths of them respondents explaining that the decrease was between one to three months. This was more evident among farmers in Zambia (75%), followed by farmers in Uganda (58%). Remarkably, 40% of farmers in Zimbabwe, followed by 28% in Guatemala indicated that the food scarcity period was reduced by four to six months after one year of the program. Additionally, 89% of respondents agreed that adding more diversity of local food plants to their diets helped them to strengthen their strategies to cope with the food scarcity period (see Figures 10, 11 and 12).

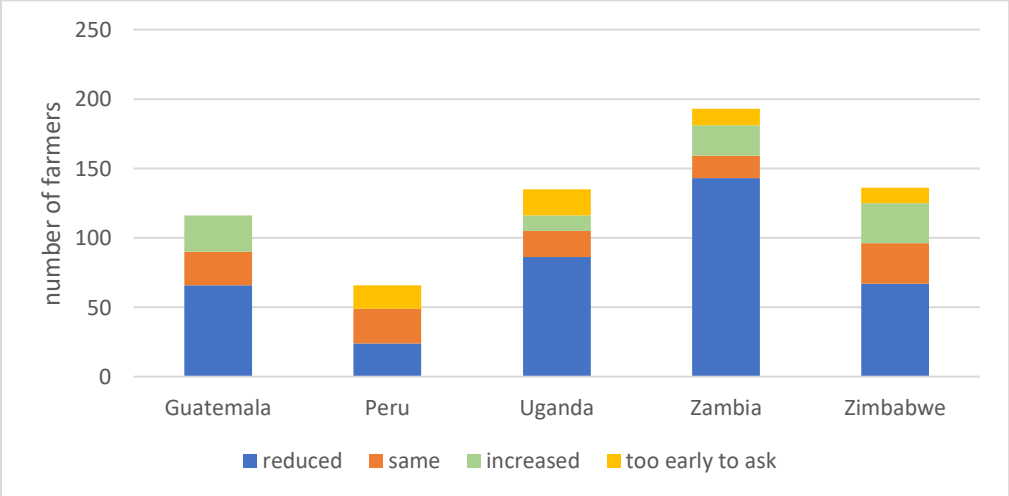


Figure 10. *Has the food scarcity period of your household been reduced after joining the FFS? (n=668 farmers)*

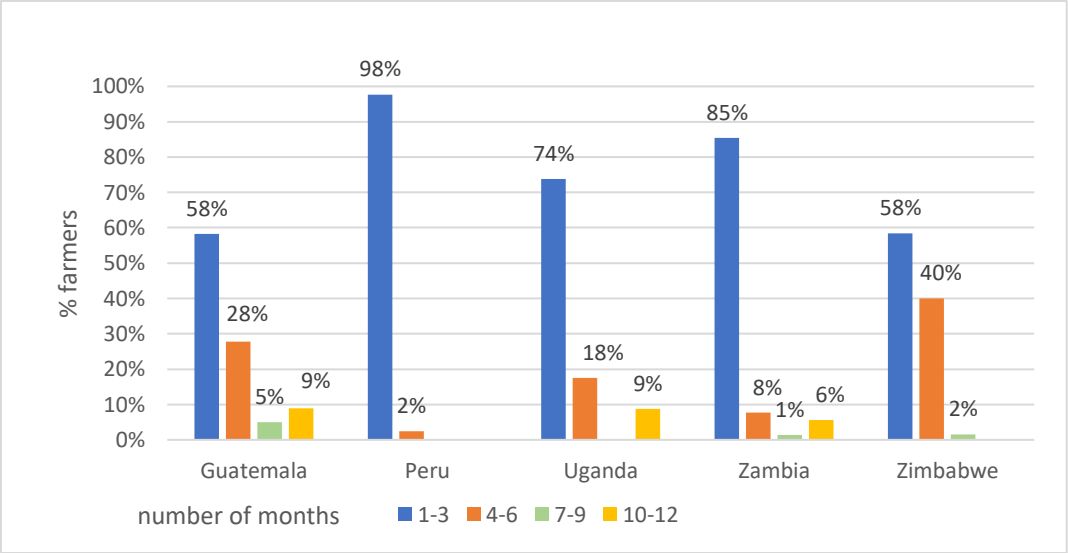


Figure 11. *How many months has your food scarcity period been reduced? (n=668 farmers)*

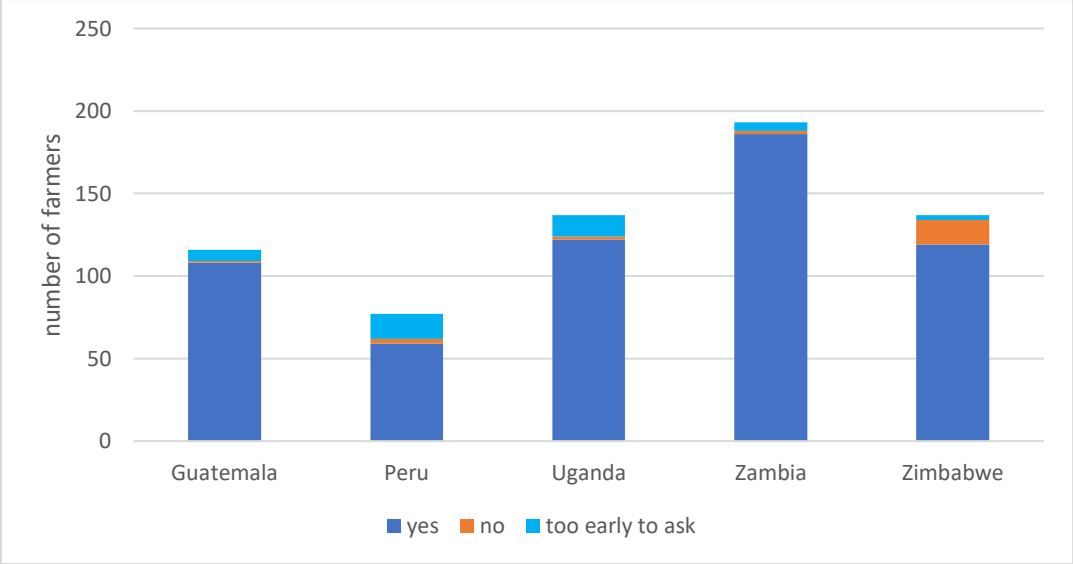


Figure 12. *Do you think local food plants helped you to strengthen your strategies to cope with the food scarcity period? (n=668 farmers)*

Contribution for Improving Nutrition

The results of the mid-term evaluation after one year of FFS activities showed that 76% of sampled FFS participants observed an improvement in the nutrition of their families, while 9% indicated that their nutrition is the same and for 9% it was too early to perceive any change. The improvement was more evident in Zambia (92% farmers), followed by Zimbabwe (83%), Guatemala (72%) and Uganda (71%). In Peru, the improvement was observed by 38% of the FFS participants, which might be related to the fact that Peru was among the countries with the highest dietary diversity when comparing the different project sites at the start of the program (see Figure 13).

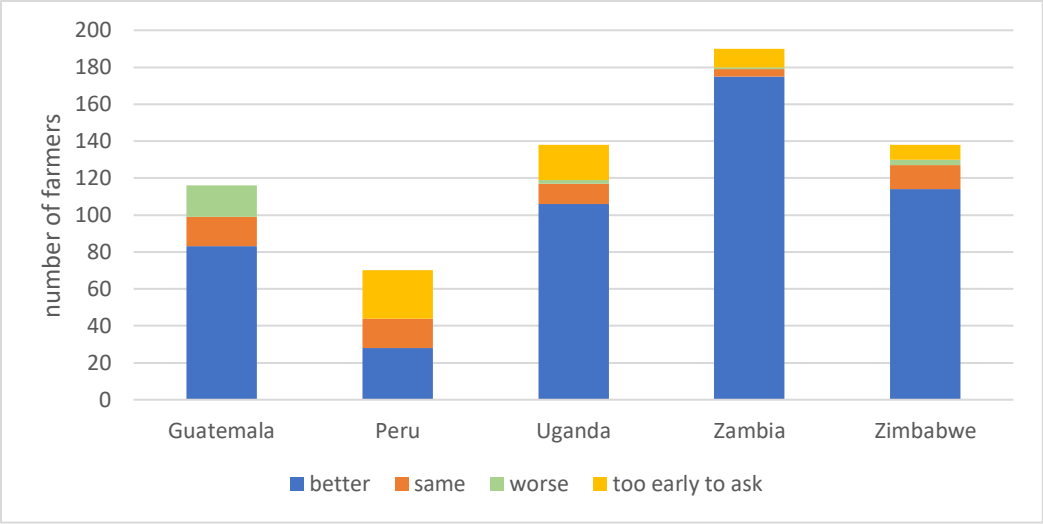


Figure 13. *How is the nutrition of your family after joining the FFS? (n=668 farmers)*

Changes in Practices

The participation in FFS activities also contributed to change farmer's food consumption patterns after one year of program implementation. For instance, 78% farmers indicated that they eat local food plants that they did not eat before joining the FFS, and 67% explained that they eat more frequently local food plants than before joining the program, which was more evident in Guatemala and the African countries (see Figures 14 and 15).

Conversely, more Peruvian farmers indicated that the consumption of local food plants did not change after program activities, in comparison to the other countries. This is echoed in the fact that they already had a higher dietary diversity at the beginning of the program.

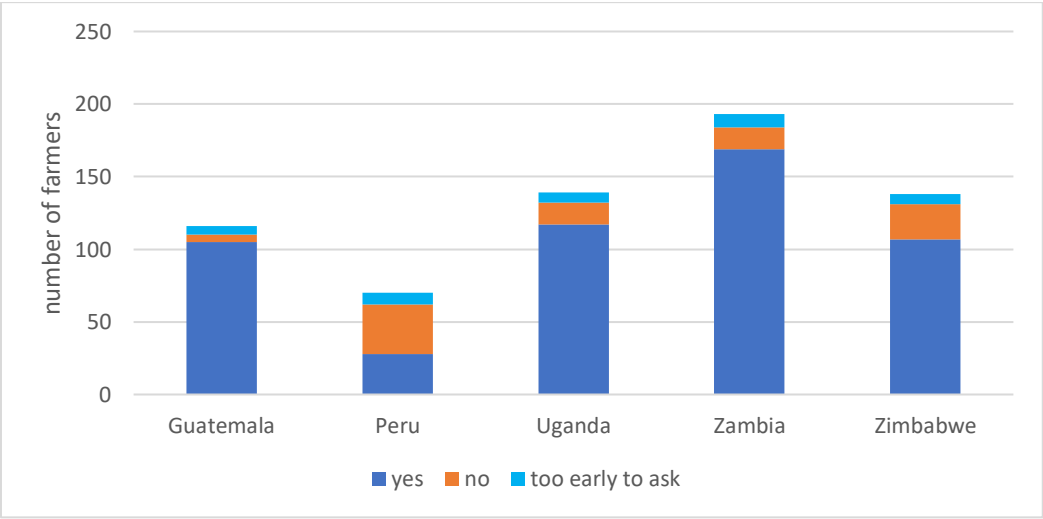


Figure 14. *Do you eat local food plants that you did not eat before joining the FFS? (n=668 farmers)*

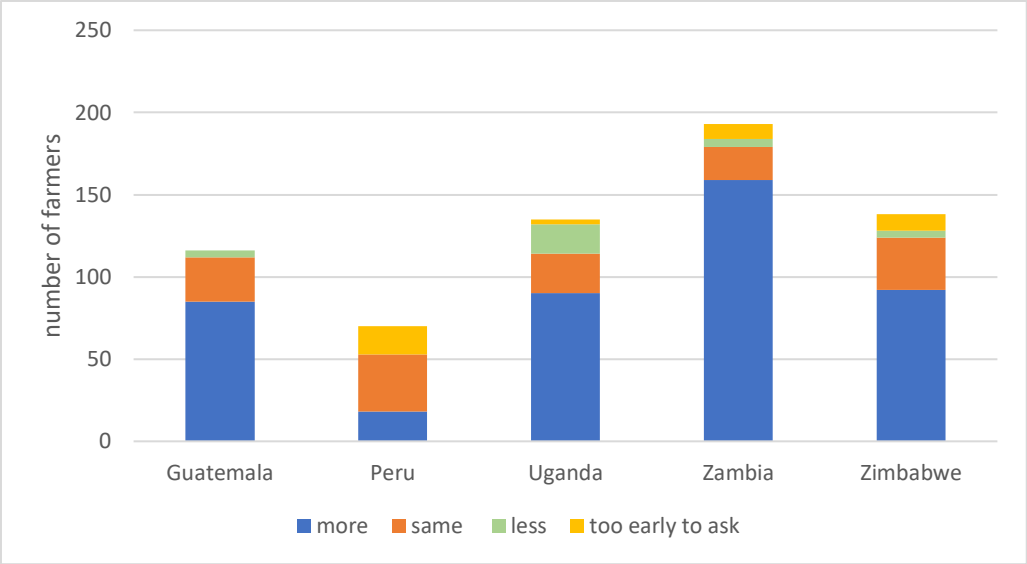


Figure 15. *Do you eat more frequently local food plants than before joining the FFS? (n=668 farmers)*

Final Evaluation of our FFS Work

As a result of the different teams' efforts, the program communities diversified their food sources with local food plants. More than 230 local food plants were promoted with very positive results. This was especially relevant between 2019 and 2023, when the world's food systems faced significant difficulties, and many of the inputs for food production became unaffordable affecting producers and consumers all over the world.

A total of 342 FFS on local food plants for nutrition were implemented by the end of the program (see Figure 16). At least 12321 men and 9141 women participated in the FFS activities between 2019 and 2023, with 13% of them youth. About 500 master trainers and facilitators (of whom >50% women) were trained for FFS on local food plants for nutrition.

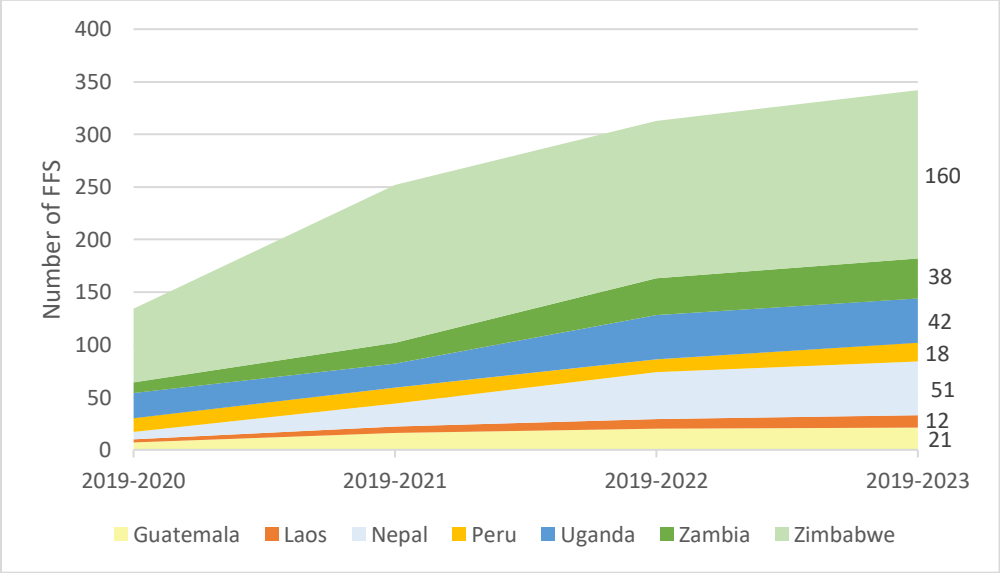


Figure 16. *Total number of FFS established in each country during the program.*

The FFS work during the second phase of the SD=HS program was complemented with knowledge and experience sharing activities[14]. For instance, in Nepal, videos and flyers on traditional foods and NUS cultivation practices were developed and disseminated. In Uganda, knowledge on the significance of local food plants reached over 20,000 individuals through video documentaries and radio discussions. In Zambia, project beneficiaries utilized multiple platforms, like seed and food fairs, farmer exchange visits, and led workshops reaching 29,499 farmers, with a focus on women and girls. In Zimbabwe, knowledge-sharing occurred at seed and food fairs, field days, and various community events, impacting over 6,500 farmers. During these events, farmers highlighted the benefits of local food plants in family diets. The Guatemalan team conducted a comprehensive diagnosis of local food plant species, leading to the creation of a manual covering identification, knowledge, and diverse methods of preparation, and benefiting 500 FFS participants directly and 2,500 indirectly. In Peru, trade fairs and demonstration days on NUS were conducted, in collaboration with public and private institutions, reaching 78 participants directly and hundreds more indirectly, ensuring collaboration for sharing and replicating recipes. In both countries, these materials were widely shared in events such as food fairs, field days and social media platforms.

Additionally, the program encouraged the establishment of partnerships with governmental institutions and the creation of networks of seed and information exchange[15]. For instance, SD=HS reached 8,194 households through women seed networks established at country level distributing seed for local food plants and diverse seasonal vegetables enhancing production and consumption. Community Seed Banks networks and nurseries were also supported to multiply and supply seedlings of local NUS. In Peru, Guatemala, Uganda, Nepal, Zambia and Zimbabwe, the project participated in events such as UN World Food Festival Celebration Day, food fairs, seed and food caravan, radio shows to promote social status of NUS.

The final evaluation at FFS-level took place in 2023, by the end of the program. A sample of 115 FFS conducted the self-evaluation of their activities, 23 FFS in Uganda, 55 in Zimbabwe, 23 in Zambia and four in Guatemala[16], capturing the views of more than 1000 FFS participants. The evaluation was conducted following the Facilitators' Guide for Farmer Field Schools on Local Food Plants for Nutrition for the End of cycle evaluation. The evaluation captured information on the usefulness of the FFS activities, perceived progress of the FFS work for helping farmers to cope with the food scarcity period and improving their nutrition, changes in knowledge and practices, influence in the wider community and dissemination. Country partner organizations recorded yearly the main outcomes of the program. At the end of the program, national level evaluation workshops took place in every country (the results of these workshops are not presented in this document).

Although there was not sufficient data to present in this document the results of the final evaluation conducted at FFS-level in Nepal, Peru and Laos, the positive impact of the program was also emphasized in these countries. For instance, in Peru the new recipes with local food plants were widely accepted and often consumed twice a week. In Nepal, the acknowledged importance of local vegetables in diets, especially during the lean season, led to an increasing trend in their consumption and a surge in their cultivation and utilization. The FFS work in Laos resulted in a 15-20% increase in food security, through greater availability of edible plants and an improved variety of consumption.

[14] The information presented in this paragraph was extracted from the SeedsGROW Final Report, submitted to the Swedish International Development Cooperation Agency (Sida) in 2024.

[15] Please refer to the SeedsGROW Final Report for more information on the partnerships that were established at national level to support the objectives of the work on local food plants for nutrition.

[16] Not all FFS in Guatemala answered all questions and all modules of the evaluation.

FFS Activities Conducted

The most popular FFS activity among the sampled FFS in Uganda, Zimbabwe, Zambia and Guatemala was sowing local food plants. Other popular FFS activities were cooking demonstrations, seed storage improvement, food preservation and harvesting of local food plants[17] (see Figure 17). FFS participants were greatly satisfied with the activities, for instance, more than 90% of the farmers that participated in the FFS activities seed storage and cooking demonstrations across the four sampled countries, found these useful (see Table 4).

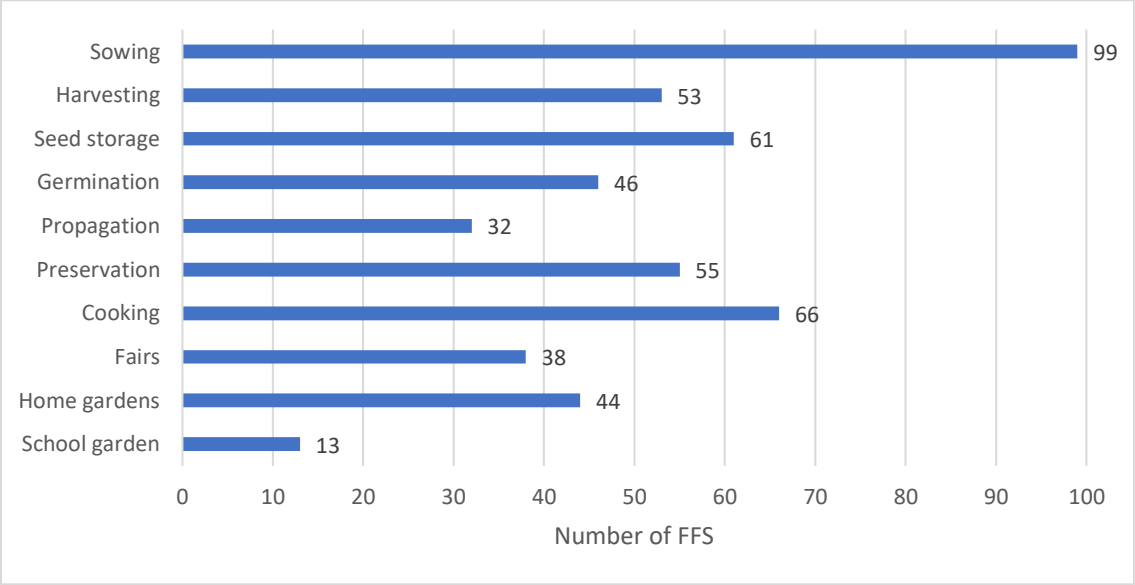


Figure 17. *Number of FFS implementing each activity across sampled countries.*

Table 4. *Percentage of FFS participants that found the FFS activities on local food plants for nutrition useful (satisfaction), indicating the number of FFS that implemented each activity and the total number of men and women that participated in the FFS[1,2]. A: Results for Guatemala and Uganda. B: Results for Zambia and Zimbabwe.*

A

FFS activity	Guatemala				Uganda			
	FFS	FFS participants			FFS	FFS participants		
	Total	Women	Men	Satisfaction	Total	Women	Men	Satisfaction
Sowing	14	225	19	100%	24	509	205	97%
Harvesting	14	223	15	92%	-	-	-	
Seed storage	12	182	10	95%	15	237	95	98%
Germination	7	93	10	100%	12	182	79	98%
Propagation	4	78	8	93%	12	180	73	96%
Preservation	2	20	2	77%	11	214	69	96%
Cooking	14	241	9	100%	18	358	137	100%
Fairs	-	-	-		8	129	42	97%
Home gardens	13	215	19	99%	20	381	132	96%
School garden	-	-	-		9	143	61	100%

[17] The guidelines for implementing these activities are explained in the Online course for Farmer Field Schools on Nutrition and Local Food Plants, and the Facilitators' Guides for FFS on Local Food Plants for Nutrition Improving nutrition and Managing local food plants.

B

FFS activity	Zambia				Zimbabwe			
	FFS	FFS participants			FFS	FFS participants		
	Total	Women	Men	Satisfaction	Total	Women	Men	Satisfaction
Sowing	10	241	193	100%	51	947	231	89%
Harvesting	8	67	18	82%	31	508	99	86%
Seed storage	9	175	112	98%	25	374	70	96%
Germination	2	31	16	100%	25	394	72	72%
Propagation	-	-	-		16	240	36	100%
Preservation	16	268	128	88%	26	446	69	95%
Cooking	13	250	136	100%	21	303	50	95%
Fairs	5	95	54	100%	25	254	43	89%
Home gardens	4	75	38	100%	7	113	5	83%
School garden	3	58	45	94%	-	-	-	

[1] One FFS could have undertaken more than one activity. Likewise, FFS participants might have participated in one or more FFS activities.

[2] Highlighted in red: the values higher than 90% of FFS participants. Empty cells: when an activity was not implemented in a country.

Although FFS participants were overall satisfied with the results of the activities, during the FFS evaluation they also indicated the main problems they encountered. For instance, the most common constraints faced by the FFS groups conducted across the African countries, were related to the facilities (i.e. accessibility to the study site), and lack of adequate tools or equipment. Other limitations faced during the implementation of the FFS activities were associated to the treatments or techniques applied, and lack of adequate backstopping or organization. To a lesser extent, FFS participants also emphasized how environmental constraints affected the results of their work (i.e. presence of pests, weather conditions). Table 4 details the main problems indicated for each one of the FFS activities.

Table 5. *Main problems associated to the implementation of FFS activities[1] in Uganda, Zambia and Zimbabwe, indicating the number of FFS groups that mentioned each concern. A: Results for sowing local food plants, B: harvesting, C: seed storage, D: seed germination, E: vegetative propagation, F: food preservation, G: cooking, H: fairs, I: home gardens, J: school gardens.*

A

Sowing (n=97 FFS)	number of FFS
Poor growth and development of the plant	55
Low percentage of seeds germinated	33
Lack of tools and/or equipment	25
Lack of expert technical backstopping	23
Low viability of seedlings	23
Quality seeds unavailable	23
Not adequate study site/plot to allow the proper development of the activity	22
Long times for germination	18
Organizational problems	18
Study site/plot was too far	15
Other	13

B

Harvesting (n=59 FFS)	number of FFS
Lack of tools and/or equipment	27
Forest, garden or gathering place was too far	26
Failure to get adequate materials to harvest	22
Forest, garden or gathering place did not allow the proper development of the activity	22
Lack of expert technical backstopping	10
Organizational problems	7
Other	6
Seasonal constraints caused stunted growth of the selected food plants	3

C

Seed storage (n=47 FFS)	number of FFS
Lack of tools and/or equipment	15
Not adequate facilities to allow the proper development of the activity	15
Not enough seeds available for storage	15
Lack of expert technical back stopping	8
Organizational problems	8
Facilities were too far	7
No access to a Community Seed Bank	6
Other	4

D

Seed germination (n=39 FFS)	number of FFS
Seeds failing to germinate	15
Lack of tools and/or equipment	13
Not adequate study site/plot to allow the proper development of the activity	13
Difficult to get planting material	9
Lack of expert technical backstopping	4
Difficulties with the water boiling treatment soaking Bambara nuts	3
Other	6

E

Vegetative propagation (n=26 FFS)	number of FFS
Lack of tools and/or equipment	13
Low survival rate of the transplanting material	12
Difficulty in accessing planting materials	10
Drought	9
Pests and/or diseases	7
Sweet potato vines were affected by prolonged mid-season dry spells	6
Lack of expert technical backstopping	4
Not adequate study site/plot to allow the proper development of the activity	3
Other	2

F

Food preservation (n=51 FFS)	number of FFS
Lack of tools and/or equipment	37
Not adequate facilities for food processing	22
Fruit trees produce too many fruits during a good rainfall season	6
Could not identify a good way of processing to address the main problems	5
Lack of expert technical backstopping	5
Organizational problems	5
Food processing facilities were too far	2
Other	1

G

Cooking (n=55 FFS)	number of FFS
Lack of utensils, tools and/or equipment	24
Lack of food ingredients	21
Lack of recipes	18
Not adequate facilities for cooking	18
Other	8
Cooking facilities were too far	6
Lack of expert technical backstopping	6
Lack of recipes	5
Organizational problems	5

H

Fairs (n=30 FFS)	number of FFS
Limited seed quantities	18
Few participants	15
Low quality seeds	12
Unavailability of preferred species	12
Limited crop varieties	6
Other	5

I

Home gardens (n=27 FFS)	number of FFS
Lack of seeds	20
Lack of tools and/or equipment	16
Not adequate garden/plot to allow the proper development of the activity	12
Organizational problems	6
Lack of expert technical backstopping	3
Shortage of seeds and water	3
Other	4

J

School gardens (n=12 FFS)	number of FFS
Pests and/or diseases	12
Lack of water	10
Lack of tools and/or equipment	7
Time balance between school curriculum and home garden implementation and/or maintenance	7
Not adequate garden/plot to allow the proper development of the activity	6
Poor soil quality	4
Lack of seeds	3
Other	6

[1] One FFS could have conducted more than one activity.

Contribution to Reduce the Food Scarcity Period

The results of the final FFS evaluation conducted in Uganda, Zambia and Zimbabwe indicated that for more than 80% of the participating farmers there was a reduction in the length of the food scarcity period (n= 1011 farmers participating in 49 FFS). Participants from 81% of the sampled FFS explained that the decrease was between one to three months, and participants from 65% of FFS indicated that the decrease was four or more months (n=68 FFS, with some FFS providing more than one answer to capture the perspectives of all participants).

Remarkably, all farmers from the sampled FFS in Uganda and Zambia, and 91% of the farmers sampled in Zimbabwe, agreed that local food plants helped them to strengthen their strategies to cope with the food scarcity period. The program helped them to increase the availability of some local food plant species, and/or increase the number of plants that are part of their diets (see Figures 18, 19 and 20).

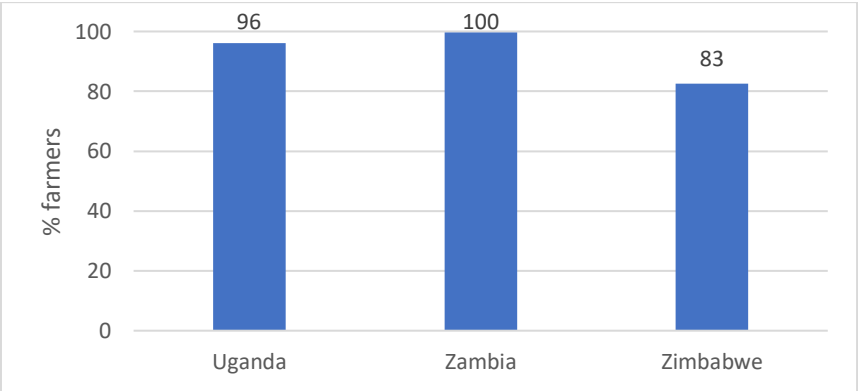


Figure 18. *Has the food scarcity period of your household been reduced after joining the FFS? (In total n=1011 farmers participating in 49 FFS: 10 FFS in Uganda with 255 participants, 9 FFS in Zambia with 245 participants, 30 FFS in Zimbabwe with 511 participants).*

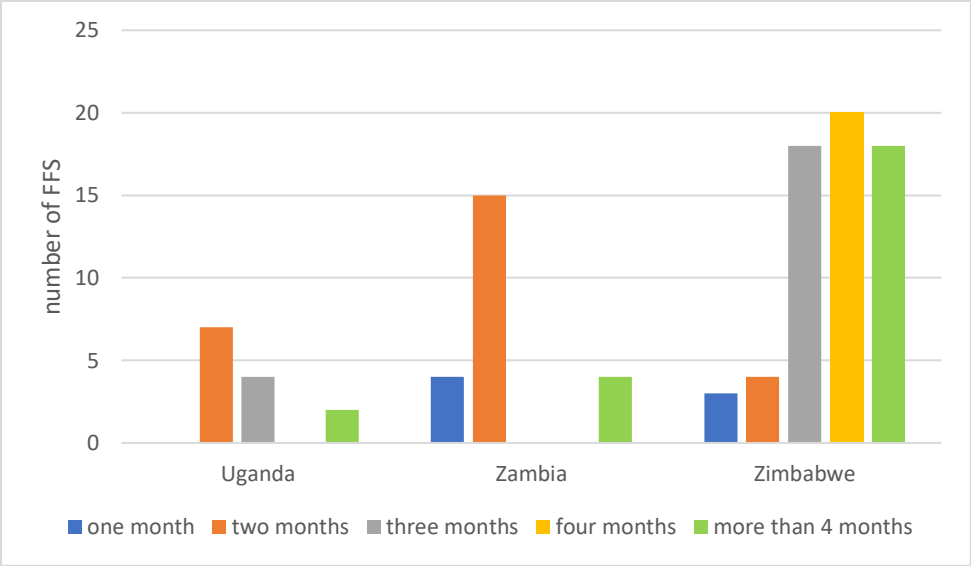


Figure 19. *Howmany months has the food scarcity period been reduced? (n= 68 FFS: 10 FFS in Uganda, 14 in Zambia, 44 in Zimbabwe, with some FFS providing more than one answer to capture the perspectives of all participants).*

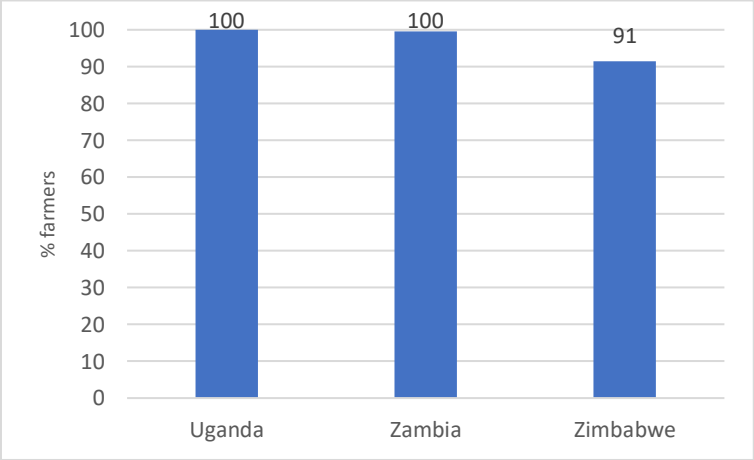


Figure 20. *Do you think local food plants helped you to strengthen your strategies to cope with the food scarcity period? (In total n=1011 farmers participating in 49 FFS: 10 FFS in Uganda with 255 participants, 9 FFS in Zambia with 245 participants, 30 FFS in Zimbabwe with 511 participants).*

In Uganda, farmers managed to reduce the scarcity period by diversifying, through preservation techniques, and by increasing the consumption of local food plants such as *eboo, akobokobo, emalakany* and Bambara nuts. Zambian households with year-round food reserves increased from 9% to 34%, showcasing improved food security. Similarly, in Zimbabwe, the proportion of households experiencing food scarcity reduced while the consumption of local food plants increased, particularly among men and youth, leading to improved dietary diversity and heightened demand in both local and urban markets.

While there was no data available for the other SD=HS countries, participants in the national-level evaluation workshops highlighted that there was a decrease in the food scarcity period as product of the FFS work.

Contribution for Improving Nutrition

The results of the final FFS evaluation showed that 91% of the FFS participants across 49 sampled FFS groups in Uganda, Zambia and Zimbabwe observed an improvement in the nutrition of their families by the end of the program (see Figure 21).

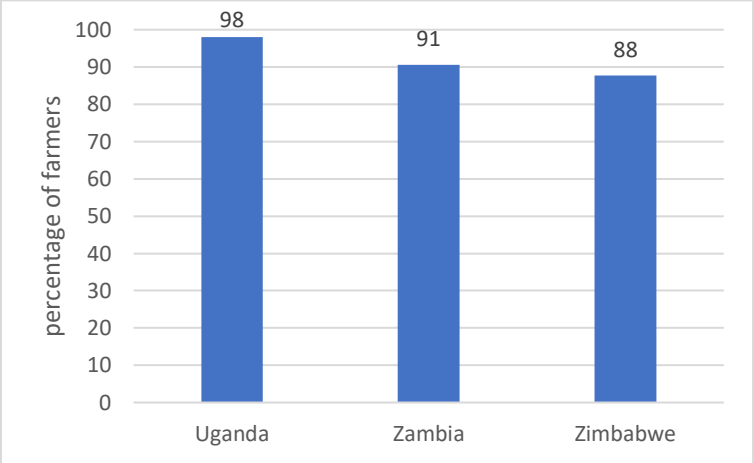


Figure 21. *How is the nutrition of your family after joining the FFS? (In total n=1011 farmers participating in 49 FFS: 10 FFS in Uganda with 255 participants, 9 FFS in Zambia with 245 participants, 30 FFS in Zimbabwe with 511 participants).*

While there was no data available for the other SD=HS countries, participants in the national-level evaluation workshops highlighted that there was a diversification in the diets of the households that participated in the FFS work. This is a necessary for an improved nutrition.

Changes in Knowledge and Practices

The results of the FFS evaluation showed a great learning among FFS participants (n= 1373 participants from 75 FFS). For instance, more than 80% of men and women participating in FFS in Guatemala and Zambia learned new approaches towards plant management and food preparation. Likewise, 89% or more farmers in Guatemala, Zambia and Uganda learned about better nutrition. More than 60% of farmers in Zimbabwe acquired these sets of knowledge (see Figure 22).

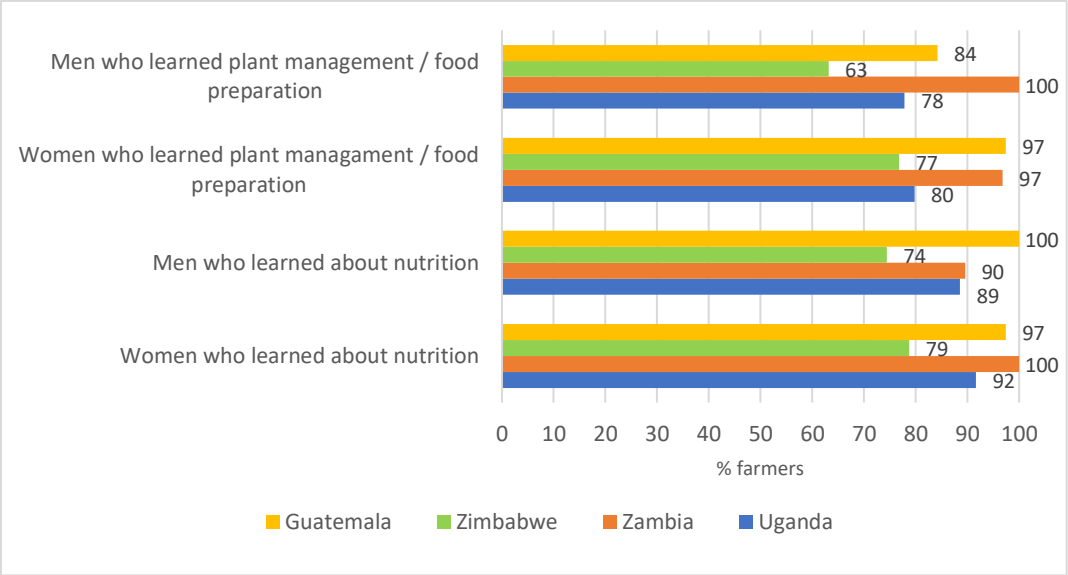
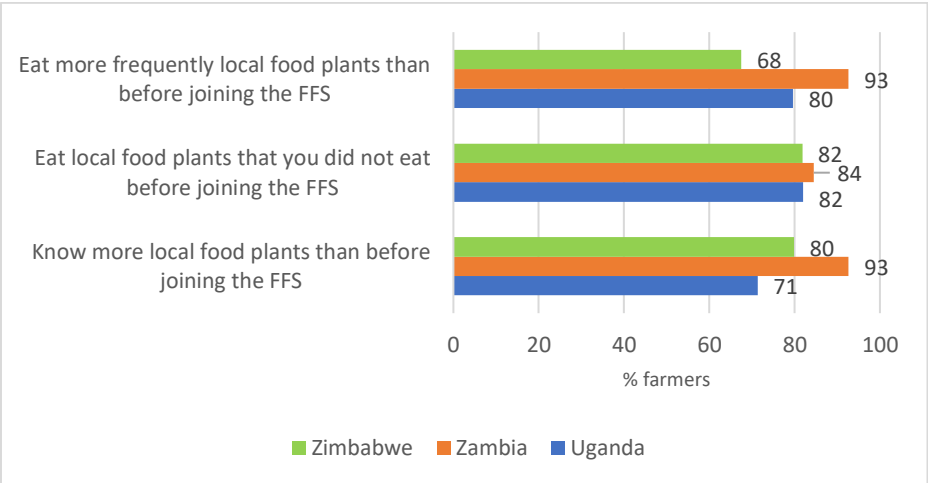


Figure 22. *Men and women who learned about plant management and food preparation, and nutrition (n=75 FFS with 1373 participants: 23 FFS in Uganda with 257 participants, 9 FFS in Zambia with 271 participants, 29 FFS in Zimbabwe with 594 participants and 14 FFS in Guatemala with 251 participants).*

Regarding the consumption and knowledge of local food plants, more than 65% of FFS participants from the sampled FFS in Zimbabwe, Zambia and Uganda (n=1011 farmers participating in 49 FFS) eat more frequently local food plants and know more local food plants than before joining the FFS, and introduced new plants to their diets (see Figure 23). With respect to food preparation, preservation and cooking, 87% or more farmers acquired new knowledge and skills, and 78% or more are applying them at home. Likewise, 90% or more farmers acquired new knowledge that helped them to improve the nutrition of their families, and 85% or more are applying this knowledge at home. Regarding local food plant management, 88% or more farmers acquired new skills or knowledge, and 82% or more are putting them into practice. In addition, 66% of FFS participants from Uganda, 69% from Zambia, and 69% from Zimbabwe indicated that they are exchanging more seeds or planting material of local food plants with other farmers than before joining the program.

A



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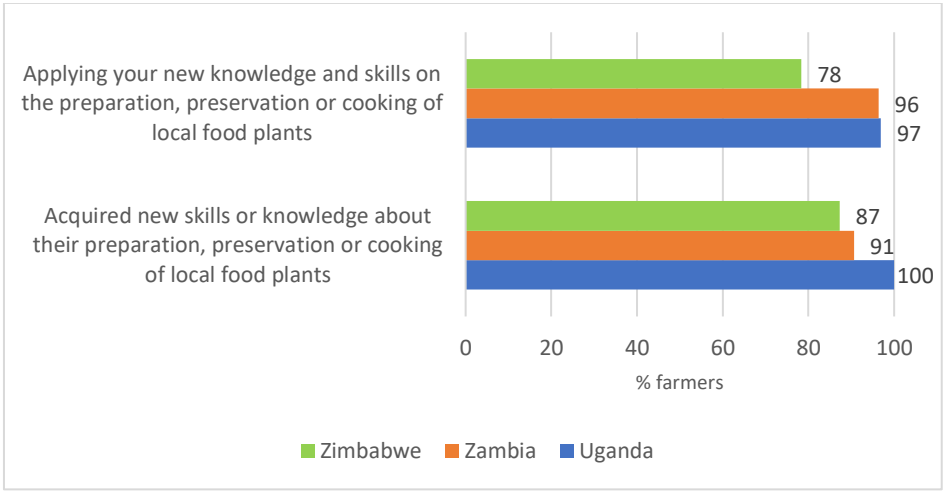

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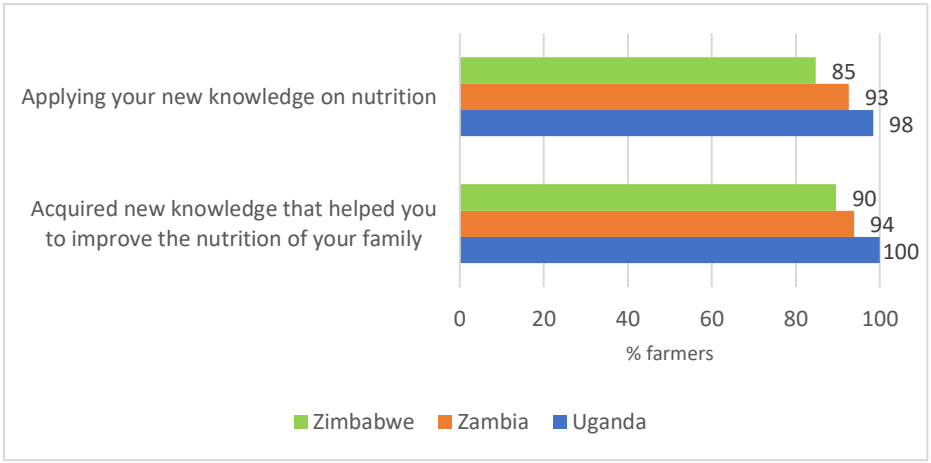

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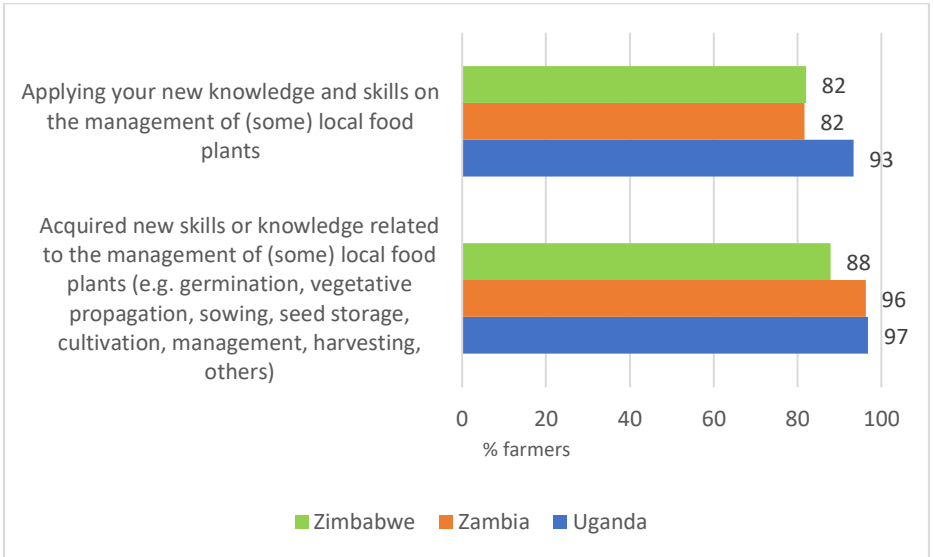

Figure 23. *Changes in knowledge and practices among FFS participants. A: Results for consumption and knowledge of local food plants. B: Results for skills and their application regarding food preparation,*

preservation and cooking. C: Results for application of knowledge on nutrition. D: Results for skills and their application regarding local food plant management. (In total n=1011 farmers participating in 49 FFS: 10 FFS in Uganda with 255 participants, 9 FFS in Zambia with 245 participants, 30 FFS in Zimbabwe with 511 participants).

Participants in the national evaluation workshops of the other SD=HS countries, also highlighted that the FFS work certainly helped to increase the knowledge and consumption of local food plants, benefiting FFS participants from an increased availability and access to NUS. For instance, more than hundred home gardens were built in Guatemala making NUS more accessible to local households, FFS participants in Peru improved the management practices of important food plants, and Nepali farmers received seed kits of local NUS to complement their diets during the COVID 19 pandemic. Indeed, it was highlighted that local food plants have been functioning as a rural safety net during the pandemic, ensuring the resilience of family farmers while preserving biodiversity. In addition, recipe books and other materials were produced and disseminated, sharing knowledge not only among FFS participants, but also with the wider community.

Dissemination and Influence in the Wider Community

The results of the FFS evaluation conducted in Uganda, Zambia, Zimbabwe, and Guatemala emphasized that the impact of the FFS work not only was for the FFS groups, but also in their wider communities. FFS participants shared the results of their work during seed and food fairs, farmer field days, and when hosting visitors in their communities (see Figure 24).

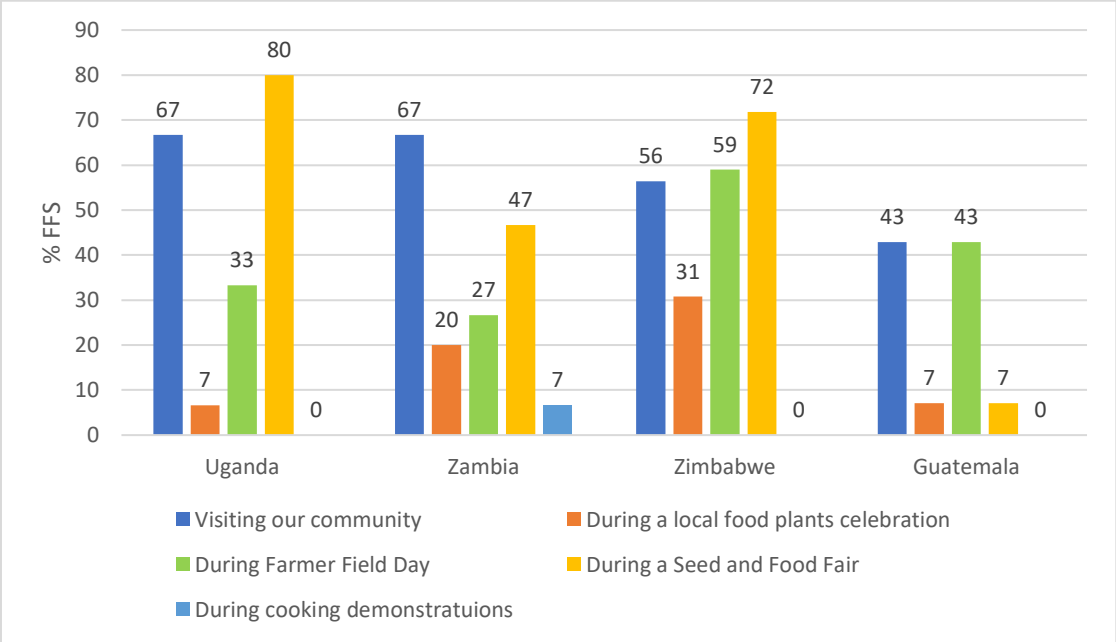

Figure 24. *How other people got to know about the FFS work? (n= 83 FFS: 15 FFS in Uganda, 15 FFS in Zambia, 39 FFS in Zimbabwe, 14 FFS in Guatemala).*

The results of the dissemination of the FFS work was reflected in the presence of changes in the wider community (n=114 FFS). For instance, FFS participants from Guatemala, Zimbabwe, Zambia and Uganda observed an increase in the consumption of local food plants in their communities. Farmers from Guatemala observed that their communities are creating new recipes with local food plants. Farmers from Zimbabwe indicated that more farmers are growing local food plants and their yields are increasing. Farmers from Uganda and Zimbabwe are using more local food plants for medicinal

purposes. Farmers from Guatemala, Zambia and Uganda explained that the diets in their communities are getting more diverse (see Figure 25).

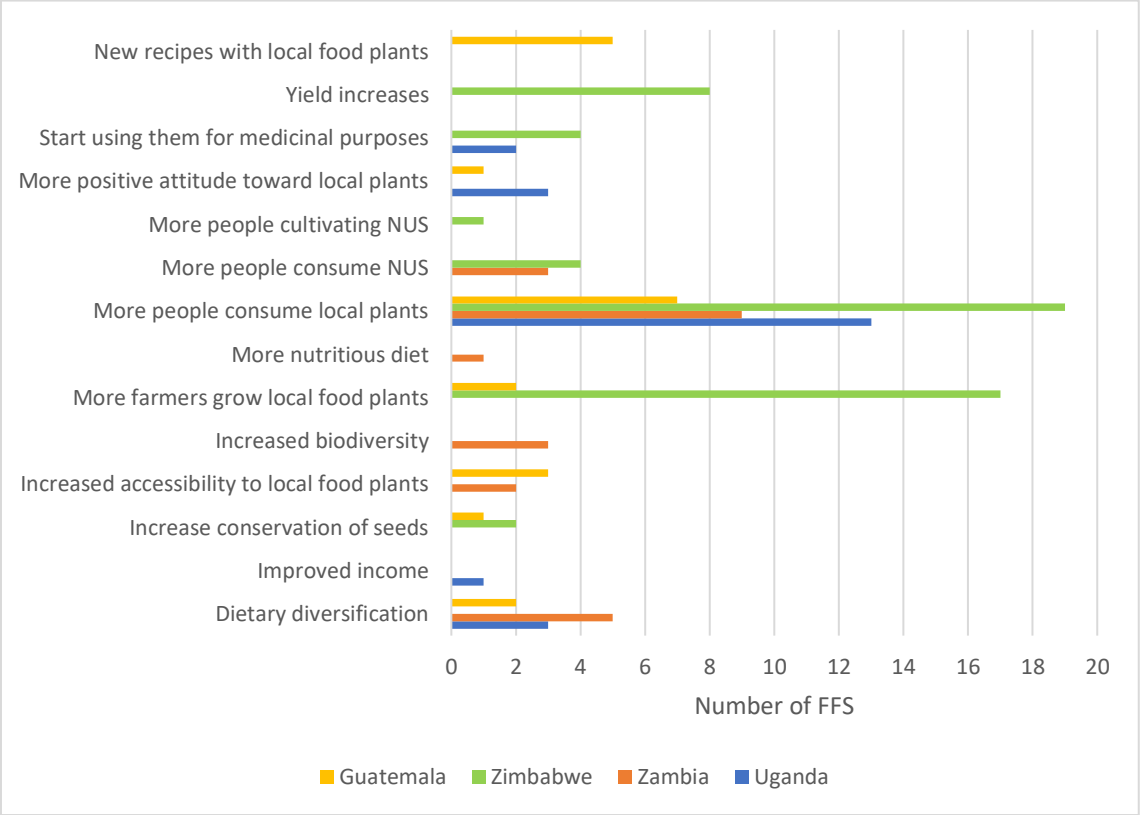

Figure 25. *Changes in the wider community as reflection of the FFS work (n= 114 FFS: 22 FFS in Uganda, 23 FFS in Zambia, 55 FFS in Zimbabwe, 14 FFS in Guatemala).*

Final Reflections

The mid-term evaluation of our farmer field school (FFS) work on Local Food Plants for Nutrition – conducted with a sample of 668 FFS participants from Guatemala, Zambia, Zimbabwe, Uganda and Peru – and the final evaluation of our work - which captured the views of more than 1000 FFS participants from Uganda, Zimbabwe, Zambia and Guatemala – highlighted the success of our approach for achieving the program objectives.

Our success was built over the years of implementation, for instance:

a) While the results of the mid-term evaluation (conducted after the first year of implementation) showed that that there was a reduction in the length of the food scarcity period for 58% of the interviewed FFS participants, this reduction was visible for more than 80% of respondents at the end of the program.

b) The results of the mid-term evaluation showed that 76% of interviewed FFS participants observed an improvement in the nutrition of their families, whereas this improvement was evident for 91% of respondents by the end of the program.

The FFS evaluation showed major changes in knowledge and practices among most FFS participants, i.e. increased consumption and knowledge of local food plants, application of new skills regarding food preparation, preservation, cooking, and local food plant management. FFS participants were greatly satisfied with the activities, and most of them found the activities useful. The impact of the FFS work also had an influence in the wider community, thanks to the implementation of dissemination activities. It would be very interesting to record in the future how persistent and sustainable these partly behavioral changes are, and how well these practices and associated knowledge are maintained in these communities.

It is also very important to reflect on the main constraints faced during the implementation of the FFS activities, which is valuable feedback for future FFS work. For instance, the FFS final evaluation conducted at FFS level across the African countries came to the following recommendations:

a) To ensure that the study site is accessible for all.

b) To guarantee that farmers have adequate tools or equipment for the implementation of the FFS activities.

c) To provide timely and adequate backstopping in relation to the treatments or techniques applied, and to offer a better guidance for the organization of the FFS groups and/or activities.

d) To provide timely support when weather conditions, pests or diseases affect the development of the FFS activities.

The results of our work also highlighted the importance of diversity threefold:

a) Diversity of plants – from crops to semi-domesticated and wild species – for diverse and nutritious diets, increasing the diversity of food groups and micronutrients.

b) Diversity of plants ensuring the seasonal availability of food throughout the year, particularly during the food scarcity period.

c) Diversity of agroecosystems and habitats where these species grow, including agricultural fields, forests, home gardens, among others.

Therefore, any strategies that aim at strengthening the role of local food plants for nutrition, should also take into account the conservation and diversification of the agroecosystems and habitats where these species grow. Healthy and nutritious diets should be promoted together with the conservation of biodiversity at genetic, species and ecosystem levels, and the recognition of local knowledge and cultures.

The work on local food plants for nutrition clearly illustrates the important role that local plant biodiversity and traditional knowledge can play in ensuring food and nutrition security for millions of people around the world. Certainly, Indigenous peoples and smallholder farmers' (IPSHF) knowledge and a gender approach, are the basis to build solutions to malnutrition that are culturally, environmentally and locally sound.

Local food plants have been functioning as a rural safety net during the pandemic, ensuring the resilience of family farmers while preserving biodiversity. Local food plants should play a key role in addressing micronutrient deficiencies and reducing the food scarcity period of IPSHF, not only in the Sowing Diversity = Harvesting Security (SD=HS) program regions, but also globally. This should be taken into account in national and regional policy development.

Acknowledgements

I would like to thank Hilton Mbozi, Konstantina Togka, Bert Visser and Elena Nera, whose valuable support was key to the implementation of the work on nutrition and local food plants. My gratitude is extended to the SD=HS staff from Oxfam Novib in the Hague and Oxfam country offices. I am deeply thankful to those who made our FFS work possible in the field, particularly project coordinators, master trainers and staff from country partner organizations; FFS facilitators and FFS participants. I am grateful to the staff and consultants engaged in the data collection and revision for the baseline and FFS evaluation, the interviewed farmers and households for their efforts to provide insight into the role of local food plants in their agroecosystems, diets and food culture. I also wish to thank Alejandra Avendano and Jorge Chavez-Tafur for the analysis of the FFS evaluation data, Gea Galluzzi for the analysis of the FFS diagnostic exercises and Matteo Petitti for the preparation of the maps. I am very grateful to Bert Visser who edited this publication. The work was possible thanks to our collaborators at all levels, in the project countries and globally. Finally, I wish to thank Sida for making this work possible by funding the nutrition activities as part of the SD=HS program.

Appendix

Appendix 1. Country Profiles

This appendix includes the maps indicating the location where the household surveys took place, and where the FFS were implemented in each country. It also includes the links to the briefing notes, which present the profiles of the countries where our work took place and detail the results of the household survey.

The country briefing notes include the following results of the household survey: food scarcity period, food insecurity, local diets, local knowledge on local food plants and local food plant acquisition. In addition, the briefing notes present the results of the following FFS diagnosis exercises: farmer's views on malnutrition (including causes and consequences of malnutrition, nutrition timeline and intrahousehold food distribution), how farmers cope with malnutrition, importance of local food plants for farmers, bottlenecks in the use and management of local plants, and farmer's FFS research objectives.

Zambia

The work took place in four districts of the Central, Southern, and Lusaka provinces of Zambia. The districts of Chikankata and Chirundu are located in Southern Province, Rufunsa district is in Lusaka Province, and Shibuyunji is a district of Central Province. In total, data were collected from 634 households for the baseline survey.

Please click here to access the briefing note "Improving diets and reducing food scarcity with the help of local food plants in Central, Southern and Lusaka provinces of Zambia".

Please click here to access the briefing note "Champion species help to tackle main nutritional problems in Central, Southern, and Lusaka Provinces of Zambia".

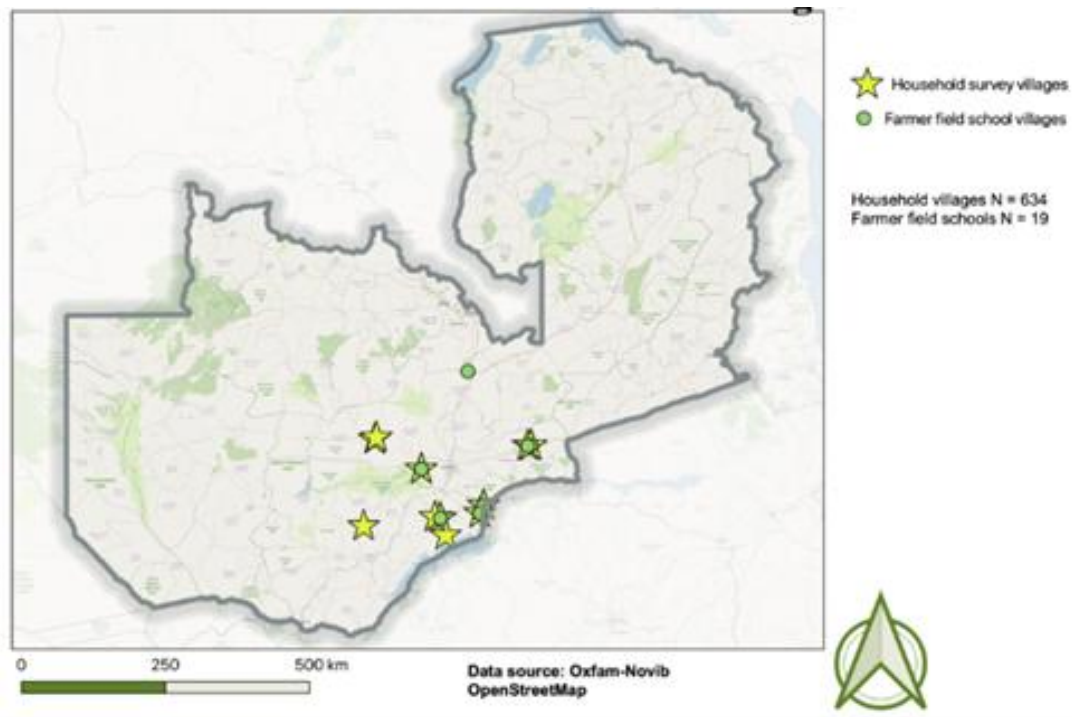

Figure 26. *Location of the villages where the household survey and FFS work took place in Zambia*

Zimbabwe

The household surveys took place in five districts of the Mashonaland Central, Mashonaland East, Masvingo, and Matabeleland North provinces of Zimbabwe. In total, data were collected from 522 households.

Please click here to access the briefing note "Improving diets and reducing food scarcity with the help of local food plants in Mashonaland Central, Mashonaland East, Masvingo, Matabele land North provinces in Zimbabwe".

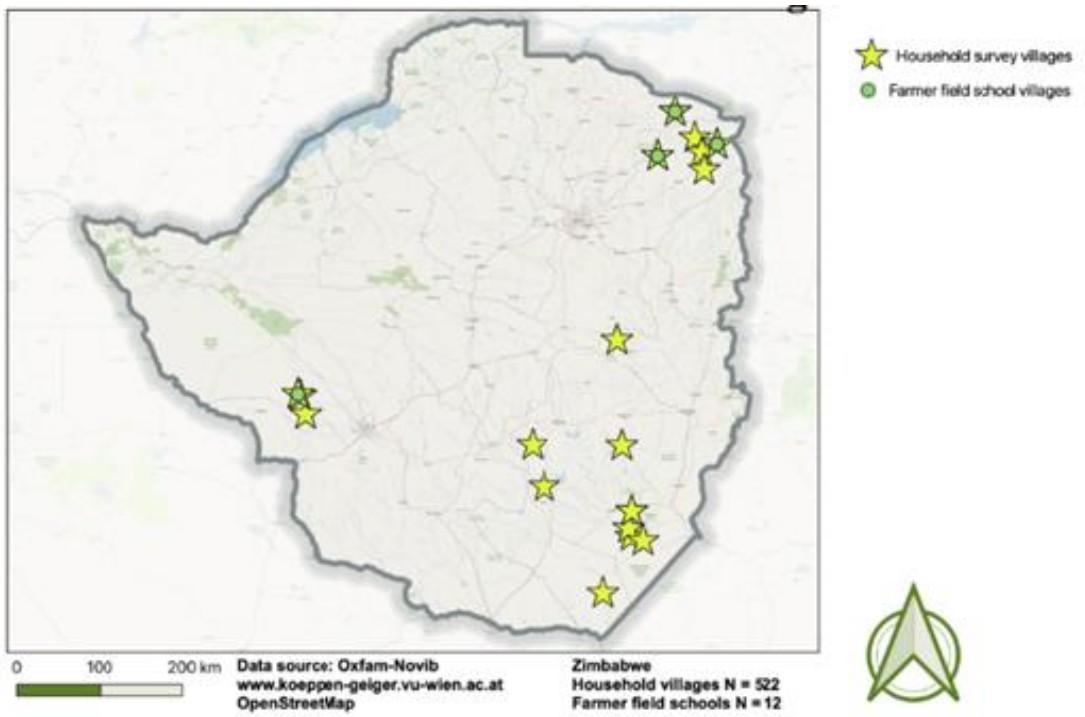

Figure 27. *Location of the villages where the household survey and FFS work took place in Zimbabwe.*

Uganda

The work on Local Food Plants for Nutrition took place in the Northern and the Eastern regions of Uganda, where a total of 644 households were surveyed.

Please click here to access the briefing note "Improving diets and reducing food scarcity with the help of local food plants in the Northern and Eastern regions of Uganda".

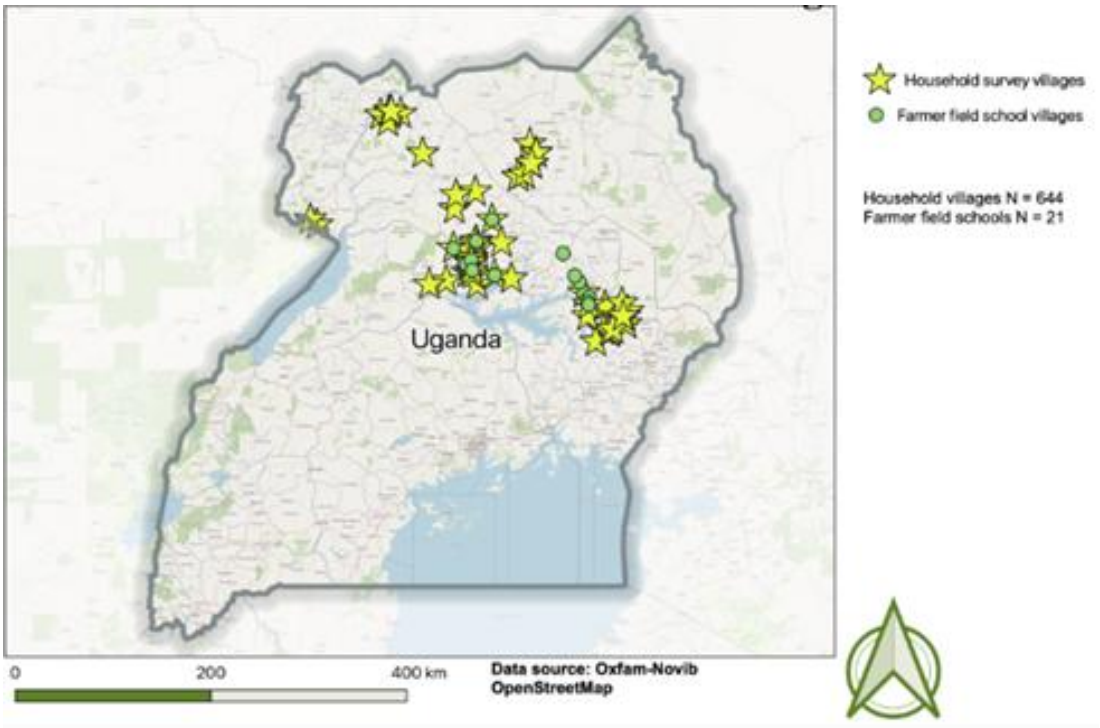

Figure 28. *Location of the villages where the household survey and FFS work took place in Uganda.*

Guatemala

The survey took place in the Huehuetenango province of Guatemala, in the following districts: Todos Santos Cuchumatán, Concepción Huista, Santa Eulalia, Chiantla and Petatan. In total, 282 households were surveyed.

Please click here to access the briefing note "Improving diets and reducing food scarcity with the help of local food plants in Huehuetenango province of Guatemala".

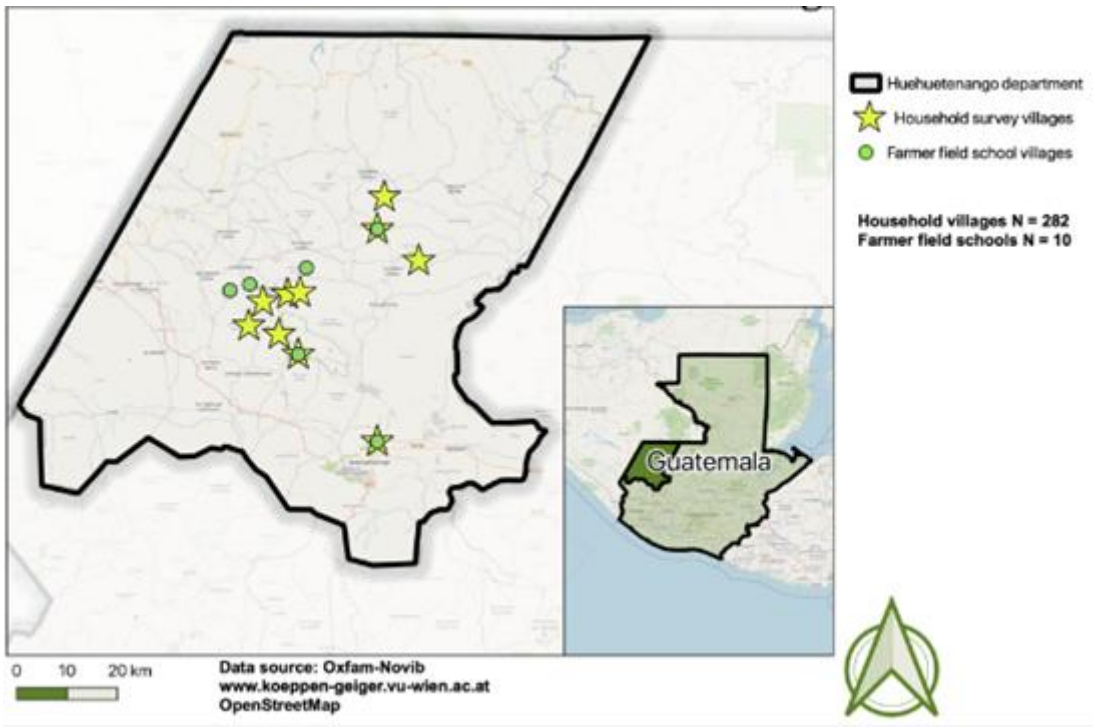

Figure 29. *Location of the villages where the household survey and FFS work took place in Guatemala*

Peru

The work took place in the Huancavelica and Junín regions of Peru. In total, data were collected from 333 households for the baseline survey.

Please click here to access the briefing note "Improving diets and reducing food scarcity with the help of local food plants in Huancavelica and Junín regions of Peru".

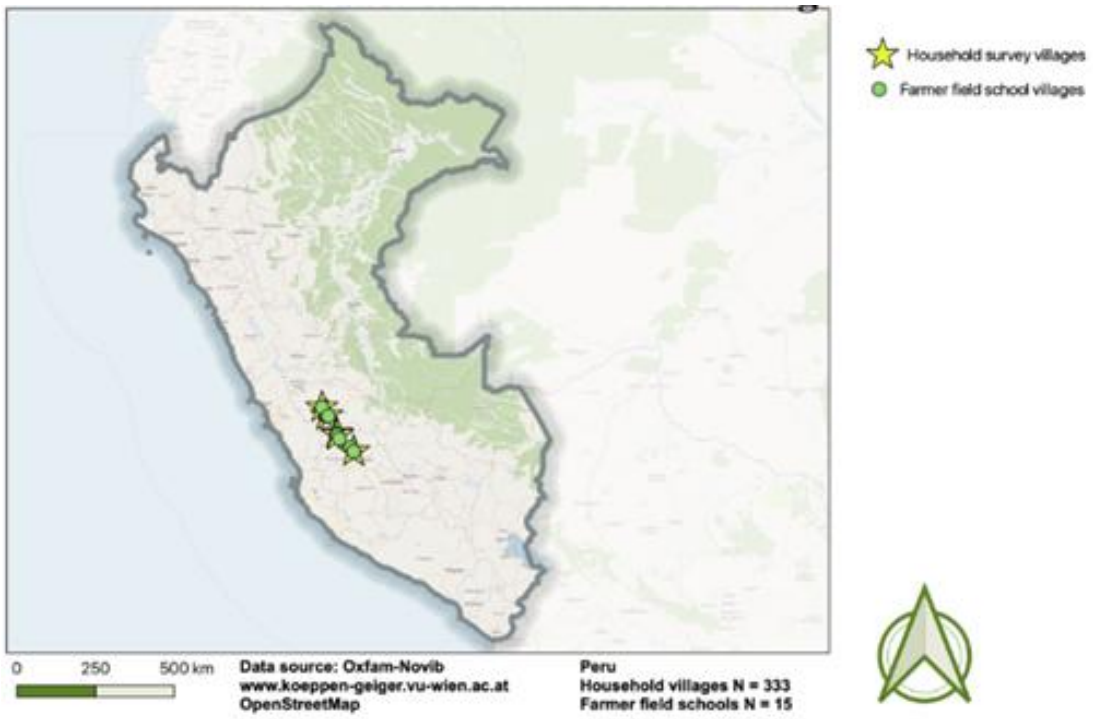

Figure 30. *Location of the villages where the household survey and FFS work took place in Peru*

Nepal

The work in Nepal took place in the following rural municipalities of the Sudurpaschim province: Jorayal, Ganyapdhura, Joshipur, Laljhadi, Gauriganga, KailarI. Data were collected from 473 households for the baseline survey.

Please click here to access the briefing note "Improving diets and reducing food scarcity with the help of local food plants in Sudurpaschim province of Nepal".

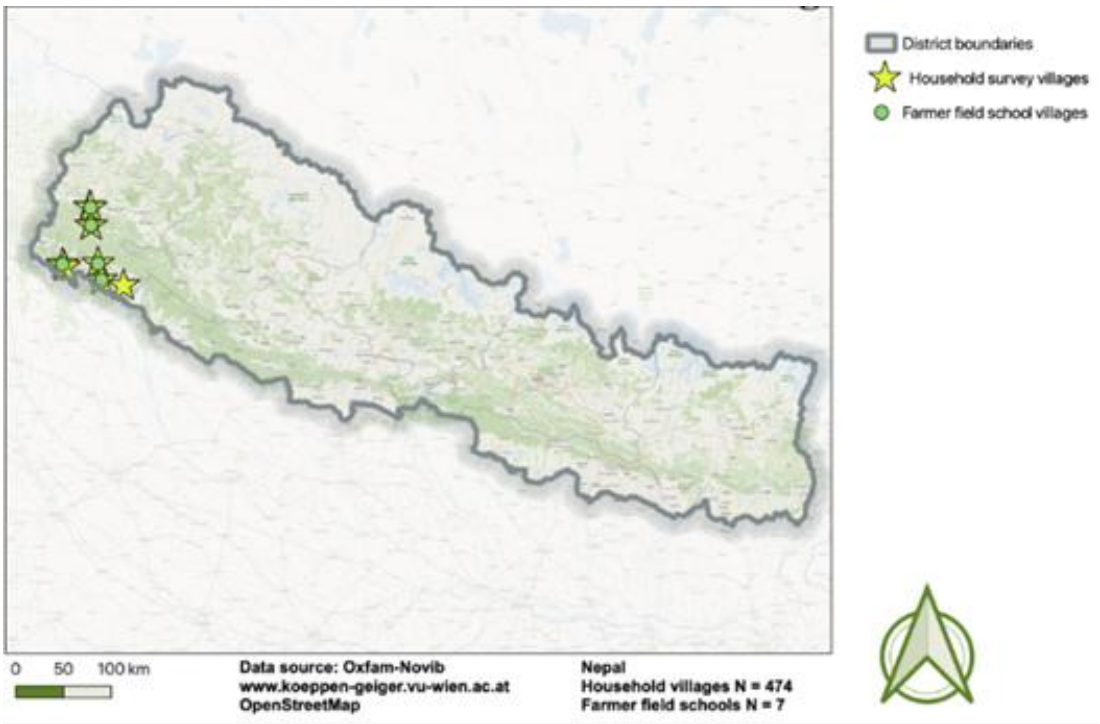

Figure 31. *Location of the villages where the household survey and FFS work took place in Nepal*

Laos

The work took place in the Sayaboury province of Laos. Data were collected from 63 households during the first survey round (scarcity season), and 69 households during the second survey round (sufficiency season). Only households from Kor village were interviewed in both seasons, while households from the other villages were interviewed either in the scarcity season (Kongthieng) or sufficiency season (Samakixay and Mixay).

Please click here to access the briefing note "Improving diets and reducing food scarcity with the help of local food plants in Sayaboury province of Laos".

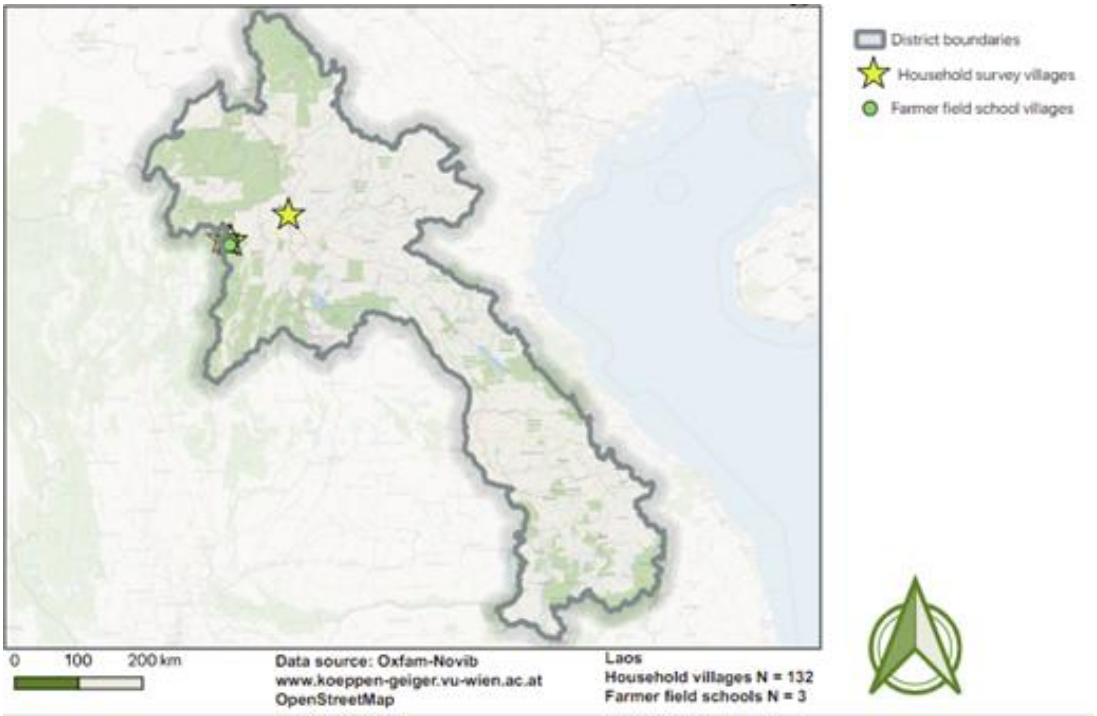

Figure 32. *Location of the villages where the household survey and FFS work took place in Laos*

Appendix 2. Methodology of the Baseline Survey

The household survey took place at two different periods: food scarcity season and sufficiency season (Table 5 indicates when the survey was implemented in each country, and Table 6 details the periods of data collection during scarcity and sufficiency seasons in the project countries). Data was collected by local enumerators who speak the local language. They were trained by the country partner organizations, and the questionnaire was pilot tested before collecting the data. The household survey was conducted in a representative sample of communities, representing each agroecosystem and ethnic group in the project region. In each selected community, a random household sampling equivalent to 30% of all households living in the community took place to ensure statistical representativeness. For villages with 30 to 100 households, a sample of 30 households was used; for villages with 30 or fewer households, all households were interviewed. Households that had been living for less than one year in the community or households that had not been engaged in farming were excluded from the sample. All informants participated freely and with prior informed consent. The tools were revised and agreed upon by all partner organizations. Each partner could adapt, test the tools, and include specific sections relevant to their own context.

Table 6. *Number of households surveyed in each country*

Country	**Regions**	**Number of households**	**Percentage of households**
Uganda, n=644	Northern	458	71%
	Eastern	186	29%
Guatemala, n=282	Todos Santos Cuchumatán	63	22%
	Concepción Huista	129	46%
	Santa Eulalia	81	29%
	Chiantla	9	3%
Laos[1], n=63	Kongthieng	31/0	49%/0%
	Kor	32/30	51%/52%
	Samakixay	0/19	0%/28%
	Mixay	0/20	0%/29%
Nepal, n=476	Jorayal	99	20.9%
	Ganyapdhura	82	17.3%
	Joshipur	31	6.6%
	Laljhadi	105	22.2%
	Gauriganga	126	26.6%
	Kailari	30	6.3%
Peru, n=333	Acostambo	61	18%
	Masma Chicche	37	11%

Peru (continued)	Ñahuinpuquio	36	11%
	Ricran	62	19%
	Rosario	137	41%
Zambia, n=634	Chikankata	98	15%
	Chirundu	125	19%
	Rufunsa	119	18%
	Shibuyunji	292	46%
Zimbabwe, n=522	Chiredzi	111	21%
	Mudzi	97	19%
	Rushinga	101	19%
	Tsholotsho	103	20%
	UMP	110	21%

[1] For Laos, the first value corresponds to the first survey round (scarcity season), and the second number to the second round (sufficiency season).

Table 7. *Periods of data collection during scarcity and sufficiency seasons in the project countries*

Country	**Scarcity season**	**Sufficiency season**
Guatemala	March 2021	December 2019
Peru	October 2020	May - August 2021
Zambia		
- Shibuyunji	December 2019 – January 2020	August 2021
- Rufunsa	March 2021	September – October 2021
- Chirundu	March – April 2021	September – October 2021
- Chikankata	July – October 2020	December 2020 – February 2021
Zimbabwe	November – December 2019	July 2021
Uganda		
- Northern	May 2021	July – November 2019
- Eastern	April – May 2021	January – February 2021
Nepal	April - May 2021	December 2019
Laos	August 2020	June 2021

The main modules of the household survey were: (1) demographic and socio-economic characteristics, (2) severity of food insecurity, (3) dietary diversity, (4) local food plant acquisition, (5) free listings of local food plants, and (6) features of the food scarcity season. The second survey round included an additional module to evaluate the impacts of the FFS work (mid-term evaluation).

The food scarcity module not only assessed the months in which households have reduced access to food but also captured the variety of local food plants consumed in times of food scarcity.

A 24-hour dietary recall-based interview was also conducted to capture detailed information about all foods and beverages consumed by the respondent in the past 24 hours[18]. Based on the results of the 24-hour recall, the HDDS was calculated.

Food insecurity was measured using the HFIAS. According to the HFIAS indicator guide[19], a food secure household experiences no food insecurity conditions, or it might rarely experience concerns on sufficient access to food. A mildly food insecure household often worries about not having enough food, it might be unable to eat preferred foods and have a more monotonous diet than desired, or it can even consume some foods considered undesirable. A moderately food insecure household often sacrifices quality more frequently, by eating a monotonous diet or undesirable foods and can start to cut back on quantity by reducing the size of meals or number of meals. Finally, a severely food insecure household has resorted to cutting back on meal size or number of meals and its members can still run out of food, go to bed hungry, or go a whole day without eating.

Local food plant acquisition events, based on a recall period of seven days, also captured the multiple environments from which local food plants were acquired, and gender roles related to their harvesting or gathering.

The free listings of the food plants aimed to provide an overview of local knowledge and were used for the development of a list of species based on the knowledge that is shared by community members. Given that knowledge is intrinsically related to gender, free listings were requested from the head of household and his/her spouse separately.

The data was analysed with descriptive and non-parametric statistics. A detailed explanation of how each index was calculated, alongside the rationale of each survey module, and the survey questionnaire itself are accessible in the Baseline tool on Nutrition and Local Food Plants.

More country level details about the methodology are included in the country briefing notes (see Appendix 1).

[17] For Laos, the first value corresponds to the first survey round (scarcity season), and the second number to the second round (sufficiency season).

[18] For more information, please see the "Guidelines for measuring household and individual dietary diversity" prepared by the FAO.

[19] For more information please see the "Household Food Insecurity Scale (HFIAS) for the Measurement of Household Food Access: Indicator Guide" prepared by the Food and Nutrition Technical Assistance Project (FANTA).


SD
HS
Sowing
Diversity =
Harvesting
Security

ESAFF

COMMUNITY TECHNOLOGY DEVELOPMENT
TRUST

LI-BIRD

ASOCUCH

OXFAM Novib

PELUM ASSOCIATION

FOVIDA
- FOMENTO DE LA VIDA -

NAFRI

Sweden
Sverige