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Agriculture in Complex Emergencies: Exploring the Association between Agricultural Programs and Dietary Diversity among Women and Children in Cameroon

Study Findings



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Contents

Acknowledgments	v
Acronyms.....	vi
Executive Summary	vii
Research Methods and Findings	vii
Discussion and Conclusions.....	ix
Recommendations	x
Chapter 1. Introduction.....	1
Chapter 2. Background	3
Agriculture for Nutrition in Complex Emergencies	3
Far North Context.....	4
Chapter 3. Methodology.....	7
Conceptual Framework	7
Research Questions	9
Qualitative Interviews (Research Questions 1, 3–5)	9
Online Survey (Research Question 1).....	11
Quantitative Household Survey (Research Questions 2–5)	12
Ethics and Confidentiality	14
Chapter 4. Description of Project and Implementation Activities	16
Participant Selection.....	17
Agricultural Interventions.....	17
Outcomes.....	18
Factors Influencing Implementation (Research Question 1)	18
Chapter 5. Dietary Diversity Findings	20
Household Characteristics	20
Prevalence of Minimum Dietary Diversity (Research Question 2)	21
Association between Project Participation and Dietary Diversity (Research Question 3)	24
Household-Level Factors Associated with Dietary Diversity (Research Question 4).....	32
Association between Dietary Diversity and Maternal Social Support (Research Question 5).....	39
Chapter 6. Discussion and Conclusions.....	43
Chapter 7. Recommendations.....	46
BHA and Other Donors	46
Emergency Implementing Partners.....	47
Further Research	48
References	50

Annex I. Data Collection Instruments.....	54
Endline Household Survey.....	54
Semi-Structured Interview Guide.....	63
Online Implementing Staff Survey.....	67

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Acronyms

BHA	Bureau for Humanitarian Assistance
CFA	<i>Communauté Financière Africaine</i> (African Financial Community)
CI	confidence interval
CSI	Coping Strategies Index
FCS	Food Consumption Score
FFS	Farmer Field School
IDP	internally displaced person
IPC	Integrated Food Security Phase Classification
MDD	minimum dietary diversity
MDD-W	minimum dietary diversity for women
MINADER	Ministry of Agriculture and Rural Development
n/a	not applicable
PUI	Première Urgence Internationale
rCSI	Reduced Coping Strategies Index
SBC	social and behavior change
SD	standard deviation
UNICEF	United Nations Children's Fund
USAID	U.S. Agency for International Development
WFP	World Food Programme

Executive Summary

The U.S. Agency for International Development's (USAID's) Bureau for Humanitarian Assistance (BHA) seeks to improve the impact of emergency-funded agricultural activities on nutritional status, especially for women and young children. Although evidence supports the idea that nutrition-sensitive agriculture can improve dietary diversity in development contexts, there is little evidence that these investments improve nutrition outcomes in complex emergency contexts (FAO 2010; Catley, Henderson, and Radday 2021; Hall, Blankson, and Shoham 2011; Levine and Chastre 2011). To help fill this evidence gap, USAID Advancing Nutrition explored where nutrition-sensitive agriculture activities are appropriate in emergency contexts and how they can be designed to improve nutrition outcomes.

To inform these recommendations, USAID Advancing Nutrition conducted research with two BHA-funded activities. One activity is the Emergency Response to Food Insecurity for Lake Chad Basin Crisis-Affected Populations in the Far North Region of Cameroon (hereafter, "the project"), which is implemented by Première Urgence Internationale (PUI). The project was implemented from April 2020 to March 2021 in the Far North Region of Cameroon and provided training, agricultural tools, and seeds; it also facilitated a Farmer Field School. Although the project aimed to improve food security rather than dietary diversity or nutrition specifically, it nonetheless provided an opportunity to explore whether typical BHA-funded agriculture interventions can be appropriate for improving nutrition outcomes.

Research Methods and Findings

USAID Advancing Nutrition collaborated with PUI to implement a mixed-methods study to explore the relationship between dietary diversity for women and children aged 6 to 23 months and the agriculture interventions they delivered through the project. We used data from PUI's cross-sectional endline household survey ($n = 84$ women; $n = 40$ children), semi-structured interviews with a subset of survey respondents ($n = 24$), and an online survey with PUI staff ($n = 18$).



Key Messages

- We implemented an exploratory, mixed methods study of dietary diversity among participants in a short-term, agricultural project in northern Cameroon, a complex emergency context.
- We found that minimum dietary diversity for women (i.e., consuming at least five food groups) was associated with planting more than half the seeds received among project participants. However, we found no association when we controlled for other factors, likely due to the small sample size. We also found that a complex set of factors, including household size, food preferences, and social support, influenced women's dietary diversity. Most respondents reported that they adopted new agricultural practices because of project support, which helped to increase their household's access to food through their own production. Examining a very small set of households with children (40), we did not find an association between project participation and children's dietary diversity.
- Overall, this evidence suggests that the project's agricultural support contributed to women's dietary diversity. This study cannot isolate the impact of the project on dietary diversity from the impact of other individual and household factors, nor determine which component of the agricultural project contributed most to dietary diversity outcomes.

Research Questions and Findings

Overall, our findings suggest that the agricultural interventions the project provided supported dietary diversity among women but not children. The quantitative data showed that the project’s seed-distribution intervention had a positive influence on dietary diversity because the prevalence of minimum dietary diversity for women (MDD-W) increased when more than half of the seeds received from the project were planted. This finding was not statistically significant when we controlled for confounding factors but was supported by qualitative data. In qualitative interviews, most informants reported adopting new agricultural practices, which improved yields and access to food from their own production and increased agricultural income. Taken together, and considering the small survey sample size, our findings suggest a positive association between planting more than half of the seeds received and increased MDD-W in the target population. Somewhat surprisingly, we observed a negative association between planting more than half of the seeds with children’s dietary diversity, although that association was not statistically significant and may be related to women’s increased labor, leaving them less time for child care. Of course, we interpret all results cautiously given the small survey sample size, and we cannot prove causality because of the limitations of the research design, which is cross-sectional at a single point in time. Beyond project support, we found other factors associated with dietary diversity, including maternal social support, which was positively associated with women’s dietary diversity. The table below lists the five research questions the study aimed to answer and the key findings for each.

Table 1. Key Findings by Research Question

1. Which factors influenced implementation of the nutrition-sensitive agriculture interventions within emergency activities?
<ul style="list-style-type: none"> • Participant households predominantly had positive perceptions of the quality of the PUI implementation. The primary concern that was noted was the timing of the seed distribution, which occurred late in the season. • PUI staff predominantly had positive perceptions about the quality of implementation and the likelihood of positive outcomes from project interventions. • The main challenges affecting implementation were the short duration of the project, logistical issues, and limited community interest or involvement.
2. What is the prevalence of MDD among women of reproductive age (18–49 years) and children (aged 6–23 months) in participant households?
<ul style="list-style-type: none"> • The majority of women and just over half of children met MDD.
3. What is the association between participation in the project and the dietary diversity of women of reproductive age (18–49 years) and of children (aged 6–23 months)?
<ul style="list-style-type: none"> • Planting at least half of the seeds the project provided was positively associated with the prevalence of MDD-W for women of reproductive age (18–49 years), but this association was not statistically significant when controlling for household and other factors. Planting more than half the seeds received was negatively associated with the prevalence of MDD for children aged 6–23 months, although the association was not statistically significant, and we could not conduct a multivariable analysis because of the small sample size. • In qualitative interviews, most informants reported adopting some agricultural practices taught by PUI and that planting the seeds received and adopting new practices improved their yields. Informants reported that improvement in yields influenced diets through improved access to food from their own production and through increased agricultural income.

- Taken together, the quantitative and qualitative data suggest that **the project had a positive association with MDD-W.**

4. Which household-level factors are associated with the dietary diversity of women of reproductive age (18–49 years) and of children (aged 6–23 months) in complex emergency contexts?

- Bivariate analyses showed that household size, quantity of seeds planted, and the mother’s social support was positively associated with MDD-W.
- **Child’s age, mother in a monogamous marriage, and number of shocks experienced were positively associated with MDD.**
- Qualitative data show that food access at the household level influences diets, while household coping strategies, food preferences, and perceptions of “good” foods differentially influence women’s and children’s diets.

5. What is the association between the dietary diversity of women of reproductive age (18–49 years) and of children (aged 6–23 months) and maternal social support?

- **Maternal social support was positively associated with MDD-W and MDD** but did not have a statistically significant association with MDD. The magnitude of the association with MDD-W was minimal and indicates an area that will benefit from further study.
- Female informants primarily reported in qualitative interviews receiving support from their husbands, and some also received support in the form of food or money from other family members or food from neighbors. They primarily reported a need for more material support, such as cash or food, to help provide for basic needs, which would also help relieve their worry and anxiety.

Discussion and Conclusions

We found that the majority of women and more than half of children surveyed met MDD, which is higher than the region as a whole (MDD prevalence was 21.2 percent in the Far North Region) (INS and ICF 2020). Taken together, the quantitative and qualitative data from this study suggest that the **agricultural interventions the project provided supported dietary diversity among women.** Although we were not able to estimate the effect of the intervention on dietary diversity because it was not measured at baseline, we found a positive association between planting more than half of the seeds PUI provided and MDD-W. However, we found no association when we controlled for other factors, likely due to the small sample size. Most informants reported that participating in the project helped improve their agricultural practices and access to food through their own production. They reported this was due to yield increases rather than crop diversification. They also reported increased incomes from crop sales or money saved from reduced purchases because of increased production. Women and children were more likely to consume certain foods when their households received those seeds from the project than when their households did not receive those seeds. We found a negative, though not statistically significant association, between planting more than half of the seeds and MDD, but we could not conduct a multivariable analysis because of the small sample size.

This study suggests that agricultural interventions are positively associated with women’s dietary diversity in a complex emergency context and a short program implementation time frame. It is unclear whether increased food access can be sustained without the intervention, but respondents’ reports of improved agricultural practices are promising for improved future yields and the reported associated dietary diversity after harvest, whether through the income or consumption pathway. These findings should be confirmed in larger surveys and different places, and there should be a concerted effort to study MDD. In addition, we found that an increase in social support was associated with an increase in

MDD-W and MDD, although the latter association was not statistically significant. The role of social and material support to women in these contexts and the effects on nutrition deserves further study. The role of idiosyncratic shocks deserves further study, as well—we found that MDD was positively associated with household shocks, which may have been the result of measurement issues (e.g., differing recall periods) or because households experiencing shocks were more likely to receive external support. Finally, our findings support the existence of a relationship between inadequate social and care environments with the outcome of inadequate dietary intake, as described in the drylands acute malnutrition framework (Young 2020). Household food insecurity was not related to MDD-W or MDD, but the qualitative findings suggest that food insecurity does affect dietary intake, as described in the drylands acute malnutrition framework (Young 2020)—whether that be the quantity, quality, or diversity of foods. These findings suggest that those portions of the framework may also be applicable in complex emergency contexts that are not in drylands.

Recommendations

Several programmatic implications of our findings for different audiences can be considered when designing agriculture interventions in complex emergency contexts. We developed the recommendations based on the findings from this study in addition to knowledge and best practices from USAID Advancing Nutrition’s work researching and developing guidance for nutrition-sensitive agriculture and SBC. We describe these recommendations by audience in the sections that follow. Finally, we suggest areas for further research given the limited evidence that exists on nutrition outcomes from agricultural and nutrition-sensitive agricultural programming in complex emergency contexts.

BHA and Other Donors

Our findings have implications for donors that fund nutrition and agriculture programs in complex emergencies:

- **Consider nutrition-sensitive agriculture in complex emergencies to improve women’s diets.** Agriculture projects can be appropriate for improving women’s dietary diversity within highly food insecure, complex emergency contexts. They can also be implemented within short time frames provided that the project aligns with the seasonal calendar. The nutrition outcomes from these interventions will likely be stronger if nutrition is an explicit component of the project design and implementation. Emphasis should, for instance, be placed on the production of nutrient-rich foods coupled with social and behavior change (SBC) approaches that promote the consumption of such foods.
- Consider multiple agriculture-nutrition pathways when designing nutrition-sensitive agriculture activities in complex emergencies. The three main agriculture-nutrition pathways—food production, agricultural income, and women’s empowerment (Herforth and Harris 2014)—are relevant in complex emergencies. For more guidance on nutrition-sensitive agriculture programming design, please see [USAID Advancing Nutrition’s Designing Effective Nutrition-Sensitive Agriculture Activities Workshop: Facilitator’s Guide and Slides](#). This design guide was developed for programs in development settings, but many elements will be useful and applicable for emergency settings, as well.
- Explore other nutrition activities to improve children’s diets in complex emergencies. Children’s diets are affected by care and feeding practices that are not necessarily related to household food access. For more guidance, see [USAID Advancing Nutrition’s guidance on prioritizing multi-sectoral nutrition behaviors and designing complementary feeding activities](#).

Emergency Implementing Partners

Implementing partners should consider several nuances for nutrition-sensitive agriculture projects when designing these interventions. These considerations may not be unique to complex emergency contexts, but we found that they can be applicable in such contexts. These recommendations largely focus on the design of nutrition-sensitive agricultural programming, where the design is key to making agriculture nutrition sensitive—the focus of this study. High-quality implementation is critical to achieving the intended outcomes, as shown in a recent review (Di Prima et al. 2022), but the factors that affect implementation of nutrition-sensitive agriculture projects are largely not unique to nutrition-sensitive agriculture projects:

- **Consider participants' access to land and water.** Project participants need access to suitable land for production—appropriate for vegetable or staple crop production in the dry or rainy season, depending on the project—to benefit from agriculture interventions. Implementing partners should consider such access when conducting BHA-required response analysis.
- **Implement agricultural interventions in line with seasonal calendars and climatic conditions.** The timing of agricultural interventions—input distribution, demonstrations, or training—is crucial and should align with the seasonal calendar and production cycles to ensure that households are able to optimally benefit from these interventions regardless of season. Seed distribution must be completed in advance of planting dates, otherwise, seed distribution is not of use to farmers. In addition, many geographies are subject to increased climate variability, which influences food production conditions. Changes in temperatures, precipitation, growing season length, soil moisture, and pest pressures are just a few of the variables that influence agricultural productivity and agricultural management decisions and should be considered and planned for to the extent possible. For more guidance, see [USAID Advancing Nutrition's guidance on designing effective nutrition-sensitive agriculture activities](#).
- **Include a nutrition SBC approach to improve children's and women's diets.** SBC interventions that target improved nutrition behaviors should be included in the design from the outset because the nutrition-sensitive agriculture activities should be linked with specific nutrition behaviors. The inclusion or integration of nutrition SBC can be as simple as including nutrition behavior change messages in other activities, such as training. The nutrition behaviors promoted should be tailored to the project's nutrition goals and the agricultural support provided. For more guidance, see USAID Advancing Nutrition's guidance on [designing effective nutrition-sensitive agriculture activities](#), [prioritizing multi-sectoral nutrition behaviors](#), [designing complementary feeding activities](#), and [engaging family members in nutrition](#).
- **Explore the utility of social support interventions.** The role of social support and women's diets warrants further study and consideration in complex emergency contexts where social networks and support have been fractured or weakened. Implementing partners should consider such interventions when conducting BHA-required gender analysis and ensure protection mainstreaming. For more guidance, see [USAID Advancing Nutrition's guidance on engaging family members in nutrition](#).

Suggested Further Research

This exploratory study has revealed several areas that warrant further study to better understand how agricultural interventions can be applied in complex emergency contexts to improve nutrition:

- **Conduct a study with a larger sample size or quasi-experimental design** to infer how the project affected observed outcomes. If feasible, design the project and evaluation to assess the effectiveness of each agricultural component (e.g., training vs. input distribution).
- **Further study of the influence of agricultural interventions on dietary diversity in complex emergency contexts** would also benefit from inclusion of other factors for which we did not have quantitative data, including how harvests were used and women's empowerment.

Chapter I. Introduction

Globally, there is broad recognition that humanitarian emergencies have become increasingly complex. This change has reinforced the need to maintain and protect agriculture, food production, and livelihoods to minimize the risk of further deterioration for households and communities living for prolonged periods in complex crises. Humanitarian assistance has prioritized funding agriculture in complex emergencies, but there is little evidence that these investments effectively improve nutrition outcomes in complex emergency contexts (FAO 2010; Catley, Henderson, and Radday 2021; Hall, Blankson, and Shoham 2011; Levine and Chastre 2011).

The evidence base for the effects of nutrition-sensitive agriculture on dietary and nutrition outcomes has grown in the past 15 years. Two systematic reviews concluded that nutrition-sensitive agriculture programs increased household and child dietary diversity through a range of interventions, including homestead production, production of biofortified crops, and livestock and dairy value chain interventions. In these programs, improvements were seen in agricultural production and consumption of nutrient-rich foods (Ruel, Alderman, and the Maternal and Child Nutrition Study Group 2013; Ruel, Quisumbing, and Balagamwala 2018). However, this empirical evidence is from development or nonemergency contexts.

The limited evidence available for agricultural interventions in emergency contexts raises questions of whether these impacts can occur in emergency contexts given three key differences between development and emergency programming: (1) emergency programs are short term, often funded for just one year at a time; (2) program participants in emergency contexts often face different challenges than those in developing contexts, including limited access to services and exposure to violence; and (3) emergency programs are implemented in less-than-ideal circumstances because these contexts often have fragile or weak enabling environments, including limited private sector investment and poor infrastructure (Catley, Henderson, and Radday 2021; Hall, Blankson, and Shoham 2011; Hendrix and Anderson 2021; Quak 2018). A recent systematic review of factors influencing implementation of nutrition-sensitive agriculture interventions showed that project implementation can be constrained by implementer and farmer capacity, a weak enabling environment, poor infrastructure, and shocks (Di Prima et al. 2022). Given the challenging contexts of emergency programming, understanding whether agricultural programs positively influence dietary intake in these contexts requires investigation. Importantly, in emergency contexts, the vast majority of programming has centered on addressing and meeting immediate basic needs for food and shelter. Although emergencies are becoming more protracted, there has not been a corresponding shift in improving the dietary diversity or diet quality that are essential to protecting and improving nutrition outcomes. This finding is particularly concerning for women and children: Infants and children are ultimately most at risk in terms of morbidity, mortality, and adverse long-term consequences. At the same time, nutrition stakeholders in emergency programming are gradually seeking opportunities to shift from the basic-needs paradigm—meeting caloric needs—to recognizing the need to improve diet quality. In protracted crises, achieving these intended outcomes is likely contingent in part on transforming agriculture interventions to become more nutrition sensitive. The question is whether improving dietary diversity in protracted crises through agriculture is possible, given the nature of short-term funding for emergency programming.

To investigate whether this agriculture-to-nutrition pathway applies to emergency contexts, **the Bureau for Humanitarian Assistance (BHA) engaged USAID Advancing Nutrition to explore whether nutrition-sensitive agriculture activities can improve dietary outcomes in complex emergency contexts** and how these activities could be designed to improve nutrition outcomes. The findings from this research provide BHA and its implementing partners with recommendations on how to better design nutrition-sensitive agriculture programs and interventions

and can also serve to refine and strengthen BHA’s emergency application guidelines on agriculture to be more nutrition-sensitive.

We chose to assess the associations between nutrition-sensitive agricultural activities and dietary diversity as an indicator of diet quality that can change in a short period of time. Indicators of nutrition status, such as stunting, are long-term indicators not appropriate for assessment in activities implemented for five or fewer years or for single-intervention activities (USAID Advancing Nutrition 2020).

USAID Advancing Nutrition conducted research with two BHA-funded activities. USAID Advancing Nutrition reviewed a range of projects with agriculture components that operate in complex emergency contexts.¹ We selected individual projects to examine under this activity based on the following criteria:

- The project was implemented in fiscal year 2021, and partnership was feasible given the project work plan and timeline.
- The project had a nutrition-sensitive agricultural component.
- It operated in a complex emergency context similar to other complex emergency contexts.
- The implementing partner and U.S. Agency for International Development (USAID) Mission were interested in the research activity.
- The project had received emergency funding.

Box I. Types of Emergencies

Slow-onset emergencies are gradual. They can be multiyear events in specific geographic areas known to be at risk, and early response is often inadequate to prevent them (LEGS 2014).

Rapid-onset emergencies occur with little or no warning. Impacts occur within hours or days (LEGS 2014).

Complex emergencies are associated with protracted political instability or internal or external conflict; they occur over years or decades (LEGS 2014).

The projects that we identified had food security and livelihood objectives for their agricultural activities rather than explicit nutrition objectives. The projects implemented agricultural components that address food security, which is an underlying determinant of nutrition and thus could influence dietary diversity. Because the projects did not have specific nutrition goals or actions, however, they are not nutrition-sensitive projects.² Hereafter, we will refer to the activities as *agricultural* rather than *nutrition-sensitive agriculture*.

A project implemented by Première Urgence Internationale’s (PUI) met this criteria: the Emergency Response to Food Insecurity for Lake Chad Basin Crisis-Affected Populations in the Far North Region of Cameroon (hereafter, “the project”). USAID Advancing Nutrition partnered with PUI to explore the relationship between dietary diversity for women and children and the agriculture interventions they delivered through the project. This report presents findings and recommendations from the cross-sectional mixed-methods study that USAID Advancing Nutrition conducted with PUI in 2021. This report is one of three: [A second report](#) presents findings from a similar study in South Sudan, and [the third report](#) presents a synthesis of findings across the two studies. This report provides background information about the context in chapter 2. Chapter 3 presents the research questions and methodology. Chapter 4 presents background on the project and findings from the project’s implementation. Chapter 5 presents the findings related to dietary diversity. Chapter 6 discusses the implications of these findings, and chapter 7 presents conclusions and recommendations.

¹ Food and Agriculture Organization defines *complex crises* as situations in which recurrent natural disasters or conflict (or both) lead to long food crises that threaten livelihoods (FAO 2010).

² A common definition of nutrition-sensitive agriculture interventions is, “those that address the underlying determinants of fetal and child nutrition and development ... and incorporate specific nutrition goals and actions” (Ruel, Quisumbing, and Balagamwala 2018).

Chapter 2. Background

In this chapter, we first outline the context in the Far North Region of Cameroon to provide context for the project implementation, then introduce PUI's project.

Agriculture for Nutrition in Complex Emergencies

Agriculture activities are typically implemented in complex emergency contexts to protect or strengthen livelihoods, food security, and nutrition (Catley, Henderson, and Radday 2021). BHA funds agriculture activities, including nutrition-sensitive agriculture, in emergencies to “address immediate emergency needs, enhance recovery, and contribute to the goal of preventing widespread food insecurity among vulnerable populations” (USAID BHA 2022d).

Although emergencies increase nutritional risk and can lead to an increase in acute malnutrition through a variety of pathways, an increase in food insecurity is a common issue in emergency contexts that can negatively affect nutrition outcomes (Delgado and Smith 2021; Khara and Mates 2013; IFPRI 2015; Quak 2018; USAID 2016). Food insecurity can be both a cause and a consequence of conflict; increasingly, food crises are occurring in conflict-affected and fragile contexts (Delgado and Smith 2021; Global Panel 2020; Hendrix and Anderson 2021; IFPRI 2015; Quak 2018). Decreases in agricultural production, weakened livelihoods and poverty, food price volatility, and market and supply chain disruptions contribute to food insecurity, while the specific factors leading to those issues vary depending on the nature of the crisis (e.g., violent conflict, climate shock, population displacement) (Hendrix and Anderson 2021; Global Panel 2020; USAID 2016; WFP 2020). Food system disruptions and food insecurity “lead to poor diets with low diversity, which in turn can contribute to all forms of malnutrition” (WFP 2020:2).

Agricultural activities are one approach that can be used in complex emergencies to help address food insecurity (USAID 2016). These activities can include input distribution and promotion of methods to increase adoption of improved crop and livestock production practices to increase yields, make agriculture more climate resilient, diversify crops, improve postharvest management, and improve marketing (USAID BHA 2022). Farmers in these contexts often face complex challenges that negatively affect production, including crop damage, restricted access to land, labor shortages, poor access to finance and banking services, limited access to high-quality inputs, and poor access to extension services. They further face challenges caused by weakened market and trade systems, including poor infrastructure, price volatility, and high transaction costs, as well as weak consumer demand and purchasing power (Global Panel 2020; Quak 2018).

As in development contexts, agriculture can support nutrition in complex emergencies through three key pathways to increased access to food. PUI's project worked through two of those pathways:³

- **Increased food production:** Agricultural production can help increase household agricultural yields and increase household crop diversity, which can in turn increase households' access to nutritious foods through their own production. As a result of increased yields or diversified production, households can: (a) have greater access to foods they commonly consume, (b) have greater access to foods they were not able to eat often previously, (c) reduce overall market purchases, or (d) diversify food purchases. Improved postharvest management can ensure that household production is safely stored for consumption (Herforth and Harris 2014; Quak 2018).

³ The project did not address the women's empowerment pathway.

- **Increased agricultural income:** Households can sell products from increased agricultural production to earn income. This extra income can enable households to: (a) increase the quantity of foods they typically purchase, or (b) diversify food purchases, including purchase of more expensive, nutritious foods, such as food from animal sources. Households also use this income to invest in other nonfood necessities that support nutrition, including health care and improved water and sanitation (Herforth and Harris 2014).

Far North Context

Complex Emergency

The Far North Region is one of 10 regions in Cameroon and has historically been isolated from other parts of the country (ODI 2017). It has disproportionately high rates of poverty, low school enrollment, and low levels of development and infrastructure investment compared with other regions of Cameroon (UNDP and OCHA 2018). The Far North is part of the Lake Chad Basin, which is in the midst of a complex emergency characterized by armed conflict, climatic shocks, and extreme poverty. The conflict has been ongoing for 11 years, stemming from the Boko Haram and the Islamic State of Iraq and Syria-West Africa insurgency in Nigeria, which has spread through the Lake Chad Basin. Organized, armed insurgent groups are active in the Far North, including Boko Haram, which increased attacks between February 2020 and February 2021 (ECHO 2021; USAID 2020).

The conflict has led to a humanitarian crisis, which has displaced 2.7 million people in the region and constrained and disrupted agricultural production, livelihoods, trade, and access to basic services and humanitarian assistance (Kah 2017; ODI 2017; USAID 2020). In the Far North, there were an estimated 321,886 internally displaced people (IDPs) as of September 2020 and 116,000 Nigerian refugees as of August 2020 (USAID 2020). In 2020, climatic shocks, such as flooding and the COVID-19 pandemic, further drove numbers of IDPs, which increased and exacerbated humanitarian assistance needs. Flooding destroyed farmland, homes, and infrastructure, and the pandemic led to increased staple food prices resulting from restrictions on movement and trade as well as delayed immunization campaigns (USAID 2020).

In March–September 2021, Famine Early Warning Network projected that there will be acute food insecurity (Integrated Food Security Phase Classification [IPC] 3) levels in Logone-et-Chari in the Far North, which reflects the anticipation that food consumption gaps will lead to high or higher-than-usual acute malnutrition or negative household coping strategies. In 2021, food insecurity was exacerbated by high staple food prices because of border closures with Chad; increased smuggling of crops to Nigeria; and disruptions to agricultural production and livelihoods from violence, insecurity, and floods (ECHO 2021; FEWS NET 2021c).

Livelihoods and Agricultural Production

The Far North is in the Sudano-Sahel agroclimatic zone, which has the lowest rainfall levels in the country (WFP 2017). Within this agroclimatic zone, the project operates in the northernmost livelihood zone in the Far North, the River Logone Flood Plain livelihood zone. This zone has flood plains from Lake Chad and the Logone River, although there has been a 60 percent reduction in flood waters in the past 30 years. The rainy season is March through October in a typical year, and the lean season is March through May (FEWS NET 2019).

The Far North has the highest poverty levels in the country, with 65.5 percent of households in the poorest wealth quartile. Nearly 75 percent of heads of household are not literate. Rural households in the Far North commonly experience shocks, such as delayed rains or drought and illness or death of a household member. Most households in the Far North rely on more than two sources of income (WFP 2017), and 26.7 percent rely on farming as an income source (WFP 2017).

Agricultural production is a main livelihood activity in the region. Nearly 80 percent of households engage in crop production (79.7 percent of male-headed households and 58.1 percent of female-headed households) (WFP 2017). On average, households in the Far North cultivate 1.7 hectares of land and primarily rely on rainfed production (WFP 2017). Rural land is largely governed by communal law. Traditional local leaders provide families with land, which is inherited patrilineally (USAID n.d.). Access to land is limited in the Far North, and women and youth in particular have limited access (Kenga et al. 2002; USAID n.d.; WFP 2017)

Fifty-seven percent of households engage in livestock production (WFP 2017). The main crops grown are millet (47 percent), sorghum (39 percent), maize (39 percent), groundnut (38 percent), and beans (33 percent) (WFP 2017). Grain crops are produced by men and women on land typically owned by men, and women may also cultivate their own fields. Women are particularly involved in seeding and are responsible for harvesting and postharvest processing. Men are largely responsible for vegetable production in gardens (Yossa 2016).

Crop diversity on farms is low, with farmers on average growing just 1.6 crop varieties (WFP 2017). Eighty percent of farmers have access to either manure (60 percent) or chemical fertilizer (just over 50 percent), and about 30 percent have access to improved seeds (WFP 2017). Crop yields are very low in the Far North due to crop disease, erratic rainfall, and constrained access to fields caused by instability (WFP 2017).

Producers primarily sell grain crops (WFP 2017). Both men and women sell grain and legume crops in the market, while men primarily sell fruit, imported rice, and meat and women primarily sell vegetables, roots, and locally produced rice (Yossa 2016). Markets near the borders with Nigeria and Chad are accessible in the River Logone Flood Plain, with crops like irrigated rice and onions primarily sold abroad in those markets (FEWS NET 2019).

Access to Health Services

Access to health facilities is poor in the Far North. Eighty-three percent of women 15 to 49 years of age in the Far North have faced significant challenges accessing health care, with obtaining money for transport and distance to a health facility being the most common (INS and ICF 2020). Facilities are more than a 30-minute walk for more than 60 percent of households (WFP 2017). Health service utilization is low during pregnancy and birth. In rural areas, 47.5 percent of women have fewer than four antenatal visits, and in the Far North, 40 percent of births are assisted by trained personnel (INS and ICF 2020).

Nutrition

In the Far North, 6 percent of women 15 to 49 years of age are underweight, and 10 percent are overweight or obese. Forty-three percent of women in this age range are anemic (INS and ICF 2020).

Malnutrition rates are higher among children than among women in the Far North. Thirty-seven percent of children younger than 2 years are stunted (have low height-for-age), 10 percent are wasted (have low weight-for-height), and 26 percent are underweight (INS and ICF 2020). Among children aged 6 to 23 months who were breastfed and nonbreastfed, only 10 percent had a minimum acceptable diet, 18 percent had minimum dietary diversity and consumed at least four food groups, and 46 percent consumed minimum meal frequency. Seventy-three percent had consumed vitamin A-rich food in the previous 24 hours, and 43 percent had consumed iron-rich foods (INS and ICF 2020). Consumption of eggs, legumes and nuts, flesh foods, dairy, grains, roots, and tubers is low (WFP 2017). Sixty-four percent of children aged 6 to 59 months have anemia (INS and ICF 2020). The World Food Programme (WFP) found that several factors are associated with low mid-upper-arm circumference scores in the country: the education level of parents (particularly the mother), access to improved drinking-water sources and sanitation facilities, household wealth, and household use of food-related coping strategies (WFP 2017).

Food Security

The Far North has the highest rates of food insecurity in the country, with 33.7 percent of the population experiencing moderate or severe food insecurity; 52.8 percent are marginally food insecure, and only 13.6 percent of households are food secure (WFP 2017). Own production and purchase are the main sources of grains for households in the Far North, while purchase is the main source for tubers. Households rely on markets for 45 percent of their food, which is lower than the national average (WFP 2017). A large portion of household expenditures are spent on food, with 64.2 percent of households in the Far North spending 75 percent or more of their monthly expenditures on food (WFP 2017). Households spend the largest portion of food spending on grains (e.g., maize, rice), followed by meat, fish, and tubers (e.g., cassava, yam) (FEWS NET 2019; WFP 2017). Availability of food in markets and food prices vary seasonally, and the reliance of refugees on markets for food further puts pressure on markets and increases prices (WFP 2017). Both men and women purchase foods in markets (Yossa 2016). In the River Logone Flood Plain, the most common foods poor households consume are sorghum from own production and in-kind payments, maize and cowpeas from market purchases and own production, and fish from own production (FEWS NET 2019).

Food security worsened from 2007 to 2017 across the country. In the Far North, the most common food consumption–related coping strategies that households employed were eating less preferred or less expensive food (80.2 percent), limiting portion sizes during meals (42.5 percent), and reducing the number of meals consumed per day (40 percent) (WFP 2017).

WFP outlines several interconnected factors that drive food insecurity in the Far North:

- **Recurring shocks:** Late rains or droughts, price increases for food and agro-inputs, plant and livestock diseases
- **Poor agricultural and livestock production:** Small farm sizes, low yields, low crop diversity, productivity affected by shocks
- **Poverty:** High reliance on agriculture and livestock production, high rates of poverty, low monthly per capita expenditures, high portion of income used on food purchases (WFP 2017)

Women's Empowerment

The Far North is patriarchal, and gender relations are unequal. In rural Cameroon, 77 percent of households are headed by men and 23 percent are headed by women. Education levels are low among men and women in the Far North, with only 5 percent and 1 percent having completed secondary school, respectively. Polygamy is relatively common in the Far North, with 32 percent of women having at least one co-wife. Fertility rates are 5.9 births per woman in the region, which decreases for women with more education and wealth. The portion of women who give birth between 15 and 19 years of age is 26 percent in the Far North (INS and ICF 2020).

According to sociocultural norms in the Far North, men are responsible for meeting their family's financial needs, and women are responsible for food preparation and are heavily involved in domestic tasks and chores (Yossa 2016). In the Far North, only 9 percent of women solely or jointly own a house compared with 51 percent of men, and only 11 percent of women solely or jointly own land compared with 49 percent of men (INS and ICF 2020). Men are the main income earners in the Far North, and 87 percent of women report that men primarily decide how to spend that income (INS and ICF 2020). Women can often solely decide how to spend the income they earn, with 75 percent of women reporting this finding (INS and ICF 2020). Women's participation in decision-making is limited: Only 36 percent of women participate in decisions about health seeking or significant household purchases, and 49 percent participate in decisions about visiting the woman's family (INS and ICF 2020).

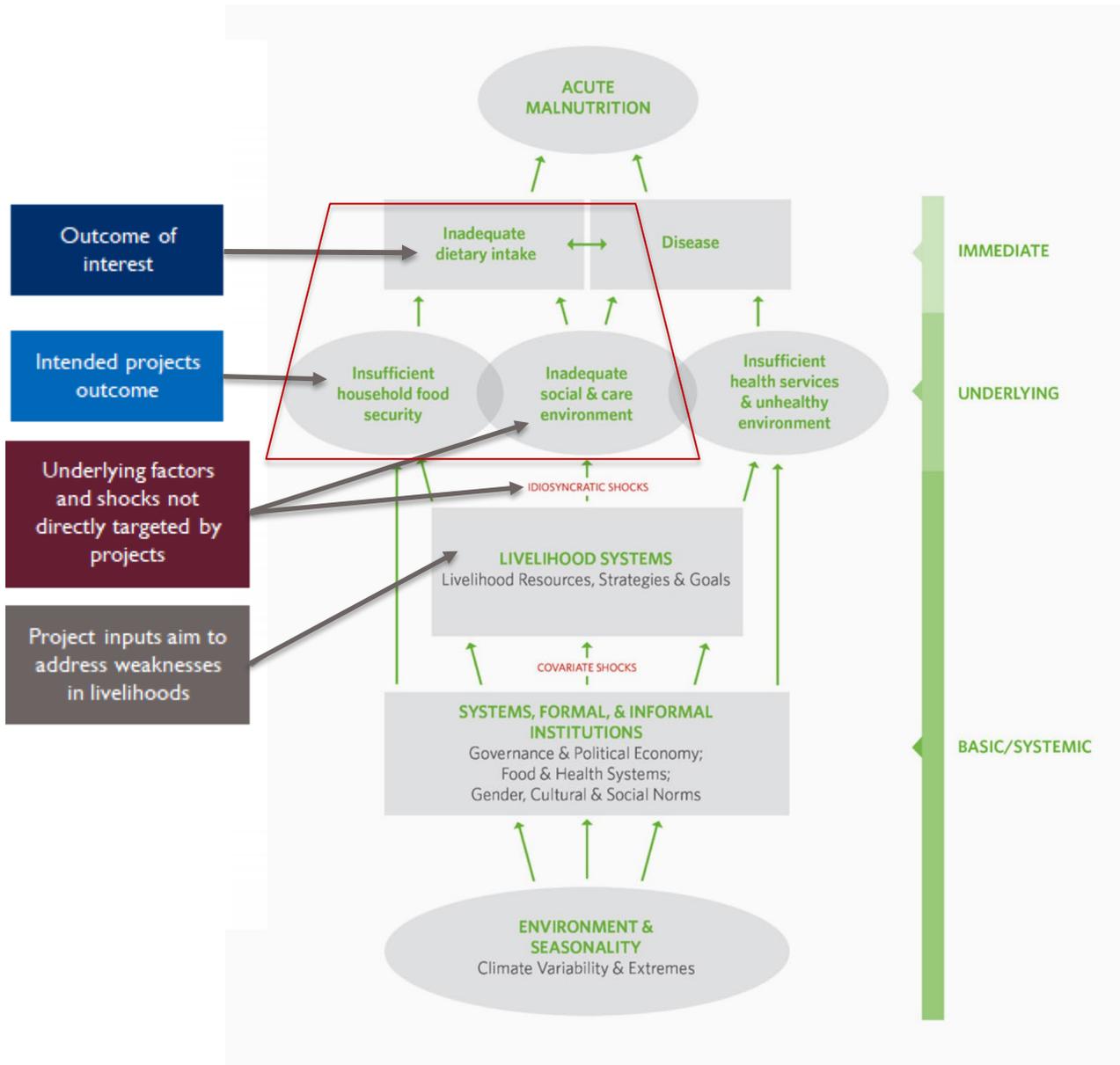
Chapter 3. Methodology

USAID Advancing Nutrition and PUI implemented a cross-sectional, mixed-methods study to understand the relationship between the project’s agriculture intervention and dietary diversity among women and children. As part of the collaboration with USAID Advancing Nutrition, PUI collected data on dietary diversity of women of reproductive age (18–49 years) and children (6–23 months) as well as women’s perceptions of social support using an endline household survey. To complement the household survey that PUI implemented, USAID Advancing Nutrition completed qualitative data collection to understand the “how” and “why” behind factors influencing dietary diversity and agricultural program implementation. These methods are discussed in more detail in the sections that follow.

Conceptual Framework

We reviewed potential conceptual frameworks in consultation with BHA to guide development of the research questions. We determined that it would be useful to use a conceptual framework rather than the project theories of change because the study is an exploration of the relationship between agricultural interventions and dietary diversity, an area not included in the project plan. This study is not a project evaluation, and a conceptual framework could help determine factors that might affect the relationship in question. In this study, we use Young’s conceptual framework for acute malnutrition in Africa’s drylands (2020). Although developed for drylands, the framework builds on the United Nations Children’s Fund’s (UNICEF’s) malnutrition framework, adding evidence that has emerged over the past 30 years and incorporating seasonality, resilience, and other underlying issues and drivers that are relevant beyond drylands contexts (Young 2020). We used this conceptual framework to determine the underlying and basic or systemic factors connected to our outcome of interest: inadequate dietary intake (as measured by dietary diversity). As shown in figure 1, we identified the components of the framework that the project targeted directly and related factors not directly targeted but that may affect dietary outcomes (as shown by the colored boxes). These mediating factors are idiosyncratic shocks and inadequate social and care environments. We used these categories to inform the research questions and data-collection instruments and to develop a more comprehensive understanding of the factors that influence dietary diversity in complex emergency contexts. While the project did not aim to improve the social and care environment or dietary intake, we explored whether they are associated with household food security to better understand the relationships among these domains. We explored two agricultural interventions to assess associations with dietary intake and determine when agricultural activities are appropriate to support nutrition in complex emergency contexts. However, because this is not a project evaluation, we were not limited to exploring the factors that the project aimed to address.

Figure I. Acute Malnutrition in Africa’s Drylands Conceptual Framework



Source: Young 2020, 15

Similar to the conceptual model illustrated in figure I, the project aimed to improve agricultural livelihoods in order to improve household food security. This study is interested in whether improvements in agricultural production and household food security translated into improvements in dietary intake. In the framework, two additional types of mediating factors lie along the pathway between livelihoods and dietary intake—idiosyncratic shocks and inadequate social and care environment. These two types of factors are relevant in complex emergency contexts.

Idiosyncratic shocks are those disruptions that affect individual households as opposed to communities. In protracted crises, households are typically more exposed and vulnerable to shocks that can negatively affect their livelihoods and health (Quak 2018). Food systems are typically weak in these contexts, and households may have to resort to negative coping strategies in the face of shocks (Global Panel 2020).

In complex emergencies, the social and care environment often undergoes stress or breakdown. This breakdown can adversely affect child nutrition because social support is a critical factor in caregiving and can be protective for maternal mental health. Mothers with greater social support have been found to have children with a more diverse diet in some contexts (Baye, Laillou, and Chitekwe 2021; Ickes et al. 2018; Matare et al. 2020). Social support networks in unsettled households can have an enabling effect on psychological well-being through several pathways (Posselt et al. 2019). In addition, social support, as part of maternal mental health interventions, has been found to reduce child stunting and underweight (WHO 2020; Mukuria et al. 2016). However, there is limited evidence of the relationship between social support and child dietary diversity in conflict-affected populations.

Research Questions

This study aimed to contribute information about how the project affected the dietary diversity of women and children in participant households and which factors influenced women’s and children’s dietary diversity. The project aimed to improve household food security through agricultural training and input distribution, which in turn had the potential to improve dietary intake. USAID Advancing Nutrition implemented the study to answer the following research questions:

1. Which factors influenced implementation of nutrition-sensitive⁴ agriculture interventions within emergency activities?
2. What is the prevalence of MDD among women of reproductive age (18–49 years) and of children (aged 6–23 months) in participant households?
3. What is the association between participation in the project⁵ and the dietary diversity of women of reproductive age (18–49 years) and of children (aged 6–23 months)?
4. Which household-level factors are associated with the dietary diversity of women of reproductive age (18–49 years) and of children (aged 6–23 months) in complex emergency contexts?
5. What is the association between the dietary diversity of women of reproductive age (18–49 years) and of children (aged 6–23 months) and maternal social support?

Qualitative Interviews (Research Questions 1, 3–5)

Data Sources and Sample

USAID Advancing Nutrition used semi-structured interviews to collect qualitative data from project participants. To determine the qualitative sample, we first selected villages from Kousséri Council and Makary Council because they had the largest portion of participant households (40 percent and 52 percent of participant households, respectively). Then, we selected the two villages per council with the highest number of women with low MDD for women scores because there were fewer women with inadequate MDD-W in these areas than in the endline sample. Within those villages, we prioritized selecting households with children 6 to 23 months of age and, when possible, selected households

⁴ During the course of this investigation, it was determined that PUI did not explicitly implement nutrition-sensitive interventions, although it monitored nutrition indicators.

⁵ The original version of the research question focused on the association between participating in the Farmer Field School (FFS) specifically and dietary diversity because participation varied among participant households. Nearly the entire endline sample participated in the FFS, however, so we were not able to complete analysis based on that. Instead, we used the portion of PUI-provided seeds planted as an indication of project participation.

where both the woman and the child had inadequate dietary diversity. Within each council, we aimed to interview six households with a woman or child who consumed a diet of minimum diversity and six households with a woman or child who did not consume a diet of minimum diversity, as measured through MDD-W and MDD in the endline survey. We were not able to reach this sample size for women with low dietary diversity, however, because some households were not available for interview at the time of data collection.

We interviewed a purposive sample of 24 households whose members were respondents in the PUI endline household survey (table 2). Fifteen of these households had a child 6 to 23 months of age (six had inadequate dietary diversity, and nine met MDD).⁶ Within these households, we interviewed 24 women of reproductive age (18–49 years) and 17 male household heads. Of the women interviewed, 10 had inadequate dietary diversity, and 14 met MDD. If a man was interviewed in the household, the man and woman participated in the initial sections of the interview on agricultural production and PUI participation. Then, the man was asked to excuse himself, and the researcher completed the interview with the woman.

Table 2. Qualitative Interview Sample

Household Category	Households (No.)	Female (No.)	Male (No.)
Households with a woman who met MDD-W	15	15	11
Households with a woman who did not meet MDD-W	9	9	6
Households with a child aged 6–23 months	16	16	13
Total households	24	24	17

A Cameroonian qualitative researcher was hired to complete data collection with the support of an interpreter. The interviews were conducted in Kotoko, Kanouri, or Arabic, depending on the informant’s preferred language. Two interpreters were engaged (one for each council), who translated between those languages and French for the qualitative researcher. The interviews were audio-recorded with permission from the informants. The qualitative researcher produced transcripts in French for coding and analysis.

The interviews covered the following primary topics:

- household agricultural production in the most recent off season (October 2020 to April 2021)
- household food access
- household mealtimes and intrahousehold food allocation
- women’s diets and decision-making about food
- children’s (aged 6–23 months) diets
- women’s experience of stress or worry and social support
- participation in the project and perceived effects.

⁶Six informants per category is likely to be sufficient to capture variation across groups (councils and those consuming and not consuming a diet of minimum diversity) based on available research, which has found that conducting interviews with 6 to 12 informants per respondent group is sufficient to reach data saturation (Guest, Bunce, and Johnson 2006).

Data Analysis

The research team imported the French interview transcripts into ATLAS.ti, a qualitative data analysis software package, to organize and code the data. Analysis of qualitative data began with coding text (i.e., categorizing data) that was related to a theme or concept of interest (thematic codes) or to a specific research question, subquestion, or objective (structural codes). The qualitative researcher developed the codebook and corresponding definitions. The codebook included both *a priori* codes (those identified before data analysis), which were informed by the research questions, and inductive codes (those that emerge from the data), which were developed based on the data. The codebook was finalized after coding an initial set of transcripts; the initial set was recoded based on the final codebook. The qualitative researcher coded all the French interview transcripts, and USAID Advancing Nutrition reviewed and revised the coding as needed for quality and consistency.

The qualitative researcher and USAID Advancing Nutrition used applied thematic analysis to identify the themes and patterns in the data (Guest, MacQueen, and Namey 2012). The qualitative researcher first conducted exploratory analysis of the coded data to identify common patterns, themes, and outliers that emerged from the data related to the research questions. Then, USAID Advancing Nutrition used structured matrices in ATLAS.ti to determine whether and how the emerging themes and patterns varied by respondent or household characteristics. Key respondent and household characteristics from the endline survey data were uploaded into ATLAS.ti to enable this analysis. This feature allowed us to compare and disaggregate responses by key factors, such as council, MDD-W, children's dietary diversity, household income, type of agricultural production, food security status, and level of social support. However, the primary disaggregation used was MDD-W. Throughout, we broadly indicated the portion of respondents across households who provided certain answers by saying “few” to indicate about a quarter or less, “some” to indicate around one-third to a half, and “most” to indicate around two-thirds to three-quarters of respondents. Illustrative quotes that are included in this report were translated by USAID Advancing Nutrition from French to English.

One household was excluded from the data analysis because of language barriers during the interview and the resulting risk of response bias because the respondent's husband was the translator during the interview.

Online Survey (Research Question 1)

Data Sources and Sample

USAID Advancing Nutrition administered an online Google Forms survey in French to collect information from project staff about the interventions implemented, perceived quality of training, perceived outcomes achieved, and implementation challenges faced. We used an online survey to obtain input from a broad set of PUI staff because PUI thought it would be more feasible than conducting phone interviews with staff. The survey included closed- and open-ended questions and is considered a qualitative method in this case because of the small sample size. The survey was developed in English and translated into French by one USAID Advancing Nutrition staff member; another staff member reviewed the translation.

We used convenience sampling: PUI management sent the survey link to staff and asked them to complete the survey. The consent statement at the beginning of the survey stated that the survey was voluntary and responses were anonymous. We received completed questionnaires from 18 PUI staff members. Of these, 2 respondents were project management, 4 were technical staff, and 12 were outreach or field staff (table 3).

Table 3. Online Survey Sample

Staff Category	No.
Project management	2
Technical staff	4
Outreach and field staff	12
Total staff	18

Data Analysis

USAID Advancing Nutrition cleaned the online survey data in Microsoft Excel. A USAID Advancing Nutrition staff member summarized the responses by question in English. When synthesizing the data on implementation, we triangulated the data from the online survey with project monitoring and evaluation data and related documents.

Quantitative Household Survey (Research Questions 2–5)

Data Sources and Sample

PUI conducted a household endline survey in March 2021 using the mobile data-collection platform KoboCollect and provided a clean data set to USAID Advancing Nutrition for this analysis. USAID Advancing Nutrition worked with PUI to include modules on dietary diversity, social support, and household shocks in the survey for this study. We are only able to use the endline survey data because these topics, including dietary diversity, were not measured at the baseline. Therefore we can only explore associations between the project and dietary diversity outcomes. We cannot assess changes in dietary diversity between baseline and endline or attribute differences in dietary diversity solely to the project. We used this cross-sectional household survey data to estimate prevalence ratios for the two primary outcomes of interest:

- Minimum Dietary Diversity for Women (MDD-W) of reproductive age (18–49 years), defined as consumption of 5 of 10 food groups in the previous day. The 10 possible food groups were (1) grains, roots, and tubers; (2) pulses; (3) nuts and seeds; (4) dairy; (5) meat, poultry, and fish; (6) eggs; (7) dark leafy greens and vegetables; (8) other vitamin A–rich fruits and vegetables; (9) other vegetables; and (10) other fruits (table 4).
- Minimum Dietary Diversity (MDD) for children (aged 6–23 months), defined as consuming five of eight food groups in the previous day. The eight possible food groups were (1) breast milk; (2) grains, roots, and tubers; (3) legumes and nuts; (4) dairy products; (5) flesh foods; (6) eggs; (7) vitamin A–rich fruits and vegetables; and (8) other fruits and vegetables (table 4).

Table 4. Food Group Categories Used for MDD-W and MDD Calculations

Women (Aged 15–49 years)	Children (Aged 6–23 months)
Food group (MDD-W categories)	Food group (MDD categories)
–	Breastmilk
Grains, roots, tubers	Grains, roots, tubers
Pulses	Legumes and nuts
Nuts and seeds	
Dairy	Dairy products
Meat, poultry, and fish	Flesh foods
Eggs	Eggs
Dark leafy greens and vegetables	Vitamin A–rich fruits and vegetables
Other vitamin A–rich fruits and vegetables	
Other vegetables	Other fruits and vegetables
Other fruits	

We used a 24-hour dietary recall to assess MDD-W and MDD. For MDD-W, one female household member of reproductive age (18–49 years) was randomly selected to complete the dietary recall. A child 6–23 months old of the selected woman was selected for MDD. If the selected woman had more than one eligible child, we randomly selected one child. We used a list-based 24-hour dietary recall approach in which the interviewer read the respondent a list of predefined sentinel foods and beverages categorized into food groups and asked if she had consumed any of the listed foods the previous day (FAO 2021). We used Diet Quality Questionnaire modules tailored for adults and children in Cameroon for this dietary recall (Herforth et al. 2019).

We also collected data on household demographic characteristics, food security, agricultural production, social support, and experience of shocks. Women’s social support was measured by an eight-item questionnaire adapted from the Duke—University of North Carolina Functional Social Support Questionnaire (Broadhead et al. 1988). The questionnaire measured different dimensions of social support, including confidante (someone to share and discuss important matters in life), affective (being shown love), and instrumental (such as having support to complete household chores) support measured on a 5-point Likert scale (Epino et al. 2012). The response options ranged from 1, “much less than I would like,” to 5, “as much as I like.” The overall score for each respondent was a simple sum of the responses, with a higher score indicating a perception of greater social support. A module on shocks measured whether the household experienced any shocks in the previous six months from a list of 17 shocks, which was based on a module from a United Nations Food and Agriculture Organization food security and nutrition survey in South Sudan.

To determine the sample size, the project team used the following formula:

$$n = t^2 \times p \times (1 - p) / m^2$$

where n was the minimum sample size to obtain meaningful results for a given event and risk level, t was the confidence level (the standard value of the 95% confidence level will be 1.96), p was the estimated proportion of the population with the characteristic (this proportion was set to 20 percent), and m was the margin of error (set at 10 percent).

The endline survey was conducted in 13 villages across 3 councils: Fotokol Council (1 village), Kousséri Council (6 villages), and Makary Council (6 villages). The sampling frame was a roster of participant households, and the household sample was selected using stratified random sampling. The sample was stratified to resemble the composition of participant households based on the sex of the household head (74 percent men and 26 percent women), host/IDP status (93 percent host community and 7 percent IDPs), and the proportion of beneficiaries per the three councils in which the project was implemented (50 percent for Kousséri, 40 percent for Makary, and 10 percent for Fotokol). A total of 267 participant households were surveyed. USAID Advancing Nutrition analyzed a subset of the data from 101 households that had complete data because household demographic information was available only for those households (taken from the targeting validation survey conducted in June/July 2020). Of those 101 households, 84 had eligible women for MDD-W, and 40 of those 84 had eligible children for MDD (table 5).

Table 5. Subset of Analyzed Household Survey Sample

Household Category	No.
Household sample with demographic data available	101
Household with woman of reproductive age interviewed for MDD-W	84
Household with child whose caregiver was interviewed for MDD	40

Data Analysis

All analyses were conducted using Stata statistical software, version 17.0 (StataCorp, College Station, TX). We calculated descriptive statistics (percentages or means and standard deviations [SDs]) to summarize all household factors, MDD-W, and MDD. The MDDs of women and children were calculated according to World Health Organization/UNICEF guidelines. Food security was measured using the Coping Strategies Index (CSI) (Maxwell and Caldwell 2008) and the Food Consumption Score (FCS) (INDDEx Project 2018). Both of these measures followed their standardized definitions. To assess the factors associated with the MDD of women and children, bivariate analyses were conducted for all categorical household variables using Chi-square (χ^2) tests; Fisher exact tests were conducted when the conditions for a χ^2 test were not met.

We estimated prevalence ratios with bivariate and multivariable Poisson regression analyses for MDD-W and MDD. For MDD-W, the outcome was defined as yes/no for women who reported MDD and those who did not over the number of women surveyed. MDD was defined as yes/no for children who met the conditions for MDD, as reported by their caregivers, and those who did not over the number of children in the survey. The multivariable analyses were conducted to control for confounding. We also assessed the association between social support and MDD-W and MDD, controlling for confounding factors. Covariates related to the program participation criteria and factors shown to be associated with dietary diversity in the literature that were collected in the survey were adjusted for in this analysis, including total social support, total number of crops grown, total area of crops grown, types of agriculture practiced, household size, head-of-household status, household monthly income, household monthly food expenditure, Coping Strategy Index score, household experience of shocks, head-of-household marital status, and whether the household had a vulnerable member. Associations were considered statistically significant at $p < .05$.

Ethics and Confidentiality

USAID Advancing Nutrition submitted the study for review by JSI Research & Training Institute, Inc.'s Institutional Review Board. The study underwent expedited review and was approved. The project

implementer obtained government clearance for the project and associated research. We also provided a letter informing the Cameroon Ministry of Health about the study.

An informed consent statement was included at the beginning of all data-collection activities to inform respondents that their participation was voluntary and to explain the purpose of the study, how the data will be used, and that participation involves minimal risk given the nonsensitive nature of the data we were collecting. The informed consent statement also stated that we will keep respondents' identity confidential to the maximum extent possible. We used a secure Google Drive folder to transfer and store the interview recordings and transcripts. We deidentified the transcripts before uploading them into ATLAS.ti.

The research team monitored COVID-19 transmission rates in Cameroon and followed national and USAID's Mission in Cameroon travel and public health guidelines. The research team took the following precautions during data collection:

- interviewed respondents outside and physically distanced (more than 2 meters)
- wore a mask when indoors and when traveling
- skipped a household if the respondent was sick (e.g., had a fever)
- regularly washed hands/used hand sanitizer
- did not work if sick (e.g., had a fever).

Chapter 4. Description of Project and Implementation Activities

In Cameroon, BHA funded PUI’s project implementation (see table 6). The project was implemented in the councils of Kousséri, Makary, and Fotokol in the Logone-et-Chari Department in the Far North Region. The project was implemented in two phases. This study covers phase 2 of the project’s agriculture component, which was implemented from April 2020 to March 2021.

The overall objective of the project was to improve the target population’s capability to withstand shocks through the provision of food assistance and access to improved agricultural activities for crisis-affected Cameroonian host population, IDPs, and out-of-camp Nigerian refugees. The project had three results and corresponding components:

- **Result 1.** Improve living conditions for the most vulnerable households through food assistance.
- **Result 2.** Respond to the urgent food needs of newly displaced vulnerable households and host communities in coordination with the Rapid Response Mechanism.
- **Result 3.** Reduce vulnerability to food insecurity through access to improved agricultural and [animal] breeding activities.

This study only looks only at result 3 and the corresponding agricultural interventions implemented under this result. The intended result for the agriculture component was to reduce vulnerability to food insecurity through access to improved agricultural activities. **The project did not aim to improve nutrition or dietary diversity among women and children.** In addition, this project presented an opportunity to explore whether agriculture interventions in complex emergency contexts can be an appropriate way to maintain, protect, and potentially improve nutrition outcomes, particularly given the short (12 months) time frame of project activities. Because the project did not have specific nutrition goals, any nutrition-related outcomes were a project by-product or positive, unintended outcome.

Table 6. Project Summary (Phase 2)

Project name	Emergency Response to Food Insecurity for Lake Chad Basin Crisis-Affected Populations in the Far North Region of Cameroon
Implementing partner	Première Urgence Internationale
Funding amount	\$1.5 million
Location	Councils of Kousséri, Makary, and Fotokol in Logone-et-Chari Department in the Far North Region
Period of performance	April 2020–March 2021
Participant household criteria for agriculture component	<ul style="list-style-type: none"> • Vulnerable households, including those with low income and a vulnerable member (e.g., pregnant or lactating women, person with disability, IDPs) • Willingness to participate in a community-based approach • Possession of basic agricultural knowledge, presence of an adult who is physically able to work, and access to agricultural land

Agriculture interventions

- Distribution of seeds (sorghum, cowpeas, tomatoes, onions, green peppers, okra, and Guinea sorrel)
- Distribution of tools (shovels, machetes, hoes, rakes, watering cans, buckets)
- Agricultural production training
- Farmer Field School (FFS) (training and demonstration plots on model farmer land)

Source: PUI 2020, 2021

Participant Selection

Phase 2 of the project's agriculture component was implemented from October 2020 to March 2021 to support farmers in off-season production. Participants came from a combination of those enrolled in phase 1 and continued to receive support and new participants who were enrolled in phase 2. In consultation with the Cameroon Ministry of Agriculture and Rural Development (MINADER), PUI selected the new villages for phase 2 based on their vulnerability and agricultural potential. Then, project participants were selected through a community-targeting process and subsequent validation through a household questionnaire. As shown in table 6, the interventions were aimed at households that had low incomes and a vulnerable household member (pregnant or lactating woman, person with a disability, or IDPs). Respondents also had to be willing to participate in the community-based Farmer Field School (FFS) approach, have basic agricultural knowledge, have an adult who is physically able to work, and have access to agricultural land (PUI 2021).

Agricultural Interventions

Farmers in all participant households received two agricultural production training sessions, which were delivered in collaboration with MINADER. The training covered sowing techniques, soil preparation, transplanting, types of amendments and fertilization, insect control, and making organic pesticides.

Participant households were also provided the opportunity to participate in the FFSs. The FFS approach empowers farmers to improve their decision-making capacity and foster adoption of agricultural innovations. The FFSs were facilitated by lead farmers, who were selected based on their literacy, agricultural experience, communication skills, and commitment. PUI and MINADER trained these lead farmers to be facilitators. Once trained, these farmers established and managed a community demonstration plot where farmers tested innovative agricultural techniques compared with common practices. PUI provided inputs for the demonstration plot. The lead farmers also facilitated weekly participatory learning and knowledge-exchange sessions with farmers. The sessions covered the full crop cycle and sought to develop agroecosystem analysis skills through field observations, analyzing and recording observations, presenting findings and conclusions, and discussing actions to take based on the conclusions (PUI 2020). Separate FFSs were held on food crop production and market gardening. Each group received seeds for staple or market garden production on a community plot. In phase 2, 11 FFSs focused on staple crop production, and 9 focused on market gardening, and participants joined the one closest to their home (PUI 2021).

The project distributed agricultural inputs to participant households for off-season production (September 2020 to March 2021). A total of 6,563 individuals received farm inputs in phase 2. Each participating household was provided with one of each of the following types of agricultural tools in August 2020: shovels, machetes, hoes, rakes, watering cans, and buckets. Participant households were also provided with seeds in September and October 2020. Households were provided with grain and legume seeds (8.25 kilograms of sorghum and 11 kilograms of cowpeas) and vegetable seeds (9 grams of tomatoes, 88 grams of onions, 176 grams of green peppers, 440 grams of okra, and 220 grams of Guinea sorrel). PUI solicited participant farmers' input on the choice of crop seeds to provide.

Based on lessons learned from phase I, PUI implemented a few other activities to address the agricultural constraints households reported. It worked with MINADER to negotiate with community leaders to allow free access to five plots for three years to facilitate communal production by project participants. PUI also built five boreholes on market gardening sites in agreement with beneficiaries, MINADER, and the Cameroon Ministry of Water and Energy. Finally, PUI helped organize participant farmers into a simplified cooperative.

Outcomes

PUI measured two outcome indicators for result 3, the agricultural component of the project, through baseline and endline household surveys:

- percentage of beneficiaries with a light Reduced CSI (rCSI)⁷
- percentage of beneficiaries who had an acceptable FCS.⁸

Both indicators exceeded the project targets at the endline. As anticipated, however, both indicators declined from the baseline to the endline. The percentage of beneficiaries with light rCSI fell from 65 percent at baseline to 47 percent at endline (the target was 40 percent). The percentage of beneficiaries with acceptable FCS decreased from 88 percent at baseline to 79 percent at endline. The declines in food security may be the result of the timing of the baseline and endline surveys and seasonal variation in food access at those times. The baseline survey was conducted in October 2020, which coincided with the end of the rainy season and the beginning of the harvest, while the endline survey was conducted in March 2021, which was the lean season.

Factors Influencing Implementation (Research Question 1)

The first research question was, “Which factors influenced implementation of the nutrition-sensitive agriculture interventions within emergency activities?” We used qualitative data from interviews with participants and from the online implementer survey to answer this question.



Key Findings

- In qualitative interviews, participant households predominantly had positive perceptions of the quality of the PUI implementation.
- The primary issue noted was the timing of the seed distribution, which occurred late in the season. In the online survey, implementing staff predominantly had positive perceptions of the quality of implementation and the likelihood of positive outcomes from project interventions.
- The main challenges affecting implementation were the short project duration, logistical issues, and limited community interest or involvement.

⁷ According to the *Indicator Handbook for Emergency Activities*, “The rCSI is a proxy indicator of household food insecurity that is based on a list of behaviors (coping strategies) that people do to manage their food insecurity situation. The index reflects both the frequency of each behavior (i.e., how many days over the last 7 days the coping strategy was used by any member of the household) and severity (i.e., how serious the strategy is relative to other strategies). The rCSI is based on a list of five food-related coping strategies” (USAID BHA 2021).

⁸ According to the *Indicator Handbook for Emergency Activities*, “The Food Consumption Score (FCS) is a composite score based on dietary diversity, food frequency, and the relative nutritional importance of different food groups. It is a proxy indicator for food intake. A questionnaire is used to ask respondents about the frequency of their households’ consumption of nine food groups over the previous seven days. To calculate the FCS, the consumption frequencies are summed and multiplied by the standardized food group weight. ... Households are then classified into three groups based on their weighted scores—poor, borderline, or acceptable—using the World Food Program recommended cutoff points” (USAID BHA 2021).

Qualitative

PUI project staff most commonly reported that having highly competent staff and a strong relationship with the community facilitated successful project implementation. Staff reported facing a range of challenges during implementation, but most challenges were reported by just a few staff members. The most common challenges reported were the short project duration, logistical issues, and limited community interest or involvement.

Most informants had positive perceptions of the quality of the training and FFS and found the content useful. A few informants emphasized that the training materials were accessible. For example, training materials with drawings illustrated the practices so that it was easy to understand, even for those who did not speak French. A few informants noted that they developed strong relationships with the lead farmer who facilitated the FFS and that that person remained a resource for them even after the project ended. Informants did not report negatives about the training or FFS.

The seeds were provided in October, after the dry season had started, which posed challenges for farmers with limited access to water. A few informants said that the quantity of seeds PUI provided was insufficient. One informant noted these two challenges saying:

We received seeds from Première Urgence—the pepper, onion, and then tomato. I sowed, but the water ran out quickly, because the seeds did not come at the right time. When we wanted to irrigate [the crops], there was no more water... . The seeds we received were in small quantities. They only covered a small [parcel]. (male respondent, Makary)

The implementing partner staff indicated that project impacts could be improved by improving the seed distribution (including the timing of distribution) and integrating nutritional awareness raising in the project, among other ideas. The informants primarily reported that future projects could help them by providing food. Other types of desired support that informants referenced were larger quantities of seed; agrochemicals inputs; and farm equipment, such as motorized pumps.

Chapter 5. Dietary Diversity Findings

In this chapter, we first present the characteristics of households with women ($n = 84$) or children ($n = 40$) in the survey. Then, we present the findings for each research question.

Household Characteristics

The household characteristics are presented in table 7. The mean age of women was about 30 years, and the mean age of children was about 13 months. The majority of women were married (approximately 88 percent), with an even split being in a monogamous marriage or in a polygamous marriage. The mean size of households was nearly 9. For the majority of households, the status of the household head was as part of the host community as opposed to an IDP (approximately 95 percent); most households had a vulnerable member (pregnant or lactating women, person with a disability, or IDPs) (approximately 87 percent), and the main source of livelihood was agriculture (approximately 99 percent). Approximately two-thirds of households practiced market gardening, which is off-season vegetable production on land that is in low-lying riverbeds or irrigated, primarily managed by men, and seen as an income-generating activity. Seventy percent of households practiced rainfed food production, and fewer than a quarter practiced off-season crop production. Approximately half of the households had a monthly household income of at least \$27.05 per month (15,000 African Financial Community [CFA] franc/month), and 60 percent of the households spent less than \$27.05 (15,000 CFA franc) on food per month. Eighty-five percent of households had acceptable food security, as measured by the FCS.

Table 7. Household Characteristics

Household Characteristic	% or Mean (SD)	No.
Woman's age, years	30.23 (8.52)	84
Child's age, months	13.05 (5.43)	40
Household size	8.78 (3.83)	84
Head-of-household status		
IDP	4.76%	4
Host	95.24%	80
Household has a vulnerable member (pregnant or lactating woman, individual with a disability, or IDP)	86.90%	73
Woman's marital status		
Divorced	3.57%	3
Married—monogamy	44.05%	37
Married—polygamy	44.05%	37
Single	3.57%	3
Widow	4.76%	4
Household monthly income, CFA franc		
<15,000	48.81%	41
≥15,000	51.19%	43

Household Characteristic	% or Mean (SD)	No.
Household monthly food expenditure, CFA franc		
<15,000	60.71%	51
≥15,000	39.29%	33
Main source of livelihood		
Agriculture	98.81%	83
Trade	1.19%	1
Type of agriculture practiced		
Rainfed food production	70.24%	59
Off-season crop production	21.43%	18
Market gardening	67.86%	57
CSI	6.14 (7.99)	84
FCS		
Poor	3.57%	3
Borderline	10.71%	9
Acceptable	85.71%	72

Prevalence of Minimum Dietary Diversity (Research Question 2)

The second research question was, “What is the prevalence of MDD among women of reproductive age (18–49 years) and of children (aged 6–23 months) in participant households?” Dietary diversity is our main outcome of interest as an indicator of the quality of diets.



Key Finding

The majority of women and just over half of children in the sample had MDD.

About 74 percent of women of reproductive age (18–49 years) had MDD, and about 53 percent of children (aged 6–23 months) had MDD (see table 8). The mean number of food groups women consumed was 5.4 of 10, while for children it was 4.5 of 8. For women, the two most consumed food groups were grains, roots, and tubers (100 percent) and meat, poultry, and fish (96 percent), while eggs were the least consumed food group (4 percent) (see figure 2). For children, the two most consumed food groups were breast milk (98 percent) and grains, roots, and tubers (73 percent), with eggs being the least consumed food group (3 percent) (see figure 3).

There was no significant difference between MDD-W and MDD for pairs of women and their children. Of the women who had a child aged 6 to 23 months, 50 percent of those who had MDD also had a child who had MDD. For women who had inadequate dietary diversity and a child aged 6 to 23 months, about 56 percent had a child who had MDD (see table 9).

Table 8. Prevalence of Dietary Diversity

MDD	%	No.
Women		
<5 food groups	26.19	22
≥5 food groups	73.81	62
Children		
<5 food groups	47.50	19
≥5 food groups	52.50	21

Table 9. Women’s Dietary Diversity by Children’s Dietary Diversity

Children’s MDD	MDD-W*			
	<5 Food Groups		≥5 Food Groups	
	%	No.	%	No.
<5 food groups	44.44	4	50.00	15
≥5 food groups	55.56	5	50.00	15

*There was one case of a child aged 6–23 months who did not have a woman aged 18–49 years in the household; therefore, the total count for this table (N = 39) is less than the total number of children aged 6–23 months surveyed (N = 40).

Dietary diversity was not measured at baseline, so no comparison or attribution of project impact is possible. The rates of MDD in this sample may be higher than the average in the Far North Region of Cameroon. For example, in the most recent Demographic and Health Survey conducted in 2018, only 18 percent of children aged 6 to 23 months in the Far North consumed at least four food groups (INS and ICF 2020) compared with just over half of children consuming at least five food groups in our sample.

The endline household survey was conducted in March 2021. This was at the end of the off-season production, so households may still have had access to crops grown in dry season gardens. The lean season started in February 2021, and off-season harvests were below average, which further constrained food security during this period. Crisis levels of food insecurity (IPC phase 3) were expected in the Far North during the 2021 lean season, as well (FEWS NET 2021a).

Figure 2. Women’s Consumption of Food Groups (N = 84)

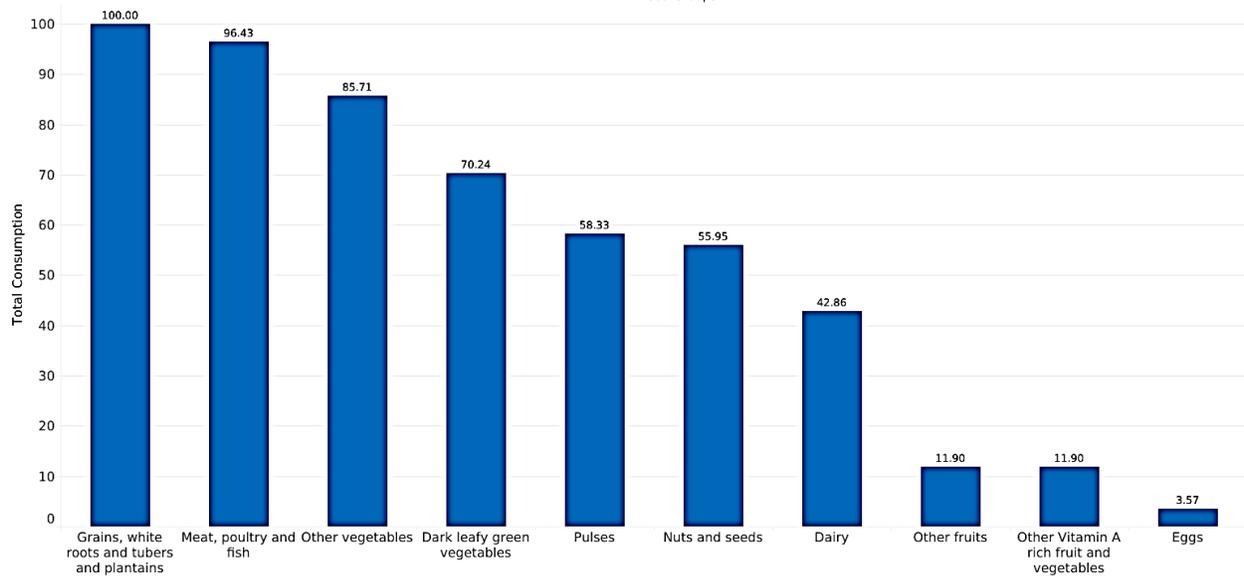
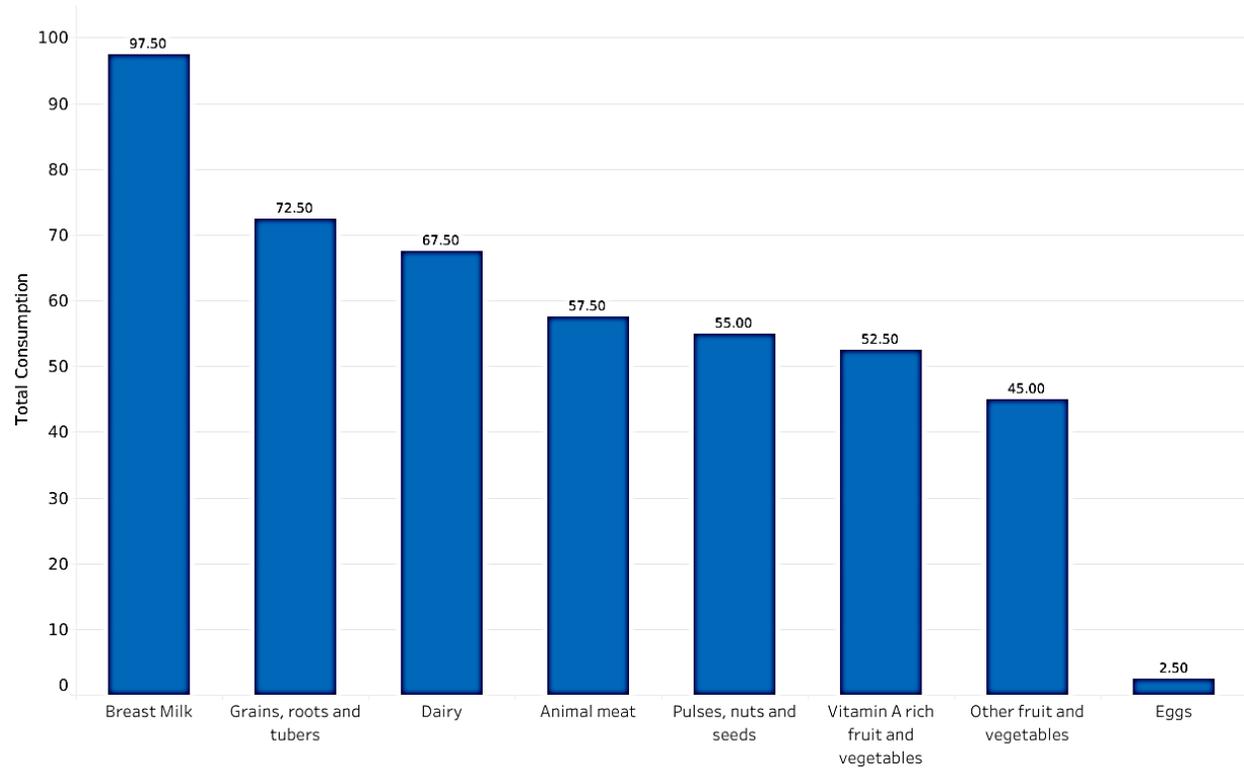


Figure 3. Children’s Consumption of Food Groups (N = 40)



Association between Project Participation and Dietary Diversity (Research Question 3)

The third research question was, “What is the association between participation in the project and the dietary diversity of women of reproductive age (18–49 years) and of children (aged 6–23 months)?” Although we cannot attribute dietary diversity to the project or determine which project components most influenced dietary diversity, we explored the associations between project participation and dietary diversity and presented qualitative data on informants’ perceptions of the project’s influence on their agricultural production, food security, and diets. We used quantitative data from the household endline survey and qualitative data from interviews with participants to answer this question.



Key Findings

- Planting at least half the seeds the project provided was positively associated with the prevalence of MDD-W for women of reproductive age (18–49 years), although this association was not statistically significant when controlling for household and other factors. Planting more than half the seeds received was negatively associated with the prevalence of MDD for children aged 6 to 23 months.
- In qualitative interviews, most informants reported adopting some of the agricultural practices taught by PUI and said that planting the seeds received and adopting new practices improved their yields. The improvement in yields influenced diets through improved access to food from their own production and through increased agricultural income.
- Taken together, the quantitative and qualitative data suggest that the project had a positive influence on MDD-W.

Quantitative

As noted in chapter 2, the PUI agriculture intervention had three principal components (see chapter 4 for details):

- distribution of seeds and tools
- agricultural production training
- FFS (training and demonstration plots on model farmer land).

Almost all (97 percent) households had a member participate in the FFS. As a result, we cannot measure the effect participation in the FFS may have on dietary diversity. Alternatively, two other project activities that household members participated in were agricultural production training and planting seeds that they received from PUI. Almost all (98 percent) households participating in the survey had a member who participated in agricultural production training.

Additionally, almost all most (98 percent) households that had an eligible woman received seeds (see chapter 4 for eligibility criteria). Of those households, nearly 88 percent planted their seeds, with 66 percent planting more than half their seeds. There was a significant difference in the quantity of seeds households planted and the dietary diversity of women but not children (table 10). In bivariate analyses, planting more than half the seeds received was positively associated with MDD-W—namely, a 56 percent increase in MDD-W. There was a negative but not statistically significant association with MDD. After adjusting for household factors, planting more than half the seeds received no longer had a statistically significant association with MDD-W (table 11). We did not conduct a multivariable analysis for MDD because of the small sample size.

Table 10. Bivariate Association of Dietary Diversity by Quantity of Seeds Planted

Quantity of Seeds Planted	MDD-W*†				MDD†			
	<5 Food Groups (n = 17)		≥5 Food Groups (n = 55)		<5 Food Groups (n = 15)		≥5 Food Groups (n = 17)	
	%	No.	%	No.	%	No.	%	No.
Half or less	59.09	13	25.00	15	16.67	3	42.86	9
More than half	40.91	9	75.00	45	83.33	15	57.14	12

*Significant at $p < .05$.

†n = 82 for MDD-W; n = 39 for MDD.

Table 11. Association between Women’s Dietary Diversity and Quantity of Seeds Planted, Adjusted for Household Factors

Planted More Than Half the Seeds Received from PUI*	Crude Probability (95% Confidence Interval [CI])	Adjusted Probability (95% CI)†
MDD-W	1.56 (1.08–2.25)‡	1.29 (0.91–1.83)
MDD	0.59 (0.35–1.02)	not applicable (N/A)
MDD-W	1.56 (1.08–2.25)‡	1.29 (0.91–1.83)

*n = 82 for MDD-W; n = 38 for MDD.

†Adjusted for total social support, total number of crops grown, total area of crops grown, types of agriculture practiced, household size, head-of-household status, household monthly income, household monthly food expenditure, CSI, household experience of shocks, head-of-household marital status, and whether the household has a vulnerable member.

‡Significant at $p < .05$.

The mean number of seed varieties households with a participating woman received was 3.63, with tomato (60 percent) and pepper (61 percent) being the most common type of seeds received (table 12). Of the households surveyed, 36 percent received only grain and legume seeds, 48 percent received only vegetable seeds, and 14 percent received both grain and legume and vegetable seeds (table 13). There was no statistically significant association between the type of seeds a household received and MDD-W or MDD (table 14).

Table 12. Types of Seeds Received (N = 82)

Type of Seeds Received	%	No.
Sorghum	48.78	40
Cowpea	51.22	42
Guinea sorrel	42.68	35
Okra	51.22	42
Tomato	59.76	49
Pepper	60.98	50
Onion	57.32	47

Table 13. Types of Seed Categories Received (N = 82)

Types of Seeds Received	%	No.
Grains and legumes only	36.59	30
Vegetables only	48.78	40
Both grains and legumes and vegetables	14.63	12

Table 14. Bivariate Association of Dietary Diversity by Type of Seed Received

Types of Seeds Received	MDD-W*				MDD*			
	<5 Food Groups (n = 22)		≥5 Food Groups (n = 60)		<5 Food Groups (n = 18)		≥5 Food Groups (n = 21)	
	%	No.	%	No.	%	No.	%	No.
Grains and legumes only	45.45	10	33.33	20	38.89	7	42.86	9
Vegetables only	45.45	10	50.00	30	38.89	7	47.62	10
Both grains and legumes and vegetables	9.09	2	16.67	10	22.22	4	9.52	2

*n = 82 for MDD-W; n = 38 for MDD.

Figures 4 and 5 show the percentage of women and children, respectively, in households receiving relevant seed varieties who consumed different food groups. In more than half (64 percent) of the households that received Guinea sorrel, women consumed dark leafy greens. Of those that received sorghum, 78 percent reported consuming grains, roots and tubers. Most (76 percent) of those households that received okra reported consuming “other vegetables” (meaning other than dark green leafy vegetables, which includes okra and others mentioned here); 75 percent that received tomato reported consuming other vegetables; 74 percent that received pepper consumed other vegetables; and 75 percent of those that received onion consumed other vegetables. Nearly half (49 percent) of those households that received cowpea reported consuming pulses. The proportion of women consuming those foods was higher for households that received the seeds than for households that did not receive the seeds, implying that receiving seeds increased women’s consumption of those foods.

Of the households with a child participating in the survey, only 33 percent of those that received sorghum reported the child consuming grains, roots, and tubers; approximately 20 percent of those that reported receiving okra, tomato, pepper, or onion reported the child consuming “other fruits and vegetables”; 26 percent that received cowpea reported the child consuming pulses, nuts, and seeds; and 23 percent that received Guinea sorrel reported the child consuming vitamin A–rich fruits and vegetables. Similar to the women, a greater proportion of children in households receiving certain types of seeds consumed those foods than children living in households that did not receive the seeds.

We do not know the baseline levels of dietary diversity among participants, so we cannot infer an increase in dietary diversity resulting from the intervention. In addition, we do not know the proportion of each seed variety participants planted.

Figure 4. Women’s Consumption of Food Groups by Seed Varieties Received

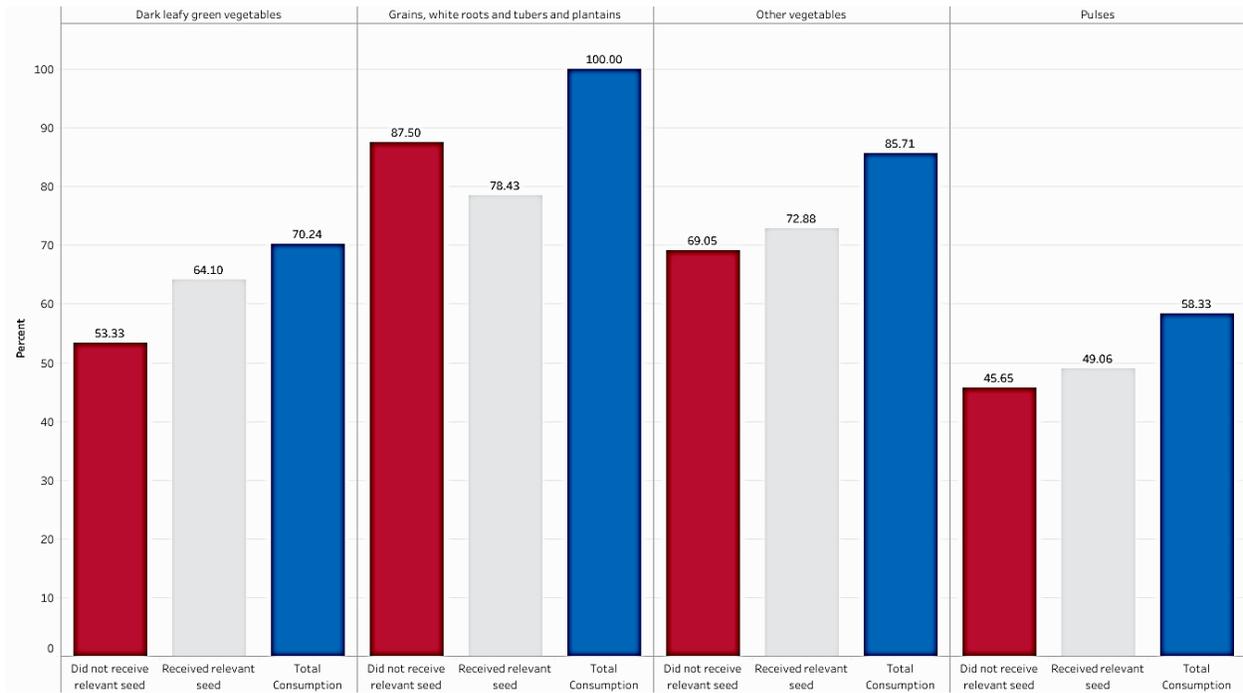
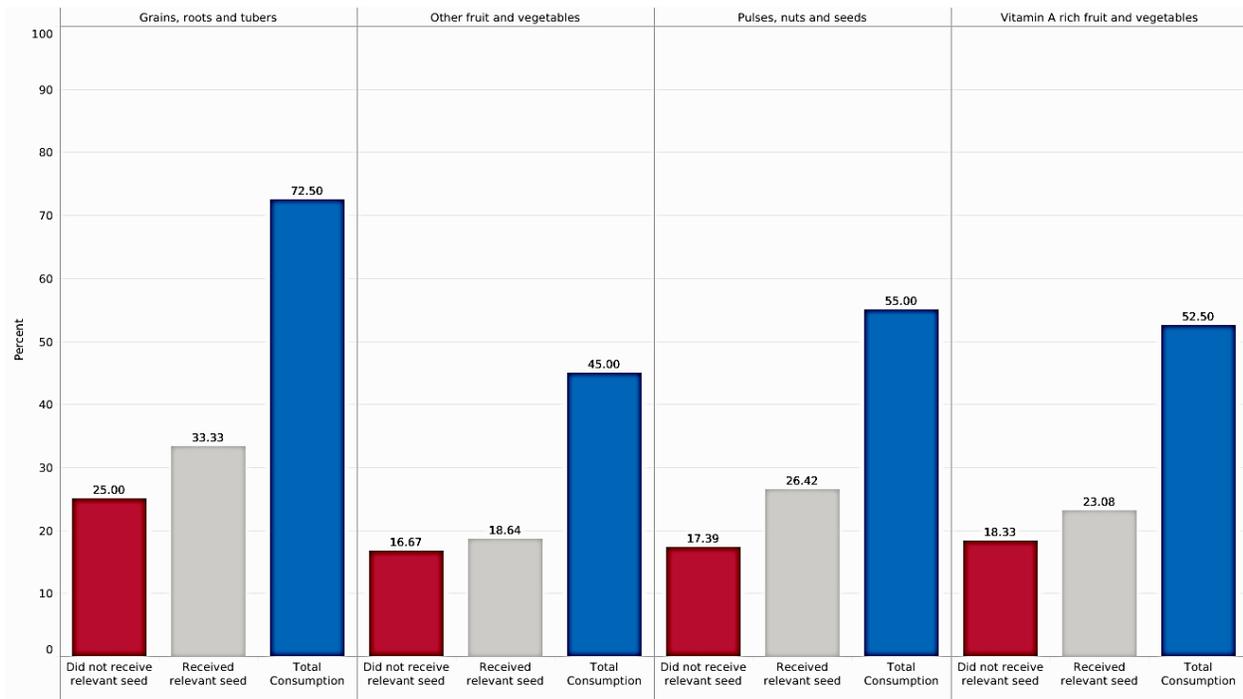


Figure 5. Children’s Consumption of Food Groups by Seed Varieties Received



Qualitative

In the qualitative interviews, we asked informants to describe their experiences participating in the project, how it affected their agricultural production, and what benefits they experienced. First, we discuss how informants participated in the project and which agricultural changes they made as a result of this participation. Then, we present how informants thought participation influenced their food security and diets.

Project Participation and Agricultural Changes

Although all farmer households participated in agricultural production training and most opted into the FFS, there was more variation in seed utilization.

Seed Use

Informants reported using the seeds PUI provided in several ways: sown during the off-season, saved to grow during the rainy season, consumed, sold, or gifted. Most informants reported planting the seeds they received.

A few informants noted that they were testing the seeds when they planted them to see if the seeds were of good quality. One farmer described how he tested the onion and okra seeds he received:

[I] only used a little [of the] onion seed [and] a little of the okra [that] [I] tested. [I] tried because [I] irrigated, as soon as [I] planted the] onions, [I] wanted to experiment with the grains there [to see if they] were the good quality seeds, but as soon as [I] planted] it really produced (male informant, Makary).

Those who did not plant any or all the seeds they received from PUI had various reasons for not planting.⁹ The primary reason was that the seeds were provided in October 2020, which farmers said was late for off-season production, which started in September 2020. By the time informants received the seeds from PUI, they said that the water levels had decreased since the rainy season,¹⁰ so there was a risk that the crops would not produce well. All the vegetable seeds PUI provided require regular watering. As one farmer noted, “We received the seeds, but the seeds arrived very late. Despite all that we tried, part of it produced [but] it did not reach maturity due to the rain, the water is finished” (male informant, Makary). The risk of planting the seeds late, however, varied both by the type of land to which the farmers had access and the type of crop. The highest risk was for farmers who produced vegetables for market gardening on land that was far from a riverbed and thus required significant irrigation. These farmers ran the risk that the water source they used for irrigation, such as a borehole, would run dry before the crops matured. This issue was acute for farmers in Makary, where land is farther from water sources than in Kousséri, which is near the banks of the Logone River. Planting late was of moderate risk for farmers planting the grains and legume seeds because the grains and legume crop varieties provided are more drought tolerant than the vegetable varieties. Planting late carried only a minor risk for farmers with access to land for market gardening on the banks of the Logone River or other water bodies because access to water is of less concern in these areas.

A few informants, including a refugee household, said that they did not grow the seeds because they did not have sufficient access to land. One informant said that they gifted the seeds to a neighbor because they had already planted by the time they received the PUI seeds and lacked the labor and land to plant more seeds. Another informant consumed the bean seeds they received and saved the rest for the next planting season.

⁹ The seed quantities distributed by PUI were enough to plant more land area than most farmers reported having access to. While informants did not report receiving more seeds than they needed, it is possible that this contributed to some farmers not planting all of the seeds they received.

¹⁰ In the River Logone Flood Plain livelihood zone, the rainy season is March through October in a typical year (FEWS NET 2019).

Agricultural Production Changes

Household heads participated in the training, so the majority of the participants were male. A few female household heads noted that it was difficult to attend the training because of time constraints. Informants reported learning about a range of agricultural production topics during training and the FFS, including soil fertility management, pest control, land preparation, and planting techniques. A few informants noted that the training content addressed the increasing risks to agricultural production they face from climate change and reduced soil fertility (in part a result of greater pressure on the land, which is reducing crop rotation and the ability to let fields lie fallow). The informants largely did not differentiate between what they learned from the training versus what they learned in the FFS.

In the online survey, PUI staff reported covering a range of topics in the agricultural training they provided to participants, with a focus on agroecological practices. The following were the most common topics reported:

- **Preparation and planting:** Crop and seed selection, land preparation, and planting and sowing
- **Crop production:** Crop growth and development; irrigation; application of agrochemicals; and soil, water, weed, disease, and pest management
- **Post-production:** Harvesting, post-harvest storage, and processing.

A minority of implementers reported including nutrition information in training, including on dietary diversity and food safety and hygiene.

PUI staff reported that they thought the primary benefits of the training for farmers were increased agronomic knowledge, improved sustainability of agricultural practices, and increased crop diversity and yields. They reported that the demonstration plots, as part of the FFS, provided farmers with increased confidence and ability to try new practices and hands-on experience with sustainable practices.

A few farmers emphasized that they learned a lot from the training. A few also reported sharing what they learned in the training with other household members who did not participate. One farmer described gaining enough confidence in their agricultural production to adopt the new practices. The farmer said, “Before, in my household, we relied on luck when we cultivated, but the training gave us more assurance and certainty about the crops. Première Urgence succeeded in this sense because, thanks to their advice, we harvested the quantities we hoped for” (male informant, Kousséri).

Informants reported a range of agricultural production changes that they made or planned to make after completing the training and FFS, as shown in table 15. Although most informants explicitly reported adopting new agricultural practices, a few noted that they were not able to apply the new practices in the 2020–21 off-season and planned to apply the new practices during the 2021 rainy season. Most commonly, farmers reported making and applying organic fertilizer and organic pesticides. A few informants reported growing plants in rows rather than planting beds.

Table 15. Agricultural Practice Changes Reported by Interview Informants

Type	Description	Illustrative Quote
Land preparation	Farmers described switching from forming planting beds (<i>les carreaux</i>) to forming ridges to plant in because the ridges allow production in waterlogged soils while retaining water in the furrows. The training helped dispel farmers' concerns that using ridges does not allow dense planting and is thus a less efficient use of land.	"Before, we made our planting beds like that, we did not put the ridges. Today, they have shown us that if we do that, we have to lift the ridges because the water must not touch the plant, otherwise it risks [the plants/crops] may not [grow]. Before, this was what used to delay the growth of the plants. With all that, [we] also tried to make the plant beds with the ridges and plant beds without ridges. We found that plant beds with ridges performed well, unlike plant beds without ridges." (male informant, Makary)
Sowing/ plant spacing	Farmers described changing how they planted. In the training, they said that they were taught to plant in a line and to have proper spacing between plants.	"It was effective. It was easy because we were shown the distancing for pepper; so, how to plant the pepper. Before we planted in a non-aligned way, now [we apply] planting in lines and well-spaced, so we respected the spacing, [and] it produced a lot." (male informant, Kousséri)
Soil fertility	Farmers reported using organic practices to increase soil fertility, such as making compost out of household waste or using animal manure to fertilize their land.	"I applied the technique of pouring [organic] waste on the field, and it makes the harvest good ... I tried and it worked. I think it [gave me] more harvest, that's why I'm going to continue with this." (male informant, Kousséri)
Pest control	Farmers also tried making organic pesticide, as taught in the training. They used neem tree (<i>Azadirachta indica</i>) leaves to make an organic pesticide to control pests.	"I have even already started using the leaves of the neem tree there to chase insects [away]." (female informant, Kousséri)

Changes in Food Security and Diets

Informants largely reported success trying new practices that they learned about and using the seeds PUI provided. They reported several types of benefits that resulted from the PUI support. These benefits demonstrate multiple agriculture-nutrition pathways at work that may have influenced informants' diets and the diversity of foods they consumed. The primary pathways are through food production and agricultural income (Herforth and Harris 2014), as shown in table 16; the project did not address the women's empowerment pathway. The direct benefits stemming from improved production from the training are likely to be more sustainable than those from growing the seeds that PUI provided.

Some informants reported an increase in yields resulting from the agricultural practices they adopted after the PUI training and the additional seeds they received from PUI. The increase in yields improved access to food through production, according to informants. Although informants reported an increase in yields, they did not report that they were able to diversify production as a result of project participation. Crop diversity remained low, with endline survey data showing that households only grew an average of 1.96 crops in the last off-season.

Increased access to agricultural income and savings from not purchasing food also enabled a few informants to purchase more diverse foods than they otherwise would have. In addition to keeping some crops for consumption, the increased yields enabled a few households to sell more crops. In particular, informants discussed selling vegetables produced in market gardens. Market gardening is primarily seen as an income-generating activity. Informants also noted a motivation to sell vegetables because they do not store well. Although married women typically do not have customary rights over land, market gardens are primarily managed by women, and vegetables such as okra, Guinea sorrel, tomatoes, and peppers are seen as women’s crops, so this provided an income-generating opportunity for women. Along the edge of the Logone River, however, where the land is well suited to off-season production, market gardening tends to be more male dominated. Women typically had control over the income from market gardening sales if they were the ones who managed the garden. A few informants also said that they were able to save money from not having to buy vegetables. A few informants also reported cost savings from not having to buy tools or agrochemical inputs as a result of the tools they received from PUI and the organic practices they learned. They were then able to use the money they saved to purchase food, such as meat, fish, pasta, groundnuts, beans, or fruit, or pay for other household expenses, such as children’s school fees or medical expenses.

Table 16. Agriculture-Nutrition Pathways Reported by Interview Participants

Agriculture-Nutrition Pathway	Link to Diets	Illustrative Quotes
Improved food access from own food production		
Increased yields	Increased yields improved access to food from their own production. Informants said that in some cases, this improvement enabled them to increase the quantity of foods they consumed.	<p>“It has evolved a lot, we have benefited a lot because before we were not trained, [now] we were supported. I [harvested] five bags sometimes, [but] with the support, we ended up with 50 bags. It was beneficial [as] it increased the [amount] of food in my household.” (male informant, Makary)</p> <p>“The project has helped us a lot. In the sense that our production has increased a lot. Before, we [prepared many] hectares but the production was not good. Now, [on] just a small portion, the harvest is very good. We really appreciated the training, and the seeds were of good quality, too. It produced a lot, the production was enormous.” (female informant, Kousséri)</p>
Improved access to food through agricultural income		
Increased sales	Increased sales from agriculture provided households with more income to purchase additional food and, in some cases, more diverse food.	<p>“Apart from daily food, with the Première Urgence project, there are also the [food] varieties that we continued to buy as needed. As soon as we produce a certain quantity, we bring it to the market. We buy other foods that we would not eat before, such as meat. We change our food from time to time thanks to the project.” (male informant, Kousséri)</p>

Increased savings/income available for other purposes	Increased savings from not having to buy vegetables in the market and lower agricultural input costs enabled households to use these savings on food or other household expenses.	“Before, we even bought hibiscus leaves, [and] even okra at the market. But with the Première Urgence project, we are sowing our hibiscus and our okra. We do not buy anymore. So the money we [would use to] buy okra, we buy something else with it.” (male informant, Kousséri)
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In the online survey, PUI staff reported that they thought the main outcomes participants experienced as a result of the project were increased crop yields and improved food security, which aligns with the participants’ interview responses.

Despite the positive outcomes reported by informants, they still noted several challenges that continued to limit their agricultural production and crop sales. These challenges included limited labor available in the household and the high labor demands on women, who are largely responsible for market gardening in addition to household chores. Another challenge was insufficient access to water through land located near a water source or access to boreholes or motorized water pumps to use in their gardens. Other challenges were largely related to external factors that the project did not seek to influence, including limited access to land with access to water and risk of crop destruction by hippopotami that are attracted to the smell of vegetables. Crop sales were also constrained by border closures with Chad and Nigeria because of the COVID-19 pandemic; also, sale prices were lower because the more lucrative cross-border market opportunities were out of reach during this period.

Household-Level Factors Associated with Dietary Diversity (Research Question 4)

The fourth research question was, “Which household-level factors are associated with the dietary diversity of women of reproductive age (18–49 years) and of children (aged 6–23 months) in complex emergency contexts?” To answer this question, we used quantitative data from the household endline survey and qualitative data from interviews with participants and the online implementer survey.



Key Findings

- Bivariate analyses showed that household size, quantity of seeds planted, and mother’s social support were positively associated with MDD-W. Total area of crops grown, child’s age, mother in a monogamous marriage, and number of shocks experienced were positively associated with MDD.
- The qualitative data show that food access at the household level influences diets, while household coping strategies, food preferences, and perceptions of “good” foods differentially influence women’s and children’s diets.

Quantitative

We explored bivariate associations between MDD-W and MDD and household characteristics. As shown in table 17, household size was significantly associated with women’s dietary diversity. Women who met MDD were more likely to live in a larger household (mean, 9.27 members; SD, 3.98), which can be explained by the positive effects larger households (resulting from the presence of grown-up children or polygamy) can have on the increased availability of labor for agricultural production. Other

household factors, such as food security status, income, and number of household shocks experienced, were not significantly associated with MDD-W.

Table 17. Associations of Household Factors with Women’s Dietary Diversity

Household Factors	MDD-W				
	<5 Food Groups (n = 22)		≥5 Food Groups (n = 62)		p Value
	% or Mean (SD)	No.	% or Mean (SD)	No.	
Woman’s age, years	29.36 (9.47)	22	30.53 (8.22)	62	.602
Household size, No.	7.36 (3.0)	22	9.27 (3.98)	62	.011*
Head-of-household status					.280
IDP	9.09%	2	3.23%	2	
Host	90.91%	20	96.77%	60	
Household has a vulnerable member	81.82%	18	88.71%	55	.467
Woman’s marital status					.740
Divorced	4.55%	1	3.23%	2	
Married–monogamous	54.55%	12	40.32%	25	
Married–polygamous	36.36%	8	46.77%	29	
Single	0%	0	4.84%	3	
Widow	4.55%	1	4.84%	3	
Household monthly income, CFA franc					.174
<15,000	36.36%	8	53.23%	33	
≥15,000	63.64%	14	46.77%	29	
Household monthly food expenditure, CFA franc					.310
<15,000	50.00%	11	64.52%	40	
≥15,000	50.00%	11	35.48%	22	
Main source of livelihood					>.99
Agriculture	100.00%	22	98.39%	61	
Trade	0.00%	0	1.61%	1	
CSI	4.82 (7.75)	22	6.61 (8.08)	62	.346
FCS					.744
Poor	4.55%	1	3.23%	2	

Household Factors	MDD-W				
	<5 Food Groups (n = 22)		≥5 Food Groups (n = 62)		p Value
	% or Mean (SD)	No.	% or Mean (SD)	No.	
Borderline	13.64%	3	9.68%	6	
Acceptable	81.82%	18	87.10%	54	
Total area of crops grown, acres	1.89 (1.57)	22	1.56 (1.16)	62	.359
Type of agriculture practiced					
Rainfed food production	54.55%	12	75.81%	47	.061
Off-season crop production	18.18%	4	22.58%	14	.770
Market gardening	59.09%	13	70.97%	44	.305
Total number of crops grown	1.77 (1.15)	22	1.69 (1.69)	62	.808
Household experienced any shocks	90.91%	20	75.81%	47	.216
Total household shocks experienced in the previous 12 months	3.5 (2.18)	22	2.48 (2.64)	62	.144

*Significant at $p < .05$.

As shown in table 18, children with MDD were more likely to be older (mean [SD] age, 16 [4.88] months) and have a mother who was married monogamously (50 percent) and less likely to have a mother in a polygamous union (25 percent), and live in a household that experienced more household shocks (mean [SD], 3.62 [2.80]) compared with children who did not meet MDD. It seems counterintuitive that a child with MDD was more likely to live in a household with more shocks, but this may be because households experiencing more shocks received more assistance than those that did not experience shocks; it may also reflect a measurement issue with the timing of shocks (the recall period for shocks was the past 6 months, while the dietary recall period was the previous 24 hours). In the future, including survey questions about the timing and effects of shocks would be useful if that is an area of interest. Other household factors, such as food security status and income, were not significantly associated with MDD.

Table 18. Association of Household Factors with Children’s Dietary Diversity

Household Factors	MDD				
	<5 Food Groups (n = 19)		≥5 Food Groups (n = 21)		p Value
	% or Mean (SD)	No.	% or Mean (SD)	No.	
Woman’s age, years	30.16 (7.75)	19	28.6 (6.29)	20	.495
Child’s age, months	9.79 (4.02)	19	16 (4.88)	21	.002*
Household size, No.	9.79 (3.05)	19	9.76 (5.43)	21	.984
Head-of-household status					.098
IDP	15.79%	3	0.00%	0	
Host	84.21%	16	100.00%	21	
Household has a vulnerable member	100.00%	19	90.48%	19	.488
Woman’s marital status	63.16%	12	23.81%	5	.012*
Divorced	5.26%	1	5.00%	1	
Married—monogamous	26.32%	5	50.00%	10	
Married—polygamous	63.16%	12	25.00%	5	
Single	5.26%	1	0	0	
Widow	0	0	20.00%	4	
Household monthly income, CFA franc					.775
<15,000	52.63%	10	57.40%	12	
≥15,000	47.37%	9	42.86%	9	
Household monthly food expenditure, CFA franc					.170
<15,000	57.89%	11	80.95%	17	
≥15,000	42.11%	8	19.05%	4	
Main source of livelihood					N/A
Agriculture	100.00%	19	100.00%	21	
Trade	0.00%	0	0.00%	0	
CSI	10.47 (10.82)	19	7.14 (7.98)	21	.309
FCS					.664
Poor	0.00%	0	4.76%	1	

Household Factors	MDD				
	<5 Food Groups (n = 19)		≥5 Food Groups (n = 21)		p Value
	% or Mean (SD)	No.	% or Mean (SD)	No.	
Borderline	10.53%	2	19.05%	4	
Acceptable	89.47%	17	76.19%	16	
Total area of crops grown, acres	1.34 (1.20)	19	2.66 (3.83)	21	.002*
Type of agriculture practiced					
Rainfed food production	73.68%	14	71.43%	15	.873
Off-season crop production	31.58%	6	14.29%	3	.265
Market gardening	57.89%	11	66.67%	14	.567
Total number of crops grown	1.79 (1.75)	19	2.05 (1.698)	21	.633
Household experienced any shocks	73.68%	14	95.24%	20	.085
Total household shocks experienced in the previous 12 months	1.74 (2.08)	19	3.62 (2.80)	21	.011*
FCS					.664
Poor	0.00%	0	4.76%	1	
Borderline	10.53%	2	19.05%	4	
Acceptable	89.47%	17	76.19%	16	
Total area of crops grown, acres	1.34 (1.20)	19	2.66 (3.83)	21	.002*
Type of agriculture practiced					
Rainfed food production	73.68%	14	71.43%	15	.873
Off-season crop production	31.58%	6	14.29%	3	.265
Market gardening	57.89%	11	66.67%	14	.567
Total number of crops grown	1.79 (1.75)	19	2.05 (1.698)	21	.633
Household experienced any shocks	73.68%	14	95.24%	20	.085
Total household shocks experienced in the previous 12 months	1.74 (2.08)	19	3.62 (2.80)	21	.011*

*Significant at $p < .05$.

Qualitative

Beyond project participation, we asked informants about the factors that influenced their food consumption. Questions about food security and intrahousehold food allocation were asked of male and female informants, while questions specifically about women and children’s consumption were directed to female informants. These factors included access to food, coping strategies, and food choices. As summarized in table 19 and discussed in more detail below, some of these factors similarly affected all household members, while others influenced women and children in different ways.

Table 19. Factors Influencing Dietary Diversity as Reported by Interview Participants

Level	Factors
Household (all members)	<ul style="list-style-type: none"> • Affordability of foods/food prices influence food purchases • Access to income influences food purchases • Food access varies by season (based on a household’s ability to store cereals and pulses or preserve perishable crops) • Food insecurity constrains the diversity of diets
Women	<ul style="list-style-type: none"> • Food insecurity limits the quantity of food consumed • Food preferences shape food choices • Pregnancy and lactation status can increase women’s access to food within the household • Pregnancy can change the foods desired
Children	<ul style="list-style-type: none"> • Foods considered good for children are fed when available • Foods children prefer influence what they are fed • Food insecurity constrains the diversity of diets • Children are prioritized over adults in intrahousehold food allocation in times of food insecurity

Food Access

Informants sourced food from both agricultural production and market purchases. Households often consumed grains (e.g., red millet, sorghum, maize); vegetables (e.g., onion, okra, tomatoes, sorrel); and, to a lesser extent, legumes from their own production. Households purchased foods such as meat, fish, rice, pasta, groundnuts, beans, and oil. Most informants described food as being available in local markets, and only a few informants noted challenges accessing markets. Affordability posed a greater constraint than market access or availability for foods that households typically purchased. For example, an informant explained that limited income affected their ability to access some foods. She said, “Sometimes the dad goes to the market. He also brings the fruit for the children, but [it’s] very rare, it is certainly available in the market, but very rare because we do not have the means to buy every day” (female informant, Kousséri). In the endline survey, half of the qualitative sample (and half of the full endline sample) informants reported that they had experienced abnormally high food price spikes in the previous six months (FEWS NET 2021b). Indeed, wholesale prices for local rice and sorghum were at or above five-year averages in Kousséri during this period (FEWS NET 2021a).

As members of households that primarily engage in agricultural production for their livelihoods, informants noted that seasonality had a strong influence on their access to food and what they eat (see figure 6). In the post-harvest season (November–January), after the main rainy season production, households have improved access to food through their own production, which informants said enables them to consume food in larger quantities and to consume “good” foods. If a household has harvested more than its household needs to save for consumption and seeds for those who saved seeds, then they

sold the excess harvest and purchased foods that their household did not produce with the agricultural income. For example, an informant said, “When I go to the market and manage to sell, I get some meat and the food is good. But the period when we eat normally and well is the period after the harvest” (female informant, Kousséri).

Figure 6. Far North Region Seasonal Calendar

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Seasons	Dry season			Rainy season							Dry season	
Rainy season	Main production		Main production							Main harvest		
Dry season	Off-season harvest			Off-season production								
Lean season	Lean season											

Source: FEWS NET 2019; interview transcripts.

The lean season typically lasts from March to May, although the lean season began early in 2021 in February (FEWS NET 2021). During the lean season, households had less access to food from their own production, and their access to income significantly affected food access. A few informants noted that it is typically harder to engage in income-generating activities at this time of year, such as masonry or motorcycle taxis, because of the heavy rains. The limited access to food during the lean season can limit both the quantity and the diversity of foods that households consume. One informant described not having access to diverse foods in the lean season: “Here in the village, there is no alternative, it is the same thing that I have to eat. Because there is no variation, because there is nothing else [to eat], you cannot find [anything] anywhere else. It’s the same, it’s the same food you have to eat every day” (female informant, Makary).

Coping Strategies

Most informants discussed how limited access to food, whether from their own production or from purchases, constrains their dietary diversity. This discussion included informants from households that consisted of women and children that achieved MDD in the endline survey.

One way informants said that they cope with food insecurity is to purchase less expensive foods, which constrains the diversity of family diets during times of food insecurity. For instance, an informant explained, “During the lean season, we fall back on cheaper and less preferred foods. We eat them at least five times a week, because we don’t have the capacity to eat the good [foods] that require a lot of money. Also, we reduce the number of meals consumed” (female informant, Makary).

Most informants said that when they experience food insecurity, they prioritize children, so parents consume less so that they do not have to reduce the amount of food they feed their children. For example, an informant said, “The amount of food that we are used to eating, we are reducing it. Now, me personally, I only eat once a day. It’s only the little children who can eat twice [a day]” (male informant, Makary). Both mothers and fathers described making this sacrifice for their children because the children need the food more than the adults do. A few women said that their consumption is prioritized over men in the household, especially during pregnancy and lactation, because their health is particularly important for children at these times. For instance, a woman said, “It’s normal! The community believes that a woman should eat well, because she is breastfeeding, [or] she is carrying the child. She needs to eat enough, more than a man” (female informant, Kousséri). Intrahousehold allocation did not seem to favor men consistently over women, as may be expected, but gender inequality is often internalized, so informants may not have described intrahousehold allocation as being unequal if it aligned with cultural norms. One woman noted that people may say that women eat more, but they actually prioritize children:

They say it is the woman who eats more, but in reality it is not the woman. When they say that the woman eats more, it is because she cares about the children and she makes everything available to the children. Not for her[self]. They say she eats too much, because she is the mother of the household, but in reality it is for the children (female informant, Kousséri).

Even though parents tried to reduce their own consumption so that children could eat enough, parents said that it is sometimes necessary to reduce the quantity of food they feed to their children as well as their own consumption. As one informant explained, “I eat less and less preferred foods just to be able to sustain myself ... Even the nutrition of small children is declining. My own food [intake] is decreasing. I’m just doing something to keep them going” (female informant, Makary).

Food Choices

Food choices for women and children were shaped by food access, food preferences, and perceptions of good food. Food choices were constrained based on their access to food. Depending on the household, women or men may purchase food. In households where men primarily do the food shopping, female informants noted that they were limited in what they can cook by what their husband brings home.

Food preferences and what was seen as “good” foods also shaped food choices within the constraints that households faced. When we asked what foods women would like to eat if they could choose, they primarily described meals with rice, including fresh fish with rice, meat with rice, and rice and beans. “Good” foods were described as meals containing meat, such as chicken, fresh fish, or rice for adults. During pregnancy, women particularly wanted to consume these good foods and also desired specific foods—for example, sour foods, such as sorrel and fruit. When we asked about children’s food preferences, female informants primarily said that they like starchy foods, such as porridge, spaghetti, and rice. A few other foods women noted that children like are milk, sorrel, and fish. Good foods for children were seen as milk, porridge or enriched porridge, rice, and fresh fish. Informants primarily discussed feeding children starchy foods, such as porridge, which may be shaped by children’s preferences for those foods and a perception that they are good foods for children. Diversifying food day to day was also seen as part of what it means to eat well. For instance, one woman said, “Good food is a variety of food. Per day you can eat porridge in the morning, fish at noon, meat in the evening. You vary as you go” (female informant, Kousséri). Typically, informants talked about diversifying the sauce or side dish eaten with couscous (stiff dough balls made of starch, such as millet or sorghum boiled in water), such as having fish rather than only sauce with okra or sorrel. A few also said that they wanted to diversify the grains they ate to have rice or other staples.

Association between Dietary Diversity and Maternal Social Support (Research Question 5)

The fifth research question was, “What is the association between the dietary diversity of women of reproductive age (18–49 years) and of children (aged 6–23 months) and maternal social support?” Because complex crises can cause a breakdown in support systems and structures and as social support interventions have been found to improve child nutrition in certain contexts, we explored this factor as a potential influence on diets given the complex emergency context in the Far North Region. We used quantitative data from the household endline survey and qualitative data from interviews with participants to answer this question.



Key Findings

- Maternal social support was positively associated with MDD-W but not with MDD. The magnitude of the association was minimal but indicates an area that will benefit from further study.
- In qualitative interviews, female informants primarily reported receiving support from their husbands, and some also received support in the form of food or money from other family members or food from neighbors. They primarily reported a need for more material support, such as cash or food, to help provide for basic needs, which would also help relieve their worry and anxiety.

Quantitative

The mean score of women’s social support for each factor did not go beyond 3 (see table 20). A score of 3 on the measurement scale for the Duke/University of North Carolina Functional Social Support Questionnaire means that a woman reported receiving some support in that area but would like more, while a score of 2 means that a woman reported that she receives less support than she would like in that specific area. Overall, women reported receiving some social support, but they would like to receive more in all aspects of social support. The overall mean score was nearly 26 out of a possible 50. Following most scale interpretations, this would signal “low” support.

Table 20. Mean Score of Each Factor of Women’s Social Support (Range, 1–5)

Factors of Social Support	Mean (SD)
Women’s self-report of having people care about her	2.64 (0.94)
Women’s self-report of having love and affection	2.74 (0.91)
Women’s self-report of having someone to talk to about problems at work or with housework	2.56 (0.91)
Women’s self-report of having someone they trust to talk with about personal and family issues	2.54 (0.96)
Women’s self-report of having the chance to talk about money matters	2.21 (1.08)
Women’s self-report of receiving invitations to go out and do things with others	2.61 (0.94)*
Women’s self-report of receiving helpful advice on important things in her life	2.69 (0.94)*
Women’s self-report of receiving help when she is sick	2.46 (1.06)
Women’s self-report of having support from others to do household chores	2.55 (1.22)
Women’s self-report of participating in making decisions about the education of children	2.65 (1.03)
Women’s self-reported total social support score	25.65 (7.09)

*Statistically significant difference ($p < .05$) between having and not having MDD.

Women’s social support was positively associated with MDD-W both in the bivariate and multivariable analyses. In the multivariable analysis, while adjusting for household factors based on the existing literature, we found that for each one-point increase in women’s social support, there was a 2 percent increase in the prevalence of MDD-W. Although minimal, this positive association indicates the need for further study. There was a positive but not statistically significant association between maternal social support and MDD (table 21). We did not conduct a multivariable analysis for MDD because of the small sample size.

Table 21. Association between MDD-W and MDD and Maternal Social Support Score, Adjusted for Household Factors

Total Social Support*	Crude Probability (95% CI)	Adjusted Probability (95% CI)†
MDD-W	1.02 (1.01–1.03)‡	1.02 (1.00–1.04)‡
MDD	1.01 (0.96–1.05)	N/A

*n = 82 for MDD-W; n = 38 for MDD.

†Adjusted for quantity of seeds planted, total number of crops grown, total area of crops grown, types of agriculture practiced, household size, head-of-household status, household monthly income, household monthly food expenditure, CSI, household experience of shocks, head-of-household marital status, and whether the household has a vulnerable member.

‡Significant at $p < .05$.

Qualitative

Women described receiving support from their husbands more than from others in their social networks, followed by other family members, such as parents or siblings. They also focused on the receipt of and desire for more material support rather than other elements of functional social support, such as emotional support or advice. They said that they sometimes receive support from other members of their families or in-laws in the form of food or money. Neighbors also sometimes provided support in the form of cooked and uncooked food. When asked what type of support they would like more of, female informants reported that they primarily would like to receive more support from projects, including distributions of food or cash, along with agricultural inputs, rather than support from within their social networks. A few women explained that they wanted this support from humanitarian organizations because others in their social network did not have the means to provide this support. In addition, some women said that material support is what would help ease their worry and anxiety.

It was not clear whether women’s relationships with their spouses or level of social support influenced intrahousehold food allocation. Families typically ate in several groups—adult men ate with older male children, adult women ate with older female children, and young children around the same age ate together. Men were most often present for the evening meal, which was typically the main meal of the day, because that was when men are back home from working. Women with above-average social support scores in the endline survey more commonly described meals as joyful times for their families in interviews, whereas women with below-average social support were more likely to describe meals as stressful. Similarly, women with above-average social support scores were less likely than women with below-average social support scores to discuss tensions or problems in their relationship with their husband.

We were also interested in understanding how mental health may affect the dietary diversity of women and children. A few women said that they commonly experience worry and anxiety. Some female informants said that social support is available or provided to those experiencing depression, worry, or anxiety. They discussed how the availability of support from others can help during these times. Female informants said that this worry or anxiety can result from a conflict with their spouse, financial issues, food insecurity, or health issues of a close family member. They said that experiencing worry and anxiety reduced their ability to complete household and agricultural work. Female informants also said that feeling psychological stress can cause illness, loss of appetite, and subsequent weight loss. Women

in polygamous households said that their co-wives were able to help with their household chores and childcare if they were unable to because of anxiety or worry. Women in monogamous marriages said that an older daughter, sister, cousin, or neighbor could provide this support, although a husband would be unlikely to do so. For example, a female informant said, “If it gets too complicated, I get help from my family who are not in the village, but a little outside. If I have a need, I call on my family for help” (female informant, Makary). In a few cases, respondents said that the childcare others provided is unavailable or inadequate, which can negatively affect their ability to cook for and feed children, although the quantitative results did not show an association between social support and MDD.

Chapter 6. Discussion and Conclusions

We found that the majority of women and more than half of children surveyed met MDD, which is higher than the region as a whole (MDD prevalence was 21.2 percent in the Far North Region) (INS and ICF 2020). Taken together, the quantitative and qualitative data from this study suggest that the **agricultural interventions the project provided supported dietary diversity among women**. Although we were not able to estimate the effect of the intervention on dietary diversity because it was not measured at baseline, we found a positive (though not statistically significant) association between planting more than half the seeds PUI provided and MDD-W. Most informants reported that participating in the project helped improve their agricultural practices and access to food through their own production and increased incomes from crop sales or money saved from reduced purchases resulting from increased production. Women and children were more likely to consume certain foods when their households received those seeds from the project than when their households did not receive those seeds. We found a negative though not statistically significant association between planting more than half the seeds and MDD but could not conduct a multivariable analysis because of the small sample size.

Other factors affected dietary diversity differentially for women and children. Women's dietary diversity was associated with maternal social support and household size. Importantly, an increase in the social support score increased the prevalence of MDD-W, controlling for household and other factors. The statistically significant elements of social support associated with MDD-W included receiving invitations to go out and do things and receiving advice on important things in life. Maternal social support has been found to be associated with children's dietary diversity in other contexts (Baye, Laillou, and Chitekwe 2021; Ickes et al. 2018; Matare et al. 2020). However, there has been little research on the associations between women's social support and their own dietary diversity. Social support can be both a facilitator and a product of women's empowerment. Research on women's empowerment and dietary diversity shows that women's dietary diversity is positively associated with women's empowerment (Bonis-Profumo, Stacey, and Brimblecombe 2021; Sinharoy et al. 2017; Yimer and Tadesse 2015). Women stated that cash and material support, more than emotional support, would decrease their stress and anxiety. Stress may also influence diets. There is evidence of an association between poor diets and maternal depression (Emerson et al. 2020; Madegh et al. 2021; Sparling et al. 2020; Surkan and Behbehani 2020) and social support has been found to modify the association between depression and food insecurity in Uganda and South Africa (Tsai et al. 2012; Tsai et al. 2016). Female informants had extended social networks through family, friends, and neighbors, but they would like to receive material support from humanitarian organizations because they are less likely to receive that kind of support from their extended social network.

Children's dietary diversity was associated with the child's age, mother's marital status, total area of crops grown, and the number of shocks experienced. Household coping strategies, food preferences, and perceptions and norms of what are considered "good" foods differentially influence women's and children's diets, as has been found in other contexts (Broilo et al. 2017; Dalaba et al. 2021; Herforth and Ahmed 2015; Maxwell and Caldwell 2008; USAID Advancing Nutrition 2022). Children in particular, and in some cases women (especially if they are pregnant or lactating), are prioritized in intrahousehold allocation when food is scarce, which has been found in other humanitarian emergencies (Maxwell and Caldwell 2008). Children's food preferences and which foods are considered "good" for children also influence children's diets. Starchy foods, such as porridge, spaghetti, and rice, were described as foods that children like and that are good for them. Other foods that informants said that children like and that are good for them are milk and fish. The focus on feeding young children starchy foods may have limited the influence of improved food access on children's diets. In non-complex emergency contexts, nutrition-sensitive agriculture has been found to increase MDD (Margolies 2022; Ruel, Quisumbing, and Balagamwala 2018; Ruel, Alderman, and the Maternal and Child Nutrition Study Group 2013). Children's

nutrition outcomes, however, including dietary diversity, tend to be greater when health and water, sanitation, and hygiene interventions are incorporated with agriculture, and young children may benefit from agriculture interventions less than other nutritionally vulnerable household members (Ruel, Quisumbing, and Balagamwala 2018). We may not have seen a positive association between the project and MDD in this study because of the small sample size; the lack of a nutrition component; the complex emergency context; or other factors that influence MDD, including additional gardening or farming labor for women. Maternal social support may not have been associated with MDD, again because of the small sample size or because social support in the Far North Region of Cameroon may truly have a different influence on MDD-W than on MDD. Different domains of women's empowerment have been found to be associated with women's versus children's nutrition and diets in different contexts (Ruel, Quisumbing, and Balagamwala 2018).

Seasonality dictates the rhythm of life for farmers and their households, including their access to food. Informants reported greater access to a variety of food after harvest. One factor that informants believed affected project results was the distribution of seeds to households too late in the growing season, preventing them from getting an optimal yield. Informants believed, however, that practicing what they learned from training and the FFS improved the farming experience. The lean season came early in 2021 (February), and that season typically requires a variety of coping strategies. In addition to prioritizing children's food intake during lean seasons, informants reported purchasing less expensive foods, which constrains the diversity of family diets. Also, it was generally acknowledged that everyone, including children, eat less during food insecure times. These coping strategies in the face of food insecurity are well documented in emergency contexts (Maxwell and Caldwell 2008). Interventions to promote post-harvest storage and processing may be beneficial in contexts like this one. Notably, although the survey was conducted in the lean season, we still found a high proportion of women and children with MDD.

This study has some limitations. These data may reflect response and recall bias. Respondents may have answered questions in a way that they thought reflected well on the project, and they may have provided answers that they thought would help them receive project support in the future, although they were advised before data collection began that this would not be the case. They may also have provided responses that they considered to be socially acceptable rather than reporting what they actually thought or did. We used a clear informed consent script to help mitigate these risks and asked key questions in multiple ways in the qualitative interviews. There may have been recall bias because some questions, such as those about agricultural production, asked informants to think back to the previous six months. Use of an online survey may have hindered staff participation because it required access to the internet.

The quantitative data and design did not allow us to determine changes in dietary diversity between baseline and endline or to attribute differences in dietary diversity to the project. Instead, we could only assess associations between project participation and dietary diversity. The quantitative analysis was limited by the small sample size; therefore, the results should be interpreted cautiously. We did not conduct multivariable analysis for MDD because of the small sample size. The qualitative data support the survey findings for MDD-W, and that is a strength of using mixed methods to answer these questions. We were limited to analyzing data from the endline survey because the baseline did not collect dietary diversity data for women and children, and we cannot draw conclusions about the intervention's specific effects. In addition, the endline survey focused on project monitoring and did not collect data on some additional factors that would have been useful for our analysis, such as adoption of agricultural practices, crop yields, how respondents used their harvest, post-harvest losses, and women's empowerment. Finally, we do not know the proportion of each seed variety participants planted.

This study's findings suggest that agricultural interventions are positively associated with women's dietary diversity in a complex emergency context and a short program implementation time frame. It is unclear whether increased food access can be sustained without the intervention, but respondents' reports of improved agricultural practices is promising for improved future yields and the reported dietary diversity associated with it after harvest, whether through the income or consumption pathway. These findings should be confirmed in larger surveys and different places, and there should be a concerted effort to study MDD. In addition, we found that an increase in social support was associated with an increase in MDD-W and MDD, although the latter was not statistically significant. The role of social and material support for women in these contexts and the effects on nutrition deserves further study. The role of idiosyncratic shocks deserves further study, as well, because we found that MDD was positively associated with household shocks, which may have been caused by measurement issues (e.g., differing recall periods) or because households experiencing shocks were more likely to receive external support. Finally, our findings support the existence of a relationship between inadequate social and care environments with the outcome of inadequate dietary intake, as described in the drylands acute malnutrition framework (Young 2020). Although household food insecurity was not related to MDD-W or MDD, the qualitative findings suggest that food insecurity does affect dietary intake as described in the drylands acute malnutrition framework (Young 2020), whether that be the quantity, quality, or diversity of foods. These findings suggest that those portions of the framework may also be applicable in complex emergency contexts that are not in drylands.

Chapter 7. Recommendations

Several programmatic implications of our findings for different audiences can be considered when designing agriculture interventions in complex emergency contexts. We developed the recommendations based on the findings from this study in addition to knowledge and best practices from USAID Advancing Nutrition’s work researching and developing guidance for nutrition-sensitive agriculture and SBC. We describe these recommendations below by audience. Finally, we discuss suggested areas for further research given the limited evidence of nutrition outcomes from agricultural and nutrition-sensitive agricultural programming in complex emergency contexts.

BHA and Other Donors

Our findings have implications for donors that fund nutrition and agriculture programs in complex emergencies:

- **Consider nutrition-sensitive agriculture in complex emergencies to improve women’s diets.** Agriculture projects can be appropriate to improve women’s dietary diversity within highly food-insecure, complex emergency contexts. They can also be implemented within short time frames provided that the project aligns with the seasonal calendar and production cycles. The nutrition outcomes from these interventions will likely be stronger if nutrition is an explicit component of the project design and implementation. Key to this is determining the nutritional gaps in diets (e.g., gaps in consumption by food group), the main constraints related to household access to the foods that would fill the nutritional gaps, and how agricultural support could help address the nutritional gaps *and* food access constraints. Complementary nutrition interventions should also be provided. Emphasis should be placed on the production of nutrient-rich foods coupled with social and behavior change (SBC) approaches that promote the consumption of such foods. A context-specific (taking into account seasonality for production and market availability during different seasons) nutrition-sensitive agricultural project could provide inputs and training to address the constraints farmers face producing specific nutrient-rich foods that are lacking in their diets. Formative research approaches, such as trials of improved practices, can be used to design SBC strategies to support consumption of those foods by nutritionally vulnerable household members. In instances where agricultural production cannot adequately address dietary needs or nutritional gaps, market based approaches like cash and vouchers should be considered if markets are functioning and accessible. Otherwise, other nutrition interventions can be provided alongside nutrition-sensitive agriculture, such as micronutrient powders or lipid-based nutrient supplements (Ruel, Alderman, and the Maternal and Child Nutrition Study Group 2013; Ruel, Quisumbing, and Balagamwala 2018).
- **Consider multiple agriculture-nutrition pathways when designing nutrition-sensitive agriculture activities in complex emergencies.** The three main agriculture-nutrition pathways—food production, agricultural income, and women’s empowerment (Herforth and Harris 2014)—are likely relevant in complex emergencies. We found that the agricultural support influenced diets through both food production and agricultural income. Our findings on social support warrant further consideration of social support specifically and women’s empowerment more generally as factors that may influence women’s diets. Importantly, agriculture interventions that are implemented by creating and implementing group activities can serve a dual purpose: one for improving agricultural practices and the other to serve as a social network that provides women with social support. Notably, in this project, most agricultural training engaged men because they controlled the farming resources predominantly. In this case, more intentional efforts to engage women could be beneficial for increasing and improving dietary diversity, including considerations of increased women’s labor, which could have a negative impact on MDD

and other aspects of child care. For more guidance on nutrition-sensitive agriculture programming design, please see [USAID Advancing Nutrition's Designing Effective Nutrition-Sensitive Agriculture Activities Workshop: Facilitator's Guide and Slides](#). This design guide was developed for programs in development settings, but many elements will be useful and applicable for emergency settings, as well.

- **Explore other nutrition activities to improve children's diets in complex emergencies.** Children's diets are affected by care and feeding practices that are not necessarily related to household food access. Even in development contexts, nutrition-sensitive agriculture tends to benefit children less than other nutritionally vulnerable household members, in part because efforts to increase agricultural production rely heavily on women's labor, reducing the time they have available for child care and adversely affecting nutrition outcomes (Ruel, Quisumbing, and Balagamwala 2018). Other evidence-based nutrition-sensitive and specific activities for infant and young child feeding should be considered in line with the context and needs of the population; planning for agricultural interventions should consider unintended consequences for young child nutrition. For more guidance, see [USAID Advancing Nutrition's guidance on prioritizing multi-sectoral nutrition behaviors and designing complementary feeding activities](#).

Emergency Implementing Partners

Implementing partners should consider several details of nutrition-sensitive agriculture projects when designing these interventions. Although these considerations may not be unique to complex emergency contexts, we have found that they can be applicable in such contexts. These recommendations largely focus on the design of nutrition-sensitive agricultural programming because the design is key to making agriculture programming nutrition sensitive and was the focus of this study. High-quality implementation is critical to achieving the intended outcomes, but as shown in a recent review, the factors that affect implementation of nutrition-sensitive agriculture projects are largely not unique to nutrition-sensitive agriculture projects (Di Prima et al. 2022):

- **Consider participants' access to land and water.** Access to suitable land for production—appropriate for vegetable or staple crop production in the dry or rainy season, depending on the project—is needed for project participants to benefit from agriculture interventions. In particular, agricultural interventions may not be appropriate for refugees or IDPs if they lack access to agricultural land. Implementing partners can consider this when conducting BHA-required response analysis.
- **Implement agriculture interventions in line with seasonal calendars and climatic conditions.** The timing of agricultural interventions, whether input distribution, demonstrations, or training, should align with the seasonal calendar to ensure that households are able to optimally benefit from these interventions in the appropriate season. Seed distribution must be completed in advance of planting dates, otherwise, seed distribution is not of use to farmers. In addition, many geographies are subjected to increased climate variability, which influences food production conditions. Changes in temperatures, precipitation, growing season length, soil moisture, and pest pressures are just a few of the variables that influence agricultural productivity and agricultural management decisions and should be considered and planned for to the extent possible. Because emergency projects are often of limited duration and may be implemented for just one season, the timing of the intervention is particularly important. It may be useful to plan to provide interventions in advance of the timing required for the typical seasonal calendar given the variation in climate conditions resulting from climate change and the risk of disruptions to programming resulting from insecurity or other shocks. For more guidance, see [USAID Advancing Nutrition's guidance on designing effective nutrition-sensitive agriculture activities](#).

- Include a nutrition SBC approach to improve children’s and women’s diets.** SBC interventions targeting improved nutrition behaviors should be included in the design from the outset because the nutrition-sensitive agriculture activities should be linked with specific nutrition behaviors. The inclusion or integration of nutrition SBC activities, even if as simple as including nutrition behavior change communication in agricultural training, can help translate improvements in agricultural production to improvements in consumption, as dietary intake is affected by factors other than just access to food from production. Such communication can address joint decision-making about how to use harvests, planning to keep a certain portion of harvests for consumption, how to integrate a nutrient-rich ingredient into children’s porridge, or the importance of ensuring that pregnant and lactating women consume more of a promoted nutrient-rich food. The nutrition behaviors that are promoted should be tailored to the project’s nutrition goals and the agricultural support provided. For example, if a project provides iron-rich bean seeds to households, the nutrition SBC activities could promote the consumption of iron-rich beans by pregnant and lactating women. These activities could engage husbands through agricultural training and FFSs to encourage keeping the beans for consumption and ensuring that their pregnant or lactating wife eats them regularly; they could engage women through cooking demonstrations so that they are comfortable cooking the new variety and get the opportunity to taste them. To improve dietary diversity for children, intentionally addressing norms and behaviors around what families feed children and how the food is prepared may be needed. For more guidance, see USAID Advancing Nutrition’s guidance on [designing effective nutrition-sensitive agriculture activities](#), [prioritizing multi-sectoral nutrition behaviors](#), [designing complementary feeding activities](#), and [engaging family members in nutrition](#).
- Explore the utility of social support interventions.** The role of social support and women’s diets warrants further study and consideration in complex emergency contexts where social networks and support have fractured or weakened. Social support can also be considered as an aspect of women’s empowerment because social support can be both a cause and a consequence of women’s empowerment. Implementing partners should consider empowerment when they conduct BHA-required gender analysis and ensure protection mainstreaming. Agriculture activities can be implemented through group approaches, such as FFSs or village savings and loan groups, to strengthen social networks and cohesion. Nutrition SBC activities implemented through approaches such as family dialogues, fathers groups, or mothers groups can also include aspects to improve social support. For more guidance, see [USAID Advancing Nutrition’s guidance on engaging family members in nutrition](#).

Further Research

This exploratory study has prompted several areas that warrant further study to better understand how agricultural interventions can be applied in complex emergency contexts in a way that improves nutrition:

- Conduct a study with a larger sample size or quasi-experimental design.** The associations found in this study between an aspect of the agricultural intervention and several household- and individual-level factors, including maternal social support, warrant further investigation and confirmation through a cross-sectional study with a larger sample size or an impact evaluation. USAID Advancing Nutrition is conducting a similar study in South Sudan with a large cross-sectional survey data, but a study with a quasi-experimental design would be useful to understand the impact of agricultural interventions. If feasible, it would also be useful to design the project and evaluation in a way that assesses the effectiveness of each agricultural component (e.g., training vs. input distribution). See the [Emergency Nutrition Network’s review of emergency nutrition interventions](#) for feasible evaluation study options in emergency contexts.

- **Collect data about more factors that influence nutrition.** Further study of the influence of agricultural interventions on dietary diversity in complex emergency contexts would also benefit from inclusion of other factors related to agriculture-nutrition pathways (e.g., as outlined in Herforth and Harris 2014) that we did not have quantitative data for, including how harvests were used and women's empowerment. Such study would help interested parties better understand which factors mediate the benefits of the project and which agriculture-nutrition pathways have the greatest potential to improve diet quality in complex emergency contexts.

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Annex I. Data Collection Instruments

Endline Household Survey

The following are modules from the PUI endline household survey that we used in the analysis. These are three out of nine modules in part I of the survey and part 2 of the endline survey.

Partie I	
SECTION 2: CATÉGORIE SOCIO-PROFESSIONNELLE DE L'ENQUÊTE	
Quelles est l'activité économique principale du ménage?	1. Agriculture 2. Élevage 3. Commerce 4. Pêche 5. Travaux journaliers 6. Autres
Quel type d'agriculture pratiquez-vous?	1. Vivrier pluvial 2. Vivrier de la contre saison 3. Maraîcher 4. Autres (plusieurs réponses possibles)
Quelles cultures avez-vous pratiqué cette année?	1. Maraîcher 2. Vivrier 3. Les deux
Quels types de semences ou de plants votre ménage a-t-il reçus?	1. Sorgho 2. Niébé 3. Oseille de guinée 4. Gombo 5. Tomate 6. Poivron 7. Oignon
Avez-vous planté l'une des graines que vous avez reçues?	1. Oui 2. Non
Quelle quantité (part) de graines as-tu plantée?	1. Moins de la moitié 2. La moitié 3. Plus de la moitié 4. Ne sait pas
Quelle est la superficie de cultures céréalières que vous avez cultivé? (en m ²)	
Quelle est la superficie de cultures maraîchères que vous avez cultivé? (en m ²)	
Quelle est la superficie de cultures que vous avez cultivé? (en m ²)	
Quelqu'un dans votre ménage a-t-il reçu une formation en production agricole au cours des six derniers mois (depuis octobre 2020)?	1. Oui 2. Non
Si oui, quelle organisation a fourni la formation en production agricole?	1. PUI 2. MINADER 3. PUI et le MINADER 4. USAID 5. Autre organisation non gouvernementale 6. Autres (précisez) 7. Ne sait pas
Quelqu'un dans votre ménage a-t-il vu une parcelle de démonstration agricole au cours des six derniers mois (depuis octobre 2020)?	1. Oui 2. Non 3. Ne sait pas
Quelqu'un dans votre ménage a-t-il reçu une formation en nutrition au cours des six derniers mois (depuis octobre 2020)?	1. Oui 2. Non 3. Ne sait pas

SECTION 4: PREPARATION DU SOL	
Avez-vous participé aux formations Champs Écoles Paysans?	1. Oui 2. Non 3. Ne sait pas
Si oui, avez-vous été satisfait de ces formations?	1. Oui 2. Non 3. Ne sait pas
Avez-vous fait l'association des cultures?	1. Oui 2. Non
Si oui, quelles types d'association de cultures?	1. Mil arachide 2. Mil niébé 3. Sorgho niébé 4. Sorgho arachide 5. Autre
SECTION 5 : LE SEMIS	
Quel type de spéculacion produisez-vous depuis Octobre 2020? (cultures vivrières)	1. Maïs, 2. Sorgho, 3. Mil, 4. Riz, 5. Arachide 6. Autres
Quel type de spéculacion produisez-vous depuis Octobre 2020? (cultures maraichères)	1. Oignon 2. Tomate 3. Poivron 4. Carottes 5. Autres

Partie 2—Endline uniquement : Indicateurs de sécurité alimentaire + module Advancing Nutrition—échantillon de bénéficiaires

Combien de repas par jour prennent les adultes de votre ménage (plus de 18 ans)?	
Combien de repas par jour prennent les enfants de moins de 5 ans?	
Le ménage a-t-il organisé une fête ou participé à une cérémonie festive dans le village au cours des 7 derniers jours précédents l'enquête (rituel de mariage/fiançailles, cérémonies funèbres, célébrations religieuses, réunion de famille, etc.)?	1. Oui 2. Non
Le ménage a-t-il organisé une fête ou participé à une cérémonie festive dans le village la veille de l'enquête (rituel de mariage/fiançailles, cérémonies funèbres, célébrations religieuses ; réunion de famille ; etc.)?	1. Oui 2. Non
MDD-Ws des femmes de 15–49 ans :	
<p>J'aimerais maintenant vous poser quelques questions sur les aliments et les boissons que vous avez consommés hier pendant la journée ou la nuit, que ce soit à la maison ou ailleurs.</p> <p>Tout d'abord, je voudrais que vous pensiez à la journée d'hier, depuis votre réveil jusqu'à la nuit. Pensez à la première chose que vous avez mangée ou bue après votre réveil le matin... Pensez à l'endroit où vous vous trouviez lorsque vous avez mangé ou bu en milieu de journée... Pensez à l'endroit où vous vous trouviez lorsque vous avez pris votre repas du soir... et à tout ce que vous avez pu manger ou boire dans la soirée ou tard dans la nuit... et à l'endroit où vous vous trouviez</p>	

<p>lorsque vous avez pris votre repas du soir.... ou tard dans la nuit... et à tout autre nourriture ou boisson que vous avez pu prendre entre les repas pendant la journée ou la nuit.</p> <p>Je veux savoir si vous avez consommé les aliments que je vais mentionner, même s'ils étaient associés à d'autres aliments.</p> <p>Veillez écouter la liste des aliments et des boissons, et si vous avez mangé ou bu L'UN D'ENTRE EUX, dites oui.</p>	
Informations générales sur la Femme/Fille enquêtée :	Si pas de femme de 0 à 49 ans; passer à la section suivante
	mettre un paramètre pour > 15 ans et <=49 ans pour permettre de dérouler le questionnaire
Position dans le ménage : 1. Veuve , 2. Marié Polygame , 3. Marié Monogame , 4. Célibataire , 5. Divorcée	
Age de la Femme/Fille enquêtée :	
Hier, avez-vous mangé l'un des aliments suivants?	Laisser la personne répondre et cocher les groupes
le riz, du pain, des spaghettis, des macaronis, des pâtes, du maïs, du sorgho ou du millet, du fufu ou de la bouillie de riz?	1 : Oui 2 : Non
Maïs brûlant, maïs bouillant, sorgho ou millet?	1 : Oui 2 : Non
Plantain, igname, manioc, bobolo, fufu de manioc, patate douce, pomme de terre ou cocoyam	1 : Oui 2 : Non
Haricots blancs, haricots rouges, koki, niébé, pomme pilée, bambara ou sajo?	1 : Oui 2 : Non
Hier, avez-vous mangé l'un des légumes suivants?	
Des carottes ou du potiron qui est orange à l'intérieur?	1 : Oui 2: Non
Njama njama, feuilles de manioc, feuilles amères, kelen kelen, okongobong, ou encore feuille de céleri	1 : Oui 2 : Non
Amarante/verte, eru, ekwang, feuilles d'eau, foléré, morelle noire, ou feuille de sésame	1 : Oui 2 : Non
Tomates, choux, gombo, oeuf du jardin ou concombre	1 : Oui 2 : Non
Poivron vert, champignons, laitue, courgettes ou haricots verts?	1 : Oui 2 : Non
Hier, avez-vous mangé l'un des fruits suivants?	
Mangue ou papaye	1 : Oui 2 : Non

Orange, mandarine, ou pamplemousse	1 : Oui 2 : Non
Banane, ananas, avocat, prune, goyave, pastèque, ou fruits sauvages	1 : Oui 2 : Non
Hier avez-vous consommé l'un des aliments d'origine animale suivants?	1 : Oui 2 : Non
Oeufs?	1 : Oui 2 : Non
le fromage ou la vache qui rit?	1 : Oui 2 : Non
Yaourt, kossam, pendidam ou dakéré?	1 : Oui 2 : Non
Saucisses, jambon, corned-beef, ou pâté?	1 : Oui 2 : Non
Bœuf, mouton, chèvre ou organes?	1 : Oui 2 : Non
Porc ou viande de brousse?	1 : Oui 2 : Non
Poulet, pintade, canard ou dinde?	1 : Oui 2 : Non
Poisson frais, poisson congelé, poisson fumé, sardines, muandj'a moto, njanga, ou crevettes fraîches?	1 : Oui 2 : Non
Hier avez-vous consommé l'un des autres aliments suivants?	
Arachides, sauce aux arachides, pâte d'arachide, pudding aux arachides, egoussi, ou pudding aux egoussi?	1 : Oui 2 : Non
Hier, avez-vous consommé l'une des boissons suivantes?	
Lait ou lait en poudre?	1 : Oui 2 : Non
MDD-IYCF des enfants de 06–23 mois	Maintenant, je voudrais vous poser des questions sur les liquides que votre enfant peut avoir eu hier pendant la journée ou la nuit. S'il vous plaît parlez-moi de toutes les boissons et nourriture qu'il a consommées que ce soit à la maison ou ailleurs. ces informations sont anonymes et ne seront pas partagées en dehors de l'équipe d'évaluation
combien d'enfants de 6 à 23 mois avez-vous?	Si 0, passer à la section suivante
Ces enfants ont-ils été allaités? 1. Oui 2. Non	
<i>Maintenant, je voudrais vous poser des questions sur les liquides que [NOM de l'enfant] peut avoir eu hier pendant la journée ou la nuit. S'il vous plaît parlez-moi de toutes les boissons, si [NOM de l'enfant] les avait à la maison, ou ailleurs.</i>	L'enquêteur laisse le répondant énumérer et coche les groupes d'aliments
Informations générales sur l'enfant enquêté :	

Nom de l'enfant enquêté :	
Sexe de l'enfant: Féminin, Masculin	mettre un paramètre pour >6 mois et <=23 mois pour permettre de dérouler le questionnaire
âge de l'enfant enquêté	
Position dans le ménage : 1. Veuve , 2. Marié Polygame , 3. Marié Monogame , 4. Célibataire , 5. Divorcée	
Age de la Femme/Fille enquêtée :	
Est-ce que l'enfant a déjà été allaité au sein?	Oui; Non
Est-ce que l'enfant a été allaité hier pendant la journée ou la nuit?	Oui; Non
Hier, pendant la journée ou la nuit, est-ce que l'enfant a eu.	
Lait artificiel, comme, Gallia, Nursie, Cerelac, Guigoz ou bledilait?	1 : Oui 2 : Non
Lait d'origine animale, y compris le lait en poudre?	1 : Oui 2 : Non
Kossam?	1 : Oui 2 : Non
Des boissons chaudes au cacao comme l'Ovomaltine ou le Matinal, ou du lait concentré sucré?	1 : Oui 2 : Non
Hier, pendant la journée ou la nuit, est-ce que l'enfant (nom) a mangé?	
Yogourt, pendidam ou dakéré?	1 : Oui 2 : Non
Riz, pain, maïs, fufu, pap, ou bouillie de maïs, de riz, de blé, ou de spaghetti?	1 : Oui 2 : Non
Des carottes, ou du potiron qui est orange à l'intérieur?	1 : Oui 2 : Non
Plantain, igname, manioc, bobolo, fufu d'eau, patate douce, pomme de terre, ou cocoyam?	1 : Oui 2 : Non
Njama njama, feuilles de manioc, feuilles ameres, kelen kelen, okongobong, ou encore feuilles de celeri?	1 : Oui 2 : Non
Amarante/verte, eru, ekwang, feuilles d'eau, foléré, morelle noire, ou feuilles des sésames?	1 : Oui 2 : Non
D'autres légumes, tels que tomates, choux, gombo, œuf du jardin, concombre, purée de légumes ou autres?	1 : Oui 2 : Non
Mangue ou Papaye?	1 : Oui 2 : Non
D'autres fruits, comme la banane, l'ananas, la poire, la goyave, l'orange, ou d'autres fruits?	1 : Oui 2 : Non
Foie, rein, cœur ou poumon?	1 : Oui 2 : Non

Saucisses, jambon, corned-beef, ou pâté?	I : Oui 2 : Non
Toute autre viande, comme le bœuf, le mouton, la chèvre, le porc ou le poulet?	I : Oui 2 : Non
Des oeufs?	I : Oui 2 : Non
Poisson frais, poisson congelé, sardines, muandj'a moto, sodamoka, poudre de poisson ou poudre de crevette?	I : Oui 2 : Non
Haricots blancs, haricots rouges, koki, pomme pilé, bambara ou poudre de soja	I : Oui 2 : Non
Arachides, sauce aux arachides, pâte d'arachides, pudding aux arachides, egoussi, pudding aux egoussi, ou ragoût de graines de sésame?	I : Oui 2 : Non
Le fromage ou la vache qui rit?	I : Oui 2 : Non
Termites, viande de congo, sauterelles, ou vers de palmier?	I : Oui 2 : Non
Des chips comme pringles ou kelon, des crackers aux crevettes, des pommes de terre frites, du dodo, des patates douces frites, du chin chin ou de l'indomie?	I : Oui 2 : Non
Huile de palme rouge ou esuk?	I : Oui 2 : Non
Combien de fois l'enfant (nom) a-t-il mangé des aliments solides ou semi-solides autres que les liquides hier pendant la journée ou la nuit?	
Est-ce que l'enfant (nom) a bu quelque chose ou biberon avec une tétine hier pendant la journée ou la nuit?	I : Oui 2 : Non
Hier, de jour comme de nuit, est-ce que l'enfant (nom) a consommé un aliment donné par un centre de santé pour le traitement de la malnutrition (Plumpy'Nut, Plumpy'sup, Plumpy'Nut dose, Sprinkles/sachet, etc.) Ou un aliment enrichi (porridge composé de plusieurs repas mélangés, Corn-Soy Blend) Ou tout aliment additionné de micronutriments en poudre	I : Oui 2 : Non
MDD : Au cours des 24 heures passées, avez-vous consommé ...	laisser le répondant se remémorer
Céréales (maïs, riz, blé, mil, sorgho, farine, pain, spaghettis...)	
Racines, tubercules, banane plantain : Manioc, pomme de terre, igname, taro, patate douce, banane plantain	
Légumes : tomate, oignon, poivron, aubergine, chou, amarante, gombo, oseille, feuilles de manioc, etc.	
Fruits : mangue, banane, avocat, orange, ananas, etc.	

Viande : bœuf, mouton, cabri, volaille, tripes...	
Œufs	
Poisson frais, poisson séché, crevettes, fruits de mer...	
Arachide, niébé, haricot, pois, sésame, graines de courge, autres noix...	
Lait, yaourt, fromage	
Huile de cuisson, huile de friture, beurre, mayonnaise	
Sucre, miel, bonbon, confiture...	
Condiments : Thé, café, sel, piment, petite quantité de lait pour le thé...	
FCS : Combien de jours durant ces 7 derniers jours votre ménage a-t-il consommé les produits suivants? (0 si non consommé)	Nombre de jours de 0 à 7
Céréales, Racines, tubercules, banane plantain : sorgho, millet, maïs, blé, riz, spaghettis, pain, beignets, patate douce, pomme de terre, manioc, igname...	
Légumineuses/noix : haricots, pois, arachides, lentilles, soja, pistache...	
Légumes : tomate, oignon, gombo, carotte, poivron, amarante, oseille, légumes feuilles...	
Fruits: banane, ananas, citron, orange, mangue, papaye etc.	
Viande, poisson, œufs : chèvre, bœuf, mouton, volaille, poisson, sardine, poisson séché (<i>exclure les condiments en petites quantités</i>)...	
Lait et autres produits laitiers : Lait frais ou fermenté, yaourt, fromage, autre produits laitiers (<i>exclure le beurre ou de petites quantités de lait pour le thé/café</i>)	
Huile, beurre, matière grasse : huile rouge, huile végétale, beurre, margarine, graisse...	
Sucre ou produits sucré : miel, confiture, beignets, bonbons, biscuits, pâtisseries, gâteaux et autre produits sucré	
Epices/Condiments : thé, café/cacao, sel, ail, épices, levure/poudre à pâte, tomate/sauce piquante, autres condiments y compris petite quantité de lait pour le thé/café	
rCSI : Pendant les 7 derniers jours précédant cette enquête, y a-t-il eu des jours (et si oui, combien) où votre ménage n'avait pas assez de	1. Oui 2. Non

nourriture ou pas assez d'argent pour en acheter?	
Si oui, avez-vous adopté les comportements suivants et combien de jours (lire à haute voix)?	Nombre de jours de 0 à 7
Remplacer des aliments par des aliments moins appréciés et moins chers	
Emprunter de la nourriture ou demander de l'aide à un proche	
Réduire la quantité d'aliments lors des repas	
Restreindre la consommation des adultes pour permettre aux enfants de manger	
Réduire le nombre de repas par jour	
Chocs subis par le ménage	
I. Votre ménage a-t-il fait face à une difficulté particulière ou un choc ces 06 derniers mois (depuis octobre 2020)?	0=Non 1=oui
Si oui, quels chocs/difficultés?	1=Perte ou réduction de l'emploi pour tout membre du ménage 2=Revenu réduit de tout membre du ménage 3=Maladie grave ou accident entraînant des blessures pour tout membre du ménage 4=Décès d'un membre adulte du ménage qui travaille 5=Prix alimentaires anormalement élevés 6=Prix anormalement élevés pour le carburant/transport et d'autres produits non alimentaires 7=Sécheresse/pluies irrégulières, période de sécheresse prolongée 8=Trop de pluie 9=Niveau anormalement élevé de ravageurs ou de maladies des cultures 10=Écllosion de maladie du bétail 11=Cultures détruites par les inondations 12=Maisons inondées 13=Marchés inondés 14=Insécurité/violence/raid/pillage 15=Vol de non-violence/criminels 16=Membre du ménage touché par COVID-19 17=Écllosion de maladie dans la collectivité 88=Autre (spécifier)

	1=Aucun impact sur la capacité de mon ménage à obtenir de l'argent ou de la nourriture
1.2. (Si 1=1) Quel a été l'impact des chocs sur la capacité de votre ménage à obtenir de l'argent ou de la nourriture?	2=Légère diminution de la capacité de mon ménage à obtenir de l'argent ou de la nourriture
	3=Fort diminution de la capacité de mon ménage à obtenir de l'argent ou de la nourriture
	4=La faim est faible, des stratégies sont disponibles pour faire face à la réduction de l'accès à la nourriture
	5=La faim est mauvaise, il existe des moyens limités de faire face à la réduction de l'accès à la nourriture
	6=La faim est la pire qu'elle puisse être
Amélioration du bien-être	<i>« L'enquêteur demande aux bénéficiaires de penser aux choses qui vont bien et qui vont moins bien dans sa vie dans les domaines physiques et psychologiques (se nourrir ; se vêtir ; se soigner ; éduquer les enfants ; réussite sociale et économique ; bonne relation avec la famille et les voisins ; bonne harmonie dans le ménage ; etc.) En lui expliquant l'échelle de notation, il lui demande d'estimer son niveau de bien-être. »</i>
Votre ménage éprouve t-il un meilleur bien être général depuis le début du programme? Oui ou Non	Oui; Non
Sur une échelle de 1 à 5, à quel niveau estimez-vous votre bien-être (physique : santé ; besoins primordiaux) et psychologique : réussite sociale ; réalisation de soi ; Harmonie avec soi et les autres)? (1 : médiocre à 5 : très bien)	Une seule réponse de 1 à 5
1 : médiocre	
2 : passable	
3 : assez bien	
4 : bien	
5 : très bien	

SUPPORT SOCIAL	ici 1 est le minimum et 5 le maximum (paramétrer sur Kobo)
1. Les gens se soucient de ce qui m'arrive.	5=Autant que je voudrais ... 1=Beaucoup moins que ce que je voudrais
2. J'ai de l'amour et de l'affection.	5=Autant que je voudrais ... 1=Beaucoup moins que ce que je voudrais
3. J'ai la chance de parler à quelqu'un de problèmes au travail ou avec mes travaux ménagers.	5=Autant que je voudrais ... 1=Beaucoup moins que ce que je voudrais
4. J'ai la chance de parler à quelqu'un en qui j'ai confiance au sujet de problèmes personnels et familiaux.	5=Autant que je voudrais ... 1=Beaucoup moins que ce que je voudrais
5. J'ai la chance de parler de questions d'argent.	5=Autant que je voudrais ... 1=Beaucoup moins que ce que je voudrais
6. Je reçois des invitations pour sortir et faire des choses avec d'autres personnes.	5=Autant que je voudrais ... 1=Beaucoup moins que ce que je voudrais
7. Je reçois des conseils utiles sur des choses importantes dans la vie.	5=Autant que je voudrais ... 1=Beaucoup moins que ce que je voudrais
8. Je reçois de l'aide quand je suis malade au lit.	5=Autant que je voudrais ... 1=Beaucoup moins que ce que je voudrais
9. J'ai le soutien d'autres personnes pour effectuer des tâches ménagères (aller chercher de l'eau, cuisiner, laver les vêtements...)	5=Autant que je voudrais ... 1=Beaucoup moins que ce que je voudrais
10. Je participe à la prise de décisions concernant l'éducation des enfants	5=Autant que je voudrais ... 1=Beaucoup moins que ce que je voudrais

Semi-Structured Interview Guide

Section A–C can be answered by the male household head or the female endline respondent, depending who is home and who is most comfortable answering these questions.

Section A: Household Food Access

First, we would like to learn about how your household gets food.

1. How does your household normally get food?
2. What were the main sources of food supply for your household from October 2020 to April 2021? (e.g., own production, purchase, project or vouchers)
3. What types of foods did you typically buy from October 2020 to April 2021? (probe for different food groups, such as vegetables, cereals, beans, fruits, eggs)
4. How does your household adapt during the lean season?
 - a. How does the food at meals differ during this lean season?
 - b. To what extent do adults eat less than the children during this lean season?
 - c. To what extent do women eat less than men during this lean season?

Section B: Household Agricultural Production (October 2020–April 2021)

Next, we are interested in learning more about your household farming practices.

1. What are the main agricultural crops (e.g., cereals, vegetables, fruits) that your household produced from October 2020 to April 2021?
 - a. Where were these crops planted? (e.g., home garden, market garden, field, communal land)
 - b. Who owns this land? (e.g., me, another female spouse, owned by female spouse, male household head, land rented)
 - c. Why did your household decide to grow those crops?
 - d. Who was involved in growing and harvesting these crops?
 - e. How did you use the harvest from October 2020 to April 2021? (e.g., the portion sold and the portion kept for consumption)

Section C: PUI Project

Next, we would like to learn about your experiences with the PUI project (related to agricultural tools in August 2020, seeds in October 2020, and training).

1. How did your household use the seeds that you received (e.g., planted, sold, shared)? Why did you decide to use the seeds that way?
 - a. Who decided how to use the seeds?
 - b. If you planted the seeds, where did you plant them? (e.g., home garden, market garden, field)
 - c. If you planted the seed, who owns this land?
2. Did you or another household member participate in the Farmer Field School training?
 - a. What did you think of the role of the facilitator? How useful was the support she/he provided?
3. How did your households' agricultural production change as a result of PUI support? (e.g., grew new crops, used new types of seeds, adopted new practices and technologies, increased area planted)
 - a. Which of these changes do you think you will continue to use on your own land in the future? Why?
4. What kind of changes did the project encourage that your household did not make? Please explain. (e.g., technology adoption, changes to production practices, use of agricultural inputs)
5. What were the main benefits that your household experienced from participating in the project? (e.g., learning about new agricultural practices, improved yields, improved food security)
6. How did the project influence your household's access to food from October 2020 to April 2021, if at all?
7. How did the project influence the diversity of the food your household ate from October 2020 to April 2021, if at all?
8. What was negative or could have been better with regard to engaging with the project?
9. What could future projects do better to help improve the diversity and quality of food that households like yours eat?

Section D-F should be answered by the female respondent in the endline survey. The male household head should not be present during this section.

Section D: Household Food Practices

1. Can you tell me a little about mealtimes in your household? Who eats together in a group and who eats separately?
 - a. To what extent is everyone able to eat the same types, quality, and amount of food?
 - b. Are mealtimes a time of worry or joy in your household? Please explain.

Section E: Women's Diets

Next, we are interested in the food that you eat yourself.

1. Can you tell me about the food you ate yesterday from when you woke up to when you went to sleep (including meals and food/snacks in between meals)?
 - a. How similar or different was what you ate yesterday compared to what other household members ate?
 - b. How similar or different was what you ate yesterday compared to what you usually eat?
 - c. For how many days do you repeat the same meal in a week?
 - d. If you had the opportunity to choose, what would you have liked to eat yesterday?
2. How did you or your household decide on the food that you ate yesterday?
 - a. How does this compare to how your household usually decides what to eat?
3. For you, what do you consider as good, healthy food?
4. What are factors that guide your food choices? (e.g., beans, meat, cereals)
 - a. What limits the different types of food that you eat? (e.g., availability, seasonality, cost, hard to prepare, food preferences)
 - b. When are you able to eat more types of foods? (e.g., during certain seasons or times of the year)
5. What do people in your household or community think women should usually eat compared to other family members?
 - a. Does this change during pregnancy?
 - b. What would family members say if a woman ate more food or better food than others?
6. To what extent do you get as much help or support from your spouse, family members, and friends as you would like when you face problems or worries? (e.g., access to land, access to seeds, access to health care, access to money to meet your needs)
 - a. Which kind of support or help would you like that you currently do not get? Who would you like to provide that support?
 - b. How supported do you feel by your spouse?
 - c. How does this support influence what you eat? (e.g., time you have to eat, comfort you feel in eating more)
 - d. Are there tensions between you and your husband? If yes, what is the origin of the tension? When you have these tensions, how is it resolved between you?
7. If a female family member or friend was worried or depressed, how do you think it would influence her appetite and what she eats?
 - a. How does your mood affect what you eat?
 - b. To what extent do you think being worried influences what you eat? Please explain.

Section F: Children's Diets

[If they have a child 6–23 months, only ask the questions about that child. If they have a child between 2–5 years, only ask the questions about that child. If they do not have any children between the ages of 6 months and 5 years, skip this section.]

Now, we would like to know about the food that your [6–23 month/two to five years old] child eats. (please specify age group and gender)

1. Can you tell me about the food that your child ate yesterday from when she/he woke up to when she/he went to sleep (including meals and food in between meals)?
 - a. What did your child like about what they ate yesterday?
 - b. What did she/he not like?
 - c. How similar or different was what she/he ate yesterday compared to what she/he usually eats?
 - d. What would you have liked to do differently when feeding your child yesterday? (e.g., fed different types of food, fed larger quantities, had more time to sit with her/him)
2. How did you or your household decide what food your child ate yesterday?
 - a. How does this compare to how your household usually decides what to feed your child?
3. What factors influence how many different types of food your child eats? (e.g., beans, meat, cereals, vegetables, eggs, fruits)
 - a. What limits the different types of food that your child eats? (e.g., availability, seasonality, cost, hard to prepare, food preferences)
 - b. When are you able to feed your child more types of foods (e.g., during certain seasons or times of year)?
4. What do you consider as good, healthy food for your child?
 - a. Are there specific foods that children this age should not eat?
5. What challenges do you face feeding your child complementary foods (not breastfeeding)? (e.g., time to prepare foods, limited access to food, child is picky eater)
6. How much support do you get from your family or friends that help you feed and care for your child?
 - a. If yes, who supports or helps you? What type of support do they provide? (e.g., emotional support, information/educational support, help with certain tasks)
 - b. What kind of support or help would you like that you currently do not get? Who would you like to provide that support?
7. If a family member or friend was worried or depressed, how do you think it would influence her ability to feed and care for her child?
 - a. To what extent do you think being worried affects how you feed your child? Please explain.

Section G: Closing Questions

1. Is there anything else that you would like to share about farming or food production or food consumption?
2. Do you have any questions for us?

Online Implementing Staff Survey

A	Introduction
A01	What organization do you work for? (<i>open text</i>)
A02	What is your role on Emergency Response to Food Insecurity for Lake Chad Basin Crisis Affected Populations in the Far-North Region? (<i>select one</i>) <ul style="list-style-type: none"> • Project management/leadership • Technical staff • Monitoring and evaluation staff • Outreach or field staff • Other (<i>specify</i>)
A03	What geographic area(s) do work in for the Emergency Response to Food Insecurity for Lake Chad Basin Crisis Affected Populations in the Far-North Region?
B	Program Implementation
<i>The next questions are about the activities that were implemented in the agriculture components of the project and what you think the direct benefits were for participants.</i>	
B01	What agriculture activities were part of the project? (<i>select all that apply</i>) <ul style="list-style-type: none"> • Agriculture training (if yes, go to B02) • Distribution of seeds or seedlings (if yes, go to B03) • Distribution of agricultural tools, equipment, or agro-chemicals (if yes, go to B04) • Demonstration plots or gardens and Farmer Field Schools (if yes, go to B05) • Nutrition training and demonstrations (if yes, go to B06) • Other (<i>specify</i>)
B02	What topics were covered in the agriculture training? (<i>select all that apply</i>) <ul style="list-style-type: none"> • Crop and seed selection • Land preparation • Planting and sowing • Crop growth and development • Irrigation • Weed management • Agro-chemical application • Climate smart agriculture • Agro-ecology practices • Soil management and conservation • Water management and conservation • Pests and pest management • Crop diseases and management • Harvesting • Post-harvest storage and processing • Farm planning • Crop sales and marketing • Other (<i>specify</i>)
B02.1	Who provided the agriculture training? (<i>select all that apply</i>) <ul style="list-style-type: none"> • PUI (if yes, go to B02.2)

	<ul style="list-style-type: none"> • Ministry of Agriculture (if yes, go to B02.3) • PUI and Ministry of Agriculture jointly (if yes, go to B02.4) • Other (<i>specify</i>) (if yes, go to B02.5)
B02.2	<p>How would you rate the overall quality of the agriculture training provided by PUI? (<i>select one</i>)</p> <ul style="list-style-type: none"> • Very high quality • High quality • Moderate quality • Low quality • Very low quality
B02.3	<p>How would you rate the overall quality of the agriculture training provided by the Ministry of Agriculture? (<i>select one</i>)</p> <ul style="list-style-type: none"> • Very high quality • High quality • Moderate quality • Low quality • Very low quality
B02.4	<p>How would you rate the overall quality of the agriculture training provided jointly by the Ministry of Agriculture and PUI? (<i>select one</i>)</p> <ul style="list-style-type: none"> • Very high quality • High quality • Moderate quality • Low quality • Very low quality
B02.5	<p>How would you rate the overall quality of the agriculture training provided by other organizations? (<i>select one</i>)</p> <ul style="list-style-type: none"> • Very high quality • High quality • Moderate quality • Low quality • Very low quality
B02.6	<p>What were the <u>main three benefits</u> of the agriculture training for participants? (<i>select up to three</i>)</p> <ul style="list-style-type: none"> • Increased agronomic knowledge • Improved decision-making and planning skills • Improved sustainability of agricultural practices • Labor savings • Cost savings • Increased crop diversity • Increased crop yields • Improved post-harvest storage • Increased confidence to try new practices • Raised awareness about environmentally unsustainable practices • Other (<i>specify</i>)

B03	<p>What were the <u>main three benefits</u> of the seed distribution for participants? <i>(select up to three)</i></p> <ul style="list-style-type: none"> • Ability to farm/grow crops • Increased crop diversity • Expansion of area under production • Increased crop yields • Improved food security • More diverse diets • Other <i>(specify)</i>
B04	<p>What were the <u>main three benefits</u> of the agricultural tools, equipment, or agro-chemicals distribution for participants? <i>(select up to three)</i></p> <ul style="list-style-type: none"> • Ability to farm/grow crops • Improved soil fertility • Labor savings • Expansion of area under production • Increased crop yields • Improved weed management • Improved pest management • Improved crop disease management • Improved post-harvest storage • Other <i>(specify)</i>
B05	<p>What were the <u>main three benefits</u> of the demonstration plots and Farmer Field School for participants? <i>(select up to three)</i></p> <ul style="list-style-type: none"> • Increased agronomic knowledge • Improved decision-making and planning skills • Hands on experience with sustainable and best agricultural practices • Exposure to labor saving practices/technologies • Exposure to cost saving practices/technologies • Exposure to crop diversification and intercropping practices • Exposure to harvest and post-harvest storage practices/technologies • Increased confidence and ability to try new practices • Understand benefits of improved practices • Calculating crop yields • Social networking and exchange • Agricultural trade and marketing opportunities • Other <i>(specify)</i>
B06	<p>What topics were covered in nutrition education? <i>(select all that apply)</i></p> <p>Food groups and nutrients</p> <ul style="list-style-type: none"> • Dietary diversity • Recommended portion sizes • Infant and young child feeding • Nutrition for pregnant and lactating women • Food preparation and cooking • Food safety and hygiene • Personal hygiene and sanitation practices • Other <i>(specify)</i>

B06.1	<p>Who provided the nutrition training? <i>(select all that apply)</i></p> <ul style="list-style-type: none"> • PUI (if yes, go to B06.2) • Ministry of Health (if yes, go to B06.3) • PUI and Ministry of Health jointly (if yes, go to B06.4) • Other <i>(specify)</i> (if yes, go to B06.5)
B06.2	<p>How would you rate the overall quality of the nutrition training provided by PUI? <i>(select one)</i></p> <ul style="list-style-type: none"> • Very high quality • High quality • Moderate quality • Low quality • Very low quality
B06.3	<p>How would you rate the overall quality of the nutrition training provided by the Ministry of Health? <i>(select one)</i></p> <ul style="list-style-type: none"> • Very high quality • High quality • Moderate quality • Low quality • Very low quality
B06.4	<p>How would you rate the overall quality of the nutrition training provided jointly by PUI and the Ministry of Health? <i>(select one)</i></p> <ul style="list-style-type: none"> • Very high quality • High quality • Moderate quality • Low quality • Very low quality
B06.5	<p>How would you rate the overall quality of the nutrition training provided by other organizations? <i>(select one)</i></p> <ul style="list-style-type: none"> • Very high quality • High quality • Moderate quality • Low quality • Very low quality
B06.6	<p>What were the <u>main three benefits</u> of the nutrition training for participants? <i>(select up to three)</i></p> <ul style="list-style-type: none"> • Increased general awareness about nutrition • Increased understanding about role of nutrition for health • Improved knowledge about food groups and nutrients • Improved knowledge about recommended portion sizes • Improved understanding about recommended about infant and young child feeding practices • Improved knowledge about nutritional needs of pregnant and lactating women • Exposure to safe and hygienic food practices • Exposure to recommended personal hygiene and sanitation practices • Exposure to new food preparation or cooking practices

	<ul style="list-style-type: none"> • Improved food preparation and cooking skills • Increased motivation to eat nutritious foods • Increased confidence to try new infant and young child feeding practices • Increased motivation to purchase nutritious foods
C	Program Perceptions
<i>The next questions are about your perceptions of the challenges and successes faced while implementing the agriculture components of the project.</i>	
C01	<ul style="list-style-type: none"> • What were the main three challenges faced during implementation that affected the agriculture component of the project? (select up to three) • Insufficient funding • Inadequate numbers of staff • Inadequate staff skills and knowledge • Poor infrastructure (e.g., mobile service, internet, roads) • Insecurity and safety challenges at project implementation sites • Weak leadership or management • Weak monitoring and evaluation • Limited community interest or engagement • Distrust or conflict between project and community • Difficulty identifying vulnerable households • Difficulty working with political or community leaders • Logistical problems procuring inputs • Logistical problems distributing inputs • Logistical problems delivering training • Short project period • Project design • Other challenges related to politics • Other challenges related to economy • Other challenges related to socio-cultural factors • Challenges managing partner organizations • Challenges working with donor • Other (specify)
C02	<p>What do you think were the <u>three strongest aspects</u> of implementation of the agriculture component of the project? (select up to three)</p> <ul style="list-style-type: none"> • Sufficient funding • Strong relationship with donor • High staff technical capacity • Strong project management and leadership • High quality project design • Efficient distribution of inputs • High quality training provided to participants • Strong monitoring and evaluation • Strong relationship with the government • High capacity of government staff • Strong relationship with community • Strong interest and engagement from participants

	<ul style="list-style-type: none"> • Supportive political or community leaders • Other (<i>specify</i>)
C03	What do you think the project could do better next time to improve implementation? (<i>open ended</i>)
D	Perceived Impacts
<i>The next questions are about what <u>you</u> think the ultimate impacts were of the agriculture components of the project.</i>	
D01	<p>What do you think the <u>main three impacts</u> were for <u>participants</u> of the agriculture component of the project? (<i>select up to three</i>)</p> <ul style="list-style-type: none"> • Increased crop diversity • Increased crop yields • Decreased agricultural input costs • Increased income from crop sales • Improved food security • Improved access to healthy foods • Improved household dietary diversity (i.e., number of food groups consumed) • Improved resilience • Increased opportunities to market or trade crop surpluses • Other (<i>specify</i>)
D02	<p>To what extent do you think the agriculture component <u>resulted in increased dietary diversity</u> (i.e., number of food groups consumed) for women in participant households? (<i>select one</i>)</p> <ul style="list-style-type: none"> • Very significant increase • Significant increase • Moderate increase • Small increase • No increase
D03	<p>To what extent do you think the agriculture component <u>resulted in increased dietary diversity</u> (i.e., number of food groups consumed) for children 6-23 months in participant households? (<i>select one</i>)</p> <ul style="list-style-type: none"> • Very significant increase • Significant increase • Moderate increase • Small increase • No increase
D04	What do you think the project can do better next time to improve the impacts from the project? (<i>open ended</i>)
D05	What were any unexpected or surprising impacts from the agriculture components project? (<i>open ended</i>)
D06	Is there anything else you want to tell us about the agriculture component of the project? (<i>open ended</i>)



USAID
FROM THE AMERICAN PEOPLE

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