

Sierra Leone: Entry Points for Nutrition in Feed the Future Value Chains



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ABOUT SPRING

The Strengthening Partnerships, Results, and Innovations in Nutrition Globally (SPRING) project is a seven-year USAID-funded cooperative agreement to strengthen global and country efforts to scale up high-impact nutrition practices and policies and improve maternal and child nutrition outcomes. The project is managed by JSI Research & Training Institute, Inc., with partners Helen Keller International, The Manoff Group, Save the Children, and the International Food Policy Research Institute.

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COVER PHOTOS:

Clockwise from top left – Mile 91 market; Mafanta Agricultural Business Center; Pumpkins, Mountain Lion rice mill; Local and imported rice.

All photos by the SPRING study team.

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Acronyms and Abbreviations

ABC	Agricultural Business Center
ACDI/VOCA	(was Agricultural Cooperative Development International/Volunteers in Oversees Cooperative Assistance—now only uses acronym)
CRS	Catholic Relief Services
EAIN	Entrepreneurial Agriculture for Improved Nutrition
FGD	focus group discussion
GAP	good agricultural practice
HACCP	Hazard Analysis Critical Control Point
HH	household
HKI	Helen Keller International
IPTT	Indicator Performance Tracking Table
IR	Intermediate Result (USAID)
NRVCC	nutrient-rich value chain commodity
SBCC	social and behavior change communication
SPRING	Strengthening Partnerships, Results, and Innovations in Nutrition Globally
USAID	United States Agency for International Development
WARC	West Africa Rice Company
WASH	water, sanitation, and hygiene
ZOI	zone of influence

Conversion:

1 US\$ = 7,250 Le (as of February 2017)

Executive Summary

The Entrepreneurial Agriculture for Improved Nutrition (EAIN) activity works to improve agricultural productivity and food security in the Tonkolili district of Sierra Leone. Funded by the United States Agency for International Development (USAID), this Feed the Future activity integrates market-led agriculture and nutrition interventions to achieve two intermediate results (IR):

1. Increase incomes through strategic value chain investments.
2. Improve nutritional status, especially among women and children.

To strengthen the results for nutrition as described in USAID's Multi-sectoral Nutrition Strategy, USAID Sierra Leone and the EAIN consortium requested assistance from the Strengthening Partnerships, Results, and Innovations in Nutrition Globally (SPRING) project. They asked SPRING to identify potential entry points for nutrition within EAIN's interventions under IR1, focusing initially on six value chains: rice, maize (for animal feed), groundnuts, chili, okra, and pumpkin/squash.

In February 2017, SPRING used rapid appraisal techniques to explore how value chains can be supported and leveraged to contribute to improvements in nutrition for women and children in the first 1,000 days from pregnancy through two years of age (a critical window of opportunity). Specifically, we analyzed how each of the six targeted value chains might result in better nutrition by—

- improving the diets of mothers and children
- reducing health and nutrition risks for mothers and children
- generating or improving women's control over income.

A team of agriculture and nutrition specialists analyzed the constraints the value chain actors face in pursuing nutrition-sensitive agriculture by identifying opportunities at each stage of the value chain. Following this exercise, we discussed the findings and recommendations with EAIN stakeholders to determine potential market-based solutions or interventions to promote nutrition-sensitive agriculture. Together, the SPRING and EAIN teams prioritized the recommended nutrition-sensitive agriculture solutions, based on their potential impact and fit within EAIN's work.

As a result, SPRING, in collaboration with EAIN partners, defined five priority market-based solutions:

1. Gender-equitable access to water for off-season production of nutrient-rich value chain commodities (NRVCCs)
2. Training and access to appropriate technology for on-farm production
3. Training in post-harvest handling and processing
4. Promotion of NRVCCs to consumers
5. Gender-equitable access and linkages to larger, higher-value buyers to increase household incomes.

We included the conceptual links that show how the market-based solutions may explicitly lead to key nutrition-sensitive agriculture outcomes, given the appropriate design, assumptions, and supporting interventions. SPRING will need to continue its engagement with the EAIN team to make decisions about the suggested entry points and develop program impact pathways and causal linkages in an activity monitoring plan, as they apply to the roles of each EAIN implementing partner.

1. Introduction

In December 2016, the United States Agency for International Development (USAID) launched the Feed the Future Sierra Leone Entrepreneurial Agriculture for Improved Nutrition (EAIN) activity, led by Catholic Relief Services (CRS). The USAID-funded Strengthening Partnerships, Results, and Innovations in Nutrition Globally (SPRING) project, which began working in Sierra Leone in September 2015, was funded through the Feed the Future to provide technical support to the EAIN project in nutrition, nutrition-sensitive agriculture, and social and behavior change communication (SBCC). Other EAIN partners include ACDI/VOCA, Helen Keller International (HKI), Fresh Salone, and the West Africa Rice Company (WARC).

EAIN's goal is to improve agricultural productivity and food security in the Tonkolili district by sustainably reducing rural poverty and improving nutrition by integrating the market-led agriculture and nutrition interventions. EAIN will achieve this through two Intermediate Results (IR): **IR1: Increase incomes by strategic value chain investments**, and **IR2: Improve nutritional status, especially among women and children**.

Box 1. Nutrition-sensitive agriculture

In this report, **nutrition-sensitive agriculture** refers to agricultural approaches that incorporate specific nutrition-related outcomes *and* address the underlying causes of undernutrition—physical, economic, and market access to nutritious food year-round; and adequate resources for health, WASH, and care at the individual and household levels.

It is widely recognized that agriculture has the potential to improve nutrition, but there is still little evidence on the most effective interventions for “nutrition-sensitive agriculture.” In 2016, SPRING completed a study on the factors that impede or promote the use of nutrition-sensitive agricultural practices in producing, selling, and consuming two nutrient-rich foods common in the district: pumpkin and fish. Based on this work, USAID Sierra Leone and the EAIN partners recognized the usefulness of undertaking a similar study to identify nutrition-sensitive agriculture practices for the project’s initial target value chain commodities, especially for *rice*, *maize* (for animal feed), *groundnuts*, and three horticultural crops: *chili*, *okra*, and *pumpkin/squash*. The EAIN partners had previously conducted a value chain analyses before the implementation started, which

informed the selection of these commodities as a focus for promoting economic growth and improved nutrition.

In February 2017, SPRING conducted a follow-up study, focusing on EAIN’s six targeted value chains, to identify potential entry points for nutrition within EAIN’s planned interventions. We used rapid appraisal techniques adapted from the value chain approach to identify a range of potential market-based solutions that could help partners ensure that their agricultural outcomes and interventions are explicitly contributing to nutrition. This report summarizes the methodology we employed and the results of the fieldwork, including recommendations for promoting nutrition-sensitive agriculture within EAIN.

Objectives

The study objectives were to—

- Apply a nutrition lens to EAIN to determine how each activity-promoted value chain might (1) improve the diets of mothers and children, (2) reduce the health and nutrition risks for mothers and children, and (3) generate or improve women’s control over income.
- Analyze constraints faced by value chain actors in pursuing nutrition-sensitive agriculture.

- With EAIN stakeholders, recommend and vet potential market-based solutions or interventions to promote nutrition-sensitive agriculture.
- Prioritize these nutrition-sensitive agriculture solutions for potential inclusion in EAIN work plans.

In addition, using a value chain approach, SPRING anticipated using this assessment to generate learning and evidence on methods to identify nutrition-sensitive agriculture interventions.

2. Study Methodology

There is no standard methodology for identifying entry points for nutrition within market systems development or value chain activities. This study, in our view, is the first attempt to systematically analyze the constraints to enhancing the potential of value chain activities to contribute to nutrition-related outcomes, and then identify market-based solutions to eliminate or minimize those constraints.

The methodology comprises five component steps:

1. Review of secondary documents, including EAIN’s work plan; and project design documents, including the results framework and draft Indicator Performance Tracking Table (IPTT) and Value Chain Analysis reports completed by ACDI/VOCA in 2015 and 2017.
2. Identify the nutrition-sensitive agriculture outcomes that align with the agriculture and economic growth objectives of EAIN’s **Intermediate Result 1: Increase incomes by strategic value chain investments**.
3. Use the identified nutrition-sensitive agriculture outcomes to guide the line of inquiry and build on the value chain analyses already completed, and undertake a rapid assessment to identify constraints to nutrition-sensitive agriculture outcomes, including—
 - o a series of key informant interviews with value chain actors
 - o market observation
 - o focus group discussions (FGDs) with farmers and women consumers
 - o interviews with EAIN staff.
4. Analyze the information and data from both the primary and secondary sources; develop potential solutions using tabulation, ranking, and synthesis during participatory discussions led by the multi-disciplinary team.
5. Vet findings with EAIN stakeholders during individual sessions and a half-day group meeting to validate findings and nutrition-sensitive agriculture interventions that prioritize the use of market-based solutions. In this way, the nutrition-sensitive agriculture solutions will minimize the requirements for additional input, will be in line with already-planned market-based approaches,¹ and will have clear pathways to the nutrition-sensitive agriculture outcomes considered to be the most relevant for the EAIN activity.

The following sections summarize steps 2–5.

Nutrition-sensitive agriculture outcomes

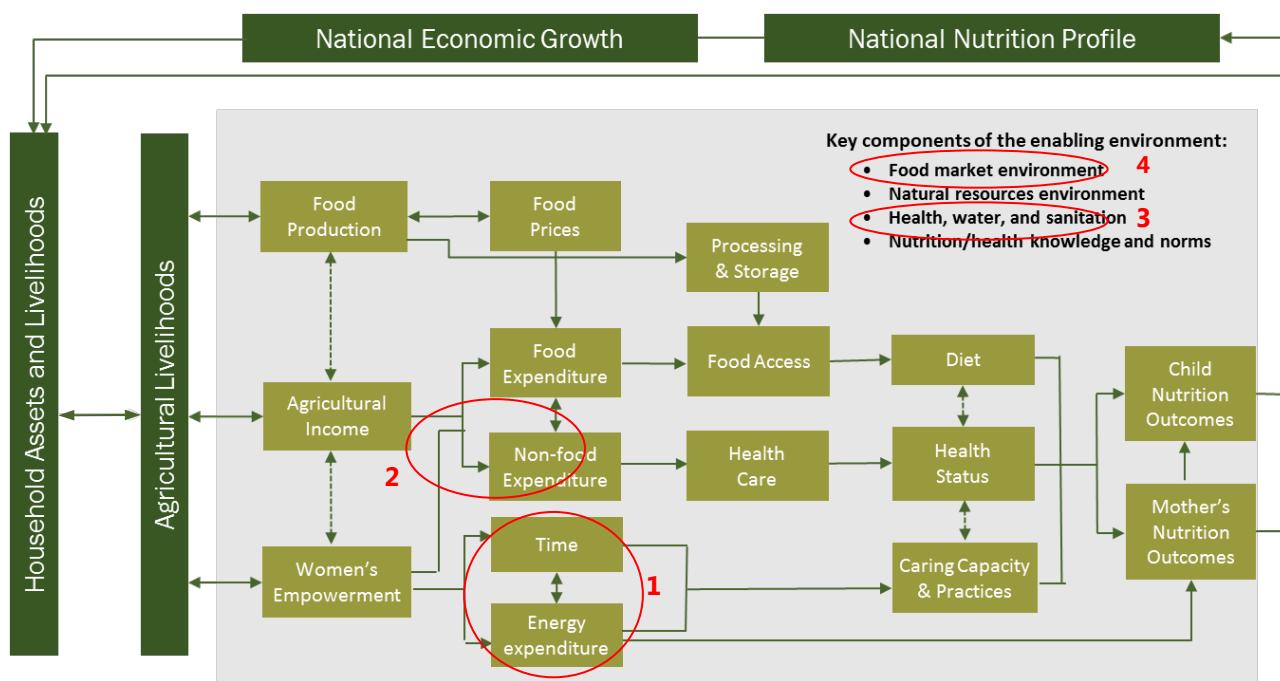
SPRING defines nutrition-sensitive agriculture approaches as those that strive to contribute to one or more stated nutrition-related outcomes (see box 1, page 1). One of the core principles for the EAIN’s project is nutrition-sensitive agriculture—the objective is to **improve nutritional status, especially among women and children**; and the project specifies improved nutritional status as a high-level outcome. However, the planned input, interventions, output, and lower level or intermediate outcomes under IR2 are primarily linked to strengthening

¹ Approaches delivered by commercially viable providers that do not displace local private sector actors and do contribute to greater profitability for smallholders participating in each value chain.

health delivery systems that support the uptake of nutrition-specific practices and services. Therefore, to strengthen and complement the nutrition-specific outcomes, it was necessary to consider how market-led solutions planned under EAIN could be more nutrition sensitive.

Using SPRING's *Agriculture to Nutrition Pathways* conceptual framework as a guide (see figure 1), we identified several points in the pathways that were in line with EAIN's stated outcomes. Specifically, those related to (1) saving the time and energy expenditure of women; (2) using agricultural income; and (3) using water resources and promoting good hygiene as part of the agriculture activities/practices; and (4) strengthening the food market environment to improve availability, affordability, appeal, and quality of diverse, nutrient-rich foods in local markets. The four focal points are circled in red on figure 1:

Figure 1. SPRING Agriculture-to-Nutrition Pathways



Herforth, Anna, and Jody Harris. 2014.

Building on the four points in the pathways determined to be most relevant to the objectives of EAIN's IR1, we identified the following key intermediate nutrition-sensitive agriculture outcomes:

1. **INCREASED time and energy savings for women.** Women spend a disproportionate amount of their time engaged in agricultural activities compared to self- and childcare, whether planting, irrigating, weeding, harvesting, processing, transporting, marketing, or working with other agricultural commodities. Similarly, extreme energy expenditure by pregnant and lactating mothers has proven to have negative effects on both the mothers' and children's nutritional outcomes; therefore, any time and/or energy savings within the range of agricultural livelihood tasks done by women can contribute to nutrition.
2. **INCREASED income control by women.** Women are more likely to spend income on food, health, and education than their male counterparts, which benefits the health and nutrition of mothers and children. Therefore, promoting opportunities to increase women's control of agricultural income contributes to nutrition.

3. **IMPROVED environmental and food safety.** Mitigating the harmful effects of toxins in agricultural production—whether the result of chemical inputs or naturally occurring contamination, such as mycotoxins—reduces the risk of disease. Similarly, food sold in markets must be hygienic and free of pathogens. Nutrition-sensitive agriculture keeps environmental and food safety in check.
4. **IMPROVED availability, affordability, or desirability of diverse, nutrient foods in local markets.** As suggested by the literature (Herforth and Ahmed 2015; Global Panel on Agriculture and Food Systems for Nutrition 2016), a favorable food market environment for nutrition strives to ensure that—
 - o Nutritious foods are available year-round in local markets.
 - o Nutritious foods are affordable in local markets for target consumers.
 - o Nutritious foods are desirable and appeal² to target consumers; this will sustain the local demand for these foods.

Data collection and analysis

At the time of SPRING’s fieldwork, EAIN had not yet identified the Agricultural Business Centers (ABCs) that will be the focus of initial activities. However, two satellite farm locations for the rice and maize value chains had been identified (Mile 91 and Makali), with a third identified while the study was underway. For these reasons, we conducted our FGD in Mile 91 and Makali, because we knew they would be the sites of EAIN activity. In each location, we conducted two group discussions: one with a group of farmers (with equal numbers of female and male farmers), and another with a group of new mothers who are consumers of the value chain commodities under study.

For key informant interviews, we conducted semi-structured interviews of key actors in Tonkolili and Freetown, informed by the previous value chain analyses and building on early interviews. We also visited and observed local markets in a small village (Makali), small towns (Mile 91 and Magburaka), a city (Makeni), and a weekly market or *luma* (Faradugu).

To ensure the consistency and breadth of primary data collected, we developed interviews and FGD guides, and reviewed these instruments with the study team. The interview guides were not exhaustive questionnaires, but rather tools or checklists for us to review topics and possible areas of inquiry during the interviews, which revolved primarily around the constraints to key intermediate nutrition-sensitive agriculture outcomes mentioned above (see annex 2).

The following six specialists comprised the multi-disciplinary study team:

- two local nutrition and community development experts
- an expatriate value chain specialist



A focus group discussion

² Desirability and appeal of nutritious foods are also associated with convenience. Demand for more nutritious foods is supported when time in home food preparation can also be saved.

- a local enterprise development specialist
- a local agriculture and natural resources management specialist
- an expatriate agriculture-nutrition specialist.

We used a rapid, participatory approach within the study team during data analysis; it involved the entire team in summarizing findings, analyzing trends, identifying key constraints, brainstorming potential solutions to each constraint, and discussing additional points raised by our local experts. To arrive at a consensus, this highly participatory approach to analysis revealed the perspectives of each specialist, and allowed the testing of experts' analyses within and among the group.

Validation of findings with EAIN partners

We presented our findings and potential solutions with EAIN stakeholders in one-on-one meetings and in a vetting workshop held with EAIN managers and the leadership. In addition to sharing the findings from the team's analysis, the workshop was an opportunity to identify additional potential solutions that build on market-led approaches already planned within EAIN. Sections 3 and 4 present the results from these discussions, including a summary of the key constraints to applying a nutrition-sensitive lens to the target EAIN value chains and the potential market-based solutions within the activity design. The concept of "**market-based solutions**" is a critical aspect of the value chain approach, as defined by USAID, and reflects the core importance of market sustainability as an objective for both economic and nutrition-sensitive agriculture outcomes.



Participatory approach to analysis using a multi-disciplinary team of experts

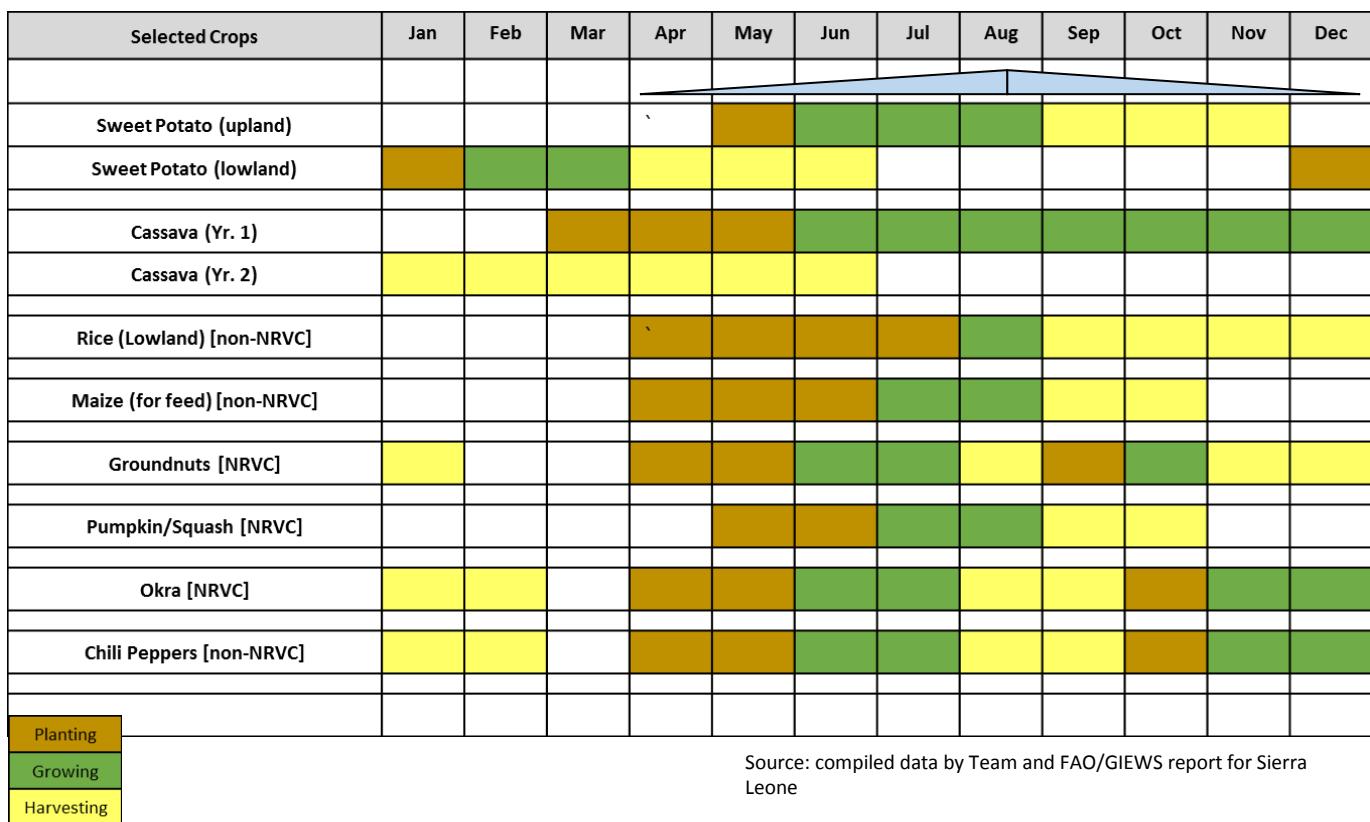
3. Summary of Key Constraints to Nutrition-Sensitive Agriculture, by Value Chain

Tonkolili, a rural district, relies heavily on rain-fed smallholder agriculture. Most farmers in the district grow one or more of the six EAIN target crops. Farmers usually grow groundnuts and lowland (paddy) rice as monocrops, but most other crops are mixed or inter-cropped. The mixtures depend on soils, micro-climatic variations, labor availability, and access to water. We found no specialized producers (farmers who concentrate on only one crop or category of crops).

The EAIN value chains include horticulture (pumpkin/squash, okra, and chili), groundnuts, rice, and maize for animal feed. Groundnuts, pumpkin/squash, and okra are nutrient-rich value chain commodities (NRVCC), while rice, maize, and chili are non-NRVCCs (USAID 2015). Each of the EAIN value chains are represented in local markets, making them potential sources of household income, which can contribute to better nutrition by allowing households to purchase better diets; access health services; or improve water, sanitation, and hygiene (WASH). In addition, growing NRVCCs can contribute to household nutrition, particularly when consumed by mothers and children.

To understand the availability of these crops in local markets throughout the year, it is useful to note the cropping calendar in Tonkolili district (see figure 2):

Figure 2. Cropping Calendar in Tonkolili District



Three of the six focus crops—groundnuts, okra, and chili—are harvested twice a year; while rice, maize, and pumpkins/squash have only one season. During February and March, farmers are busy with yams and cassava. These crops are not included in EAIN, but they are important local staples.

The following sections summarize the key constraints each EAIN focus value chain faces in contributing to the intermediate nutrition-sensitive agriculture outcomes listed above, namely—

- INCREASED time and energy savings for women
- INCREASED income control by women
- IMPROVED environmental and food safety
- IMPROVED availability, affordability, or desirability of diverse, nutrient foods promoted by EAIN (i.e., nutrient rich value chain commodities or NRVCCs) in local markets.

We recorded these constraints from our interviews and FGDs, and used tabulation and ranking to summarize our findings during our final day of fieldwork. We then refined the summary through discussions within the multi-disciplinary team.

3.1 Constraints to nutrition-sensitive agriculture common to all EAIN value chains

Women's control over use of household income

- Most women and staff members interviewed reported a cultural norm requiring women to turn over all income to their male partner. Women's control over income, therefore, is severely constrained in many households.
- There is no guarantee that income from women's crops is or will be in women's control as these crops gain economic importance.
- Household incomes are insufficient to finance expanding the production of NRVCCs and other crops; many focus on just meeting basic needs.

Transportation services affect availability and affordability of NRVCCs

- The high cost and limited availability of transport services increases the cost of delivering to markets.
- The basic production systems lack economies of scale, and this small-scale agricultural production increases the cost of transportation.



While the town chief discussed the problems of farming with us, Barrie, his wife, was busy watering her garden. We met Barrie by chance while observing the land under cultivation in the Makali lowlands. Her plot was about 20 meters by 5 meters and located fairly close to the stream, which was running at the bottom of a steep muddy bank. She used an old battered enameled pan to collect the water and used her hand to scatter the water over the plants. At a round trip (walk to stream, climb down bank, collect water, climb up bank, walk to plot, scatter water) of 2 minutes, she needs 2 hours of uninterrupted labor to water her small plot, which she does every day.

Water for off-season vegetable production affects availability and affordability of NRVCCs

- Many cannot afford the cost of lifting/moving irrigation water because of the distance to water points, or the technology required for irrigation.
- Most farms lack basic equipment and tools: water cans, pumps, and pipes, among others.
- Current methods can only be used to irrigate limited areas of land.

3.2 Horticulture value chain

Major constraints to nutrition-sensitive agriculture: Chili

- Women work in all areas of transplanting, watering, harvesting, and marketing—a significant time and energy burden.
- Women have limited control over their income from chili sales (see above).
- The quality of dried chili in local markets is inconsistent, and it is exposed to contamination.

Major constraints to nutrition-sensitive agriculture: Okra

- For women, watering during the dry season is very labor intensive.
- Women have limited control over their income from okra sales.
- Production is highly seasonal—it peaks during the rainy season—hampering marketing because of poor transport.
- Okra is expensive to purchase during the off-season (whether fresh or dried).
- Fresh okra has a limited shelf life (only 2 days).
- Some consumers do not know how to cook okra in the dried form.



Chili at the local market

Major constraints to nutrition-sensitive agriculture: Pumpkin/squash

- Pumpkins are available in local markets only seasonally. It can be expensive during the late dry season/early rains.
- Pumpkins are an intercrop to cash crops, and incentives are limited to increase production.
- When sliced in markets, the flesh is exposed to the elements, reducing appeal (but consumers can test quality).
- Large pumpkins are inconvenient to consume and are not affordable.



Local pumpkin/squash varieties

3.3 Groundnut value chain

Major constraints to nutrition-sensitive agriculture: Groundnut

- Weeding is a very laborious activity for women.
- Hand-shelling and paste processing are time consuming for women.
- Access to large buyers/processors is limited due to the perceived high level of aflatoxins; testing for aflatoxins is not available or affordable.
- Storage facilities are inadequate, leading to aflatoxin contamination and variable supply in local markets.
- Groundnuts are in short supply during the lean dry season, leading to higher prices.



Groundnut paste processing

3.4 Maize value chain

Major constraints to nutrition-sensitive agriculture: Maize for animal feed

- An increased need for animal feed for use in poultry, fishery, and other livestock production is increasing the demand for maize in Sierra Leone. Livestock producers usually mill their own feed, and it is not clear how competitive smallholder maize farmers will be because of their distance to large-scale potential feed buyers. New markets may open after investments in fisheries scale up in the district.
- In general, men lead the production and sale of maize. It is, therefore, unlikely that women will have much control over income from maize.
- Women are engaged in supporting tasks—such as weeding, harvesting, and shelling, among other jobs—all expending time and energy.
- Although it is for animal feed, inappropriate and inadequate drying to the proper moisture content exposes the risk of aflatoxin contamination, which may persist in the food chain.

3.5 Rice value chain

Major constraints to nutrition-sensitive agriculture: Lowland rice

- Women are heavily involved in transplanting, weeding, and harvesting.
- Women are also involved in post-harvest activities: threshing, parboiling, drying, and milling/pounding.
- Men control the rice stocks and income from sales.
- The double-cropping of rice in lowlands (swamps), if proposed in the EAIN, may displace the inter-cropping of nutritious crops, several—such as groundnuts and vegetables in the dry season—provide more opportunity for women to be involved in and benefit from their production and sale.

4. Potential Market-Based Solutions

Building on the constraints to nutrition that were identified within and across each of the value chains, SPRING identified an initial list of possible entry points for nutrition-sensitive agriculture, which we validated with the EAIN consortium through individual meetings and a brief stakeholder workshop. This section includes a set of recommendations for integrating nutrition into select value chain activities. It is important to note that the proposed nutrition-sensitive agriculture entry points are only a subset of the total EAIN strategy, as most of the activities to increase incomes in the target value chains may not directly apply to nutrition.

To the extent possible, we worked within the value chain and market systems development principles that underpin many USAID Feed the Future initiatives: (i) project facilitation versus direct provision, (ii) market-based versus supply-based, and (iii) commercial private sector-oriented versus public sector/donor-dependent. As noted in section 2, we prioritized recommendations for nutrition entry points and interventions that fit within EAIN's market-based solutions. These priority nutrition-sensitive agriculture interventions target private sector value chain actors or service providers, where feasible. The interventions can then be included by EAIN implementing partners, based on the level and type of technical support and assistance they will provide to their end beneficiaries. Project facilitation and market-based solutions will more likely continue to reap benefits beyond the life of the EAIN activity.

As a starting point for defining these nutrition entry points and potential market-based solutions, we reviewed each constraint noted in section 3 and identified commonalities that might affect nutrition across the value chains. While several of these are general in nature, we hope that they will allow EAIN partners to undertake further economic, technical, and programmatic assessments to inform specific actions, based on the current project context.

For every constraint we identified in each value chain, we brainstormed a solution or set of solutions, relying on the local experience of the multi-disciplinary team, and from the insights we gained from our interviews and focus group discussions. Because many of the proposed solutions repeated and cut across multiple value chains, we compiled a short-list of possible market-based solutions for both NRVCC and non-NRVCC crops. Each solution contributed to one or more of the intermediate nutrition-sensitive agriculture outcomes identified earlier in the study. The solutions are presented in table 1 and reflect preliminary brainstorming during data analysis.

Table 1. Short-List of Possible Market-Based Solutions

Possible Market Based Solutions, and Link to Nutrition Sensitive Outcome	NRVCCs			Non NRVCCs		
	Pumpkin	Ground nut	Okra	Chili	Rice	Maize
(1) Training smallholders in dry season production and promoting NRVCCs for HH consumption to ensure an adequate diet year-round	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
(2) Training smallholders in GAP: composting, crop nutrition & protection, farm management, and others to increase production, especially for NRVCCs	<input type="checkbox"/>					

Possible Market Based Solutions, and Link to Nutrition Sensitive Outcome	NRVCCs			Non NRVCCs		
	Pumpkin	Ground nut	Okra	Chili	Rice	Maize
(3) Access to/availability of inputs (e.g., seeds, fertilizers, tools, etc.), promoted in the GAP training above, to realize yields and prevent loss, especially for NRVCCs	<input type="checkbox"/>					
(4) Availability of post-harvest processing facilities or equipment (e.g., storage, drying, etc.) for smallholders to prevent post-harvest loss and preserve quality, especially for NRVCCs	<input type="checkbox"/>					
(5) Gender equitable access for smallholders to larger buyers of higher-value products/crops to increase household income and control by women	<input type="checkbox"/>					
(6) Gender-equitable availability of appropriate technology or equipment for on- and off-farm activities of smallholders, to save women time and energy		<input type="checkbox"/>				
(7) Availability of aflatoxin testing equipment for smallholders, processors to ensure food safety		<input type="checkbox"/>				<input type="checkbox"/>
(8) Availability of/access to appropriate irrigation for women's production of NRVCCs, to save time and energy, and improve productivity of NRVCCs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
(9) Availability of/gender-equitable access to processing facilities or services for smallholder value-added NRVCCs for improved year-round availability of NRVCCs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
(10) Availability of/access to micro-financial services—savings, insurance, credit—for women, to improve control over income	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		<input type="checkbox"/>

Short-list and consolidation of potential market-based solutions

To further consolidate and prioritize the possible solutions, we considered how they addressed the target nutrition-sensitive outcomes. To facilitate the ranking of solutions, we prioritized the nutrition-sensitive outcomes based on where EAIN and SPRING determined better opportunities for nutrition were available, given the EAIN context, or where implementing partners are more likely to achieve results. In consolidating the solutions, we emphasized the actionable solutions according to their potential to—

1. expand the availability of NRVCCs
2. increase household incomes, with women exerting more control over its use
3. reduce the time and energy burden of women in the value chain.

These three outcomes do not imply that environmental and food safety, the fourth nutrition-sensitive outcome, is no longer important. It is a critical component of nutrition-sensitive agriculture that the implementing partners must not forget. We used a shorter list of outcomes to enable us to focus on the more critical and actionable solutions; and, in the end, environmental and food safety considerations were maintained in the action items. We

recommend considering the nutrition entry points holistically, as these processes are closely interlinked; but it is often essential to prioritize specific interventions or target practices because of the potential for impact, available program resources, and current coverage.

The following are our five proposed priority market-based solutions. Each includes illustrative nutrition-sensitive actions and illustrative interventions following a project facilitation—as opposed to direct project provision—for consideration under the prioritized market-based solution. The list of actions and facilitation interventions is not exhaustive. EAIN private sector providers may propose additional comprehensive actions and facilitation interventions.

The facilitation interventions, by themselves, may not appear to contribute to nutrition. However, by leading to improvements in intermediate outcomes along agriculture-to-nutrition program impact pathways, these actions *can lead* to nutrition-sensitive outcomes, given supportive design and realized assumptions toward the recommended market-based solution. See annex 2 for the summarized rationale and program impact pathway for each action.

1. **Gender-equitable access to water for off-season production of NRVCCs.** Adequate access to land and water is a basic requirement for cultivation of any crop, but they have a higher return on investment for higher-value crops; therefore, they contribute to the first nutrition-sensitive agriculture outcome, *Expand the availability of NRVCCs*. Most smallholder production in Tonkolili is rain-fed; but, with appropriate irrigation and water access, smallholders can expand production in the off-season and plan their cropping cycles to earn higher, more stable year-round income. Promoting access to water resources for women producers also has the potential to contribute to greater control of agricultural income for women³ and help save time and energy. This contributes to the second and third prioritized nutrition-sensitive agriculture outcomes: *Increase household incomes, with women exerting greater control over its use*; and, *Reduce the time and energy burden of women in the value chain*.

Action: Adopt improved water saving or diverting technologies for off-season production

EAIN facilitation interventions:

- Support service providers to identify and develop trial plots in the project area to pilot test new water-saving or diverting technology, such as drip irrigation and water pumps.
 - Assist service providers to identify sources of credit or possible value chain financing for smallholders to adopt the technology.
 - Support service providers to install the new technology, and develop training materials for proper adoption and maintenance.
2. **Training and access to appropriate technology for on-farm production.** Training smallholders in GAP, with better access and availability of improved inputs, tools, and technology could increase on-farm production and productivity for all crops, and save the producers' time and energy. This solution and the proposed

³ Given the constraints women may face retaining control over income earned (see section 3), EAIN needs to consider implementing this action with number (5), as well as with relevant social and behavior change interventions by the members if the consortium or other development partners operate in the same area.

actions described below contribute primarily to agricultural productivity, and to the objective, *Reduce the time and energy burden of women in the value chain, such as weeding*.

Action: Promote no-till cultivation for agronomic crops, reducing land preparation tasks.

EAIN facilitation interventions:

- Identify and document prevailing good farming practices using low/no-till techniques. Weigh the pros and cons of no-till agriculture, including increased herbicide use.
- Develop and pilot test tools, technology, production techniques, and monitoring systems for low/no-till farming practice documented above.
- Support providers to pilot test technical training and extension delivery through local farmer-to-farmer exchanges, study visits, and field days/demonstrations.

Action: Promote the safe use of herbicides (and other chemicals).

EAIN facilitation interventions:

- Identify and document prevailing good practices in the safe application and storage of agro-chemicals.
 - Based on the findings above, support service providers in pilot testing smallholder training and demonstrations; for example, using local farmer-to-farmer exchanges and practical field days during key periods in the cropping cycle.
 - Increase awareness of how over-exposure to chemical inputs can affect nutrition by explaining biological pathways during trainings/orientations.
3. Training in post-harvest handling and processing. Training in post-harvest handling, and increasing the availability of appropriate processing equipment and facilities, could further improve crop/product quality, ensure food safety, and reduce post-harvest losses, while also extending staple food and NRVCC availability in households and local markets. This training is another opportunity to empower women through agriculture. This solution and the proposed actions described below may contribute to all three prioritized nutrition-sensitive agriculture objectives: (1) *Expand the availability of NRVCCs*; (2) *Increase household incomes, with women exerting greater control over its use*; and (3) *Reduce the time and energy burden of women in the value chain*.

Action: Promote sorting and grading for local and distant markets (i.e., grades A and B).

EAIN facilitation interventions:

- Assist service providers to test and assess improved sorting and grading systems and procedures for smallholders, based on the crop/product specifications of higher-quality buyers and for extending the life and quality of target commodities.
- Ensure delivery of timely feedback from higher-quality buyers to service providers and, ultimately, smallholders for grade, quality, and rejection of their crops or produce. A timely and efficient information/feedback loop will help expand the adoption and replication of the sorting and grading systems and procedures.

Action: Promote mechanical threshing, milling (rice), and shelling (maize).

EAIN facilitation interventions:

- Assess the technical and commercial feasibility of improved mechanical threshing, milling, and shelling equipment and services for smallholders.
- Depending on the feasibility finding above, support service providers to develop training program on the use and maintenance of equipment, ensuring equitable access by men and women.

Action: Promote value-addition and quality processing (e.g., dried okra, groundnut paste, pumpkin-gari, dried chili).

EAIN facilitation interventions:

- Assess the commercial and technical feasibility for zone of influence (ZOI) smallholders to produce semi- or fully- processed products of selected NRVCCs.
- Based on findings from the above assessment, support linkages between smallholder suppliers and potential buyers of higher quality NRVCC products.

Action: Promote environmental safety, hygiene, and aflatoxin mitigation (groundnuts).

EAIN facilitation interventions:

- Identify and document prevailing good post-harvest handling, drying, and storage practices; equipment; and facilities that affect environmental and food safety for groundnuts. Validate the cost-effectiveness and technical assumptions of these practices with ZOI smallholders.
- Based on the findings above, support service providers to pilot test and assess improved practices.
- Support dissemination and promotion of these post-harvest handling and processing practices through other private sector providers.

4. Promote NRVCCs to consumers. The availability of NRVCCs is important to improve the nutritional well-being of women and children, and increasing the demand for these nutrient-rich foods can benefit smallholder producers by expanding markets for the same foods. While greater NRVCC production is supported through access to water or from improved post-harvest practices (see 1, 2, and 3 above), opportunities to promote consumption of NRVCCs to pregnant and lactating women and children 6–23 months of age should also be considered by linking with EAIN's interventions related to improving nutrition. This solution contributes primarily to the first prioritized nutrition-sensitive outcome: *Expand the availability of NRVCCs*. And, linking to interventions under IR2 will lead to more nutrition-specific outcomes, as well.

Action: Promote the consumption of NRVCCs through radio programs and other communication channels.

EAIN facilitation interventions:

- Support service providers to develop media and marketing messages to promote the household consumption of NRVCCs in the ZOI. Target messages to household members who influence household decisions for food preparation, especially for children under 2 years of age.

- Assist service providers to access innovative communication channels to reach women in the ZOI through radio programs; performance of drama/skits during *luma* market days; and dissemination of promotional calendars, t-shirts, and other materials.
5. **Gender-equitable access and linkages to larger, higher-value buyers to increase household incomes.** Although most crops in Tonkolili are sold through traditional market channels, the process and functional upgrading of market-ready smallholders to access larger buyers with value-added products is also possible. This could include better aggregation, quality control, and market coordination to achieve the consistent quality and quantities required by higher-value buyers. Assuming some women producers are market ready, EAIN should ensure men and women are given equitable access to larger buyers. This solution may contribute to the first and second prioritized nutrition-sensitive agriculture outcomes: *Expand the availability of NRVCCs and Increase household incomes, with women exerting greater control over its use.*

Action: Develop systems and mechanisms for direct procurement from women smallholders.

EAIN facilitation interventions:

- Support the development of women smallholder schemes with selected providers selling to higher quality markets. For example, Mountain Lion wants to expand its network of rice smallholders using natural and low input techniques to meet its market demand. EAIN can pursue the same for other crops, especially those more commonly produced by women—for example, groundnuts or chilies.
- Assist providers in developing transparent procurement and payment systems that allow timely and efficient payment to smallholder suppliers, especially women.
- As appropriate, support the improvement of internal control systems of providers to gain or maintain certification (Hazard Analysis Critical Control Point [HACCP], chemical free, organic, etc.) for crops, including access to higher value domestic markets.



Promoting women's empowerment through gender sensitive business and marketing management

As the representative of 80 women farmers in Mile 91, United Women Farmers' Association Chairwoman Aminata Kamara is familiar with the opportunities and constraints that women in Tonkolili district face. "Frequently," she explained, "these women are in polygamous marriages, experiencing the demand of caring for as many as 24 children in a single family unit." Because the husband cannot take care of all of the family needs, financing and providing major child related responsibilities fall largely to the women. To do so, they depend largely on farming a variety of crops, including rice, cassava, sweet potatoes, groundnuts, watermelon, maize, chili pepper, okra, cucumber, among others.

While they struggle with the high labor demands of farming from weeding and watering, to storage, marketing, and transportation participation in the women's group has provided some support. In addition to accessing seeds through the Red Cross and the Youni Chiefdom councilor's board, the women farmers' groups also provide access to women controlled shared land, increased marketing channels to sell produce, and improved credit through joint village saving loans.

Action: Engage buyers and processors to connect/commit to new suppliers (e.g., Project Peanut Butter, Sierra Mix, and Pikin Mix).

EAIN facilitation interventions:

- Facilitate a forum for companies and organizations implementing smallholder outgrowing or contract farming systems in Sierra Leone to share experience and address issues of common concern.
- Support the development of officially sanctioned mechanisms to differentiate higher quality products, especially for NRVCCs, in the domestic market (e.g., a formal "Safe Food, Safe Farms" or "Natural and chemical-free" campaign as an official seal or label).

Action: Promote gender-sensitive business and marketing management (e.g., women's group marketing with micro-financial services that allow women greater control over income).

EAIN facilitation interventions:

- Identify and short-list possible providers (e.g., farmer business organizations, network of master farmers, cooperatives, etc.) for group marketing opportunities among women producers.
- Assess the business and marketing capacity of the providers to market its members' crop production—whether from individual or group farms.

The solutions above support increased agricultural productivity; improved labor efficiency, profitability, product quality, and consumer demand; and they support the goals of agriculture and economic growth development activities. They can also contribute directly or indirectly to the prioritized nutrition-sensitive agriculture outcomes, which are not automatic and require deliberate design to produce results for nutrition. See annex 2 for the results chains or program impact pathways for each solution and associated actions.

In addition, annex 3 presents some general value chain/market development facilitation principles, which may be helpful to EAIN implementing partners when planning interventions. Applying facilitation principles can enhance the rollout and sustainability of the proposed nutrition-sensitive, market-based solutions included in this study.

5. Summary and Conclusion

In this study, we analyzed six EAIN value chains and identified points of entry for nutrition within the value chains. We aimed to ensure a win-win for nutrition, as well as for income and economic growth, avoiding the common pitfall of siloed agricultural and nutrition interventions. We pursued this approach by first identifying key nutrition-sensitive agriculture outcomes informed by the conceptual framework of the SPRING agriculture-to-nutrition pathways. We determined how each value chain affected the diet, health, and nutrition risks; and the household income controlled by women, who are the primary caregivers for household members.

Through rapid participatory techniques, we analyzed the constraints to the key nutrition-sensitive agriculture outcomes in each EAIN value chain, without compromising economic growth, income, and employment objectives. From this analysis, we recommended potential market-based solutions to promote the desired nutrition-sensitive agriculture outcomes. Specifically, we considered how the solutions addressed key elements of nutrition-sensitive agriculture in the value chains, mainly their potential to—

- expand the *availability of NRVCCs*
- increase *household incomes, with women exerting greater control over its use*
- reduce the *time and energy burden of women* in the value chain.

Under each market-based solution, we provided illustrative action and facilitation interventions that value chain actors can promote. These are only illustrative actions and interventions because EAIN will need to decide what solutions to prioritize; and more important, the service providers who will lead each facilitation intervention.

Notably, the West Africa Rice Group and Fresh Salone are EAIN implementing partners during the same time as the private sector actors and potential solution providers.

We included the explicit links between how each illustrative action may lead to nutrition-sensitive agriculture outcomes given the appropriate design, supporting interventions, and assumptions. A more in-depth analysis will be required to think through the details to ensure EAIN partners can execute these actions.

At the same time, SPRING is assisting EAIN in developing a social and behavior change strategy, which will contribute to the process of detailing some of the illustrative actions and next steps for the implementing partners. Finally, SPRING conducted additional technical assistance to support EAIN to (1) incorporate select nutrition-sensitive agriculture outcomes outlined in this analysis into its activity monitoring and evaluation plan, (2) identify key assumptions and detailed program impact pathways, and (3) define a few key nutrition-sensitive agriculture custom indicators that implementing partners can monitor without placing an undue burden on staff and resources.⁴

SPRING's experience working with USAID Missions and a range of Feed the Future activities during the past three years underscores the challenge in bringing together the often-siloed agriculture and nutrition interventions and goals. This study is an early attempt at a systematic approach to identify constraints to nutrition-sensitive agriculture and to prioritize market-based solutions within the context of a value chain activity.

⁴ Translating the selected nutrition-sensitive outcomes into custom indicators for inclusion in EAIN's Program Monitoring Plan is detailed in SPRING's trip report: 2017 SPRING Trip Report (Lidan Du and John Haydu March 2017).

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Annex 1. Focus Group Discussion and Interview Guides

FOCUS GROUP DISCUSSION: for Selected Farmers in Tonkolili District

Note: Participants at this focus group discussion (FGD) should be farmers in Tonkolili district that produce and sell surplus production of groundnuts and horticulture crops (i.e., not only subsistence-level farmers).

Times: 2 hours 30 min.

STEPS	TIME	MATERIALS
Step 1: Background and Context for the Focus Group Discussion (FGD) After greeting the participants, the facilitator asks the participants to introduce themselves. The facilitator then presents the agenda for the focus group discussion and provides some background information. The facilitator presents the main questions to discuss during this FGD: (1) For the crops that you grow, which functions or roles are women engaged in (e.g. farming, processing, selling etc.)? Of the functions that use the most time/energy of women, are there any ways to do it better to save time or reduce labor? (2) When these crops are sold, who in the family/household is responsible for selling them? Who receives the money from the sales of these crops? (3) For these crops, do you use any agro-chemicals or fertilizers? If so, how do you apply, handle, and store these inputs? Do you use any organic fertilizers (animal manure)? If so, how do you apply, handle, and store these inputs? (4) For these crops of groundnut and horticulture, how do you decide whether to sell or keep any production for your household to eat?	30 min	
Step 2: Small Group Discussion The facilitator explains that participants will be split into smaller groups for easier discussion and more active participation. Facilitator will assign the participants into a smaller sub-group or they can count off by "1"s and "2"s to break out into Group 1 and Group 2. In each small group, facilitators will support participants to share and discuss each of the proposed questions. If possible, a member of the group may be selected to be the note-taker.	1 hour	
Step 3: Presentation and Discussion of Participant Responses Each sub-group will present a summary of their responses in plenary. The facilitator will then encourage the other participants to add, confirm, and/or clarify these responses.	45 min	
Step 4: Summary and Closing The facilitator summarizes the overall findings of the FGD. The facilitator revisits the goals of the workshop and thanks everyone for their time and active participation.	15 min	

**FOCUS GROUP DISCUSSION:
for Selected Women Consumers of Nutrient-rich Value Chains in Tonkolili District**

Note: Participants at this focus group discussion (FGD) should be mothers of any age.

Time: 2 hours 30 min.

STEPS	TIME	MATERIALS
<p><u>Step 1: Background and Context for the Focus Group Discussion (FGD)</u></p> <p>After greeting the participants, the facilitator asks the participants to introduce themselves. The facilitator then presents the agenda for the focus group discussion and provides some background information.</p> <p>The facilitator presents the main questions to discuss during this FGD:</p> <ul style="list-style-type: none"> (1) Do you buy [groundnut/horticulture] from the local market? If so, <ul style="list-style-type: none"> 1.1 What do you look for when you buy [groundnut/horticulture]? 1.2 When are [groundnut/horticulture] available for sale? Which months or season? 1.3 Are [groundnut/horticulture] expensive? 1.4 Are [groundnut/horticulture] easy to prepare for eating? (2) What would make you buy more [groundnut/horticulture] for your household to eat? 	30 min	
<p><u>Step 2: Small Group Discussion</u></p> <p>The facilitator explains that participants will be split into smaller groups for easier discussion and more active participation. Facilitator will assign the participants into a smaller sub-group or they can count off by "1"s and "2"s to break out into Group 1 and Group 2.</p> <p>In each small group, facilitators will support participants to share and discuss each of the proposed questions. If possible, a member of the group may be selected to be the note-taker.</p>	1 hour	
<p><u>Step 3: Presentation and Discussion of Participant Responses</u></p> <p>Each sub-group will present a summary of their responses in plenary. The facilitator will then encourage the other participants to add, confirm, and/or clarify these responses.</p>	45 min	
<p><u>Step 4: Summary and Closing</u></p> <p>The facilitator summarizes the overall findings of the FGD. The facilitator revisits the goals of the workshop and thanks everyone for their time and active participation.</p>	15 min	

Interview Guides for Value Chain Analysis

Red text reflect additions to a traditional value chain analysis questionnaire to add a nutrition lens

When conducting agricultural value chain analysis, three primary components or aspects of the value chain must be assessed: (i) *output and end markets* for the final product, including trading, processing, retailing, etc.; (ii) *input markets*, including seed, fertilizer, equipment, etc.; and (iii) *on-farm production and post-harvest structures*. Three types of interview guides (presented below) can be used to organize primary data collection, based on the value chain component and type of actor being interviewed. Some questions can be crop- and location-specific, but they were left generic for the "selected crop" and target area to be determined later. To conclude the interviews, final cross-cutting questions for all value chains actors and key informants are also shown.

From a food security perspective, most of the questions in the value chain interview guides identify key constraints/opportunities to improve the **year-round** availability (via production) and access (via income) to food. **Additional value chain questions to further assess potential nutrition-sensitive solutions for targeted 1,000 day households and individuals are highlighted in red.**

Note that these guides are only checklists for a range of information to be collected during semi-structured discussions with various value chain actors and key informants; they are not detailed comprehensive questionnaires for formal enumeration.

Introduction and Purpose:

- Entrepreneurial Agriculture for Improved Nutrition (EAIN) is a new USAID-funded project that focuses on rice, groundnuts, horticulture, and maize (for animal feed) farming households in the Tonkolili district.
- EAIN will support the private sector to expand production and sales of these selected crops and improve the nutrition of farming households (and targeted individuals) (**through sale and/or household consumption**) in the Tonkolili district.
- As the title states, the goal is to improve nutrition, therefore, we are interested in the elements of value chain development that will improve nutrition and ensure they are given priority support.
- We are gathering information about the challenges private sector actors have in growing their business and expanding production and sales of farmers in the Tonkolili district **and how this would relate to nutrition improvements directly and/or indirectly**.
- We are also interested in discussing initiatives or investments needed to overcome those challenges, and how the EAIN project might support those initiatives.
- We also want to understand the role that nutrition plays in the food market system for the range of crops and food products targeted by EAIN.

Interview Background Summary:

Date of Interview: _____	Interviewer: _____
Type of Market Actor: _____	Main Products/Services: _____
Interviewee(s) and Position: _____	Years in Business: _____

I. OUTPUT-END MARKETS: Interview Guide for Buyers (traders, processors, retailers, etc.)

Buyer Procurement:

- ✓ What agricultural products do you buy and sell? Why buy or sell these crops/products?
- ✓ How much (volume) [selected crop] do you purchase per year? When (which months/seasons) do you purchase [selected crop]? During what seasons do you have shortages of [selected crop]?
- ✓ From which areas do you purchase [selected crop]? Who are your main suppliers of [selected crop] and where are they located? How many (estimated) suppliers of [selected crop] do you have? Have you noticed any difference between the geographical locations you mention in terms of quality/quantity—attention to food safety?
- ✓ Do you perform any food safety tests—for example, for aflatoxin or E. coli contaminations?
- ✓ Do you engage at different levels in the value chain in different geographical areas?
- ✓ Do you provide any support (e.g., credit, information, technical, etc.) to your [selected crop] suppliers to ensure quality or build loyalty? If so, who do you provide this to (gender, household member(s), cooperatives/farmer groups, etc.)?
- ✓ How do you pay your [selected crop] suppliers? How often do you make supplier payments?
- ✓ Is post-harvest loss or storage a constraint to farmers and other market actors selling [selected crop]? What opportunities are there to reduce post-harvest loss and/or expand storage services?
- ✓ Do you test produce for quality and safety prior to purchasing or agreeing to contract purchasing (i.e., aflatoxin or E. coli or fungus, etc.)?
- ✓ What percentage of your total purchases of [selected crop] are from the target area? What is the growth potential for [selected crop] procurement from the target area?
- ✓ What key challenges do you have in sourcing [selected crop] from the target area? What investments would you make to expand purchases of [selected crop] from the target area?
- ✓ Would any nutritional information be useful to you?

Buyer Sales:

- ✓ Who are the major end market buyers (firms that purchase the largest quantities) that drive demand for [selected crop]? Among these buyers, how many are women or are women-owned businesses?
- ✓ How much (volume/value) [selected crop] have you sold this year? How does it compare to previous years?
- ✓ What are the [selected crop] specifications or requirements of end market buyers (e.g., form, size/shape, quality, color, etc.)? To what extent are consumers aware of food safety and quality for XX crop/product?
- ✓ What incentives or premiums do end market buyers offer to ensure that the end product specifications are met?
- ✓ What are your marketing channels for [selected crop] (i.e., chain of actors from producer to consumer)?
- ✓ Do the end market buyers ever mention the nutritional value of a crop? Are they aware of what a

crop can do nutritionally?

- ✓ Can you think of any nutritional information that could be useful?
- ✓ To what extent do you think that nutritional quality of food affects consumer purchase decisions or behavior?

Market Segmentation and Growth:

- ✓ What end market segments/channels for [selected crop] have the greatest opportunity for growth and income for farmers in the target area? Are there seasonal market windows for farmers to increase income? *What are they?*
- ✓ What are the current demand and end market trends for [selected crop] (e.g., competition from imports, increasing urbanization, and income growth, etc.)?
- ✓ *What are consumer preferences for [selected crop] (e.g., form, source, brand, production area, etc.)? What drives these consumer preferences (price, quality, convenience, availability, etc.)?*
- ✓ *What are the health or food safety concerns for [selected crop] sales and consumption?*
- ✓ Can you think of any nutritional information that could be useful or encourage people to think about nutrition?

II. INPUT MARKETS: Interview Guide for Agricultural Input Suppliers and Users (farmers)

Input Supply Companies or Providers

- ✓ What input products or services do you offer? How much do you sell per year (estimated volume/value)?
- ✓ How often do farmers/customers buy your input products?
- ✓ How and from where do you source your input products?
- ✓ How do you distribute and sell your products/services (e.g., directly at own shop, via retailers/traders, etc.)?
- ✓ How many farmers buy your input products/services (estimated total) per year? Where are they located?
- ✓ What is the demand for these input products/services? What are the input market trends?
- ✓ How do you promote or market your input products/services to customers?
- ✓ *Are any input products/services specifically targeted for women? Why or why not?*
- ✓ What kind of support or technical advice do you provide to your customers (either before or after sales)? *Do any of these center around the safe use of inputs?*
- ✓ *Is nutritional information provided on the inputs—i.e., seed varieties with greater nutrient content than others, or health and safety warnings?*
- ✓ What challenges or risks do you face in selling inputs in the target areas? What support do you need to reduce risks or develop capacity to address these challenges?
- ✓ *What sort of nutritional information would be useful to you?*

Farmers and Users of Inputs

- ✓ What specific inputs are needed to produce [selected crop]?

- ✓ How much (and how often) do you use these inputs? Where do you get these inputs?
- ✓ What input products/services (e.g., seeds, mechanization, etc.) would improve the productivity of women engaged in production, processing, or sales of [selected crop]?
- ✓ What kind of support (e.g., technical, financial, etc.) do your input suppliers provide to you? Do any of these center around the safe use of inputs? Is this same advice made available to your spouse?
- ✓ What technical or extension advice do you access for [selected crop]? From where? How often?
- ✓ Are the results/yield for [selected crop] what you expected from these inputs? Why or why not?
- ✓ What are your major input challenges for [selected crop] production (e.g., cost, quality, availability, etc.)?
- ✓ Are you using any technologies or practices that save you time? What about technologies or practices that decrease heavy labor?

III. ON-FARM PRODUCTION and POST-HARVEST: Interview Guide for Farmers in Target Area

- ✓ What crops/products do you produce? How long have you produced these crops?
- ✓ How large is your production area/farm? What area per crop?
- ✓ What is the seasonal cropping pattern? How many crops per year?
- ✓ Which crops/products are most profitable? What are production costs/crop? What is your yield per crop?
- ✓ Do you hire any labor to produce these crops? How much/how often? What is the labor calendar?
- ✓ Do women and men have different roles in [selected crop] production, processing, or marketing?
What are the specific challenges for women engaged in the [selected crop]?
- ✓ Do you use formal or informal credit to grow [selected crop]? From where, and at what terms (e.g., loans from buyers/input suppliers, family members or neighbors, microfinance institutions, etc.)? Who does the borrowing (i.e., which family member)?
- ✓ Do you own the land where you produce? Do you have a documented title?
- ✓ What can be done to reduce any post-harvest loss of [selected crop] before it is sold?
- ✓ Do you process and/or store [selected crop] after harvest? How much (volume) and how/where is it stored? What do you do with your stored crops?
- ✓ What are you doing to improve your production of [selected crop] (e.g., improved varieties, fertilizer, production techniques, etc.)? If you are not making improvements, why not?

Subsistence/Household Consumption

- ✓ How much of [selected crop] do you sell and how much do you keep for your family to eat? What determines your decision to save [selected crop] as food for your household or to sell as a cash crop?
- ✓ Do you also ever buy [selected crop] for your household consumption during the year? If so, when and from where? Why do you buy those particular crops?
- ✓ What other foods do you buy?
- ✓ Are there any times during the year when your family doesn't have enough food to eat? Why?

IV. CROSS-CUTTING ISSUES: Final Questions for all Interviews

Finance and Infrastructure

- ✓ Where can you finance your [selected crop] activities? Who is your preferred source of finance (e.g., family, buyers, suppliers, savings and credit groups, etc.)? What are the terms (e.g., interest, collateral, etc.)?
- ✓ Who (which family member) borrows money from this preferred source of finance?
- ✓ What are the most important infrastructure constraints affecting your [selected crop] activities (e.g., road and transportation conditions, telephone service, electric supply, crime/corruption, storage, etc.)?

Horizontal Linkages and Enabling Environment

- ✓ Are you a member of an association or group related to your [specific crop] activities? Why or why not?
- ✓ What benefits do you receive from being a member of this association or group?
- ✓ What are the formal/informal policies and regulations that negatively affect your [selected crop] activities? (e.g., registration and licensing, import/export tariffs, cross-border trade, etc.)? How do you think the [selected crop] industry can best address these policy and regulatory constraints?
- ✓ Have you ever (or do you currently) received support from government or donor-funded programs for your [specific crop] activities? If so, how?

Final Questions

- ✓ What are the *top three major constraints*, or issues, currently affecting your [specific crop] activities? What *investments* can be made to address these issues? What prevents these investments from being made?
- ✓ Who else do you recommend that we meet to discuss the [selected crop] value chain and opportunities for growth in the target area? List the specific name and contact information.

Annex 2. Actions and Nutrition-Sensitive Agriculture Outcomes for EAIN Value Chains

SOLUTION	IMPLEMENTING PARTNER	ACTIONS	NUTRITION SENSITIVE AGRICULTURE OUTCOMES
(1) Gender-equitable access to water for off-season production of NRVCCs	Fresh Salone	<p>Improved water saving or diverting technologies for off-season production; supporting actions include assistance with securing business loans to adopt technology:</p> <ul style="list-style-type: none"> o drip irrigation water systems o water collection/pump system o mulching 	<p>(a) Adoption of improved technologies → Less time and energy requirements for women who traditionally collect water from water points and irrigates the crops → Improved caregiving resources (time, energy).</p> <p>(b) Adoption of improved technologies → Increased yields → More income for women who traditionally cultivate groundnuts and horticulture → Increased household income controlled by women.</p> <p>(c) Adoption of improved technologies → Increased yields → More produce available year round in local markets → Improved access to diverse foods by households.</p>
(2) Training and access to appropriate technology for on-farm production	WARC	<p>i. No-till cultivation reducing land preparation tasks</p> <p>ii. Safe use of herbicides (and other chemicals) and environmental safety</p>	<p>i. Adoption of no-till cultivation → Less time and energy requirements for men and women who perform or contribute to these tasks → Improved caregiving resources (time, energy) in the household</p> <p>ii. (a) Safe use of herbicides → Reduced risk of toxin contamination</p> <p>(b) Safe use of herbicides → Less time and energy requirements for women who traditionally perform weeding → Improved caregiving resources (time, energy).</p>
(3) Training and access to appropriate technology for post-harvest handling and processing	Fresh Salone	<p>i. Environmental safety, hygiene, aflatoxin mitigation (groundnuts) Sorting and grading for local and distant markets (i.e., grades A and B)</p> <p>ii.</p>	<p>i. Safe use and handling practices → Reduced risk of toxin contamination and/or disease burden</p> <p>ii. Adoption of sorting and grading practices → Increased marketing of safe B grade produce in local markets → Improved availability and affordability of safe, nutritious foods in local markets → Improved access to diverse foods by households.</p>

SOLUTION	IMPLEMENTING PARTNER	ACTIONS	NUTRITION SENSITIVE AGRICULTURE OUTCOMES
	WARC	iii. Mechanical threshing, milling (rice), shelling (maize)	iii. Adoption of labor-saving technology → Less time and energy requirements on women who traditionally perform or contribute to these tasks → Improved caregiving resources (time, energy).
	ACDI/VOCA	iv. Value-added and quality processing (e.g., dried okra, groundnut paste, pumpkin-gari, dried chili)	iv. (a) Value addition in commodities → Increased income-generating opportunities for women → Increased household income controlled by women. (b) Processing of NRVCCs to shelf-stable food products → Increased year-round availability of nutritious foods in local markets → Improved access to diverse foods by households. (c) Safe and hygienic processing of commodities → Increased availability of safe, nutritious food products → Reduced disease burden. (d) Processing of NRVCCs to shelf-stable, semi-processed food products → Easier, convenient preparation for home consumption → Reduced time demands on caregivers → Increased demand and consumption of nutritious food products.
(4) Availability and promotion of NRVCCs to consumers	HKI/SPRING	Communications to increase consumption of NRVCCs (through radio programs and other communication channels)	Promotion of NRVCCs → Improved NRVCC appeal/demand in local markets and/or desirability among consumers.
(5) Gender-equitable access and linkages to larger, higher-value buyers	ACDI/VOCA	i. Direct procurement from women smallholders	i. (a) Direct market linkages → Direct payments to women → Increased household income controlled by women. (b) Direct market linkages → Increased volumes and improved quality of produce; embedded transport costs → Increased revenue and revenue streams through stable markets → Improved year-round cash flow and cash management for households → Increased year-round expenditures on diverse nutritious

SOLUTION	IMPLEMENTING PARTNER	ACTIONS	NUTRITION SENSITIVE AGRICULTURE OUTCOMES
		<ul style="list-style-type: none"> ii. Buyers and processors connect/commit to new suppliers (e.g., Project Peanut Butter, Sierra Mix, Pikin Mix) iii. Gender-sensitive business and marketing management (e.g., women's group marketing coupled to micro-financial services that allow control over women's income, increased involvement of women in business and marketing management opportunities) 	<p>foods and health services.</p> <p>ii. Linkages with NRVCC food processors → Increased availability in local markets of nutritious convenience foods suitable for complementary feeding.</p> <p>iii. (a) Group marketing by women → Direct payments to women deposited through the women's group → Increased household income controlled by women.</p> <p>(b) Increased involvement of women in business and marketing management → Improved communication between men and women at farm and HH level → Increased household income controlled by women.</p>

Annex 3. General Value Chain and Market Development Facilitation Principles

- Stay out of commercial, intermediary, or negotiation roles in the value chain. Development activities (or projects) should be careful not to get between private sector market actors. Negotiating with buyers on behalf of producers (or vice versa) can lead to market distortions and unsustainable impact. Let providers and smallholders work out the most appropriate structures for buying/selling without imposing preconceived organizational structures, such as groups or cooperatives.
- Build provider capacity to upgrade products/services and linkages with smallholders. Development activities can be critical to improving or expanding the capacity of targeted providers to offer needed products and services for smallholders. They may provide this through technical support, training, input, finance, and support to access markets.
- Develop private sector competitiveness. Development activities can work closely with targeted providers to build their overall value chain competitiveness; this, in turn, will have a positive impact on their smallholder suppliers.
- Assess the feasibility of private sector provider investments in their suppliers. An initial intervention can be to work with targeted providers to assess the feasibility of a proposed investment in their supply chain(s). These investments might include capacity building of smallholder suppliers, establishing direct procurement operations, or sourcing improved inputs for their suppliers. Development activities can maintain responsiveness and professionalism while supporting private sector providers with this type of activity to establish credibility.
- Create the right incentives. Development activities can help reduce the risks that providers face in making value chain investments for the mutual benefit of their smallholder suppliers and themselves. They should be careful to strike the right balance in providing incentives or subsidies. Smart subsidies can include those that build the capacity of providers to explore new initiatives, such as those that enhance nutrition-sensitive results, offset the cost of pilot activities, link to new buyers and input suppliers, support feasibility assessments, and improve research and development. However, subsidies covering all or part of a provider's recurring operational costs, personnel, or physical assets are problematic; they can create dependency, distort markets, and slow private sector ownership of the process.
- Monitor agreements. All development activities must monitor work plans and/or cost share agreements with collaborating private sector providers to ensure that partners implement agreed-upon investments, practices, and activities (Action for Enterprise 2014).

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