

INTEGRATING NUTRITION IN FARMER FIELD SCHOOLS IN EASTERN AFRICA

— LESSONS LEARNED —

By Dr. Elizabeth Nafula Kuria

MEAS Evaluation Series

November 2014



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Abbreviations/Acronyms

AESA	Agro-Ecosystem Analysis
AIDS	Acquired Immune Deficiency Syndrome
AVSI	Association of Volunteers in International Service
BTC	Belgium Technical Cooperation
CBO	Community Based Organization
DAO	District Agricultural Officer
FAAB	Farming as a Business
FAO	Food and Agricultural Organization of the United Nations
FFPS	Farmer Field Promotion Services
FFS	Farmer Field Schools
FFLS	Farmer Field Life Schools
FGD	Focus Group Discussion
GBV	Gender Based Violence
HINI	High Impact Nutrition Interventions
HIV	HI virus
IDI	In-depth Interviews
IPM	Integrated Pest Management
KFSM	Kenya Food Security Meeting
KII	Key Informant Interviews
KSSFSG	Kenya Food Security Steering Group
LWF	Lutheran World Federation
M&E	Monitoring and Evaluation
NAAD	National Agricultural Advisory Services
OVC	Orphans and Vulnerable Children
PLWA	People living with AIDS
PLWHIV	People Living with HIV
SIDA	Swedish International Development Agency
TOF	Training of Facilitators
UNGASS	UN General Assembly Special Session
VSLA	Village Savings Loans Associations

Executive Summary

Eastern and Central Africa continue to face acute and chronic food and nutrition insecurity¹. Combined with a high incidence of HIV, food security continues to affect the nutrition and health status of poor households. There is growing recognition of the vital importance of expanding agricultural development capacity to include nutrition objectives, particularly in agricultural extension and training. The adoption of participatory extension approaches, such as the Farmer Field School (FFS), provides additional opportunities to move agricultural development beyond productivity and yield goals to more effectively contributing to improved nutritional outcomes.

The FFS approach is based on discovery and experiential learning principles, and was developed as an alternative to the past conventional top-down Training and Visit extension approach. It is now a widely applied approach in the sub-region². The basis of FFS is a group of farmers with a common interest who together engage in a season-long study program with weekly meetings. The FFS groups decide on their main topic of study and set up experiments at a field-learning site. In Farmer Field and Life Schools (FFLS), a variant of FFS, special emphasis is being given to learning life skills. The curriculum of FFLS commonly addresses gender issues, gender based violence, human health, HIV and AIDs, and conflict management as special life skills topics. The topic of human nutrition has been emphasized as a key area of learning in this context. A regional program that is currently applying the FFLS approach provides the empirical framework for this study.

Few studies have been done in Eastern and Central Africa to assess the integration of nutrition into FFS. This evaluative case study aims at assessing how this has been done in FFS practice and to provide recommendations on how to better improve nutrition integration in FFS.

The empirical framework for the study that forms the basis for this report is a Swedish International Development Agency (SIDA) funded and Food and Agricultural Organization of the United Nations (FAO) implemented regional project³ undertaken from 2010-2013 in Kenya, Uganda, Rwanda, Democratic Republic of Congo, Burundi, and Central Africa Republic to address gender and HIV through a food security and nutrition response. The sample in this study includes FFLS groups that had operated in the six countries as part of this project. The fieldwork focused on sampled FFLS groups in Uganda and Rwanda initiated in 2011-2012 by the project while the desk review covered FFS implementation in all six countries. Fieldwork data collection was undertaken from September to October 2013. Purposive sampling was used to define case study respondents, key informants' interviews were held with facilitators, FAO field staffs who worked in FFLS as well as staff of the field implementing organizations Lutheran World Federation (LWF), in Uganda and Association of Volunteers in International Service (AVSI) in Rwanda. A focus group discussion (FGD) was also held with staff of AVSI. Descriptive statistics were used to analyze data using SPSS version 20. Validation of findings was undertaken with the key stakeholders in both countries in the form of feedback meetings that validated the key findings and

¹ IFAD. 2001. "Rural Poverty Report. The challenge of ending rural poverty."

² Braun, A. et al. 2006. "A Global Survey and Review of Farmer Field School Experiences."

³ FAO. 2013. "Addressing HIV and Gender Inequities through a Food Security and Nutrition Response in Eastern and Central Africa". OSRO/RAF/010/SWE Terminal Evaluation Report, Uganda Component.

recommendations. Preliminary findings were discussed and reviewed with FAO offices in Nairobi, Kampala, and Kigali.

Key findings from the study are highlighted below. Of the 145 household survey respondents, 73% were females and 27% males. About 73% were married, among which 17% were widowed. Head of household respondents were aged between 20-88 years with a majority of the FFLS participants aged above 30 years.

Uptake of improved farming and nutritional practices. Participants were found to have increased and diversified their food production as a result of their participation in FFLS. A major contributor to improved nutrition practices was through kitchen gardens and the promotion of vegetable production. These vegetables were both for home consumption and for sale, so as to earn income to purchase other foods that families did not grow, or to purchase of non-food items.

Improved nutrition at household level. The findings show that crops that are promoted through the FFLS are also consumed by the participating families to improve their nutrition and health.

The sampled households were consuming more meals than they did before joining the FFLS project. Nutrition status of women assessed using Mid-Upper Arm Circumference (MUAC) was normal in both countries MUAC ≥ 21.0 cm. Children aged five years and below were found to be well nourished in Rwanda MUAC ≥ 13.5 cm, while 22.3% were malnourished in Uganda with 17.5% being at risk of malnutrition with MUAC $12.5 < 13.5$ cm and 4.8% moderately malnourished with MAUC $11.5 > 12.5$ cm.

Integration of nutrition in FFLS. Nutrition learning in FFLS is linked closely to the food production component, whereby members of the groups were encouraged to grow diversified and nutrient dense crops using good agricultural practices. This encouraged high yields, and it resulted in adequate food for the family and surplus sold to earn income for other household needs. FFLS learning sessions followed recommended FFS practice. The FFLS sessions studied generally ran weekly on a day and time the members had agreed upon. After the field practice, members grouped together at their designated learning place to discuss the findings and develop an action plan on challenges experienced. At the end of this activity, a selected topic for the day, such as nutrition, was handled. However, the nutrition component was inadequately included in a structural manner within the schedule of FFLS. No nutrition-specific curriculum for FFLS was found in the targeted project and the facilitators lacked the necessary technical skills to handle the nutrition component in FFLS adequately, which made inclusion of nutrition a challenge.

Knowledge on nutrition. The farmers had inadequate knowledge on the composition of a balanced diet. They also had little knowledge on the nutritive value of the foods they grew and consumed.

Facilitators' selection and training. Facilitators in the sample program were selected from the community according to field school's guidelines. The facilitators underwent a three week Training of Facilitators (TOF) course on the FFLS methodology and on certain subject matters. Topics related to vegetable production for household consumption and as an income-generating activity were covered in the TOF. However, only minimal nutrition subjects were included.

Social cultural considerations. The FFLS members who were HIV positive felt that they were more accepted in the communities they belonged to than before they had joined the FFLS; they were more confident and reported better methods of making decisions in relation to problems they faced and addressing gender-based violence through dialogue. Thus, embracing the participatory approaches of integrating life skills (including nutrition) in the FFLS contributes positively to improved wellbeing of the participating families in their cultural context.

Overall, there is a highly promising scope for linking agricultural development and education with nutrition through the FFS approach. The impact of nutrition among FFLS members could be greatly increased if nutrition were better mainstreamed and integrated in the FFS approach. Kitchen gardens promoted production of vegetables for home consumption and for sale. However, lack of water was a key challenge for garden expansion and sustainability. Nutrition education to farmers on the nutritional value of diversified crops they produce and the importance of consuming these foods to improve their health is essential. Nutrition is indirectly implied in FFLS activities focused on food production, but there was generally poor or no specific or structured content or curriculums included to enhance nutrition education in the FFLS program studied. Nutrition topics come in ad hoc, based on members' or facilitators' demands rather than being scheduled or mainstreamed in the FFLS groups learning programs.

Facilitator training in nutrition was found to be insufficient for them to effectively handle the wide spectrum of nutrition related topics and little to no material, such as nutrition modules or recipes, was available to assist facilitators in addressing nutrition topics. In addition, there were no clear nutrition indicators put in place to monitor and assess the nutrition impact through the FFLS.

Although the study focused on FFLS in particular, the following recommendations are valid for FFS more generally, especially FFS programs that aim to contribute more directly to nutrition outcomes.

Field practice. The nutrition component needs to be strengthened in existing and ongoing FFS in the region. The FFS learning schedule should include adequate nutrition content on a regular basis and education on nutrition should follow the participatory and discovery based training mechanisms and tools inherent in the FFS approach. Infant and young child nutrition should be incorporated in nutrition education and promote the use of locally available foods in food demonstrations. Technical experts and resource persons should complement FFS facilitators for delivery of nutrition-related topics. There is a need to also include a component of fruit trees, useful herbs and other trees in FFS activities not only for food security and nutrition, but also for environmental conservation.

Training and support of facilitators. Existing FFS facilitators should undergo a refresher training to improve their skills and knowledge on integration of nutrition in their field practice. The curriculum for the FFS facilitators should be reviewed; it must be detailed and have a separate slot for nutrition in the training. Existing Master Trainers will require training on new nutrition modules in order to be able to support and mentor field staffs and facilitators on the topic. There is a need to improve on existing nutrition materials and develop new materials on aspects that are currently missing. In addition, materials on local recipes that can be adopted for each context for use by facilitators during the training and for members will be highly beneficial.

Program formulation and management. FFS can be used as an entry point for integration of nutrition in agriculture and food security due the structure of FFS that enables the community to learn in a favorable manner and the strong food security component already in place in the FFSs investigated. The FFS programs need clearer exit strategies to maintain momentum and adoption of practices post-FFS. Duration of FFS programs on the ground-implementation phase should last 1½ to 2 years; hence 2½ to 3 year project duration is recommended to allow adequate time for program start-up. A strong linkage with the health sector is necessary in order to rehabilitate malnourished individuals within the groups. Training on innovations like energy saving stoves, sun drying of vegetables, and fireless cookers should be integrated into FFS programs. If this cannot be done by the project, efforts should be made to link up the groups with other organizations that are promoting this. Nutrition indicators should be included in FFS's monitoring and evaluation (M&E) frameworks and assessed at defined intervals to ensure that nutrition impact is achieved from the project.

Integration of Nutrition in Farmer Field Schools

Eastern and Central Africa continue to face acute and chronic food and nutrition insecurity⁴. Combined with a high incidence of HIV, food security continues to affect the nutrition and health status of the members of poor households. Currently there are many global initiatives that seek to strengthen the linkage between agricultural development and human nutrition. In the past, strategies to combat malnutrition have tended to be largely health-based. Now there is growing recognition that including nutrition objectives, particularly in agricultural extension and training, is vital. The adoption of participatory extension approaches, such as FFS, provides additional opportunities to move agricultural development beyond a customary focus on productivity and yields to an approach that can more effectively contribute to improved nutritional outcomes.

The FFS approach is based on discovery and experiential learning principles, and was developed as an alternative to the conventional top-down Training and Visit extension approach, applied extensively in the past. The basis of FFS is a group of farmers with a common interest who together engage in a season long study program, usually with weekly meetings. FFS provides an environment through which farmers can learn new agricultural and management skills in a practical manner and investigate and overcome a wider range of problems. Farmers learn about production problems and ways to address them through their own observation, discussion, and participation in practical learning-by-doing field exercises.

The FFS groups decide on their main topic of study, often a crop or livestock based enterprise, and set up simple experiments at a field-learning site. Aside from the main learning topic, the group curriculum can also addresses other topics of interest and importance to farmers such as gender, conflict resolution, and business skills. It is among these so-called "special topics" that human nutrition can sometimes be included. Groups are also encouraged to engage in income-generating activities. The FFS approach is now a widely applied approach in the sub-region⁵.

⁴ IFAD 2001. "Rural Poverty Report. The challenge of ending rural poverty."

⁵ Braun, A. et al. 2006. "A Global Survey and Review of Farmer Field School Experiences."

While FFSs usually include life skills issues, special emphasis has been given to life skills in Farmer Field and Life Schools (FFLS). FFLS have been applied particularly among more vulnerable segments of the farming population such as those in post conflict situations. Much emphasis is put on linking agricultural to human ecosystem learning. The curriculum of FFLS commonly includes gender and gender-based violence, human health, HIV and AIDs, and conflict management as special life skills topics. It is in this context that the topic of human nutrition has been emphasized as a key area of learning. A regional program that is successfully applying the FFLS approach provides the empirical framework for this study.

The practical, hands-on and experimental nature of FFS complement practical nutrition strategies, which aim to increase the diversity of food consumed, preparation standards, and food storage in households. In FFS learning sessions, traditional extension topics such as cropping and pest management are being used as an entry point to discuss related issues, including health and nutrition. For example, when learning about diversity in crop production, direct action can be taken by facilitators to stimulate discussions among beneficiaries about the nutritional value of particular crops, preparation, and cooking techniques for maximum nutrient retention. By continuously drawing this link between agricultural and other human spheres, nutrition education gets interwoven and integrated into agricultural extension. In many countries across the developing world, governments have invested heavily in agricultural extension systems. The resulting physical and human capital holds great potential to address both agricultural development and nutrition through the same mechanism. By linking these two aspects, the potential for rural food and nutrition security can be greatly enhanced.

In their 2003 paper, Callens and Gallagher provide recommendations on “how” to incorporate nutrition in farmer field schools in principle, but do not discuss a specific program where this was actually done. In Bangladesh, the FFS model was adapted to support homestead food production with the aim of increasing production and consumption of diversified micronutrient rich foods (SPRING, 2014). However, within Eastern and Central Africa, few studies, if any, have been done to assess the integration of nutrition into FFS; there is limited documented evidence to suggest the inclusion of nutrition in FFS is actually increasing the level of knowledge and good nutrition practices among farmers. Thus, this evaluative case study aims at assessing how this has been done in FFS practice, in view of providing recommendations on how to better improve nutrition integration in FFS.

Objectives of the study

The specific objectives of the study were to:

1. Document the processes that have been used by actors implementing FFS to mainstream nutrition in the FFS learning process.
2. Assess and document changes in nutrition knowledge and practice amongst FFS beneficiaries, including constraints/enabling factors that prevent/encourage the uptake of improved nutrition practices.
3. Identify good practices as well as opportunities and gaps in terms of integrating nutrition in FFS and propose recommendations for improving the effectiveness of nutrition education in FFS.

Methodology

Geographical location and sampling

The empirical frame for the study that forms the basis for this report is a SIDA funded and FAO implemented regional project⁶ undertaken from 2010 to 2013 in Kenya, Uganda, Rwanda, Democratic Republic of Congo, Burundi, and Central Africa Republic to address gender and HIV through a food security and nutrition response. Following completion of the project, the final report made several recommendations, and in particular highlighted the need for increased attention to the integration of nutrition in FFS and FFLS⁷ processes.

The sample in this study includes FFLS that had operated in these countries under the project. The fieldwork focused on sampled FFS groups in Uganda (Kitgum and Lamwo districts) and Rwanda (Nyagatare and Gatsibo districts), which were initiated in 2011-2012 by the afore-mentioned project. The desk review covered experiences from FFS implementation in all the six participating countries. The primary target group for the fieldwork included the participants of FFLS groups in seven groups in Uganda and six groups in Rwanda. Field-based data collection was undertaken from September to October 2013.

Purposive sampling was used for the evaluative case study to define respondents for in-depth interviews. Respondents sought were persons who had success stories to tell in regards to their participation in FFLS, as there was more to learn in terms of program up-scaling in similar environments from such participants. Effort was made to include both women and men. Three participants were interviewed in Uganda and three in Rwanda. Key informants' interviews were also held with facilitators, FAO field staffs who worked in FFLS as well as staff of the field implementing organizations Lutheran World Federation (LWF), in Uganda and Association of Volunteers in International Service (AVSI) in Rwanda. A focus group discussion (FGD) was also held with staff of AVSI. FGDs with FFLS groups were not appropriate due to the large numbers that turned up for the meetings.

Data collection tools

The data collection in the field included both qualitative and quantitative approaches. Survey data collected from 145 respondents was based on a questionnaire format including basic information about respondents and their FFLS training experience. Qualitative data was obtained using guides developed for the different categories of respondents. A key informant interview guide was used to obtain information from key partner organizations' undertaking FFLS interventions in each country and field facilitators. In-depth interview guides were used to attain information from primary beneficiaries sampled in the study from chosen FFLS sites. A FGD guide was used during the group meetings with participants of FFLS. Observation checklists were also in use throughout the data collection process in the field to provide an understanding of the context and activities of the FFLS in Rwanda and Uganda.

⁶ FAO. 2013. "Addressing HIV and Gender Inequities through a Food Security and Nutrition Response in Eastern and Central Africa". OSRO/RAF/010/SWE Terminal Evaluation Report, Uganda Component.

⁷ The term FFLS is used in this report when referring to the specific sampling frame of the study, but FFS is used when referring more generally to the Field School approach (FFS & FFLS combined).

A description of the various tools employed is provided below.

Desk reviews and consultations

The methodology included desk reviews of existing documentation and meetings with key stakeholders. In addition, observations were made during field visits to a representative sample of FFS sites/beneficiaries in Rwanda and Uganda. Briefing sessions were held with the FAO Sub-regional Emergencies Office in Nairobi, clarifying objectives of the assessment and agreeing on a timeframe and schedule. A desk review of project proposals and reports, FFLS reports from the participating countries and other relevant documents were undertaken prior to the fieldwork. The desk review assisted in framing the appropriate fieldwork methodology. The review also enabled the determination of key findings in terms of the processes and achievements of FFLS in the six participating countries.

Quantitative data collection tools

A questionnaire was used to collect quantitative data from 145 FFLS participants in the two countries. The questionnaire was used to obtain information on how FFLS were implemented, and the training received by the farmers in order to gauge the knowledge and skills gained in terms of integrating nutrition in the FFLS. In addition, the socio-demographic, nutrition status, dietary diversity, and nutrition content covered during the FFS was collected. Data from the questionnaire was analyzed through descriptive statistics.

Qualitative data collection tools

The key informant interview guide, focus group discussion guide, in-depth interview guide and observation checklist were used to obtain qualitative data. These tools were designed to capture the attitudes and practices on the integration of nutrition in Farmer Field Life Schools (FFLS). Recording was undertaken during qualitative data collection in addition to note taking to ensure accuracy of the data.

In-Depth Interviews (IDIs) guides

The questions answered through IDIs are in relation to the target population and their experiences with Farmer Field Life Schools. Those participants selected were case studies of the success stories gained from FFLS experience.

Key Informant Interviews (KIIs) guides

The data gathered with the KII guides was related to policies, guidelines and practices related to the functioning of the Farmer Field Life Schools. This was with the implementing organizations of LWF in Uganda and AVSI in Rwanda.

Focus group discussion guides/meetings

Group meetings were done with the participants of the FFLS using FGD guide. These were from communities where these FFLS are situated. The FGD guide (Annex 7) aimed at gaining community perspectives on functioning of FFLS and achievements the project has made in terms of integrating nutrition into FFLS. Photo 1 depicts the group meetings in Duterintambwe Mu Murimo FFLS group in Rwimbogo Sector, Gatsibo District on October 10, 2013. Photo 2 shows a group meeting in Wamede Anyim in Lokung on September 25, 2013. FGD was also held with stakeholders to validate the findings in both countries.

Observation checklist

Observations were conducted throughout during the duration of the fieldwork. The observations were focused on the FFLS and on the general setup of kitchen gardens, the quality and quantity of crops in the FFLS, and any other observable elements in the project. The researcher observed the setup and status of the FFLS, the day-to-day activities related to FFLS and other details that were not collected through the quantitative tools.



Photo 1: FGD in Gatsibo, Rwanda



Photo 2: FGD in Lokung, Uganda

Data collection procedure

Pilot testing of tools

The developed tools were pilot tested for three days in Gatanga in Kenya. This involved administering questionnaires to participants of FFS, KIIs to facilitators of FFS and in-depth interviews with success story participants. The pilot test enabled the consultant with assistance from the FAO staff in Kenya to adjust the tools for fieldwork and also estimate the time and logistics that were likely to influence fieldwork data collection.

Selection and training of assessment teams

The data collection team in each country included the consultant, one moderator, and two enumerators. One moderator assisted in translation and in the collection of qualitative data in each country. The moderators and enumerators were from the locality and were fluent in English and the local language: Acholi in Uganda and Rwandese in Rwanda. In Uganda, the team had not interacted with the FFLS project but in Rwanda the moderator was the coordinator of the project and the enumerator had not interacted with the project. FAO in Kitgum selected a team comprised of two persons for the enumeration and one for the moderation. Similarly FAO Rwanda selected two persons for the enumeration and one moderator. The moderator also functioned as the coordinator for the fieldwork in Rwanda while in Uganda the FAO staff in Kitgum coordinated the fieldwork.

The teams were given a one-day training on how to undertake the fieldwork. Training focused on understanding the purpose and objectives of the assessment. During the training, the trainees were able to ask questions in the right manner and record the responses accurately. Translation and back translation of items were done to ascertain that accurate data was obtained from the respondents. The training materials were similar for the two countries. The consultant, assisted by FAO staff in Kitgum and the moderator in Rwanda, undertook field supervision of data collection.

Validation of preliminary findings with stakeholders in the field

Validation of findings was undertaken with the key stakeholders in Kitgum, Uganda and in Nyagatare, Rwanda. This was in the form of feedback meetings that validated the key findings and recommendations. Preliminary findings were also discussed and reviewed with FAO offices in Nairobi, Kampala and Kigali. Validation meetings were done in Kitgum, Uganda for FAO and stakeholders. Participants included the FAO representatives, LWF staff, Mercy Corps, Kiwepe, and Department of Agricultural Production and other partners in agriculture working in the area. A validation meeting (Photo 3) was held with the sector leaders in Nyagatare and a debriefing meeting was held with the FAO representative in Kigali. Photo 4 shows the participants of the validation outside the District offices in Kitgum. The FAO office in Kampala got the preliminary report that was shared in Kitgum.



Photo 3: Members who participated in validation of findings in Kitgum, Uganda



Photo 4: Validation group meeting in Nyagatare, Rwanda

Results

Socio-demographics of assessment participants

These sections highlight key findings from the study. Of the 145 household survey respondents, 73% were females and 27% were males (Table 1). About 73% were married, among which 17% were widowed. Head of household respondents were aged between 20 and 88 years with a majority of the FFLS participants aged above 30 years. The participants were mainly rural females with few elderly persons in the households (Table 2).

Table 1: Household composition

	Household members by gender, age categories, residence and headship		
	Uganda	Rwanda	Total
Household members			
Boys	161	128	20.3% (289)
Boys in school	111	93	14.3% (204)
Girls	172	137	21.7% (309)
Girls in School	124	99	15.7% (223)
Adult women	75	80	10.9% (155)
Adult men	81	84	11.6% (165)
Elderly women	32	11	3.0% (43)
Elderly men	23	11	2.6% (35)
Total	779	643	100 (1423)
Household headship	N = 74	N = 71	N =145
Male	85.1%	78.9%	82.1%
Female	14.9%	19.7%	17.2%
Child <18 years	---	1.4%	0.7%
Residence			
Rural	100%	91.4%	98.6%
Urban	---	8.6%	1.4%
Resident	93.3%	97.2%	94.4%
Returnee	6.7%	2.8%	5.6%

Table 2: Characteristics of respondents

	Uganda	Rwanda	Total
Age			
≤19 years	2.7%	1.4%	2.1%
20 – 29 years	10.8%	4.2%	7.5%
30-39 years	30.1%	28.2%	29.2%
40-49 years	35.2%	36.6%	35.9%
≥50 years	21.2%	29.6%	25.3%
Marital Status	N = 74	N =71	N= 145
Married	70.3%	76.1%	73.1%
Single	2.7%	2.8%	2.8%
Divorced	2.7%	1.4%	2.1%
Separated	2.8%	2.8%	4.8%
Widowed	17.6%	16.9%	17.2%
Respondents	Females	Males	Total
Rwanda	51	20	71
Uganda	55	19	74
Total	106 (73.1%)	39 (26.9%)	145

About a quarter of the participants were vulnerable because they were widowed, separated or divorced. All the participants lived in rural settings. The interviewed households had 545 persons; females made up 51.2% and males made up 48.8%. The majority of the participants in FFLS were aged above 30 years⁸.

Uptake of farming and nutritional practices

Participants were found to have increased and diversified their food production as a result of their FFLS participation. The FFLS learning activities included planting agricultural crops on experimental fields. The majority of the crops focused on were vegetables such as carrots, eggplant, cabbage, and beetroot, as they take a shorter time to grow and harvest and can bring faster returns. Other crops selected were beans, sesame, groundnuts, maize, and cassava.

Kitchen gardens

In the surveyed sample, about 37.8% and 98.6% interviewed families owned kitchen gardens in Uganda and Rwanda, respectively. There were crops in the gardens but only a few of them had viable gardens as shown in Photo 5.



Photo 5: Kitchen garden with eggplant in Lamwao



Photo 6: Facilitator Louise in her kitchen garden in Gatsibo

Farmers who did not have kitchen gardens stated, “We produce our vegetables in fields that are far from our homes. We did not have kitchen gardens here because the livestock, especially goats and chickens, destroy the vegetables so we cannot grow them here”. (Respondent Lacan Pe Kun Lamwo, district Uganda on 26 September 2013).

Those who did not have kitchen gardens obtained their vegetables for home consumption from their fields near the river and others purchased them. The rest did not eat vegetables if they were not grown on their farms. Some vegetables grown by the few families are shown in Photos 5 and 6.

⁸ On a side note: The question of how to pass the baton to the next generation must be incorporated in the FFLS by ensuring younger members of the society are in the FFLS for maximum benefits to reach the young population who have the most vulnerable children. There is need to include the younger generation in the FFLS for continuity.

Kitchen gardens were more evident in the Gatsibo than in the Nyagatare district in Rwanda. The nutrition component of the project related to ensuring food security; however, food consumption to enhance health was minimal. The members noted, “We cook vegetables and beans at home but have not had food preparation demonstrations in the group on cookery”. One of the facilitators of the FFLS group, Louise Uwayezu, stated, “I was trained as a facilitator on how to run an FFLS or the FFLS approach, modern agricultural production of crops and livestock, management of conflicts, gender-based violence, entrepreneurship, and nutrition... I was trained on energy foods, proteins, and protective foods”. During the FGD in the same group members noted, “We have put a plan to learn how to prepare nutritious foods at home in the future but have not done so now.”

Individuals here produced their crops near the river for easy watering. The aim was to increase their incomes and consumption of the products. Asked about the type of produce they ate, the majority stated, “We select the best quality produce for sale and that which was not as good was consumed by the family, as people could not buy poor quality produce”.



Photo 7: One participant checking on her carrots in the garden

It is evident that the FFLS project contributed to increased food security in the area. However, nutrition security in terms of food utilization, consumption, and storage/preservation was minimal.

The people growing various vegetables in their kitchen gardens during fieldwork are reflected in Photos 5, 6, and 7 and Figures 1 and 2.

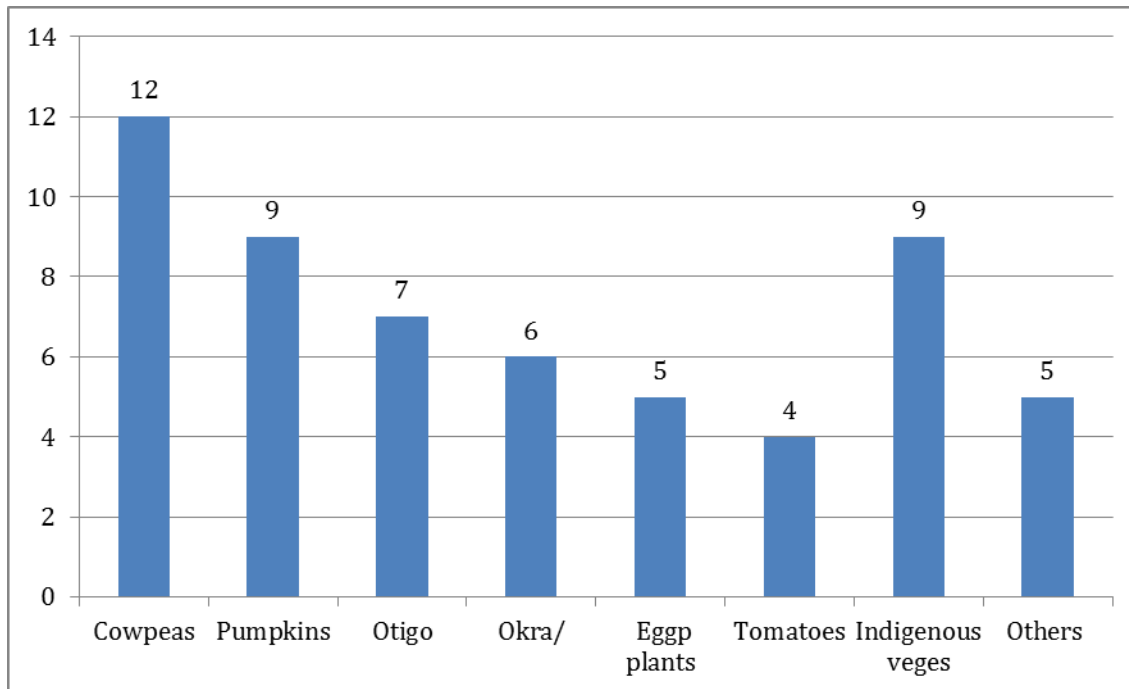


Figure 1: Number of FFLS participants growing vegetables in their gardens in FFLS in Uganda

The food security component of the project included the production of nutritious foods such as beans for proteins, vegetables to supply vitamins and maize and cassava for carbohydrates. The main crops that were in these gardens were amaranths, onions, cabbages, carrots and spinach.

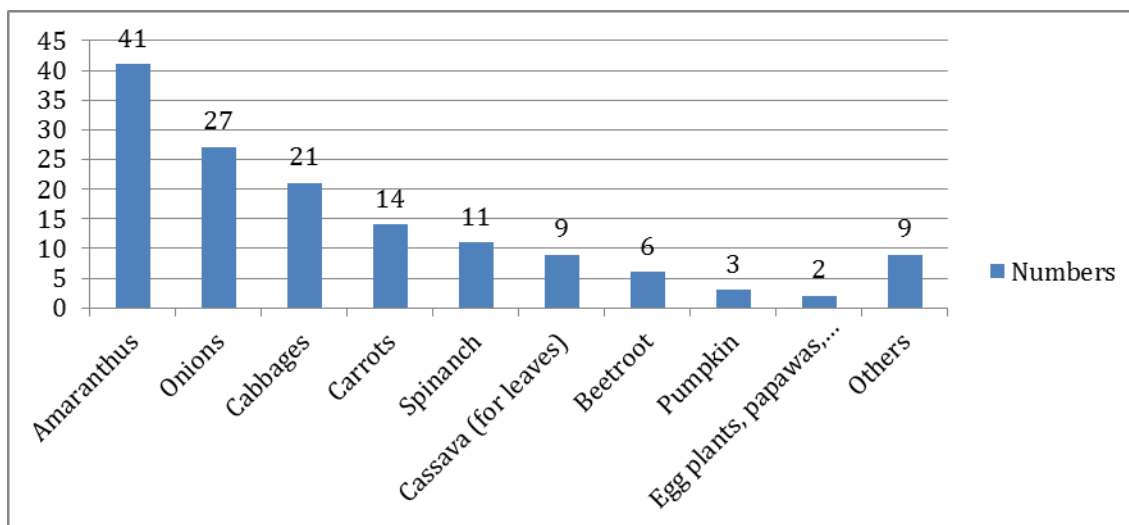


Figure 2: Respondents growing crops in their kitchen gardens in Rwanda FFLS

Nutrition practices

A major contributor to the uptake of practices benefiting nutrition were the kitchen gardens promoted for production of vegetables for home consumption and for sale to earn income to purchase food that families did not grow or non-food items. Good nutrition practices included thriving kitchen gardens with

foods used for family food consumption that also provided income for the families, preparation of nutritious foods using crops grown, plus some hygiene and related practices for about half of the assessed participants. There was a higher diversity of food eaten by the members across the FFLS⁹. However, the vegetables grown in some countries are sold but few are consumed at the household level despite their importance in the diet¹⁰.

Facilitators were able to teach their group members about qualities of a balanced diet, including the importance of consuming vegetables and having a diversified diet. Although members were taught about nutrition during their FFLS days, it was not programmed during the topical discussion sessions, but rather depended on the facilitator. As such, only very few sessions on nutrition were undertaken. During the closure of the project, the best performers were rewarded. However, no criteria for improved nutrition in terms of food utilization and consumption were used in deciding the best performance for the groups, facilitators, or individual members of FFLS. This shows the minimal focus on nutrition in FFLS.

Improved nutrition at household level

The overview of the types of foods consumed (Table 3) shows that the participating families do eat crops promoted through the FFLS to improve their nutrition and overall health. In all the countries, indicators for assessing and evaluating the nutrition and health statuses of FFLS members' households were limited to diet diversity and the number of meals consumed. Complementary feeding practices for young children that greatly impact nutrition were not addressed. In addition, the nutrition assessment to measure the nutritional impact of the project was weak in countries in East Africa because of the few clear nutrition indicators present. The results of fieldwork in two countries discuss the foods produced, meal frequency, diet dietary diversity, and nutrition assessment using MUAC.

Table 3: Overview of the types of foods consumed

<ul style="list-style-type: none"> • Cereals: maize, rice, sorghum, millet • Roots: Cassava, sweet and Irish potatoes, yams • Vegetables: Carrots, amaranth, tomatoes, eggplant, spinach, cowpea leaves, beet roots, pumpkins & traditional vegetables • Fruits: Avocados, pineapples, paw paws, bananas, wild fruits, mangoes and passion fruit • Spices: black pepper, celery, green pepper, salt, soya sauce, spices, onions 	<ul style="list-style-type: none"> • Legumes: beans, lentils, groundnuts, peas • Meats: Beef, goat meat, chicken and rabbits • Dried fish • Milk and local cheese • Eggs • Oils and fats • Sugar and honey
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⁹ FAO. 2010. "Addressing HIV and Gender Inequities through a Food Security and Nutrition Response in Eastern and Central Africa: The Case of Kenya." OSRO/RAF/010/SWE.

¹⁰ FAO. 2010. "Regional Response to Food Security, HIV/AIDS and Gender Based Violence in Eastern Africa Project. Regional FFS and FFLS status report in Congo, Rwanda and Burundi." OSRO/RAF/808/SWE.

Members of FFLS groups in Orum, Uganda completed the preservation of vegetables; however, it was not through the FFLS but by their traditional preservation methods. There were minimal food preservation and storage practices observed during the fieldwork. Food preservation and storage is necessary for the program so that families can learn to store what they produce for use during the dry period because all FFLS relied on rain-fed food production.

Household meal frequency

The sampled households were found to be consuming fewer meals per day than recommended. They were consuming more meals than they did before joining the FFLS project (Table 4). However, the difference between the meals consumed the day prior to the survey and what they usually ate was not statistically significant at $p \leq 0.05$.

Based on the 24-hour food frequency, most families were consuming cereals and vegetables that were promoted in the FFLS project. 94.2% and 98.6% of the households consumed cereals while 89.2% and 98.6% of the households consumed vegetables in Uganda and Rwanda, respectively. Similarly, legumes, nuts, and roots were consumed in high amounts in Rwanda only. These findings show that crops that are promoted through the FFLS are also consumed by the participating families to better their nutrition and overall health.

Table 4: Meals consumed and food consumption in the past 24 hours

Meals usually eaten per day	Uganda N = 74	Rwanda N = 71
1 meal	2.9%	_____
2 meals	55.15	46.5% (33)
3 meals	42.0%	53.5% (38)
Meals eaten day prior to the data collection		
1 meal	10.1%	_____
2 meals	53.6%	56.3%
3 meals	36.2%	43.7%
Food consumption in the past 24 hours		
Cereals	94.2%	98.6%
White roots and tubers	33.3%	98.6%
Vegetables	89.9%	98.6%
Fruits	13.0%	63.4%
Meats	30.4%	16.9%
Eggs	4.3%	2.8%
Fish	13.0%	38.0%
Legumes and nuts	60.9%	98.6%
Milk and milk products	2.9%	40.8%
Oils and fats	71.0%	85.9%
Sweets/sugars	24.6%	38.0%
Spices and condiments	81.2%	95.8%

Household dietary diversity

The mean dietary diversity score of households in Rwanda and Uganda was 6.4 food groups, with families in Uganda consuming from fewer food groups than in Rwanda (Table 5). Although the dietary diversity score is an average, some families consumed as few as only two types of foods in a day. The foods that families consumed were those produced on the farms with households purchasing the rest. All families in Rwanda and many families in Uganda consumed vegetables that were promoted in the project. A promotion of intake of nutrient dense foods that includes vegetables and fruits is necessary.

Table 5: Types of foods consumed in Rwanda and Uganda households

Foods	Uganda	Rwanda	Total
Cereals	65	71	136
Tubers	23	71	94
Vegetables	62	71	133
Fruits	9	45	54
Meats	21	13	34
Eggs	3	1	4
Fish	9	27	36
Legumes	42	70	112
Milk	2	29	31
Oils & fats	49	62	111
Sweets	17	28	45
Spices	56	70	126
Mean dietary diversity score	5.2 \pm 1.610	7.59 \pm 1.202	6.43 \pm 1.843
Range of foods	2 to 9	5 to 11	2 to 11

Of the children in Ugandan households studied, only seven were younger than 24 months. They were assessed on complementary practices. This size is too small to make conclusions on the feeding practices of the children but is a good indicator of the ways that children of this age are introduced to other foods and the general infant and young child feeding practices in the area.

The nutritional status of children was assessed on few children, as many women in FFLS had older children. This was for 44 and 28 children aged 12-59 months in Uganda and Rwanda, respectively. The sample size is small but does provide an indication of the nutrition status of children and women participating in FFLS. The nutritional status of women assessed using MUAC was normal in both countries at MUAC \geq 21.0cm. Children aged below five years were well nourished in Rwanda, while 22.3% were malnourished in Uganda at MUAC $<$ 12.5cm. The malnourished children came from young families where parents were aged below 30 years.

Few participants thought their families were very healthy, with the majority assessing their families to be in good health despite the fact that 21% and 52% of the children assessed were sick in the two weeks

prior to this assessment in Rwanda and Uganda, respectively (Figure 3). In addition, a fifth of the children were malnourished. Families stated that they were consuming a greater variety of foods produced despite the fact that they sold much of the produce.

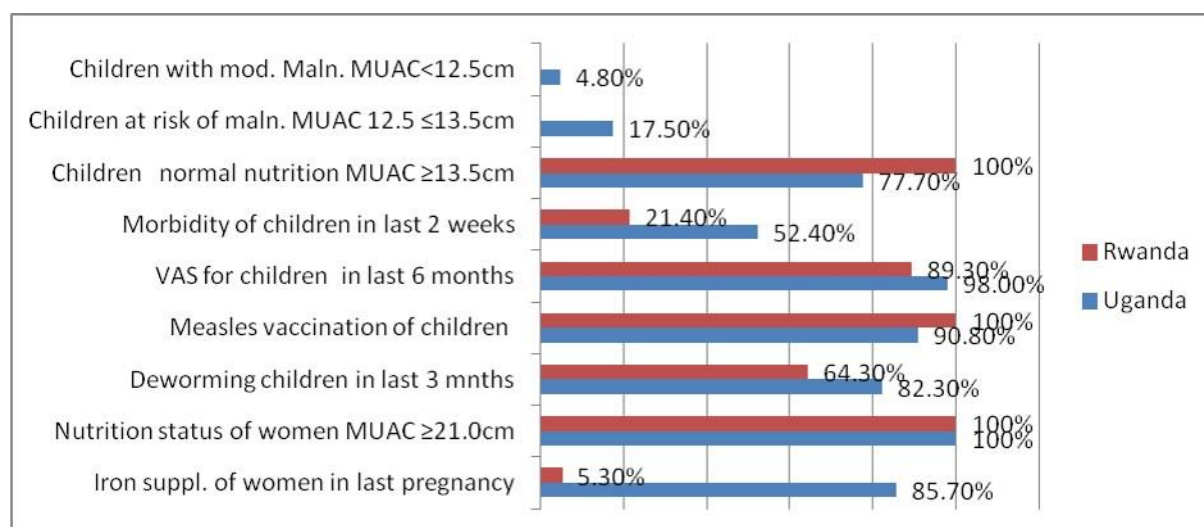


Figure 3: Nutrition status and related practices of children and women in Uganda and Rwanda

Although this was not designed to be a comparative study, the analysis of the results indicate that of the participants who were interviewed in Rwanda, more had kitchen gardens and their children were better nourished. Household members consumed more meals and the foods consumed over the past 24 hours were more varied than in Uganda. This suggests the importance of owning kitchen gardens as such families are more likely to be better nourished as was the case in Rwanda as opposed to Uganda where few families had gardens.

These findings indicate the need to empower FFLS facilitators with nutrition knowledge and skills so that they can pass on the same to families. In addition, undertaking the nutrition assessment using MUAC to monitor the nutrition situation during the project life should be among the required facilitator skills.

Integration of nutrition in FFLS

Learning about nutrition in FFLS was found to be closely linked to the food production component whereby members of the groups were encouraged to grow diversified and nutrient dense crops using good agricultural practices. This encouraged high yields, and it resulted in adequate food for the family and surplus sold to earn income for other household needs.

FFLS learning sessions were found to generally follow recommended FFS practices. The FFLS sessions studied generally ran weekly on a day the members had agreed upon with sessions starting at their learning field site as early as 7 am. The group divided themselves into sub-groups where each sub-group handled one experimental plot continuously from land preparation up to harvest time. Activities at the field experimentation plot on a typical day ran for around two hours. After the field practice, members grouped together at their designated learning place. At this point, they discussed the findings from the field and developed an action plan for challenges experienced. At the end of this activity, a selected

topic for the day was handled. This is generally where nutrition topics find an entry point into the learning schedule.

Generally the study found that the nutrition component was inadequately included in a structural manner within the schedule of FFLS. Group members felt that they had increased knowledge on the composition of a balanced diet but felt that this knowledge had been acquired in a provisional manner rather than being a planned part of their curriculum. Nutrition related topics tended to be addressed only when individual members/facilitators felt a need or desire to handle a special topic in nutrition, thus not mainstreamed in all groups. Neither nutrition-specific curricula nor nutrition-sensitive topics for FFLS were identified in the project and this made the inclusion of nutrition a challenge. The need for a curriculum with the desired number of nutrition sessions was expressed. Mostly the facilitators were the ones who handled the nutrition component with support from the implementing organization. Thus the facilitators must be equipped with the necessary knowledge and technical skills to handle the nutrition component in FFLS.

Among the sampled groups there was only one practical food preparation session undertaken in Uganda and there were no resulting significant changes in the way the beneficiaries prepared their food even though some of the food they produced was new to them. However, farmers prepared food for consumption based on knowledge they gained from each other.

Knowledge on nutrition

Nutrition knowledge regarding foods that provide specific nutrients improved slightly among study participants in FFLS. Participants were able to determine food sources for proteins, carbohydrates, vitamins, and minerals from their locality¹¹. The participants' knowledge on a balanced diet and sources of vitamins and proteins from the fieldwork showed that farmers had little knowledge on the composition of a balanced diet (Table 6). This was attributed to the weak knowledge base on the topic among facilitators. Participants indicated that they were encouraged to consume what they produced in their kitchen gardens, farms, and households; however, they lacked knowledge on the nutrients that these foods contribute to the diet. It is regrettable that although farmers produced different types of food, some did not know the nutrients in these foods and few could describe components of a balanced diet.

During the FFLS sessions, participants indicated that that they were encouraged to consume what they produced. They were taught about foods to consume for HIV and AIDS management, especially fruits and vegetables, and the importance of good nutrition. They were encouraged to eat a variety of vegetables and other foods, and they were trained to produce a variety of crops. Preparation of mixed vegetables plus fruits for the family was encouraged. Nutrition-sensitive topics that focus on underlying causes (health and care), and the role of household incomes and especially of women's empowerment in promoting nutrition were not addressed. These findings imply the need for nutrition education to the vulnerable people in these countries to enable them makes informed decisions when it comes to consuming a healthy diet. Results indicate that some participants did not comprehend the composition of a balanced diet or the rich sources of different nutrients.

¹¹ FAO. 2010. "Addressing HIV and Gender inequities through a food security and nutrition response in Eastern and Central Africa: The Case of Kenya." OSRO/RAF/010/SWE.

Table 6: Respondents' knowledge on composition of a balanced diet, sources of proteins and vitamins

Composition of balanced diet	Uganda N = 74	Rwanda N = 71	Total N = 145
Vitamins	48.6%	62.0%	55.2%
Carbohydrates	47.3%	100%	73.1%
Proteins	44.6%	95.8%	70.0%
Fats and oils	32.4%	31.0%	31.7%
Minerals	8.1%	56.3	31.7%
Water	1.4%	28.2%	14.5%
Sources of Proteins			
Legumes (beans, peas, soybeans, etc.)	27.0%	93.0%	59.3%
Meats/chickens	14.9%	22.5%	8.6%
Eggs	13.5%	5.6%	9.7%
Fish	10.8%	2.8%	6.9%
Nuts	9.5%	35.2%	22.1%
Milk			
Sources of Vitamins			
Vegetables	45.9%	100%	72.4%
Fruits	----	31.0%	
Eggs	-----	4.2%	
Fish	----	1.4%	

Food preparation demonstrations through FFLS

Farmers were taught various things during the FFLS session. Most of the trainings focused on food production using recommended agricultural practices based on the training received by the FFLS facilitators. Farmers appreciated these trainings and noted that they were able to produce new crops and their food yields increased.

On nutrition education, farmers stated that they were taught the components of a balanced diet, sources of proteins and vitamins, and to consume at least three meals per day. Farmers were also taught on feeding well to avoid malnutrition. Only few participants in Uganda had participated in the food preparation cooking demonstrations, while none were indicated to be held in other countries through FFLS. This finding indicates the need for food preparation and cooking demonstrations to be included in future FFLS activities. This is necessary because the vulnerable families are encouraged to grow new crops that they have not produced in the past, and they require demonstrations on how to prepare these foods so that they are utilized for health of their families.

There were no significant changes in the way the beneficiaries prepared their foods¹². For Uganda, during the cookery demonstrations, neither recipes nor teaching materials were provided but participants were informed on the different ingredients needed for each product. Most of the ingredients used were soybeans in preparation of soybean products such as porridge, cakes, *mandazis*, soy meat, soy paste, among others. Group members who participated in the demonstrations appreciated the cooked products as indicated by statements such as: “The cakes were very good, even the porridge was nice”. A problem with these cooking demonstrations was that they focused on soy-based products but the communities in the area are not producing soybeans. This posed a challenge in terms of replication of the trained practices.

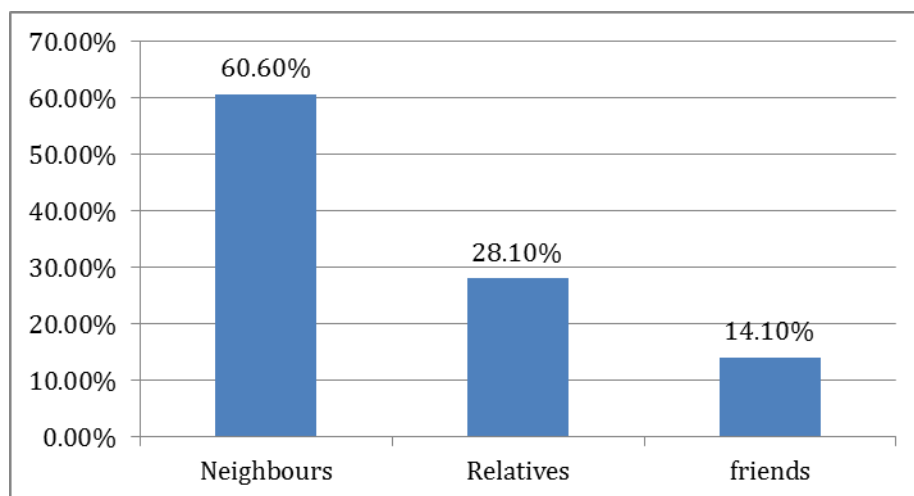


Figure 4: Number of participants who shared knowledge they gained from the FFLS sessions with neighbors, relatives, or friends.

During the FGDs, members indicated that although they had talked to others about the demonstrations (Figure 4), they had not practiced the preparation of the products since they did not have the soybeans. Practical demonstrations on how to prepare products for family consumption is necessary if participants are to benefit from using the new crops grown for the nutrition and health of their families.

Families who participated in the program had improved their knowledge and practices on nutrition as taught; however, the nutrition content was limited with very minimal demonstrations on how to prepare nutritious foods. This calls for adequate nutrition content and skills to be enhanced in future similar projects in order to have the food that farmers produce actually contribute to improved nutrition of the participating families.

Selection and training of facilitators

Partners implementing the project were responsible for the selection of the facilitators. In many cases there were both male and female; in some countries, like Rwanda, the proportions were equal, while in other countries there were more male than female facilitators. Facilitators were selected from the

¹² FAO. 2013. “Addressing HIV and Gender Inequities through a food security and nutrition response in Eastern and Central Africa.” OSRO/RAF/010/SWE Terminal Evaluation Report, Uganda Component.

community among the farmers, local persons, cooperatives, teachers, and staff from the partners according to certain guidelines but without clear procedure for their selection.

Duration of training

The facilitators underwent a three-week TOF course on the FFLS methodology and certain subject matters. The TOF covered topics related to vegetable production for household consumption and as an income generating activity. However, minimal nutrition subjects were included.

Training on nutrition for facilitators was not sufficient for them to effectively handle all preventive nutrition challenges required by group members at the community level in terms of food preparation, preservation, and storage. Additionally, good nutrition for children in terms of complementary foods was not a focus in the activities undertaken. No nutrition modules or cooking recipes had been availed to facilitators during their training. The training on nutrition was found to have been too brief to lead to better nutrition at the family and community levels.

Socio-cultural considerations

The FFLS members who were HIV positive felt that they became more accepted in the communities they belonged to than before they joined the FFLS mainly because of their involvement with FFLS activities. For example, members reported that they were more accepted in the communities where they lived because they were perceived as experts in vegetable and crop production so people consulted them on these.

Most people in the communities in which FFLS members lived aspired to be like FFLS members because they allowed the community to visit their demonstration plots and learn from them. Community people were happy with the activities of FFLS because members acted as teachers of agriculture to the community. There was also respect and understanding of cultural diversity in support of vulnerable people affected by HIV and AIDS.

With regard to the right to equitable ownership of property, members of surveyed FFLS stated that the status of women had improved. It was acknowledged that women and orphans had a right to inherit land. Some members of the FFLS had been selected or elected into leadership functions in the communities, which means they could influence others on what they had learned through FFLS.

Belonging to FFLS also enabled some members that were shy at the beginning to become more confident to speak in public. Most members of the surveyed FFLS can now talk and express themselves confidently compared to previous situations where even introductions were difficult.

FFLS members reported better methods of making decisions on the farm, dealing with problems and seasonal planning. FFLS had helped members to solve household disagreements through dialogue rather than use of violent means. Identification of problems at hand and coming up with strategies to solve their problems became easier.

With regard to gender, FFLS members gained knowledge that changed their understanding of gender. The beneficiaries reported that men had realized that women have multiple roles to play and that some

of the roles can be shared equally, especially when the workload is high. There was general appreciation of the fact that responsibilities can be shared between men, women, and children in a harmonious manner.

FELS provided an excellent entry point and platform for improved self-confidence among vulnerable people including HIV/AIDS and abuse-affected individuals. In addition, training members on gender and leadership helped to prepare them for leadership roles. This means that embracing the participatory approaches in integration of nutrition in the FELS will contribute positively to improved wellbeing of the participating families as participants are able to embrace change in making relevant food and nutrition choices for themselves and their families that take into consideration cultural diversity.

Challenges and gaps

Challenges and gaps found in relation to the integration of nutrition education in FFS/FELS relate to methodological as well as contextual issues, outlined below:

Methodological aspects

- The lack of nutrition materials for integration of nutrition in the FELS and lack of local recipes that the facilitators and group members can use was found to hamper a wider uptake of nutrition knowledge and practices.
- Nutrition topics did not receive adequate time and space in the FELS learning sessions and the topics covered were found to neglect the broader diversity of topics needed to address the issue in a comprehensive manner (i.e., production linked to food utilization, preservation & storage, consumption & preparation). Complementary feeding practices for young children that greatly impact on nutrition were not addressed.
- The facilitator training included minimal nutrition content apart from production aspects, and lacked information on food utilization, preservation and storage, consumption and preparation. The inadequate training of facilitators on nutrition was found to directly translate into minimal focus on a clear nutrition agenda in the FELS process. Lack of training modules/materials made it difficult to exploit nutrition training in terms of content and practice.
- Facilitators, often government ministry staff, did not have adequate technical support from specialists and resource persons on nutrition topics.
- Methods used to teach the minimal nutrition content were often more theoretical in nature, but production topics were covered in a more practical, hands-on manner. Few or no practical food preparation sessions were undertaken.
- The duration of field implementation was one year in most participating countries except for Rwanda, where it was a year and a half. This was rather limiting to encompass nutrition aspects related to food preservation and storage. There was also a weak follow-up mechanism in the FELS program that would contribute to sustainability of the project beyond its lifespan.

Contextual aspects

- Poverty was cited as a key challenge for applying the nutrition knowledge gained through the FFLS. Drought also poses a challenge, as there are no vegetables and fruits during such a period.
- While FFLS was found to increase openness, stigma still exists whereby some people hide and do not come out publically as HIV positive and therefore cannot be targeted for specific nutritional assistance. Weak members who are HIV positive are also unable to cultivate their plots to get sufficient food for themselves.
- While FFLS members increased their food production and diversity of food items available, this did not always contribute to a major increase in food consumption diversity. HHs are not able to consume perishables all at once without processing and preservation technologies. Also, there is the need to generate income, which often led households to sell the best produce, being left with the poorest produce for consumption at home. This was especially the case for highly perishable vegetables.
- The scarcity of water made it difficult for kitchen gardens, which are mainly rain-fed, to thrive throughout the year. This resulted in poor vegetable crop harvest during the dry seasons and few members with active kitchen gardens near their homesteads.

Main gaps

- There is no specific nutrition curriculum for use in FFS and FFLS. Thus what to teach, who is to do it, and when it might best fit in the FFS schedule, and how to accomplish it (theory, experimental) is missing, which makes nutrition integration through FFS challenging.
- Considering the rain-fed nature of agriculture in the region, food preservation and storage is of crucial importance. However, these topics were not addressed in the FFLS learning schedule.
- Follow-up activities post FFLS were not incorporated in the field programs to ensure sustainability and continuity.
- While FFLS learning covered staple crops and vegetable production, fruits and other trees were neither to be part of the learning program nor a focus of the intervention. In addition, animal sources of foods high in quality proteins were lacking. This is an opportunity that can be taken advantage of, especially for nutrition and environmental sustainability.
- Indicators for assessing and evaluating the nutrition and health status of FFLS members were limited to establishing the nutrition status of children aged 6-59 months and women in reproductive age using MUAC, household diet diversity and number of meals consumed. There is room to include more indicators focusing on food consumption, food access, food availability, and other anthropometric measurements such as BMI for women. Monitoring of nutrition sensitive outcomes that include aspects of foods, health and care that can eventually lead to positive nutrition impacts could be investigated.
- No strategy was in place to include out-of-school youths and young parents although many of the malnourished children were from younger parents.

Opportunities

A number of opportunities were identified that could be taken advantage of in FFLS program assessed.

- FFLS generally provide an excellent entry point and platform for learning about nutrition and practical improvement of nutrition among vulnerable segmented of population and less than vulnerable populations (e.g., more commercially-oriented farmers) such as those that may participate in broader FFS programs. More awareness of and work towards enhancing the potential role of FFLS for nutrition is needed.
- The FFLS process with its experiential and practical learning nature provides opportunities to also learn about nutrition in a practical manner, thus enhancing effectiveness of nutrition training as opposed to conventional training techniques. The participatory nature of the FFS approach also has the potential to increase the long term impact of projects.
- FFS with its structured approach of training of facilitators and development of training manuals and curriculums widely applied, offer a great opportunity to mainstream nutrition within these processes and documentation, an area still only insufficiently explored.
- Due to the increased production level of foods attained among FFLS participants, there is great scope to link and integrate knowledge and skills on food preparation to enhance nutrient retention and food preservation and storage. These important aspects not paid due attention to in the assessed program.
- Skill on food preparation is best acquired through practical food preparation demonstration events, linked to or in addition to FFS learning sessions, an opportunity not capitalized on.

Key lessons learned

- FFS and FFLS together form an excellent entry point for learning new knowledge and skills related to nutrition in a sustainable and culturally appropriate manner that enhances local ownership by the participants.
- Kitchen gardening (when part of the FFS/FFLS) is a highly valuable means to contribute to improvement in food consumption patterns (which contributes to better nutrition) as well as income generation at the household level, as foods grown in the gardens are used for family consumption and the surplus is sold to buy other food and non-food items.
- Practical nutrition education, like food demonstrations, contributes to members acquiring the new skills required in terms of preparing new food products, proper storage and preservation of foods, while practical crop production practices/sessions led to participants learning appropriate agricultural practices.
- Life skills acquired during the FFLS process contributed to building members' self-esteem and enabled the majority of members to think outside the box and venture into new enterprises and nutrition practices within their means.

Conclusions

Overall, there is a highly promising scope for linking agricultural development and education with nutrition through the FFS and FFLS approach. However, while increased and diversified food production has been observed from FFLS members and found contributing to better nutrition, this impact could be enriched if nutrition were more mainstreamed and better integrated in the FFS approach.

This study shows that there was success in increasing food production and food diversity and improved agronomic activities in the FFS and FFLS in the two countries. A major contributor to increased production and diversity of produce among members was the kitchen gardens promoted for production of vegetables for home consumption and for sale. However, lack of water was a key challenge for expansion and sustainability of kitchen gardens.

While FFLS and kitchen gardens in particular have led to increased diversity of food produced, diversity in consumption does not always follow suit. Due to competing priorities in families, there is pressure to sell profitable produce for income generation. Vegetables grown are sold and few consumed at the household level despite their potential to improve nutrition and health for the household members. This highlights the need to educate farmers on nutrients from diversified crops and the importance of consuming the foods they produce to improve their nutrition and health and appropriate food preservation techniques/technologies.

Whereas nutrition is indirectly implied in FFLS activities focused on food production, there was generally poor or no specific or structured content or curriculums included for enhancing nutrition education in the FFLS program studied. Nutrition topics come in provisionally, based on members' or facilitators' demands as opposed to being scheduled or mainstreamed in the FFLS groups learning programs.

Facilitator training in nutrition was found to be insufficient for effectively handling the wide spectrum of nutrition related topics with the groups, especially in relation to food preparation, preservation, and storage. Little to no documentation, such as nutrition modules and recipes, were available to support facilitation on nutrition topics. Also, skills among facilitators to translate nutrition topics into practical and participatory exercises were generally weak. In addition, there was a lack of clear nutrition indicators put in place to monitor and assess the nutrition impact through the FFLS.

Recommendations

The following section outlines some recommended actions to address conclusions from this study. While the study focused on FFLS in particular, most recommendations are largely considered valid for FFS, especially FFS programs that aim to contribute more directly to better nutrition outcomes.

Field practice

- Already existing and ongoing FFS in the region must be strengthened on topics related to food consumption and preparation as well as preservation and storage at the household level in order to complement their production knowledge with adequate corresponding nutrition knowledge.
- The FFS learning schedule should include adequate nutrition content on a regular basis and better link animal and plant health and their effect on human nutrition.
- Education on nutrition should follow the participatory and discovery-based training mechanisms and tools inherent in the FFS approach.
- Infant and young child nutrition as a topic should be incorporated in the nutrition education in order to help families apply knowledge learned through FFS for the health and nutrition well-being of their children. This necessitates that specific strategies should be incorporated in the selection of FFLS/FFS participants to include the out-of-school youths and young parents.
- To the extent possible, locally available foods should be used in food demonstrations. Where new food items are introduced, as was the case with soybeans in Uganda, this should be accompanied with agronomic education of production aspects so as to encourage growing of the crops.
- FFS facilitators should be complemented by technical experts and resource persons for delivery of nutrition related topics because the facilitators do not have adequate technical knowledge.
- There is need to include a component of fruit trees, useful herbs, and other trees in FFS activities. There is great potential for farmers to plant these along farm boundaries or as hedges around trial plots. The fruit trees and herbs will contribute to improving nutrition and food security in addition to environmental conservation and fuel wood benefits of other trees. Small livestock production could be enhanced as a source of high quality proteins.
- Aspects of food safety, hygiene and sanitation could be explored based on the context and incorporated in future programs as appropriate to avoid diminishing the positive effects of increased quality food production and consumption on nutrition and health well-being of families.
- The role played by kitchen gardens on women's control of HH income and the effect of gardening activities on their time availability and energy levels were not investigated by this study, and should be a focus in future studies.

Training and support of Facilitators

- Where previous or existing FFS facilitators exist, they should undergo a refresher course training to strengthen the integration of nutrition in their field practice in terms of food consumption, preparation, preservation, and storage at the household level.
- Review the facilitators training program to ensure adequate inclusion of the most necessary nutrition related topics.
- The Training of the Facilitators should be detailed and have a separate slot on nutrition. A separate training on nutrition for the facilitators (in addition to the FFS facilitators training program already in place) is recommended for nutrition to be effectively integrated in the FFS.
- Existing Master Trainers will require training on new nutrition modules in order to be able to support and mentor field staffs and facilitators on the topic.
- Improve on existing nutrition materials and develop new materials on missing aspects. In addition, materials on local recipes that can be adopted for each context for use by facilitators during the training and for members would be highly beneficial.
- Training to address the problem of insufficient income is required in handling food technologists, preservation and value addition to foods produced so that access to sufficient food can be assured in times of food scarcity through purchasing and for families to meet other household needs.

Program formulation and management

- FFS should be used as an entry point for the integration of nutrition in agriculture and food security due to the structure of FFS. The community will be able to learn from the strong food security component already in place in the FFS.
- FFS programs need better and clearer exit strategies to maintain momentum and adoption of practices post-FFS.
- The implementation phase of FFS should be lengthened to allow adequate time for program start-up.
- A strong linkage with the health sector is necessary in order to rehabilitate the malnourished within the groups. Nutrition training for the facilitators should include education on the local nutrition related diseases and screening and create linkages with the local health care facilities to which referrals can be made.
- Training on innovations like energy saving stoves, sun drying of vegetables, and fireless cookers should be part of FFS programs. If this cannot be done by the project, efforts should be made to link up the groups with other organizations that are promoting this.
- Nutrition objectives and indicators should be included in FFS M&E frameworks and assessed at defined intervals to help ensure that nutrition impact is achieved from the project. This could include household and individual diet diversity, meal frequency (for households and children 6-23 months), minimum acceptable diet (for children 6-23 months), breastfeeding, complementary feeding, growth monitoring for children, and MUAC, among others.

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Annex 1: Stories from the field

Based on interviews with FFLS members in Uganda and Rwanda

Malnutrition is increasingly being recognized as a threat to the well-being of vulnerable populations in Eastern Africa. Poor rural households often do not have access to high quality and nutritious foods or they lack a good understanding of improved nutrition habits. Through the UN's Food and Agriculture Organization (FAO), women and men in the region are now being trained on the nutritious value of locally available foods through the Farmer Field and Life Schools.

"First you wash the pumpkin and cut it into small pieces. Then you chop tomatoes and potatoes. You fry all these ingredients in a pan with oil." Sabina Akwero explains some of the lessons she learned during a four-day nutrition training workshop. Sabina is a member of the Farmer Field and Life Schools in Ngora, northern Uganda. The FFLS methodology is a community-based participatory learning process. Working together in small groups, farmers learn and adapt improved agricultural production techniques under the guidance of a trained facilitator. The farmers learn about the nutritious value of different local foods and are taught the importance of hygiene during preparation.



Photo 8. Louise with her family in their kitchen garden

"I was first trained on nutrition at the local health facility but the follow-up was poor," continues Sabina, who is a widow with seven children. "At the FFLS, we learned how to prepare land, plant crops, and we were trained on food preparation. I now know that a healthy diet is a combination of a variety of foods like vegetables, roots crops, cereals and fruit."

'They had never tasted carrots so I explained how to plant and cook them at home.'

**-Marie Rose Ingadire,
FFLS facilitator**

FFLS members are recommended to start their own backyard kitchen garden where they can further experiment. Louise Uweyazu, who lives in Gatsibo, Rwanda, involved her whole family in the project. Her three children each have a small plot where they grow crops (Photo 8). Her husband is in charge of watering the garden, while Louise ploughs and plants over nine different types of vegetables. Impressed with the knowledge she gained from attending her local FFLS, Louise decided to set up her own group. She now facilitates 27 farmers, mostly women, on a weekly basis. "I teach them how to grow vegetables and explain why they should be eating different types of food. I also invite my participants to my garden for observation or I pay a visit to their homes so I can

give them extra advice on the crops in their garden.” While the FFSL mainly focuses on agricultural skill development, the facilitators also spend time discussing life lessons. For Louise, the gender-based violence discussions were helpful. She shared, “I learned how to manage conflict. We now solve our problems through communication.”

Improved nutrition, better health

One of the biggest advantages of the nutrition training has been the shift to a more diversified diet as the participants learned about different crops and their varieties. Marie Rose Ingadire, who was trained as a facilitator after her active participation in her FFLS in Rwanda, introduced her members to carrots, stating, “They had never tasted carrots so I explained how to plant and cook them at home. Afterwards, many farmers decided to grow carrots in their backyard kitchen garden.” The families have noticed a significant change. Célestine Murenzi¹³ planted 15 varieties of vegetables and fruits on her plot of a quarter of an acre after she received seeds at her FFLS (Photo 9). Now Célestine and her family drink a glass of healthy beetroot and pineapple juice every morning. Célestine is HIV positive. “I used to be admitted to hospital twice a year but since I started growing and eating different types of vegetables I feel much stronger. When you look at me, you cannot see I am HIV positive unless I tell you.”



Photo 9. Sabina in her eggplant plot with her hut in the background

Although most of the vegetables are grown for her family’s own consumption, Célestine has now started to sell the surplus on the market. “I used my plot to experiment and the results were positive. I earned RWF 5,000 (USD 7.5) after the first and RWF 25,000 (USD 37) after the second harvest. With the money I constructed a kitchen.” According to the sector representative, Célestine has also shared her knowledge with her community; “Célestine has impacted the community greatly by assisting other village members growing their own vegetables.”

Although the lives of its members have improved, lessons can still be learned to further strengthen the FFLS program. Sabina attended a cooking demonstration on soybeans but she was unable to put the new knowledge into practice. “The soybean cakes and mandazis were very tasty but soybeans are expensive and not available here so I couldn’t prepare these at home.” Louise also pointed out the need for extra practical cooking sessions; “As we were not trained on how to prepare all the different foods, we cook them the way we have always done.” The Farmer Field and Life Schools have become an important approach to train women and men in Eastern Africa on improving food and nutrition practices, but Sabina concludes that more education is needed. In her words, “Younger women need to learn more about nutrition and how to prepare different foods to help raise their families. Extra food security and nutrition training is definitely required.”

¹³ Name has been changed to protect her identity

Annex 2: List of FFLS groups visited

Groups in Uganda FFLS in Kitgum and Lamwo Districts

1. Wamede Anyim FFLS group
2. Lacan Pe kun FFLS group
3. Lapur Dwogo Paco apur Dwogo FFLS group
4. Lapur Pe Tur (included Di-Cwinyi, Rupiny, Atimango & Ribe Ber B) FFLS group
5. Ribe Ber A FFLS group
6. Okony Can FFLS group
7. Ngec Ber FFLS group

Groups in Rwanda FFLS in Gatsibo and Nyagatare Districts

1. Abahuje Umurimo FFLS group in Gatsibo
2. Duteranintambwe Murimo FFLS group
3. Twitezimbere FFLS group
4. Cooperative Coabinya FFLS group
5. Indongozi, Iterambere FFLS group
6. Cooperative Codemata FFLS group

Annex 3: Focus group guide: Knowledge on nutritional skills and empowerment

1. What nutrition knowledge have you received from FFLS?
2. What is the source of nutrition knowledge?
3. How was nutrition knowledge provided in FFLS?
4. What nutrition knowledge have you used?
5. Where have you used the knowledge?
6. Whom have you shared the knowledge?
7. How have you benefited from nutrition knowledge?
8. What nutrition skills have you acquired from FFLS?
9. What is the source of the skills?
10. How were the skills acquired?
11. What skills have you used?
12. How has good dietary practices been achieved?
13. What are the benefits of good dietary practices?
14. What are the effects of poor dietary practices?
15. What are the benefits of the acquired nutrition knowledge and skills in nutrition at community level?
16. What are the challenges in using nutrition knowledge provided through FFLS?
17. What role do a) men and b) women play in FFLS and in households as concerns nutrition?
18. Any other comments

Annex 4: Household Questionnaire for Lessons Learned Sept-Oct. 2013

Country _____ District _____ Division _____
 Location _____ Sub-Location _____ Date of interview _____
 Name of Respondent _____ Gender 1. Male 2. Female FFLS member: ☐ YES ☐ NO
 Age _____ Yrs
 Name of Enumerator _____ Name of FFS Group _____

SECTION 1: HOUSEHOLD COMPOSITION

1.1 Head of household (Name): _____ 1.2: Age _____ 1.2a. Gender 1. Male 2. female

1.3 Type of household: ☐ 1) resident (host), ☐ 2) returnee, ☐ 3) IDP ☐

1.4 Type of residence 1) rural ☐ 2) urban

1.5 Household head - Type: ☐ 1) male adult ☐ 2) female adult, ☐ 3) child (below 18 years)

1.6 Marital status: ☐ 1) married, ☐ 2) single, ☐ 3) widow/er, ☐ 4) divorced ☐ 5) separated

1.7 Number of adults (above 18 years) and Elderly

(above 55 years) in HH: Men; Women

1.8 Number of children (≤ 18 years): Boys; Girls

Elderly Men	Adult Men	Boys	School-going
Elderly Woman	Adult Women	Girls	School-going

2. Do you have a kitchen garden/home garden where you grow vegetables? ☐ 1. Yes; ☐ 2. No

2.1 If Yes what is status? 1. Land Preparation 2. Crops on field 3. Dormant/Not functioning

2.2 If yes what main crops are grown in the garden?

2.3 If No, Where do you get vegetables? 1 Land near river 2. Buy 3. Other specify

SECTION 3: NUTRITION

3.1 Have you heard about balanced diet? ☐ 1. Yes ☐ 2. No

3.2 What is a balanced meal made of? Carbohydrates Proteins Water Minerals
 Vitamins Fats and Oils Alcohol and
 spirits Others

3.3 Which foods do you know that are a major source of vitamins?

3.4 Which foods do you know that are a major source of protein?

3.5 Have you been to cooking demonstrations? ☐ 1. Yes ☐ 2. No

3.6 If yes who organized the cooking demonstration? 1. FFLS 2. Other group specify

3.7 If Yes, What were you taught in the demonstrations

3.8 Is the family dependent on relief food? ☐ 1. YES totally ☐ 2. Yes Partially ☐ 3. Not at all

3.9 How would you rate the household members' health conditions? ☐ 1= very good ☐ 2= good ☐ 3= bad

3.10 Nutrition anthropometry of children aged 12-59 months

Sex	Age in months	Age verification	Oedema	MUAC	Has child suffered from sickness in last 2 weeks	Received vitamin A Supplementation in last 6 months	Received Measles Vaccination	De-wormed in last 3 months
1. Male		1. Health Card	1. Yes 2. No		1. Yes 2. No	1. Yes 2. No	1. Yes by Card 2. Yes by Recall 3. No	1. Yes 2. No
2. Female		2. Recall						

3.11 Nutrition status of women in reproductive age (15-49 years)

Age Age verified by: 1. Identify card MUAC Received iron supplementation in last pregnancy 1. Yes 2. No
2. Recall _____

3.11 What nutrition knowledge gained from FFS trainings/meetings have you practiced in your household and how?

3.12 Have you shared nutrition information with members of the community? 1. Yes 2. No

3.13 If yes , what nutrition information? _____

3.14 With whom? _____

SECTION 4: HOUSEHOLD DIETARY DIVERSITY

4.1 How many meals, per day, are usually consumed in this household? ☐ 1= One meal ☐ 2= Two meals ☐ 3=Three meals or more

4.2 How many meals, were consumed in this household yesterday? ☐ 1= One meal ☐ 2= Two meals ☐ 3=Three meals or more

4.2 Can you please describe the foods that were prepared and eaten by the HH members during the past 24 hrs?
(Please select code 1=YES and 2=NO and **CIRCLE the food eaten.**)

Q. No.	Food Group	Please CIRCLE the appropriate foods (Also Write foods consumed not included in the list)	Eaten? Yes=1 No = 0
1	Cereals	Millet, sorghum, maize, rice, wheat, bread, noodles, biscuits, cookies or any other foods made from wheat + <i>insert local foods e.g., ugali, nshima, porridge or pastes or other locally available grains</i>	
2	White tubers and roots	White potatoes, white yams, cassava, or foods made from roots. Include cooked bananas	
3	Vegetables	pumpkin, carrots, squash, or sweet potatoes that are orange inside + <i>other locally available vitamin-A rich vegetables (e.g., sweet pepper)</i> , other vegetables, including wild vegetables, dark green/leafy vegetables, including wild ones + <i>locally available vitamin-A rich leaves such as cassava leaves etc., other vegetables (for example tomatoes, onions, aubergine).</i>	
4	Fruits	ripe mangoes, papayas + <i>other locally available vitamin A-rich fruits</i> , all other fruits, including wild fruits	
5	Meats	beef, pork, lamb, goat, rabbit, wild game, chicken, duck, or other birds, insects liver, kidney, heart or other organ meats or blood-based foods	
6	Eggs		
7	Fish	fresh or dried fish or shellfish	
8	Legumes, nuts and	beans, peas, lentils, nuts, seeds or foods made from these	
9	Milk and milk	milk, cheese, yogurt or other milk products	
10	Oils and	oil, fats or butter added to food or used for cooking	
11	Sweets	sugar, honey, sweetened soda or sugary foods such as chocolates, sweets or candies	
12	Spices, condime	spices (black pepper, salt), condiments (soy sauce, hot sauce), coffee, tea, alcoholic beverages OR local examples	

5.0 Breastfeeding & Complementary foods: (For caregivers with children aged 0-<24 months Only)

5.1 Age of child _____ months Date of birth ____/____/____ 1. Verified by Health Card/birth Certificate

2. Recall _____

1. Is your child breast feeding? 1. Yes

2. No

2. How long was child breastfed without taking any other food including water? _____ months

3. At what age was the child introduced to new food foods in addition to breast milk? _____ months
4. How long was the child breastfed? _____ months
5. How many meals does the child normally take? _____ meals.
6. How many meals did the child take yesterday? _____ meals.
7. What foods does the child normally eat?
State them _____
8. What foods did the child eat yesterday (in last 24 hrs)? State them

6.0 Variety of crops grown on farm and livestock kept

1. What crops are grown on your farm? Observe and state all of them.

2. What livestock are kept on the farm? Observe and state all of them

7.0 Nutrition Management of HIV and AIDS

What have you been trained on in nutrition in relation to HIV and AIDS?

What challenges do you face in applying nutrition knowledge in HIV

8.0 Challenges: What challenges do you face in adopting nutrition knowledge learnt from FFLS?

9.0 Gender:

What nutrition activities do men perform in the FFLS trainings?

What nutrition activities do women do in the FFLS trainings?

What decisions do men make in terms of nutrition in the home?

What decisions do women make in terms of nutrition in the home?



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