



# Baseline Report

FEED THE FUTURE NIGERIA LIVELIHOODS PROJECT<sup>1</sup>

November 2016

## Abstract

This report analyzes data for the Feed the Future Nigeria Livelihoods Project impact evaluation baseline survey. The baseline survey was completed before the start of the rainy season between May 2015 and June 2015 in Kebbi State in northern Nigeria. This report provides an overview of the sampling methodology and baseline survey administration, as well as an analytical profile of the poverty status, demographic characteristics, land ownership and employment choices of the vulnerable households surveyed. It also presents data analysis of an adapted version of the Women's Empowerment in Agriculture Index (WEAI).

Feed the Future strives to increase agricultural production and the incomes of both men and women in rural areas who rely on agriculture for their livelihoods. Consistent with the targeting for the program, the study sample is made up of rural, farming households, with 80% of the surveyed population naming crop and animal production as their primary income activity. Eighty-five percent of households in the study sample fall below the international USD 1.25/day poverty line based on a measure of daily expenditures per capita. Nineteen percent of households reportedly faced food insecurity within the past 12 months. Unemployment is high in the study population, with 37% of the sample reporting no persons within their household worked at an income-generating activity in the past 30 days prior to the baseline survey. In terms of agricultural land ownership, 55% of the households in the sample reported owning at least one plot of agricultural land; self-reported average land size was 3.3 hectares. Only 15 percent of surveyed women were defined as empowered based on a measure of the adapted WEAI.

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<sup>1</sup> This document was prepared for USAID by the World Bank's Africa Region Gender Innovation Lab.

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Cover page photo: Women carrying wood in Kebbi State, Nigeria (August 2016) (Photo Credit: GIL team)

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## Abbreviations and acronyms

ALGON	Association of Local Governments of Nigeria
BRAC	Bangladesh Rural Advancement Committee
CRS	Catholic Relief Services
CSO	Civil Society Organization
DDI	Diamond Development Initiative
EV	Extremely Vulnerable
FNLP	Feed the Future Nigeria Livelihood Project
GIL	World Bank Group's Africa Region Gender Innovation Lab
HTC	Household Targeting Committee
LGA	Local Government Area
LSMS	Living Standards Measurement Study
ML	Market Limited
NGN	Nigerian Naira
PPI	Progress out of Poverty Index
PPP	Purchasing Power Parity
RCT	Randomized Controlled Trial
SHARE	Support to Vulnerable Households for Accelerated Revenue Earnings
TNS-RMS	Taylor Nelson Sofres-Research & Marketing Services, Nigeria (Survey Firm)
USAID	United States Agency for International Development
USD	United States Dollar
VV	Very Vulnerable
WEAI	Women's Empowerment in Agriculture Index

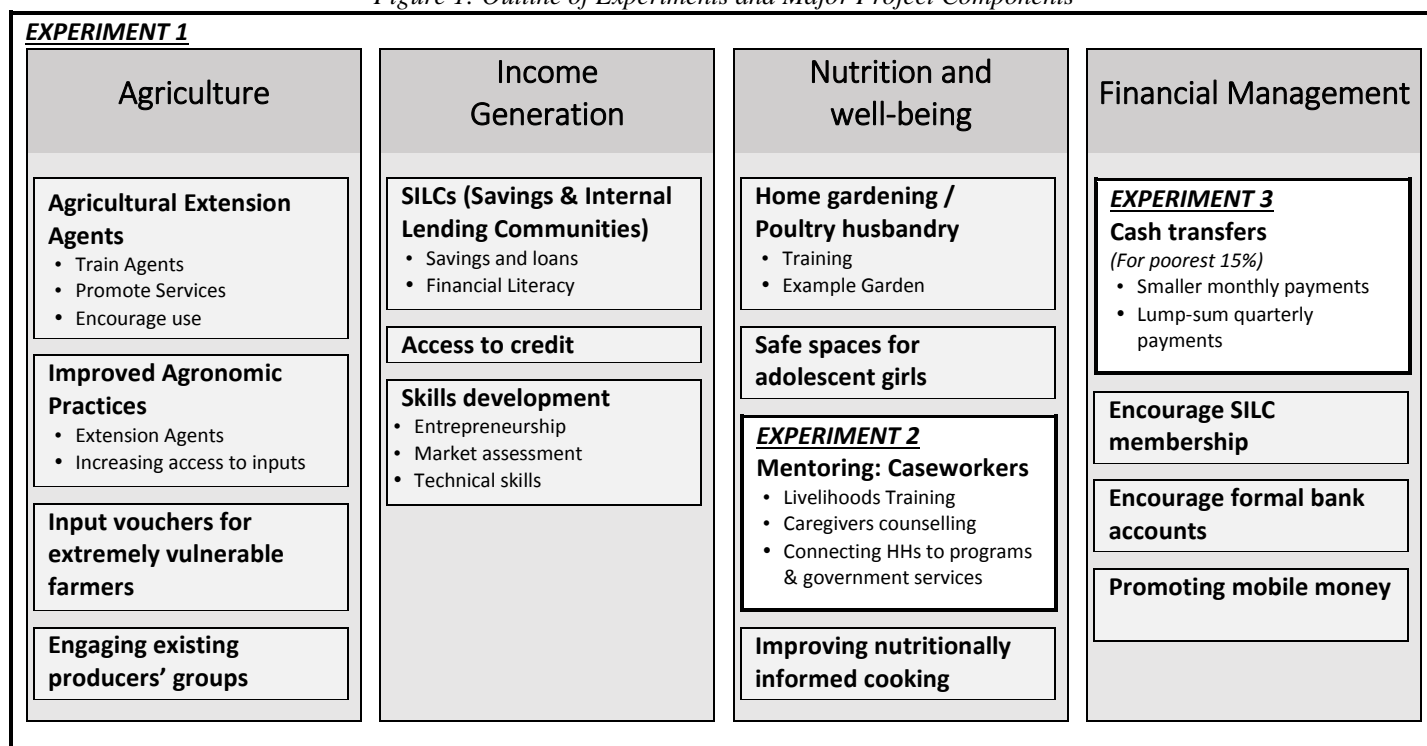
# 1 Introduction

The World Bank's Africa Region Gender Innovation Lab (GIL) is conducting an impact evaluation of the Feed the Future Nigeria Livelihoods Project (FNLP) that was formerly called the Support to Vulnerable Households for Accelerated Revenue Earnings (SHARE) project. FNLP is a multi-component development project based on the graduation model pioneered by Bangladesh Rural Advancement Committee (BRAC) that intends to help 42,000 very poor households across rural communities of northern Nigeria's Sokoto and Kebbi states, and the Federal Capital Territory (FCT). FNLP is a 5-year program implemented by Catholic Relief Services (CRS). Both the program and the impact evaluation are funded by United States Agency for International Development (USAID).

This program approach is founded on an agriculture-led growth strategy that is expected to help vulnerable families diversify their income and grow assets while the community is strengthened by improving nutrition, water sanitation, and hygiene. The most vulnerable families receive cash transfers. A caseworker-led livelihood mentoring scheme also matches households with the resources they need to engage effectively in the local economy and break free from the cycle of poverty and malnutrition.

Figure 1 outlines the major components and subcomponents of this project and the three experiments being conducted as part of an impact evaluation; a more detailed discussion of all the program components can be found in the impact evaluation concept note and the project proposal document.<sup>2</sup>

Figure 1: Outline of Experiments and Major Project Components



<sup>2</sup> Refer to the document *SHARE\_Concept\_Note\_25022015.pdf*

FNLP was designed to rollout in three phases, classes A, B, and C in 2014, 2015, and 2016 respectively. In total, 12,000 households in 104 villages are expected to receive the program in Kebbi State, where this impact evaluation is being conducted. The baseline data presented in this report was collected from a subset of these households. Outside the scope of this impact evaluation, CRS is providing services to an additional 30,000 households in Sokoto State and FCT as part of this project.

The impact evaluation is designed to capture the outcomes of three different experiments (see Figure 1). The first experiment evaluates the village level impact of the FNLP. The second and third experiments evaluate household-level impacts of two important sub-components: a caseworker-led mentoring program focused on livelihood planning, called the **caseworker model**, and an unconditional **cash transfers** program for women in extremely vulnerable households. The components evaluated in each experiment are highlighted in Figure 1 and discussed in greater detail in Section 2.

The identification of program beneficiaries for this program in Kebbi drew heavily from lessons learned in the ultra-poor graduation pilots<sup>3</sup>. Beneficiary households were selected through a multi-stage process involving the identification of vulnerable communities, followed by a community-based identification of vulnerable households and finally the use of a version of the “Progress out of Poverty Index” (PPI) to rank relative vulnerability. Households were stratified into three vulnerability categories, which were defined based on the distribution of the PPI score within each LGA ward. The category definitions are provided in Table 1 and discussed further in Section 3.

*Table 1: Vulnerability Category Definitions*

<b>Vulnerability Category</b>	<b>Vulnerability Percentiles <sup>a</sup></b>
Extremely Vulnerable (EV)	Bottom 16 percentiles
Very Vulnerable (VV)	17 <sup>th</sup> to 85 <sup>th</sup> percentile
Market Limited (ML)	Top 15 percentiles

*Note: (a) Vulnerability distributions were stratified by ward.*

In FNLP villages, households in all three vulnerability categories are eligible to benefit from all the program components except the caseworker model and the cash transfers. The caseworkers are randomly assigned to half the households in FNLP villages across all three vulnerability categories. The cash transfers are also randomly assigned to women in half of the EV households in all eligible villages.

The baseline data that are the basis of this report were collected in preparation for the program rollout in Kebbi State between May 2015 and June 2015. The objective of the baseline survey was to build a comprehensive dataset that would serve as a reference point before program implementation commenced. The survey was designed and supervised by GIL and executed by TNS-RMS, a Nigerian survey firm. This document discusses the overall design of the impact evaluation in Section 2, the sampling methodology in Section 3, a description of the baseline survey field operations in Section 4, summary statistics from the baseline data in Section 5, and conclusions in Section 6.

<sup>3</sup> CGAP Focus Note: Reaching the Poorest: Lessons from the Graduation Model (Hashemi and Montesquiou 2011).

## 2 Impact Evaluation Design

The design described in this section allows us to identify independent and joint overall effects for all of the FNLP program, and for two sub-components: the caseworker model and the cash transfers. The design was developed through extensive discussions with the implementation team (CRS) and the program funders (USAID) to identify institutional and project-specific learning objectives. This is a complex impact evaluation composed of three main experiments:

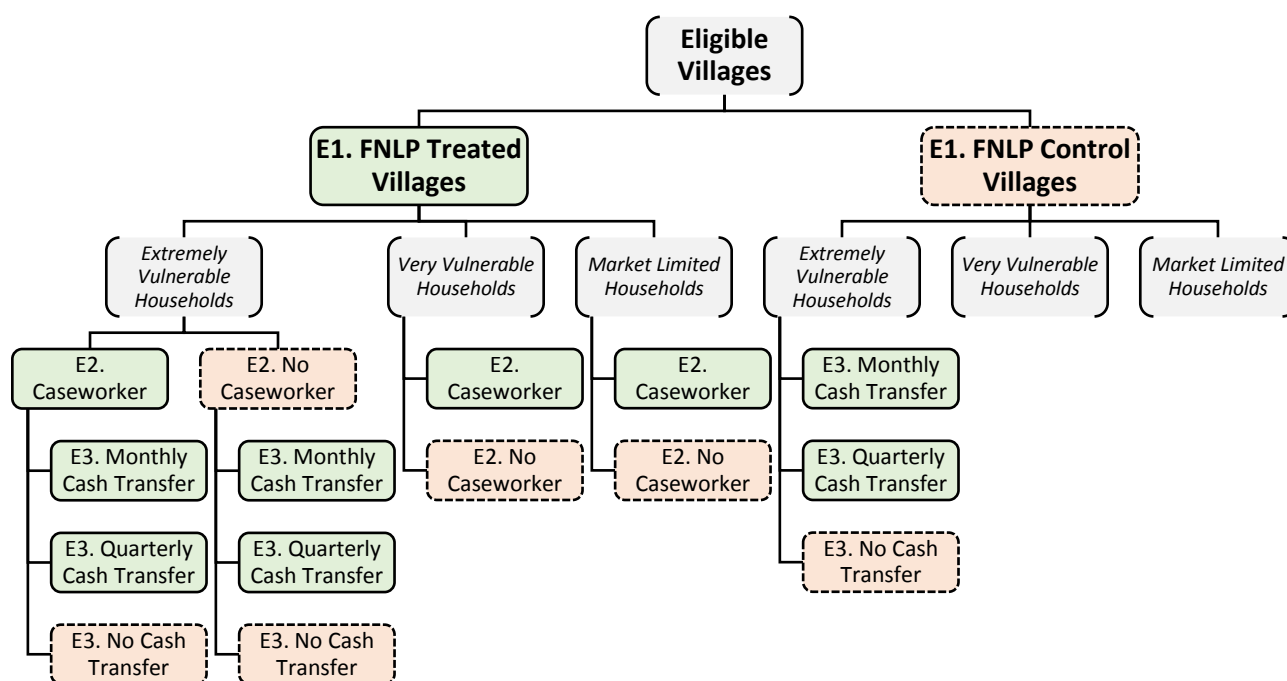
### E1. Village-level impacts of FNLP

### E2. Household-level impacts of caseworker mentoring

### E3. Household-level impacts of varying the size of cash transfers

The structure of the experiments and their inter-relationship is laid out in Figure 2 and summarized in this section.<sup>4</sup> In Figure 2, the experimental groups are displayed in boxes and non-experimental groups in box brackets. Treatment groups are in solid-lined boxes shaded green, and control groups are in broken-lined boxes shaded orange. Each experimental group is also marked for which experiment they are related to in the list above.

Figure 2: Impact Evaluation Design Diagram



<sup>4</sup> For a complete description of the impact evaluation design please refer to the Concept Note. [Refer to the document *SHARE\_Concept\_Note\_25022015.pdf*]



### 2.1.1 Experiment 1: Village-level Impacts of FNLP

In the first experiment, half the eligible villages identified by the implementer, as described in Section 3.1 below, were randomly selected to receive the FNLP intervention; the other half of the villages will not receive the FNLP interventions<sup>5</sup>. This clustered experiment allows us to identify the overall effect of the program on beneficiary households inside eligible villages since treated households and non-treated households will be in different villages. Clustering also reduces the risk that non-treated households might indirectly benefit from FNLP, minimizing spillover effects.

### 2.1.2 Experiment 2: Household-level Impacts of Caseworker Mentoring

The evaluation of the caseworker model will examine the impact of the livelihood planning and mentoring program on reducing vulnerability especially through the take-up of other FNLP and public services available to households. Local female volunteers trained by CRS, known as liaisons, provide the in-home mentoring. Beneficiary households are trained to plan their livelihoods and manage their income to help them graduate out of poverty. Liaisons will also facilitate women's caregiver groups, focused on life skills like hygiene and family planning.

The caseworker experiment allows us to identify the *incremental* effect of livelihood mentoring on households in FNLP villages. All vulnerable households in the treatment villages were eligible to receive caseworkers. Within each vulnerability category, half the households were randomly selected to receive an in-home mentoring from a trained community volunteer. Households that do not receive this additional program continue to be eligible for other FNLP services offered in the village. Since households were randomized within villages, this experiment will not be able to account for spillovers across households.

### 2.1.3 Experiment 3: Household-level Impacts of Varying the Size of Cash Transfers

The cash transfers evaluation will assess the impact of providing unconditional cash transfers to women in extremely vulnerable households. Livelihood choices, intra-household decision-making, consumption smoothing, investments, and savings are amongst outcomes of interest for this experiment. This experiment will be provided to the poorest households in both FNLP treatment and control villages.

Half of the eligible households will receive the transfers. The recipient households will be equally divided into two groups. The first group will receive fifteen monthly payments. The others group will receive five quarterly payments over the same fifteen-month time frame. Both groups will receive a total of NGN 71,500 (approximately USD 350 based on the October 2015 exchange rate).

Varying the frequency and size of the transfers may impact the allocation of the new resources between consumption and investment. Understanding the differential impact on these two groups is expected to provide important policy insights especially since high transaction costs are a barrier to scale-up.

This design allows us to assess both the incremental impact of receiving cash transfers in FNLP villages, as well as the pure effect of receiving just cash transfers without the accompanying FNLP programs. As with Experiment 2, since the treated and control households are within the same villages, we are not able to experimentally account for spillovers.

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<sup>5</sup> However, the cash transfer program is given to extremely vulnerable households even in FNLP control villages.

### 3 Beneficiary Identification & Sample Selection

To determine which areas within Kebbi State would benefit from the FNLP program and to establish a sample of vulnerable households that will be part of the program and impact evaluation, CRS and GIL identified eligible communities and households in Kebbi using a number of steps. Detailed explanations of each stage in the process are provided in the subsequent sections.

This section discusses activities related both to the impact evaluation as well as the program implementation. As in other parts of this document, when we refer to activities conducted by CRS or in collaboration with CRS we are referring to activities that were essential for program implementation but had a strong bearing on the impact evaluation design, execution and validity.

#### 3.1 Beneficiary Targeting and Categorization

##### 3.1.1 Identifying Vulnerable Households

A four-step strategy was utilized to target the most vulnerable households in the sample area. FNLP's targeting strategy was based on the approach used by the ultra-poor graduation pilot programs. The beneficiary targeting and identification strategy is summarized in Table 2 and explained in detail in the remainder of this section.

*Table 2: FNLP's Beneficiary Targeting Strategy*

#	Step	Description
1	<i>Selecting program areas</i>	The program implementer identified the program areas, i.e. the state, local government areas (LGAs) and eligible villages.
2	<i>Community identification of vulnerable households</i>	Village communities were mobilized to conduct a participatory poverty appraisal to identify vulnerable households.
3	<i>Measuring poverty using the PPI</i>	A poverty measurement survey was conducted using the Progress out of Poverty Index (PPI) to measure the poverty of households identified in Step 2.
4	<i>Verifying vulnerability status</i>	The vulnerability status of households was determined based on their PPI scores. Ineligible households were dropped from the beneficiaries list.

*Selecting Program Areas:* Out of the 21 Local Government Areas (LGAs) in Kebbi State, Birnin Kebbi and Danko Wasagu were selected through a competitive bidding process based on Expressions of Interest solicited by CRS in collaboration with the Ministry of Local Government and Chieftaincy Affairs, and the Kebbi State Chapter of the Association of Local Governments Nigeria (ALGON). The applications were evaluated by CRS and MLGCA based on the following criteria: above-average population size, largely rural population, wide geographic spread, administrative capacity to offer services and commitment to the cash transfer program.

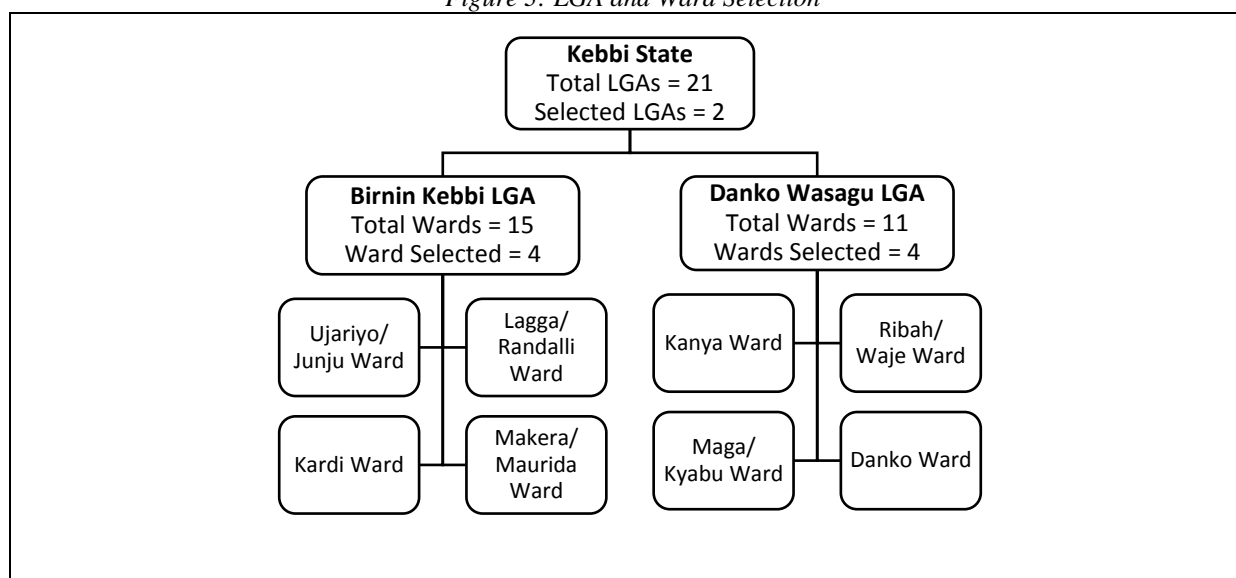
The selection of these two LGAs was unanimously endorsed by the 21 LGA chairpersons representing ALGON. The Kebbi State Ministries of Agriculture & Natural Resources, and Women Affairs & Social Development also provided approval for this selection.

A CRS team was tasked with identifying four wards and at least 50 villages in each of the LGAs. Birnin Kebbi has a total of fifteen wards, and Danko Wasagu has eleven. The FNLP wards were selected based on the existence of a substantial vulnerable population, and logistical considerations about program monitoring

and service delivery. Villages needed to have more than 250 households to be considered for inclusion in the program, however, smaller hamlets that were very close to large villages were also considered. CRS also consulted the National Population Commission of Nigeria to help estimate the village populations and attempt to estimate the concentration of vulnerable households in each village.

The eight FNLP wards that were finally selected by CRS were: Ujariyo/Junju, Lagga/Randalli, Kardi and Makera/Maurida in Birnin Kebbi; and Kanya, Ribah/Waje, Maga/Kyabu and Danko in Danko Wasagu. Figure 3 illustrates the LGA and Ward selection process.

Figure 3: LGA and Ward Selection



Based on the field work and secondary data, 132 village names were identified in the eight FNLP wards that potentially had the approximately 24,000 households that were needed to meet FNLP program and impact evaluations targets. Eleven village names were dropped from this list when the field team was not able to identify them on the ground. The remaining 121 villages were visited by CRS and the survey firm to hold a Household Targeting Committee (HTC) meeting that had the task of listing all the households considered vulnerable in that particular village.

*Community Identification of Vulnerable Households:* Drawing lessons from the ultra-poor graduation program’s targeting methodology, FNLP used a community-driven approach to identify vulnerable households. CRS convened a Household Targeting Committee (HTC) in each of the 121 FNLP villages. The following community stakeholders were invited to be part of the committees: the village heads and their counselors, religious leaders, health workers, farmers’ group leaders, teachers, youth leaders, women leaders, and agricultural extension workers. HTC meetings were generally held at the Traditional Ruler’s palace which is typically a hut building located in the center of the village.

CRS provided the following guidance about the characteristics of vulnerable households to the HTC: “Vulnerable households are households that have low income, they have few assets (like TVs, radios, bicycles or hoes), and they own less than one acre of land. They probably eat only a few times per day, and eat meat only very rarely. Vulnerable households might also have children out of school, people too sick to work, or very old. They might also have many babies or pregnant women.”

The HTC was invited to discuss the characteristics of what might constitute vulnerability in their local context and meet by itself (without CRS) to list out the vulnerable households in their communities. During the course of the HTC exercise, three more village-names were dropped from the list because two of them were names of neighborhoods in other listed villages, while one was an alias for another village already on the list. The hand-written lists produced by the HTCs of 118 villages were digitized by the survey firm and became the sample frame for the PPI.

*Measuring Poverty using the PPI:* The Progress out of Poverty Index (PPI)<sup>6</sup> is a poverty measurement tool composed of 20 questions about household demographics, health, human capital and assets. The higher the PPI score of a household the more vulnerable it is deemed to be. The PPI data was collected from 18,272 households in 116 villages<sup>7</sup>.

*Verifying Household Vulnerability Status:* Any household that received a score of less than 8 on four food security measures in the PPI were deemed insufficiently vulnerable to be included in the FNLP, as were households with an overall PPI score of less than 25. Only 209 households were excluded from the program based on this criterion.

### 3.1.2 Vulnerability Categorization

To simplify the implementation of the cash transfers, CRS agreed that all the cash transfers would be given in the 'Class B' rollout. Since a sample size of approximately 2,400 vulnerable households was required according to the power calculations (See Box 1 for details), the Extremely Vulnerable (EV) category was defined as the most vulnerable 16 percentiles of households in each ward (i.e. those with the highest PPI scores) which added up to 2,400 households across Kebbi State.

Very Vulnerable (VV) households were defined as the 17th to 85th most vulnerable percentiles, and Market Limited (ML) households were the 15 least vulnerable percentiles based on the PPI.

It was logistically infeasible to provide cash transfers in villages with less than 18 EV households. This resulted in 256 EV households in 31 villages being excluded from the cash transfers, but they continue to be eligible for other FNLP services since the total number of vulnerable households make overall FNLP coverage feasible.

## 3.2 Randomization

The implementation of the impact evaluation design strategy for each of the experiments summarized above in Figure 2 is described here.

### Experiment 1: Village Randomization

Some of the 104 villages that were found to be eligible to receive FNLP were geographically very close to each other, increasing the risks of program spillovers if they were inadvertently assigned to different

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<sup>6</sup> The PPI survey questionnaire is included as an attachment to this report.

<sup>7</sup> The village chiefs of Danguntu village in Maga/Kyabu ward of Danko Wasagu LGA and Tungar Maifada village in Lagga/Randalli ward of Birnin Kebbi LGA refused the PPI survey since it was being conducted in the run-up to the Nigerian presidential election.

treatment arms. To reduce this risk, villages that were either within a ½ mile (.802 km) radius of one another, or were within a ½ mile of each other by road, were grouped together. 14 villages were affected by this criteria, and were assembled into 6 village groups. 90 villages were unaffected by this criteria, leaving us with 96 randomization units.

To maximize statistical power, by ensuring that similar villages were included in the treatment and control groups, the village randomization was stratified by ward and an infrastructure index, used as a proxy for the development of the village. The infrastructure index was created by counting the number of infrastructure items<sup>8</sup> that existed in each village based on data collected using the Community Questionnaire. The villages were then divided into terciles (or thirds) within each ward based on their location in the distribution of infrastructure index scores. Table 3 shows the number of villages in each ward/infrastructure-tercile cell. Villages were randomized into treatment and control within each cell.

*Table 3: Number of Villages in each Village Stratified Randomization Cell*

LGA/Ward	Infrastructure Index			Total
	Bottom third	Middle third	Top third	
Birnin Kebbi LGA				
Kardi	5	3	1	9
Lagga/Randali	3	3	3	9
Makera/Maurida	5	3	4	12
Ujariyo/Junju	7	2	1	10
Danko Wasagu LGA				
Danko	5	5	1	11
Kanya	11	4	3	18
Maga/Kyabu	7	5	5	17
Waje	7	0	3	10
Total	50	25	21	96

The FNLP village-level experiment includes 104 villages comprising 12,146 households. Of these, 52 are treatment villages (with 6,094 households) and the other 52 are control villages (with 6,052 households). Based on the grouping strategy described above, this is equivalent to 96 randomization units, with 50 treatment units (2 village groups & 48 villages) and 46 control units (4 village groups & 42 villages).

#### **Box 1: Phased Program Rollout**

FNLP was designed to be rolled out in three annual phases, which is how it was implemented in Sokoto State and FCT. However, in Kebbi State, FNLP was started a year later than in the other areas, so the program was adjusted to be rolled out in two annual phases: ‘Class B’ began in June 2015, and ‘Class C’ was planned for 2016.

In total, CRS intends to reach 12,000 vulnerable households in Kebbi State through FNLP. To ensure that there would be a sufficient number of households to form the control group in the impact evaluation, the initial target was to identify 24,000 vulnerable households. 18,272 vulnerable households were identified, after PPI data collection in 116 villages.

<sup>8</sup> The infrastructure index was computed by giving the village a score of one for having at least one of each of the following 16 items: primary school, secondary school, health center, hospital, doctor, midwife, pharmacy, airtime or cellphone distributor, bus stop, main access road, bank, microfinance institution, police station, market, mosque or church and community center.

From amongst the villages randomly selected to receive FNLP, GIL assisted CRS in randomly assigning 6,094 vulnerable households to ‘Class B’; 2,382 households were assigned to ‘Class C’ within the FNLP treatment villages. CRS intends to conduct additional recruitment of households and villages to reach its total target of 12,000 households in Kebbi State. Similar top-up recruitment was also conducted in Sokoto State and FCT.

Nine villages with less than 30 vulnerable households, a large village with 1,594 vulnerable households and two other villages where PPI data was not verifiable, were not included in the impact evaluation. GIL provided the list of these households to CRS, who may decide to offer FNLP to the 2,094 vulnerable households in these villages in ‘Class C’. 104 villages were left to be randomized, a process that is described later in this section.

## Experiment 2: Caseworker Randomization

All households in the FNLP treatment villages selected in the randomization for Experiment 1 were eligible to be included in the randomization for Experiment 2. Of the 6,094 vulnerable households in the 52 FNLP treatment villages, half (3,047 vulnerable households) were randomly selected to receive the caseworker-led livelihood mentoring treatment. The remaining 3,047 vulnerable households will not receive the caseworker treatment. However, they will be eligible for other FNLP services being offered in the village. Treatment assignment was stratified by vulnerability category so the vulnerability profile of the caseworker treatment group will be similar to that of the control group as shown in Table 4. All households in the treatment villages in ‘Class B’ of the program rollout were randomly assigned to either the ‘caseworker’ or ‘no caseworker’ treatment arms. Comparing these two groups will allow us to evaluate the incremental effect of the caseworker mentoring scheme on program impact.

Table 4: Caseworker Treatment Assignment by Household Vulnerability Status

Treatment Status	Household Vulnerability Status			Total
	Extremely Vulnerable	Very Vulnerable	Market Limited	
Treatment	708	1,872	467	3,047
Control	703	1,875	469	3,047
<b>Total</b>	<b>1,411</b>	<b>3,747</b>	<b>936</b>	<b>6,094</b>

### 3.2.1 Experiment 3: Cash Transfer Randomization

A public lottery was utilized to randomly assign eligible households in the Extremely Vulnerable (EV) category in both the FNLP treatment and FNLP control villages. Eight ward-level public randomization ceremonies were organized at the residence of the ward chiefs. Community representatives from each village were invited to participate in the event. CRS and GIL representatives explained the cash transfer program and the randomization process to all present at the beginning of the ceremony. Four containers were placed at the front of the assembled group: one marked “Monthly Cash Transfers,” one marked “Quarterly Cash Transfers,” and two marked “No Cash Transfers.” The order of the containers for each ward-level ceremony was randomized by GIL in advance of the ceremony. Paper slips containing the names of all eligible households were placed before the assembly. Members of the audience would come up to the front, draw out a slip, read out the name and village, and place it in the next unused container while announcing the treatment assignment. After all the containers had been cycled through, they would circle back to the first and continue till all the names were assigned to a treatment arm. Each EV household had a 50% chance of receiving a cash transfer. The results of the treatment assignment are tabulated in Table 5.

Table 5: Cash Transfer Treatment Assignment by Village FNLP Treatment Status

Treatment Group	FNLP Treatment Villages	FNLP Control Villages	Total
Monthly Cash Transfer	322	372	694
Quarterly Cash Transfer	317	375	692
No Cash Transfer	634	760	1394
<b>Total</b>	<b>1273</b>	<b>1507</b>	<b>2780</b>

### 3.3 Baseline Sampling & Power Analysis

For the Impact Evaluation baseline survey, a sample of 2,400 EV households and 1,100 households equally divided between the VV and ML households was necessary based on power calculations. We sampled 2,074 of the ‘Class B’ households in FNLP treatment villages and 2,254 from FNLP control villages and sent this sample of 4,328 households to the survey firm to conduct a baseline survey. The number of household interviews completed was 3,976 for a household response rate of 92 percent (see section 4.6 for more detail on survey non-response).

#### Box 2: Statistical Power Analysis

For the **cash transfers experiment (Experiment 3)**, budgetary constraints limited the sample size to approximately 600 beneficiary households in treatment villages and another 600 beneficiaries in the control villages. All extremely vulnerable (EV) households were eligible for cash transfers. Adding an equal number of non-cash transfer households raised the sample size to 1,200 in each arm of the village level experiment. These households are spread over 104 villages; however, the sample is stratified by 96 village groups. Some smaller or geographically indistinct villages were grouped with larger neighbors by the implementer for logistical efficiency.

Since the sample size is programmatically fixed for the cash transfer experiment, we conducted a sensitivity analysis to find the minimum detectable effect sizes at 80% power. With a sample of 1,200 households we are powered to detect: 32-36% changes in income, 8-9% changes in hours worked, and 40-45% changes in nutrition. With a sample of 2,400, i.e. including the FNLP control village sample, we are powered to detect slightly smaller effects: 26-30% changes in income, 7-8% changes in hours worked and 32-38% changes in household nutrition.

The **caseworker mentoring experiment (Experiment 2)** includes the very vulnerable (VV) and market limited (ML) groups in addition to the extremely vulnerable (EV). All households in FNLP villages within each of these groups were randomized in this experiment. In determining the sample size required for data collection, first, we included the cash transfer sample of 1,200 households for whom we are already collecting data. The cash transfer sample is, in fact, the entire population of EV households within the FNLP villages. Power calculations indicated that roughly 550 additional households needed to be sampled, equally distributed over the VV and ML groups, with half receiving the caseworker treatment. With a combined sample size of 1,750, stratified by 48 village groups, the study is powered to detect effects in the range of 24-27% changes in income, 6-7% changes in hours worked, and 30-34% changes in household nutrition for the caseworker intervention.

Finally, for the **village-level FNLP experiment (Experiment 1)**, mirroring the stratified sample of 1,750 from the FNLP treatment villages in the FNLP control villages gives us a total sample size of 3,500 households for the village-level experiment. The random assignment is clustered at the village-group level into 96 clusters. The sample is composed of 69% EV (2,400 households), and 550 households each in the VV and ML groups. Given this sample, we are powered to detect 18-24% changes on income, 5-6% changes in the number of hours worked and 23-28% changes in household nutrition.

Appendix C of the Concept Note provides a detailed technical discussion about these power calculations.

## 4 Baseline Survey Implementation

### 4.1 Questionnaire Design

The survey questionnaire created for the FNLP baseline survey draws on a number of sections from the World Bank Living Standards Measurement Study (LSMS). For the baseline survey, three instruments were used for data collection:

1. **Household questionnaire:** The household questionnaire was administered to all households in the sample and collected demographic characteristics for all household members, information on dwelling characteristics, household consumption expenditures, household asset holdings, aspirations, exposure to shocks, and level of participation in safety net programs. In addition, individual-level questions around food security, risk aversion, and time preferences were asked to both the male and female decision-makers in the households.
2. **Women's questionnaire:** Women were also asked to respond to a separate Women's Survey that had questions based on the Women's Empowerment in Agriculture Index (WEAI).
3. **Agricultural questionnaire:** An agriculture questionnaire was administered to all households engaged in agricultural activities such as crop farming, livestock rearing and other agricultural and related activities. The instrument asked questions on land holdings, agriculture production, sales, agricultural income and level of participation in extension services programs. Plot-level information was collected from the male and female decision-makers in the households who were the target respondents for this questionnaire.
4. **Community questionnaire:** A community questionnaire was administered to each village to collect information on the socio-economic indicators of the village communities where the sampled households reside. The community questionnaire collected information on basic characteristics of the community such as location, size, distance to larger towns and markets, and availability of and distance to sources of health services and schools. Data was collected from 5-10 community members during the Household Targeting Committee meetings.

The survey questionnaires are provided as an attachment to this baseline report.<sup>9</sup>

### 4.2 Country Approvals and Informed Consent Process

In line with World Bank Group procedures and in consultation with the USAID Nigeria Mission, the project received ethical clearances to conduct the baseline survey from the Permanent Secretaries of the Kebbi State Ministries of Agriculture & Natural Resources, and Local Government & Chieftaincy Affairs.

The documents that were submitted to obtain approval were the project concept note, baseline survey questionnaire, a script to establish informed consent and a cover letter. The cover letter introduced the parties involved in the project, provided assurance that all personal data collected will be kept confidential, and outlined the objectives of the research to facilitate the design of more effective policies on agricultural

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<sup>9</sup> See Appendix A for a list of all attachments.



interventions for ultra-poor households. The FNLP Kebbi State coordinator helped the impact evaluation team navigate the country approval application process by following up with government officials.

### 4.3 Interviewer Training and Piloting

The survey firm contracted by GIL to collect the baseline data, TNS-RMS (a Nigerian survey firm with headquarters based in Lagos, Nigeria), recruited 40 interviewers and 8 supervisors for the baseline survey. TNS-RMS initially began the classroom training with 59 interviewers, but a number were dropped based on quality concerns.

#### 4.3.1 Interviewer Training

Interviewers were trained using the paper version of the questionnaire for 3 weeks and an additional week was spent studying the questionnaire in electronic format. The interviewers also conducted pilot surveys on the tablet computers<sup>10</sup> in villages outside of the impact evaluation sample. The GIL team also assessed the interviewers by ranking their interviewing skills and knowledge of the questionnaires. The 40 interviewers who were sent to the field were found to have good or excellent skills to effectively conduct the survey; those with poor skills were dismissed. Interviewers were assigned to smaller groups, and each group of 5 interviewers was expected to complete 15 interviews a day to ensure the baseline survey was completed before program implementation.

#### 4.3.2 Hausa Translation

All the questionnaires were developed in English, and translated into the Hausa language commonly spoken throughout Northern Nigeria. TNS-RMS, the survey firm contracted a local linguist to translate the baseline questionnaires from English into Hausa. A supervisor at TNS-RMS reviewed the translated questionnaire before the interviewer training. The English and Hausa versions of each question were also reviewed side-by-side during the training to ensure that the interviewers properly understood the context and meaning of the questions they were going to ask. Both the English and Hausa versions of the questionnaire and accompanying prompts and scripts were included in the electronic version of the questionnaire. Since there are a number of language dialects in this region, the interviewers were trained on the context of the question so that, where necessary, the interviewers could draw on different dialects to ensure the question was fully understood by the respondent.

#### 4.3.3 Questionnaire Piloting

The pilot surveys that were conducted ahead of data collection provided good practice for the interviewers and allowed the team to identify issues before the main data collection started. During the pilot, the team faced challenges with the tablet computers because it was very hot in Kebbi at 43 degrees Celsius. The performance of the tablets was affected by the heat, including through reductions in expected battery life. The survey firm sent power banks from Lagos to help increase the battery life of the tablet computers. During the pilot survey, the average time taken to complete an interview was four-and-quarter hours.

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<sup>10</sup> Samsung Galaxy Tab 10.1 tablets, running Android OS were used for this survey. The surveys were programmed and administered using SurveyCTO's online platform as a back-end and the SurveyCTO Collect Android app as the front-end.

However, the interviewers were retrained on sections about Economic Shocks, Risk Aversion and Hyperbolic Discounting which were taking longer to administer. The additional practice helped reduce the total time taken to complete an interview to two-and-half hours before baseline data collection commenced. During the pilot, it was found that households were not receptive to having a male interviewer interview female respondents. To rectify this, female interviewers conducted the women's interview at the end of the visit to the household in cases where the male interviewer was not well-received.

## 4.4 Baseline Survey Data Collection

Although data collection was originally planned to begin in February, restrictions related to Federal and State elections throughout Nigeria led to the survey and the program implementation being delayed. The data collection finally started on May 4<sup>th</sup> in Birnin Kebbi and continued to Danko Wasagu concluding on June 16<sup>th</sup> 2015.

Since the households interviewed during the baseline survey were selected from the PPI database, some of the supervisors and interviewers had already visited the locality prior to the baseline data collection and locating households was easier as a result.

The male and female decision-makers in the household completed the survey together unless there was only one decision-maker in the household. The respondents are those which are self-identified as the primary male and female members responsible for the decision making, both social and economic decisions mainly related to agriculture, within the household. If only one of these people were available at the time of the first visit, interviewers would complete the sections relevant to them and a second visit would be rescheduled for when the other was in attendance to complete the survey.

The questionnaires were administered in face-to-face interviews in the respondents' home, using tablet computers. Many of the female respondents in Kebbi were not permitted to come out of their homes to answer questions; in such cases, female interviewers were permitted access to their homes. The field teams worked to ensure that this challenge was minimized by having enough female interviewers as part of each team.

In some cases, power failure due to the hot and dry climate increased the duration of the interview by one to two hours. In such cases, the interviewers were encouraged to conduct the interviews in shaded areas away from direct sunlight when interviewing respondents in an effort to preclude such adverse outcomes. Some interviews were also conducted in the early morning or late afternoon to mitigate this challenge. In addition, power banks and paper questionnaires were employed in cases where power was an issue.

TNS-RMS worked with CRS to ensure that the baseline data collection activities were completed before program implementation began. This was a concern because the program needed to start before the start of planting season, which varied across the sample by location and crop mix.

## 4.5 Data Quality Assurance

Data quality was ensured at several levels. At the tablet level, the questionnaire was programmed so that questions or sections could not be skipped by interviewers. Numerous quality checks were also built into the programming that identified inconsistencies and prevented interviewers from moving forward with the

survey until errors were corrected. Logic checks and range checks were also included in the programming so that implausible entries were flagged to the interviewer at the time of surveying.

Monitoring of data collection activities was also conducted by several people. Supervisors monitored interviewer performance by observing interviews and conducting spot checks that consisted of assessing whether questions were being asked appropriately and providing immediate feedback to interviewers. The World Bank's Project Manager and Field Coordinator also provided another layer of quality control, visiting each interviewer team at least twice each week to observe interviews and review household listings.

A final level of data quality control involved the use of quality control reports that were automatically generated using a quality-check file created by the research team at the World Bank. The file would scan the data for possible errors or large outliers as soon as data was downloaded from the server. The types of checks the file would make included the following: whether the household identifiers were unique within the dataset, whether interviews were being completed in their entirety, reviewing observations with duplicate values of a variable for which duplicates are uncommon, checking that no variables have only missing values, checking important skip patterns, range checks and interviewer comments. This helped with data accuracy as the report was reviewed at least every week by the research team throughout the data collection period and any errors could be sent back to the field team and rectified in real time while the data collection was still taking place.

## 4.6 Survey Non-Completion Rates

The final number of households surveyed was 3,976 (2,772 EV households, 958 VV households, and 246 ML households). The survey non-completion rate for the full sample was 8% with no replacement households. The non-completion rates were fairly balanced across control and treatment groups at 9% and 7%, respectively. Non-response was due mainly to the selected household being away on travel, the household not being found, and refusal. Table 6 tabulates the baseline survey non-completion rate by vulnerability category while Table 7 tabulates the rate by FNLP village treatment and control status.

*Table 6: Baseline Sample Size & Non-Completion Rates by Vulnerability Category*

<b>Vulnerability Category</b>	<b>Not Surveyed</b>	<b>Survey Completed</b>	<b>Total</b>	<b>Non-completion Rate</b>
Extremely Vulnerable	264	2,772	3,036	8.7%
Very Vulnerable	73	958	1,031	7.1%
Market Limited	15	246	261	5.8%
<b>Total</b>	352	3,976	4,328	8.1%

*Table 7: Baseline Sample Size & Non-Completion Rates by Treatment Status*

<b>Treatment Status</b>	<b>Not surveyed</b>	<b>Survey completed</b>	<b>Total</b>	<b>Non-completion Rate</b>
Treatment	140	1,934	2,074	6.8%
Control	212	2,042	2,254	9.4%
<b>Total</b>	352	3,976	4,328	8.1%

## 5 Baseline Study Results

The characteristics of FNLP baseline respondents are analyzed in this section. The main objective of the baseline survey is to establish a comprehensive dataset that can serve as a benchmark for the endline impact analysis. Understanding respondents' individual and household characteristics, as well as agricultural practices, can provide valuable insights when seeking to understand any changes caused by the interventions. Quantitative data analysis was conducted in Stata (Stata Corp LP, College Station, Texas). Analysis in this baseline report includes basic descriptive statistics and some statistical testing of mean differences to test for balance across the treatment and comparison groups. Indicators are reported primarily as either percentages or means. Emphasis has been placed on presenting averages for the entire population and by splitting the data across vulnerability categories (EV, VV and ML classifications) as well as across the two LGAs where appropriate. In Appendix C, we also include information collected from a field assessment that the research team conducted in Kebbi prior to the baseline survey.

### 5.1 Comparison of LGAs

#### 5.1.1 Key Statistics

*Table 8: Key Statistics*

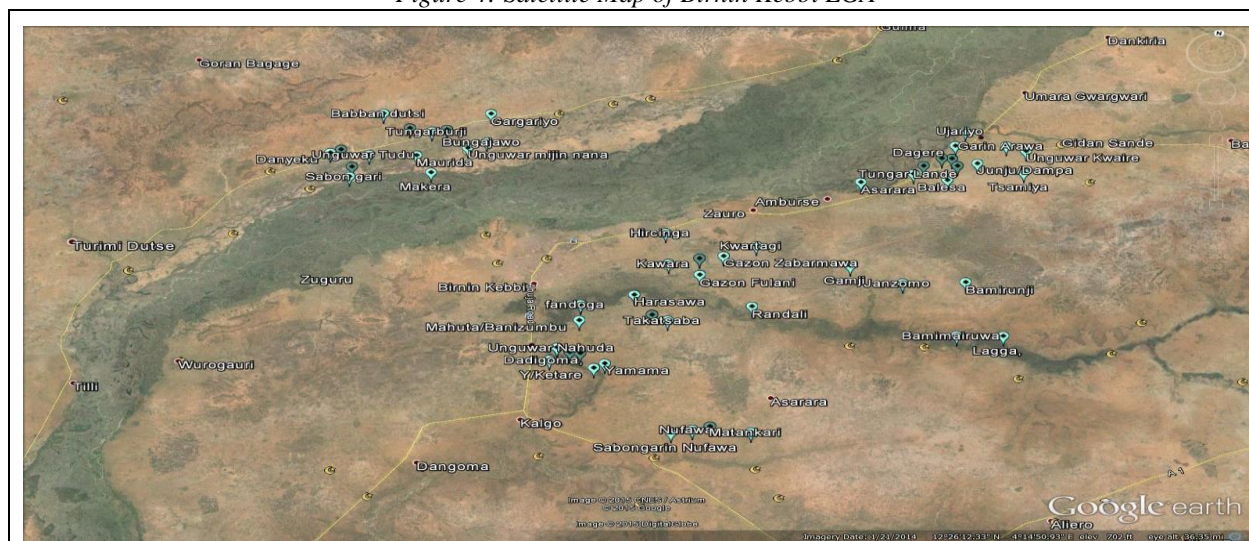
<b>Key statistics</b>	<b>All</b>	<b>Birnin Kebbi</b>	<b>Danko Wasagu</b>
PPI Sample (number of HHs identified as vulnerable)	18,272	8,641	9,631
Baseline Survey Sample (selected households)	4,328	1,985	2,343
Number of Households with completed interviews	3,976	1,870	2,106
Number of Individuals in surveyed households	19,732	9,575	10,157
Number of Adults in surveyed households	9,419	4,676	4,743
Number of Adult Males in surveyed households	4,932	2,489	2,443
Number of Adult Females in surveyed households	4,487	2,187	2,300
Average Household Size	5.0	5.1	4.8
Average Number of Children	3.0	3.1	2.9
Average Age of Adult Males	45.6	44.7	46.3
Average Age of Adult Females	34.2	32.9	35.3
Literacy Rate of Adult Sample	39.7%	52.8%	26.8%
Literacy Rate of Adult Males	47.6%	61.9%	33.0%
Literacy Rate of Adult Females	31.0%	42.3%	20.2%
School Attendance of Adults	35.4%	49.0%	22.0%
School Attendance of Children (aged 5-17 years)	36.2%	48.8%	24.1%

*Note: Adults defined as individuals aged 18 years and over.*

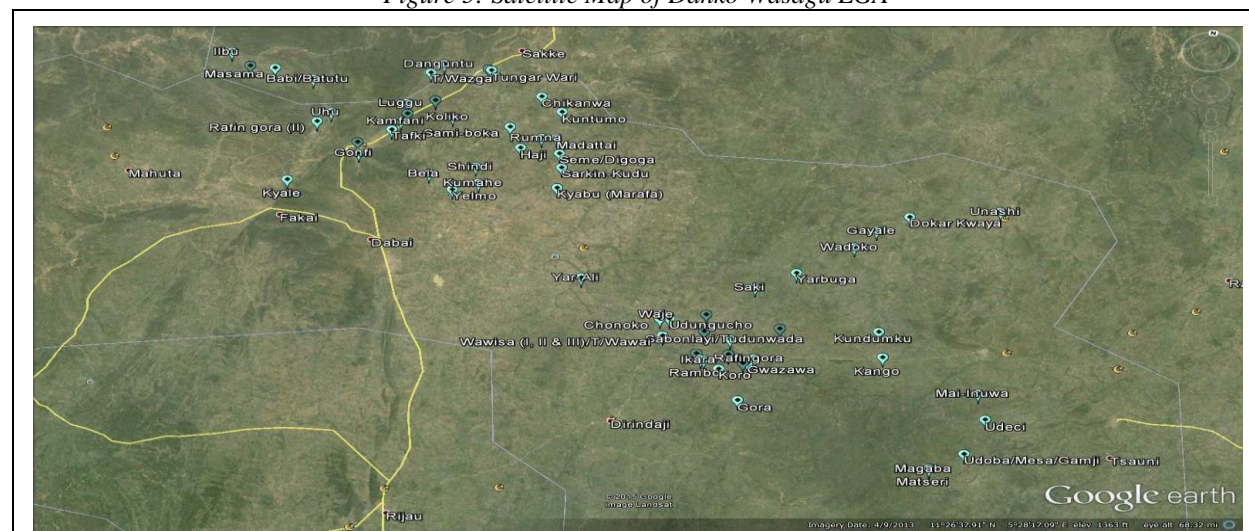
### 5.1.2 Satellite Photographs

Figures 4 and 5 are satellite maps taken from Google Earth that show visually how the two LGAs landscape differ, with Birnin Kebbi having a much drier climate than Danko Wasagu. However, the villages in Danko Wasagu LGA were found to be more isolated and less connected to infrastructure than the villages in the Birnin Kebbi LGA.<sup>11</sup>

*Figure 4: Satellite Map of Birnin Kebbi LGA*



*Figure 5: Satellite Map of Danko Wasagu LGA*



*Note: The balloons on the satellite maps indicate the placements of the villages in the sampling frame. Higher resolution images are provided as an attachment to this report.*

<sup>11</sup> Follow-up work will seek to explore whether in districts with worse infrastructure, the poverty rate increases as soil quality gets better as evidenced in “The Curse of Good Soil? Land Fertility, Roads, and Rural Poverty in Africa” Wantchekon, 2016.

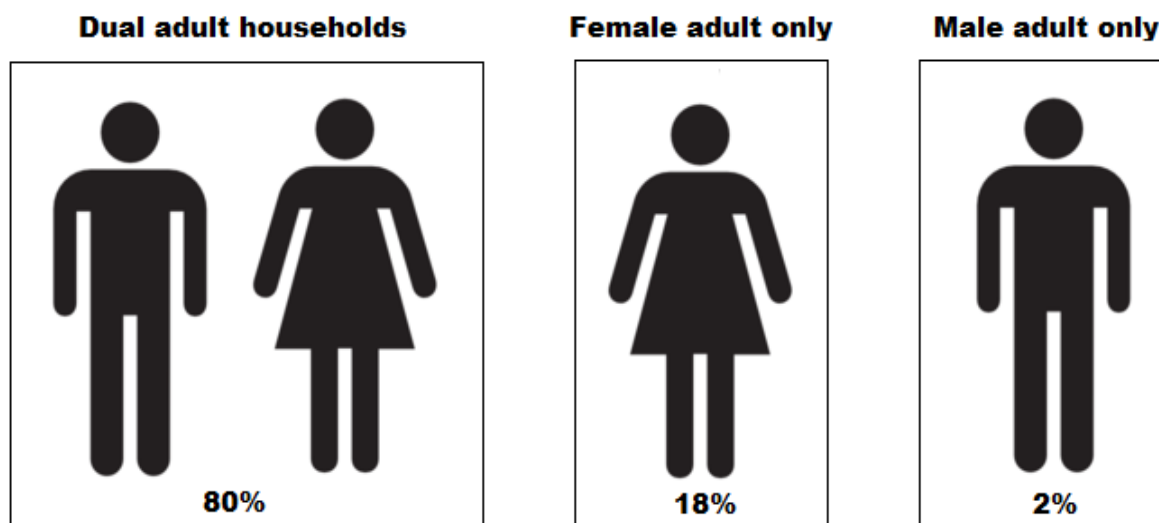
## 5.2 Household Demographics

### 5.2.1 Gendered Household Type

Feed the Future purposely does not use the concepts of male-headed and female-headed households, which are fraught with difficulties and assumptions about “headship” (see Buvinić and Rao Gupta 1997; Budlender 2003; Deere, Alvarado, and Twyman 2012)<sup>12</sup>. The concept of “head of household” is highly loaded, presumes certain characteristics that may or may not be present in household gender dynamics, and often reflects the bias of the researcher or respondent. In addition, the “head of household” concept may perpetuate existing social inequalities and prioritization of household responsibilities that may be detrimental to women. Rather, Feed the Future classifies households in terms of whether there are both male and female adults (dual-adult households), only female adults, or only male adults.

The gender composition of the households in the sample were classified into the following categories: households with both male and female adults (dual adult); households with a male adult but no female adult (male adult only); and households with female adult but no male adult (female adult only). The question on gendered household type was asked directly to the female decision maker in the household; for the 3% of households where this information was missing we imputed the information using the household roster.

The percentage of dual adult households in the sample is 80%, the percentage of female adult only households is 18% and the remaining 2% are male adult only households.



<sup>12</sup> Buvinić, Mayra, and Geeta Rao Gupta. 1997. Female-Headed Households and Female Maintained Families: Are They Worth Targeting to Reduce Poverty in Developing Countries? *Economic Development and Cultural Change* 45(2): 259–280. Budlender D. 2003. The debate about household headship. *Social Dynamics*; 29(2):48–72. Diana Deere, C., Alvarado, G. E. and Twyman, J. 2012, Gender Inequality in Asset Ownership in Latin America: Female Owners vs Household Heads. *Development and Change*, 43: 505–530

Table 9: Gender Composition of the Households

Type of household this person belongs to (self-reported)	N	%
Male and female adult	3,192	80.3
Female adult only	705	17.7
Male adult only	78	2.0
Total	3,975	100

Adults were defined as any individuals in the household who are age 18 years or older. Therefore, dual adult households could be made up of husband and wife couples, or with single men or women living with older children; they could also be comprised of more than two adults. For the purposes of the survey, the primary male and female decision-makers in the household were identified to answer the questionnaire, unless there was only one decision-maker in the household. The primary and secondary respondents are those which are self-identified as the primary members responsible for the decision making, both social and economic decisions, within the household. In polygamous households, where wives occupy one housing unit together, the female primary decision-maker was identified by the household. In cases where the wives live in separate housing units within the same compound or in different compounds— each wife was interviewed separately and classified as separate households. This followed the program approach that acknowledged that wives living in separate housing units are likely to have different budgets and so should be considered separate households.

## 5.2.2 Household Size

The average household size in the sample is 5 members. The average number of offspring is 3 and average number of children below the age of 15 years is 2.7.

## 5.2.3 Primary Decision Maker Characteristics

Table 10: Summary of Characteristics of Primary Decision-Maker

	Average Age	Married monogamous	Married polygamous	Widowed	School Attendance	Literacy Rate
Extremely Vulnerable	46.22 years	58.0% [2772]	22.9% [2772]	15.7% [2772]	33.8% [2767]	37.4% [2771]
Very Vulnerable	43.78 years	69.0% [958]	22.9% [958]	4.4% [958]	40.2% [958]	43.8% [958]
Market Limited	45.30 years	72.8% [246]	18.3% [246]	4.5% [246]	39.8% [246]	45.1% [246]
Total	45.58 years	61.5% [3976]	22.6% [3976]	12.3% [3976]	35.7% [3971]	39.4% [3975]

In the following analysis, the primary decision-maker could be male or female depending on the person who was identified as the “household head” in the household roster section of the survey. The average age of the primary decision-maker for the entire sample is 45 years; 84% report being currently married. The prevalence of polygamous marriage is 23% and widow status is 12% for the total sample. Literacy rates (self-reported “yes” to be able to read and write in any language) among primary decision-makers is 39%. School attendance (self-reported “yes” to ever attending a school) of the primary decision-maker is 12% with an additional 26% primary decision-makers reporting having received some form of Quranic study in



the past. Further breakdown analysis and graphs of these indicators for the primary decision-maker are provided in the following subsections.

### 5.2.3.1 Age of Primary Decision-Maker

The average age of the primary decision-maker in the whole sample is 45 years. In dual adult households the age of the main male decision maker is 44 years as compared to the average age of the main female decision maker at 32 years. In female adult only households the average age of the primary decision-maker is 50 years and in male adult only households the average age of the primary decision-maker is 55 years. The average age of the primary decision-maker is balanced across the EV, VV and ML vulnerability categories.

### 5.2.3.2 Marital Status of Primary Decision-Maker

The majority (84%) of primary decision-makers report they are married. The incidence of polygamy amongst the entire sample is 23% and widows make up 12%. In extremely vulnerable (EV) households, the likelihood of the primary decision-maker being widowed is 16% which is significantly higher than VV and ML households, both at approximately 4%. This difference should be expected since the widowed result is likely endogenous to the EV measure since female-headed household status is one indicator that was collected in the poverty index (PPI) that was used to rank the vulnerability category of households.

Figure 6: Marital Status of Household Head

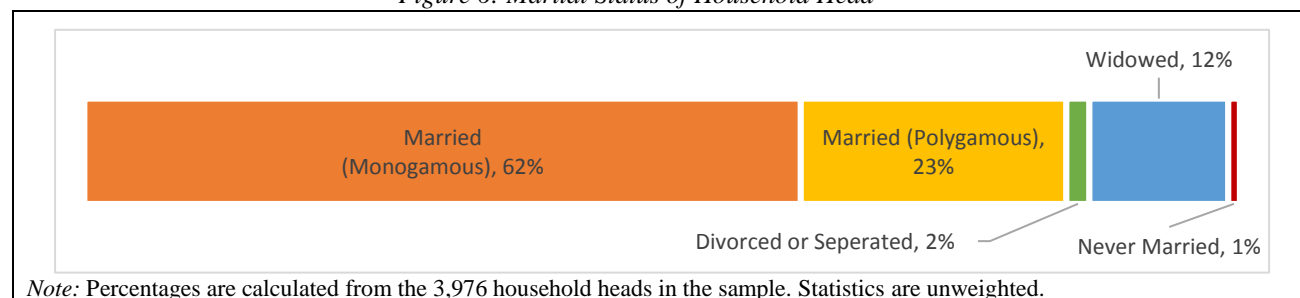
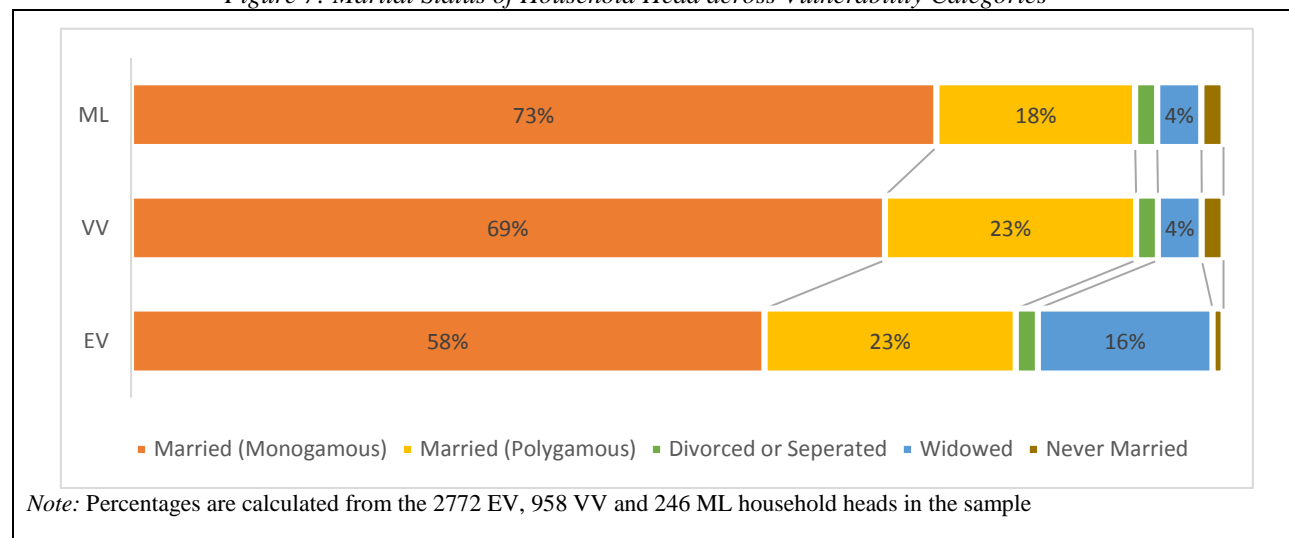


Figure 7: Marital Status of Household Head across Vulnerability Categories





### 5.2.3.3 Education of the Primary Decision-Maker

Only 12% of households reported that the primary decision-maker had received any form of schooling in the formal education system. There was a larger percentage of primary decision-makers (26%) who reported attending school but named *Quranic* or *Integrated Quranic* as their highest level of schooling. Disaggregating by sex shows us that just 27% of the adult females in the sample ever attended any school compared to 43% of the adult males.

Figure 8: Education Level of Household Head across Vulnerability Categories

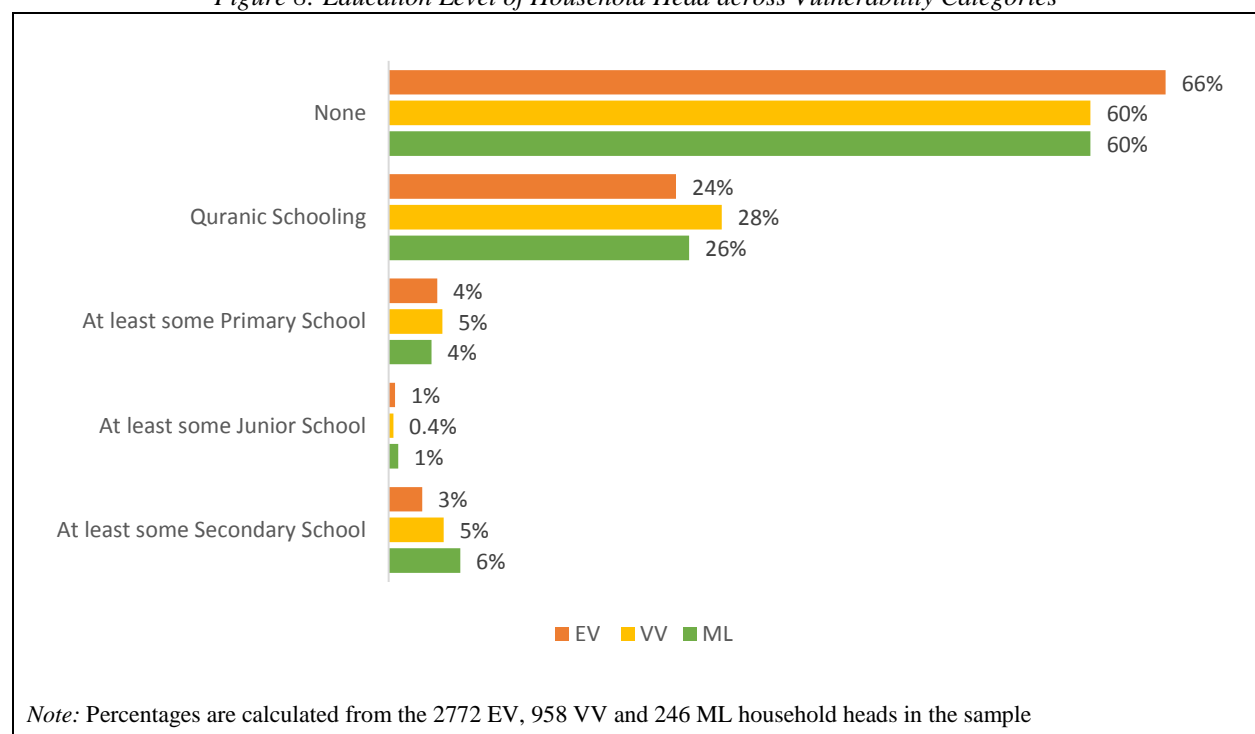
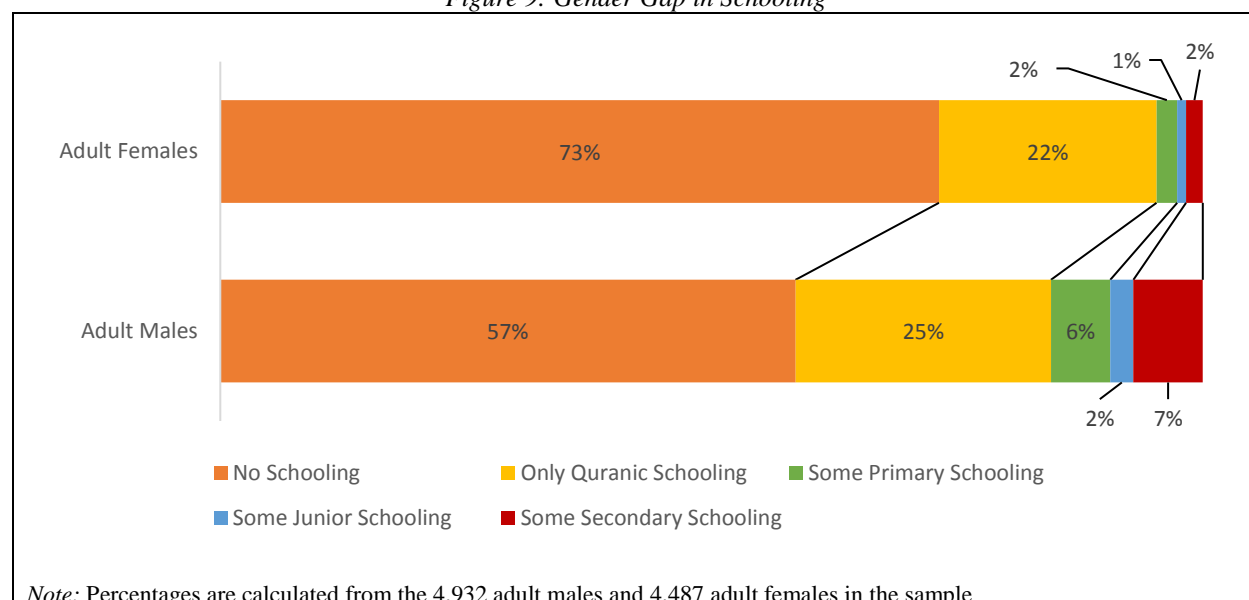


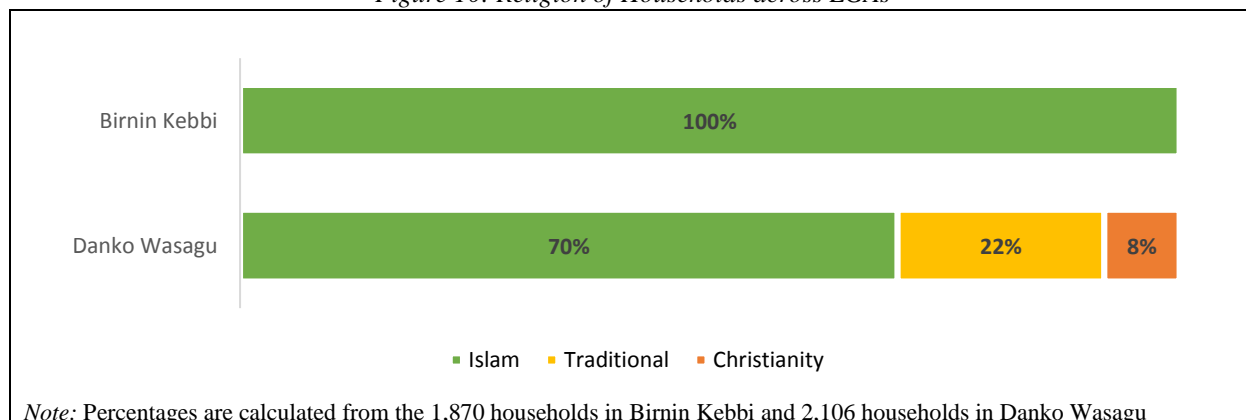
Figure 9: Gender Gap in Schooling



### 5.2.4 Religion

The majority (84%) of the households in the full sample are Muslim. All of the households in Birnin Kebbi LGA are Muslim but in Danko Wasagu LGA, 30% of the households are from other religions (i.e. Christianity and Traditional). We found a small fraction of households (42 households) that reported more than one religion among household members.

Figure 10: Religion of Households across LGAs



## 5.3 Randomization Balance Checks

Balance tests were conducted to indicate whether the randomization produced balance on various characteristics from the baseline data across the different experimental conditions. Tables B1-B10 in Appendix B present the results of weighted t-tests to test whether the different treatment arms and their corresponding comparison groups are balanced at baseline. The balance checks are conducted on sixteen key outcome indicators to examine whether the randomization processes succeeded in generating similar treatment and comparison groups. For each balance test, sampling weights were employed to correct for differential sampling probabilities across the EV, VV and ML vulnerability categories, where appropriate. The checks estimate the statistical differences between the treatment and control groups before the program implementation is rolled out. A joint test of significance (chi-squared) of mean differences demonstrates overall balance for each of the experiments outlined in Figure 2; accordingly, any differences found after the treatment can be attributed to the program. A discussion and tables for each balance check for each experiment is presented in Appendix B.

## 5.4 Labor

### 5.4.1 Income-Generating Activities

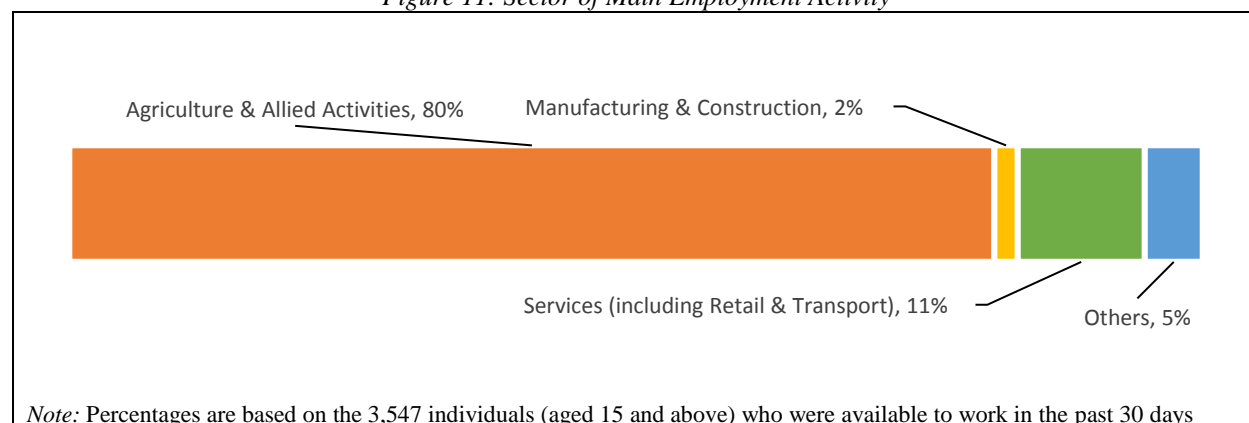
The labor module records the time use for selected activities of all household members aged 15 years or above, with emphasis on income-generating activities. We find 62% of the household sample (2,455 households) reported at least one member of their household was available for work over the past 30 days, where the definition of work is restricted to income-generating activities (cash and/or in-kind). The “availability for work” questioning was part of a series of screener questions that follow the LSMS guide that gauges whether the respondent was willing and ready to work over the past 30 days. The screener questions seek to understand whether the individual is currently working, searching for work or not part of

the labor force. We find that 38% of the sample (i.e. those individuals aged 15 years and above<sup>13</sup>) reported they were available for work in the past 30 days. The following analysis, therefore, analyzes the income-generating activities among those 3,547 individuals (76% males and 24% females) who reported availability for work in the past 30 days.

Among the dual adult households, 56% of the males reported “yes” to being available to work in the past 30 days and only 19% of females reported “yes”. Among the female adult-only households, we find 22% of the females report being available for work in the past 30 days. Overwhelmingly, females report being “too busy with household duties and taking care of children” as reasons for not working at income-generating activities. In follow-up surveys, we will attempt to unpack this result to understand better whether women are engaging in unpaid labor activities so therefore are not recording it as labor, or whether the season of the survey contributed to the low levels of participation in income-generating activities. Among those who reported engaging in income-generating activities, most worked in the agriculture sector, with 80% of individuals conducting farming activities on a household farm.

Agriculture is the main source of income for household: 86% of 2,455 households work in crop and animal production. Only 11% of households reported a household member who worked in a non-farm enterprise over the past 30 days.

*Figure 11: Sector of Main Employment Activity*

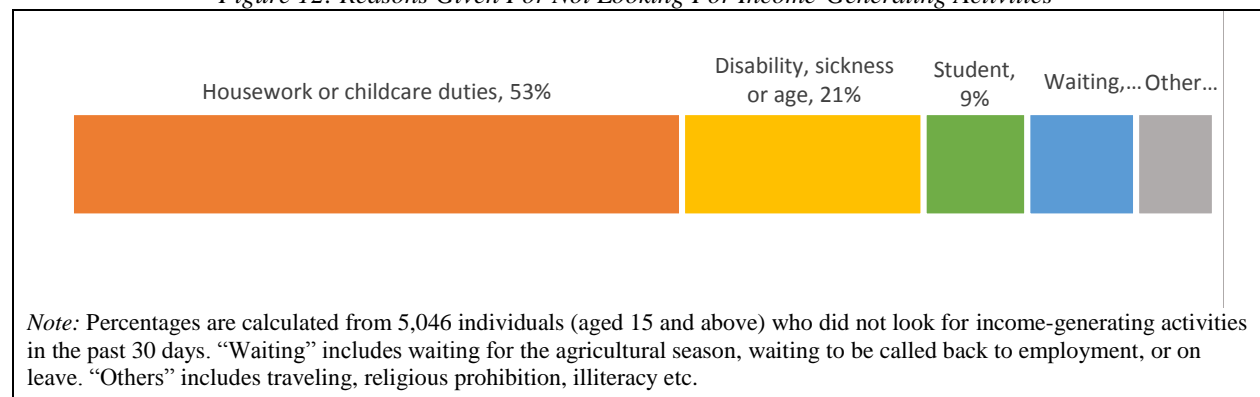


#### 5.4.2 How Large a Factor is Unemployment or Underemployment?

Thirty-eight percent of dual adult households reported that no household members worked at an income-generating activity in the 30 days before the survey. Sixty-five percent of female adult-only households reported no income-generating activity over the past 30 days, as did 63% of the male adult-only households. These households were not eligible to respond to the section of the questionnaire that asked about labor.

<sup>13</sup> The child labor law in Nigeria sets the minimum age for employment at 15 years, except for light agricultural, horticultural, or domestic work performed for the family. (Government of Nigeria, Nigeria Labour Act 1974)

Figure 12: Reasons Given For Not Looking For Income-Generating Activities



Only 10% of households gave “waiting for the agricultural season” or “waiting to be recalled to work by an employer” as reasons for not looking for an income-generating activity in the past 30 days. Dependents within the households (i.e., those who are too young, old or sick to work) and those who are still in school make up about 30% of the response. The majority of females in both dual adult households and female adult only households reported housework or childcare duties as the main reason they did not look for income-generating activities in the past 30 days.

#### 5.4.3 Female Unpaid Labor in Agriculture

In the Women’s Survey section of the household questionnaire, we ask the main female in the household whether they have participated in food crop farming, cash crop farming, or livestock raising within the past 12 months. Of the 3,860 women who reported information in this section, we find that 36% of women reported participating in any one of these activities in the last year. The discrepancy of this 36% result and the 20% that reported working in the past 30 days in the labor section could potentially be explained by the construction of the labor question, the differing timeframe of the question, the particular season that the baseline survey was conducted in, or, if the labor was unpaid, it may not have been recorded in the labor section. Follow-up surveys will pay particular attention to collecting detailed information on income-generating activities outside the home, as well as on home-based productive work and reproductive activities.

#### 5.4.4 Time Spent on Other Activities in the Household

Households within the sample spend a significant amount of time collecting firewood and fetching water in a day. These activities seem to be gendered, with men spending, on average, 82 minutes during the day prior to the interview collecting firewood, versus women, who spent 47 minutes. The gender difference in fetching water is mostly driven by women in Danko Wasagu LGA, who spent on average 64 minutes fetching water, compared to women in Birnin Kebbi, who spend 39 minutes. The time spent on these other activities does not differ when we disaggregate by vulnerability category.

Table 11: Time Spent on Fetching Firewood and Water by Vulnerability Category and Gender

Average minutes yesterday fetching ...	Vulnerability Category			Gender	
	Extremely Vulnerable	Very Vulnerable	Market Limited	Males in dual adult HHs	Females in dual adult HHs
... firewood	68.2	62.1	58.7	82.3	47.7
... water	42.4	43.8	42.3	35.3	50.8

### 5.4.5 Constraints to Business Operations

Eleven percent of the households in the sample reported a household member who worked in a non-farm enterprise over the past 30 days. The main non-farm business activities that respondents are involved in include retail, food services, tailoring, animal feed production and taxi driving. When those individuals were asked what the top three constraints to their business operations were, the majority named “financial” constraints within their top three constraints.

*Table 12: Top Constraints to Business Operations*

Constraints	Frequency
Financial services	320
Transportation	191
Markets	177
Safety	105
Water	95
Electricity	79
Telecommunications	74
Unofficial fees	34
Other	29
Business permits	19

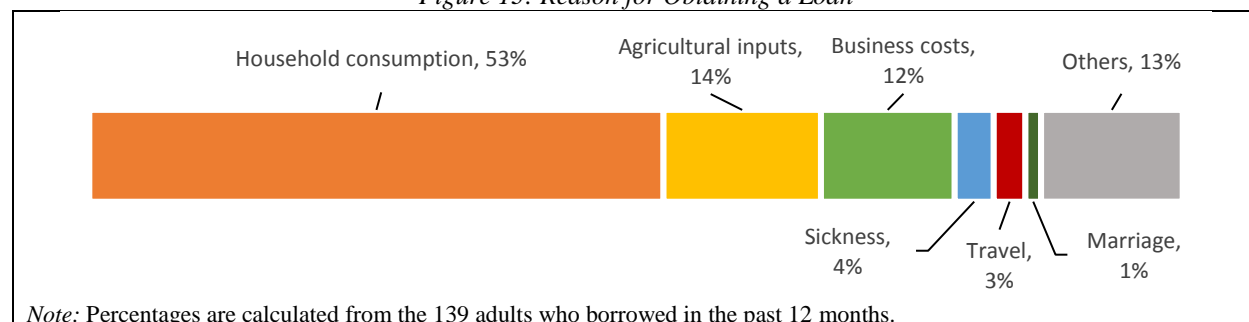
*Note:* 438 households answered the enterprise section. Frequency of occurrence as one of the top 3 constraints to business operations is reported here.

## 5.5 Access to Finance

Just 1% of adults reported owning a bank account. Seven percent of the adult sample reported saving with some other informal savings group.

Borrowing outcomes are equally very low with just 1.5% of the adult sample (139 individuals) having borrowed from any source over the last 12 months. Those individuals who were successful in borrowing funds typically borrow from friends and relatives. The primary reason for obtaining a loan was for household consumption (52% among those who obtained a loan).

*Figure 13: Reason for Obtaining a Loan*



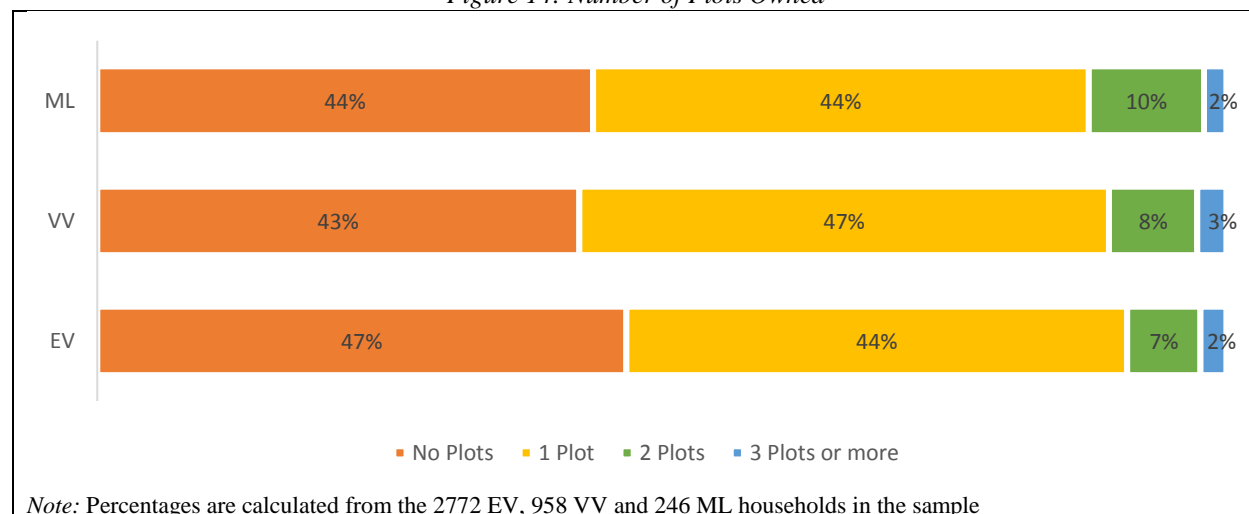
As for the ability to lend to others, only 3.5% of the adult sample reported lending to friends or family over the last 12 months. Follow-up surveys will attempt to understand further the demand and supply-side constraints being faced by households in this region in terms of access to loans and saving options available.

## 5.6 Agriculture

### 5.6.1 Ownership of Agricultural Land

The agriculture section of the survey asks whether any household member had cultivated any agricultural land and/or owns any agricultural land that was not cultivated since the beginning of the agricultural season. We find 55% of households within the full sample reported owning at least one plot of land. The graphic below suggests the number of plots owned by the household does not differ much across the vulnerability categories – EV, VV, and ML.

Figure 14: Number of Plots Owned



### 5.6.2 Size of Agricultural Land Holding

A more accurate measure of agricultural land ownership, rather than the number of plots owned, is the size of agricultural land holding, which is estimated by converting the farmer's self-reported size of each plot to common size units (hectares) and summing across all plots owned by that household. Land ownership seemingly differs considerably across the two LGAs. The high average land size in Birnin Kebbi is driven up by a few households who have substantial land holdings; however, on average, the households in Birnin Kebbi own three times as much land as households in Danko Wasagu.

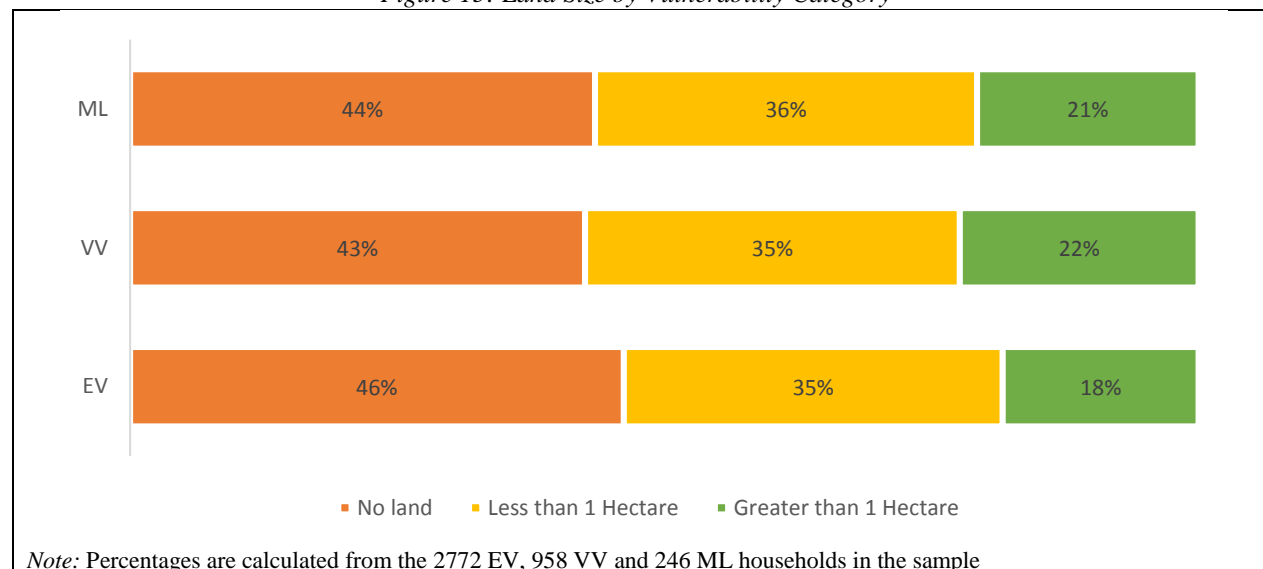
Table 13: Average Agricultural Land Sizes by LGA

Indicator Agricultural Land Size	Birnin Kebbi	Danko Wasagu
Average Number Plots (all households)	0.8	0.6
Average Number Plots (conditional on at least one plot)	1.3	1.1
Average Land Size (all households)	3.0 Hectares	0.8 Hectares
Average Land Size (households with at least one plot)	4.9 Hectares	1.6 Hectares

Using the self-reported measure of land size, we find that 19% of the households own more than one hectare of land. In the PPI survey, the percentage of households who reported owning more than one hectare of land was 36%. This discrepancy could be attributed to measurement error since it may be difficult to estimate the size of your agricultural land. There may also have been a misunderstanding of what a hectare might be in the PPI survey since initially the size of a “football field” was used to conceptualize one hectare of land which could have captured a subjective understanding. After one week of PPI data collection the interviewers were instructed to conceptualize one hectare by estimating using the ridges on farm land that are typical in the region which was also followed in the baseline survey. Land size in general is a difficult

thing to measure accurately and many recent examinations of land measurement say that using farmer estimates of land size usually lead to errors.<sup>14</sup> The agricultural questions in the baseline survey were asked to the manager of the plot (typically found to be the male decision maker in the household) whereas the PPI was typically posed to the female decision maker which could have implications on the accuracy of the estimate. The discrepancy between the two estimates of average landholdings is programmatically important since land ownership greater than one hectare is typically used as ineligibility criteria for the Feed the Future program and therefore could be excluding households who would otherwise be deemed vulnerable.

Figure 15: Land Size by Vulnerability Category



### 5.6.3 Types of Responsibility for Agricultural Land

Three different measures of responsibility for agricultural plots were collected in the survey that asked the primary manager of the plot:

- 1) Measure 1: Who in the household does this plot belong to (ownership)?
- 2) Measure 2: Who in the household primarily cultivates this plot?
- 3) Measure 3: Who in the household makes the most decisions on this plot?

When defining responsibility based on Measure 1, we find that 95% of households solely name the household head as the primary owner of the plot. Using Measure 2, we find that 90% of the households name the household head as the primary cultivator of the plot. Using Measure 3, we find that 95% of the households name the household head as the primary decision maker for the plot. This shows that when it comes to formal ownership and making decisions with regards to agricultural land, typically, the household head will be responsible. Other household members may help to cultivate the land but are rarely considered owners or decision-makers.

<sup>14</sup> See for example: Carletto, Gourlay, Winters. World Bank. "From Guesstimates to GPSstimates," July 2013.

#### 5.6.4 Common Crops

Beans (cowpea), millet (maiwa) and rice were more commonly grown in Birnin Kebbi, whereas guinea corn/sorghum, groundnut/peanut and maize were more commonly grown in Danko Wasagu.

*Table 14: Top Six Crops Cultivated by the Households*

Top crops cultivated	Percentage of households
Millet (maiwa)	45%
Guinea corn/sorghum	36%
Maize	20%
Beans (cowpea)	22%
Rice	12%
Groundnut/peanut	12%

*Note:* Percentages are calculated from the 2,158 households engaging in plot cultivation

#### 5.6.5 Extension Services

Only 12% of households in the sample report access to any kind of agricultural extension service. Five percent of households reported they received information on fertilizer use and 2% of households received information on pest control and irrigation services. The source of the information was primarily through lead farmers or peer farmers (neighbor or relative), with 59% of the households who received any information citing these two as the source of information.

#### 5.6.6 Agricultural By-products

We asked about secondary products from the farm and animals that may be used to generate income for the households; 93% of households reported that they earned no income from agricultural by-products they produced. Among the remaining 7% of households, the most common by-product items that were reported included bean stem and leaves (harawa), cow dung, eggs and guinea corn stem (dry).

### 5.7 Consumption

Consumption data was collected in the baseline survey using a questionnaire that asked about both food and non-food consumption and expenditures over three recall periods - in the past 7 days, past 30 days, and past 6 months. In the food section, 34 of the most common food items in the region were listed and households were asked questions about consumption of each item in the past 7 days. The consumption and expenditure information will be important in assessing program impact because it is hypothesized that vulnerable households in the program may change their diets or consume larger quantities or better quality food items as a result of the program. Similarly, for non-food consumption, a variety of common household items were listed; we would expect households to purchase more “luxury” items or assets once their basic nutrition needs are met as a result of the program.

#### 5.7.1 Most Important Goods in the Consumption Basket

The top five food and drink items consumed by the households were guinea corn/sorghum, millet, maize, rice and water, as measured by the number of times the food items were mentioned to have been consumed in the past 7 days. This matches with the top crops that are cultivated by the households in the sample, suggesting that many households conduct subsistence farming. We find 6.4% of the households who did not consume any of the 34 food items listed in the survey in the past 7 days. It is difficult to tell if this non-



response is due to food insecurity or how the question was being asked and therefore follow-up questionnaires will be developed to try to better capture consumption patterns.

In terms of non-food items, the most commonly mentioned items were palm kernel oil used as a cooking fuel, electricity, firewood, matches, household care items and recharge cards. In the longer recall non-food item purchases in the last 6 months, the most commonly mentioned were purchases of clothes and shoes.

## 5.8 Asset Ownership

One percent of households reported owning no household assets. The most commonly owned items were mats, beds, mattresses and radios. Just one household in the sample owned a car and 21 households owned a motorbike. Eighty-two percent of households reported owning at least one agricultural asset. The most commonly owned agricultural items include hoes, cutlasses, and sickles.

## 5.9 Animal Ownership

In Kebbi State, livestock is an important aspect of wealth and income generation for the households. We find 25% of households own at least one animal; this percentage of ownership was similar across the vulnerability categories. The most commonly owned animals include goats, cows, chickens and sheep. In terms of ownership we find there are 88% of households in Danko Wasagu LGA who do not own any animals compared to 67% in Birnin Kebbi LGA. Since field reports indicate that grazing land in Danko Wasagu is of better quality than in Birnin Kebbi, follow-up work will attempt to estimate the value of livestock held in both these locations.

## 5.10 Women's Empowerment and the Adapted WEAI

In the FNLP baseline survey questionnaire, we included a number of decision-making questions to be able to create an empowerment index that draws from the components of the Women's Empowerment in Agriculture Index (WEAI). This adaptation of the WEAI aims to measure empowerment using the WEAI as a starting point but cannot be directly compared to WEAI collected in other countries. We will use the empowerment index to make comparisons over time from baseline survey to follow-up surveys.

### 5.10.1 Indicators included in the impact evaluation baseline survey

The original WEAI includes five domains of empowerment: Production, Resources, Income, Leadership, and Time. However, this adaptation of the WEAI excluded the Leadership domain. The questions included in the baseline survey are sufficient to cover the four remaining domains. All the indicators within the four domains were not included in the survey since they were either not applicable to the sample or too difficult to collect during the baseline particularly since we were conscious of the length of the survey. The indicators collected and their associated weights that were applied to create an empowerment score are listed below:

*Table 15: WEAI Indicators in the Impact Evaluation Baseline Survey*

	<b>WEAI Indicator</b>	<b>Weight</b>
<b>1</b>	Input in productive decisions	1/4
<b>2</b>	Asset ownership	1/12
<b>3</b>	Rights over assets	1/12
<b>4</b>	Access to and decisions over credit	1/12
<b>5</b>	Control over use of income	1/4
<b>6</b>	Workload	1/4

These six indicators have been weighted so that they sum to 100%. Note that the sample of women used to calculate the asset ownership indicator (i.e. the denominator when calculating the percentages) differs from the other indicators in the empowerment index since the data was collected from the asset section and the other indicators come from data in the women's survey section. In the data 2,615 women reported ownership of any asset type and 3,860 women answered the women's survey section.

Data on the remaining 4 indicators in the WEAI (satisfaction with leisure time, autonomy in production, group membership and speaking up in public) were *not* collected in the Feed the Future Nigeria Livelihoods impact evaluation baseline survey. Administering the full WEAI questionnaire was not possible due to survey length, so proxies for the indicators were established from elsewhere in the data whenever possible. Since the objective of the baseline data collection was to be able to track measures of empowerment over time we had to forgo the opportunity to collect the full WEAI that should administer questions to the same respondent in the same section. A drawback to the approach used in this report is that the resulting score from the empowerment index cannot be directly compared to the WEAI created in other countries.

Table 16: WEAI Indicators Collected in the Impact Evaluation Baseline Survey

<b>WEAI indicators</b>	<b>Questions included in the baseline</b>	<b>Adequacy achieved when...</b>
<i>Input in productive decisions</i>	Series of decision making questions regarding: food crop farming, cash crop farming, livestock raising, fishing, types of crops to grow on agricultural plots and taking the crops to market.	Woman has decision-making input in at least two activities. Inadequate if the woman participates BUT does not have input in decisions.
<i>Autonomy in production</i>	No information collected about autonomy in production	Not applicable
<i>Ownership of assets</i>	Asks whether the household owns a list of household asset items, agricultural asset items and animals.	Woman has an ownership stake in any type of assets, as long as it is not only one small asset. Inadequate if the household owns the type of asset BUT the woman does not own it solely or jointly.
<i>Purchase, sale, or transfer of assets</i>	Asks whether the woman can decide whether to sell, give away, mortgage, rent or purchase a new item for all the household and agriculture asset items.	Woman has decision-making authority regarding the disposal or purchase of at least one type of asset owned by the household. Inadequate if: 1) the household does not own any asset or 2) if it owns the type of asset BUT woman does not participate in any of the decisions about it.
<i>Access to and decisions on credit</i>	Asks whether the woman was involved in the decision to borrow and has any input in what to do with the money borrowed.	Woman has either been involved in the decision to borrow, or has had input into decision-making about what to do with the money borrowed. Inadequate if household 1) has no credit OR 2) used a source of credit BUT she did not participate in any decisions about it.
<i>Control over use of income</i>	Asks whether the woman participates in: non-farm economic activities, wage and salary employment, major or minor household expenditures and the level of input in the decision-making process.	Woman has some input in at least one activity as long as it is not only participation in decisions about minor household expenditures. Inadequate if she participates in activities BUT has no input or little input in decisions about income generated.
<i>Group member</i>	No information collected about group membership	Not applicable
<i>Speaking in public</i>	No information collected about speaking in public	Not applicable
<i>Workload</i>	Asks about the time spent on a series of activities in the past week: Work as employed, Own business work, Farming/livestock/fishing, Shopping, Weaving/sewing/textile care, Cooking, Domestic work, Care for children/adult/elderly and Travelling/commuting.	Woman works 10.5 hours or less on average per day over the past week
<i>Leisure</i>	No questions directly measuring leisure time	Not applicable

### 5.10.2 Adapted WEAI Sample Size

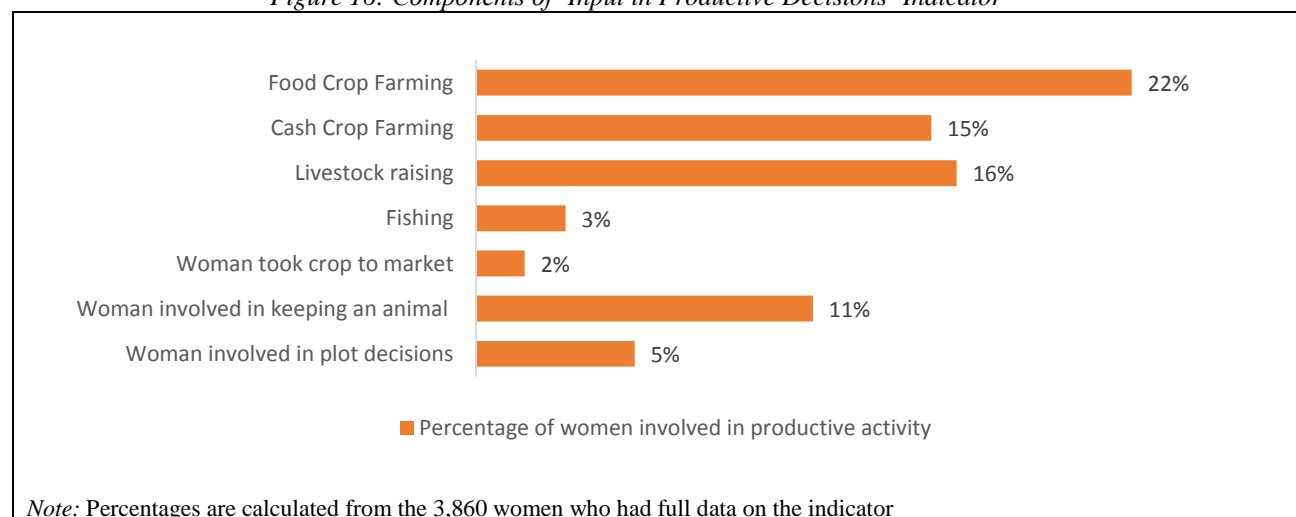
The questionnaire that collected most of the components of the adapted WEAI was administered to the main female decision maker in the household across the full sample of households – we have data on the 6 indicators for 3,860 households and this is the sample that is included in the empowerment index. In our analysis we include *all* women who responded to the WEAI questions and not just women in households that reported engaging in agricultural activity since our sample is administered in rural areas. We assume that rural livelihoods are often linked to the agricultural sector in both direct and indirect ways and so include the full sample of women. We also include a shortened analysis for the sample restricted to just women who had indicated engagement in agriculture activity at the time of the survey.

We calculated an adapted WEAI score that was created by taking the weighted average of the 6 indicators that represent 4 out of 5 domains for the sample of women. The average score for the sample is 0.38. The adapted WEAI score presented here is not directly comparable to the WEAI calculated for other countries since some of the composites were not included in the survey. The adapted WEAI, although not comparable to other adaptations of the WEAI, will be compared to follow-up data collected after the FNLP implementation is completed. The individual components are presented below and can be interpreted individually.

### 5.10.3 Indicator 1: Input in Productive Decisions

In Kebbi State, we found a large proportion of women who did not engage in any of the activities outlined in indicator 1 of the WEAI. In the labor section, only 20% of female decision makers answered “yes” to being available for work in the past 30 days, with women citing being “too busy with household duties and taking care of children” as reasons for being unavailable to work in income-generating activities. We could potentially be underestimating the involvement of women in these income-generating activities if the season when the baseline survey was conducted was during a quiet time in the agricultural season. However, this result was somewhat consistent with the result obtained from the questions analyzing a women’s adequacy into input in productive decisions where we find that only 36% of females participated (and had at least some input into the decision making) in at least one of the productive decisions that make up the indicator over the last year.

*Figure 16: Components of ‘Input in Productive Decisions’ Indicator*

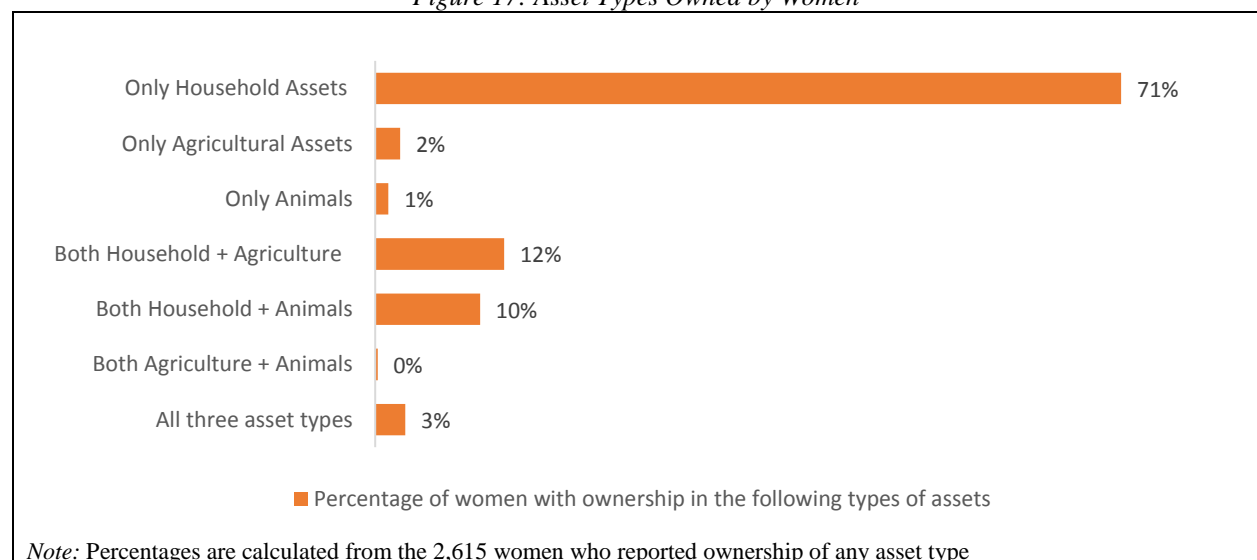


Among the seven activities, questions about the first four activities (food crop farming, cash crop farming, livestock raising and fishing) were all administered in the women's questionnaire and followed the same structure as the WEAI questionnaire. Questions about the other three activities – taking the crop to market, being involved in keeping an animal, and being involved in making plot decisions – were administered within the agricultural part of the baseline questionnaire; if the female was mentioned as a decision-maker for any plot or animal owned by the household, then she would be deemed adequate in that particular activity. The data was collected in this manner because administering the full WEAI questionnaire was not possible due to survey length, so proxies for the indicators were established from elsewhere in the data whenever possible. Figure 16 shows that most of the women had some input in food crop farming, with 22% saying they had some input into the decisions surrounding that activity. Conversely, there were just 2% of women who ever participated in taking a crop to market. We define achievement of adequacy for this indicator to be if 1) the woman participated in *at least two* productive activities and 2) had some input into the decision making. Within our sample of 3,860 women, we find that 21% of women achieved adequacy in the Production domain based on this adequacy cutoff.

#### 5.10.4 Indicator 2: Asset Ownership

If a woman is mentioned as a sole owner or joint owner of a particular asset in a list of household items, agricultural items and animals, then she is deemed adequate for the asset ownership indicator. We find 68% of the women sample (2,615 women) report sole or joint ownership of any type of asset (either household assets, agricultural assets, animals or any combination of all three). The majority of female asset ownership is concentrated within household assets, where 71% of women who owned an asset reported only owning household assets and 3% of the women who owned assets were named as owners of all three types.

Figure 17: Asset Types Owned by Women



#### 5.10.5 Indicator 3: Rights over Assets

If the woman reports that she can decide whether to sell, give away, mortgage, rent or purchase a new item for any of the household and agriculture asset items presented in the questionnaire, she is deemed adequate for this indicator. We find that 35% of women reported that they had purchase or sale rights over an asset. This result means that 53% of the women who reported that they owned an asset didn't necessarily have any rights over that asset.

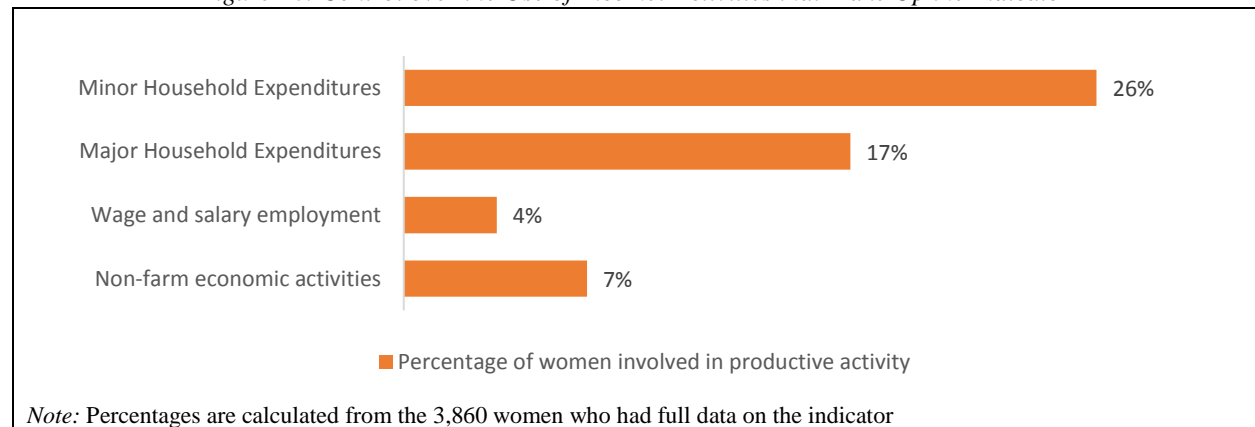
#### 5.10.6 Indicator 4: Access to and Decisions over Credit

Since just 3% of households within the sample borrowed from any source over the last 12 months, we would expect adequacy for this indicator to be very low. Only 7 women (0.2% of the sample) reported being involved in any decisions to borrow.

#### 5.10.7 Indicator 5: Control over Use of Income

We find 22% of women achieved adequacy for control over the use of household income, whereby they had some input in at least one of the decisions on spending other than making minor household expenditures. The breakdown of activities into its four components suggests that the primary driver for adequacy is involvement in making household expenditures. Since farming work is the primary activity of households in the study sample, we find overall low activity in non-farm and wage work. Of the 11% of women in the sample who said they participated in non-farm income-generating activities, 72% had at least some input into decisions about the resulting income. Of the 6% of women in the sample who participated in wage and salary employment, 63% had at least some input into decisions regarding their earnings.

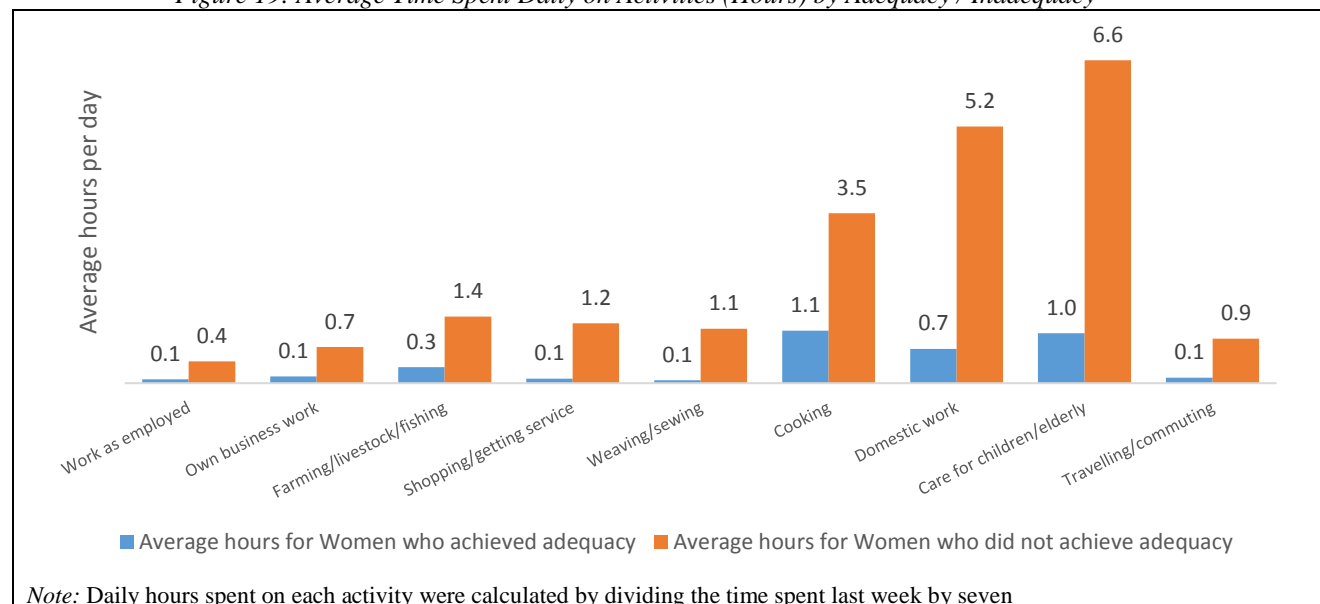
*Figure 18: Control over the Use of Income: Activities that Make Up the Indicator*



#### 5.10.8 Indicator 6: Workload

The standard approach to collecting time use data that is employed in the WEAI questionnaire collects information about activities over a 24-hour period. Since it was time-consuming to collect full time-use information, only nine activities from the WEAI were selected to be included in the survey that represent the activities that the research team considered productive work activities appropriate for the female respondent. The workload indicator requires that a woman works, on average, less than 10.5 hours per day in the last week to achieve adequacy. Based on this list of nine activities that we deemed appropriate for the study sample, we find that 75% of women achieve adequacy for the workload indicator. The average total time spent daily for all activities for the women who achieved adequacy was 3.4 hours and for those women who did not achieve adequacy the average was 15.9 hours. The components of the workload indicator is presented in Figure 19.

Figure 19: Average Time Spent Daily on Activities (Hours) by Adequacy / Inadequacy

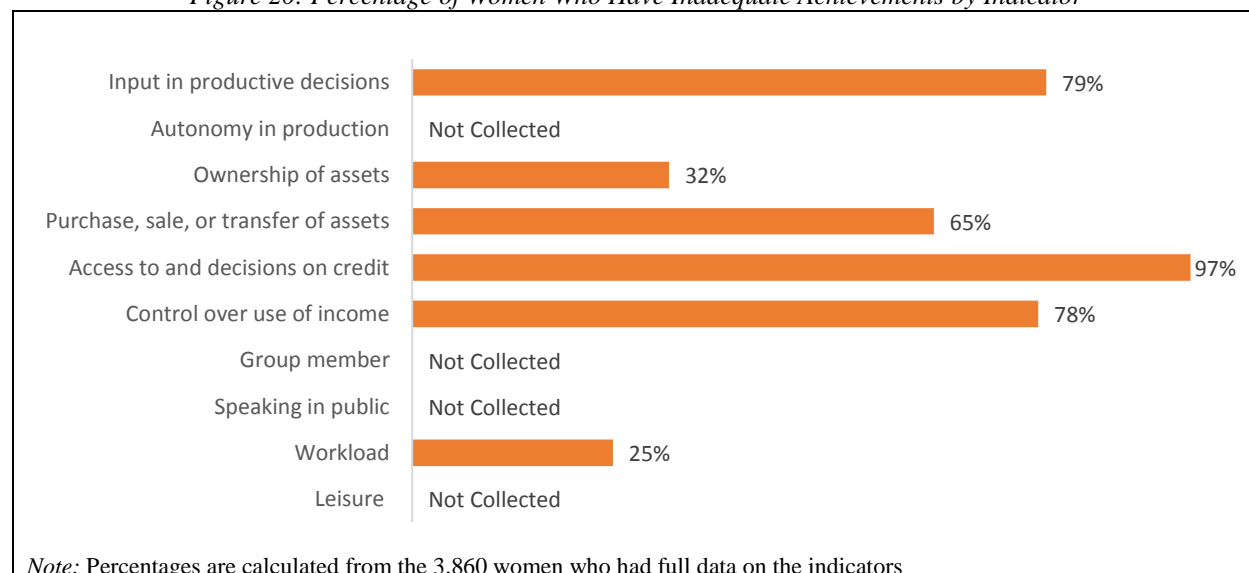


An analysis of each activity shows that women who did not achieve adequacy in this domain time spent a disproportionate amount of time cooking, doing domestic work or caring for children and the elderly: women who did not achieve adequacy spent almost 5 times longer on these three activities than women who were defined to be adequate. Because levels of working “too much” are driven by household-based production, yet many women in our sample did not report any labor force participation, further analysis is needed in follow-up work to determine an appropriate cutoff.

#### 5.10.9 Which Indicators Contribute the Most to Women’s Disempowerment?

In summary, the percentage of women who have inadequate achievements by indicator are presented in Figure 20 below.

Figure 20: Percentage of Women Who Have Inadequate Achievements by Indicator



The breakdown of individual indicators is helpful to assess the areas that might be contributing disproportionately to women's disempowerment amongst the sample. Figure 20 shows the indicators where over 50% of the women in the sample obtained inadequate achievements: Input in productive decisions; purchase, sale or transfer of assets; access to and decisions on credit; and control over the use of income. Improvements in any of these indicators resulting from the Feed the Future programming could potentially have a marked effect on our measure of women's empowerment in the study LGAs.

#### 5.10.10 Defining Empowerment

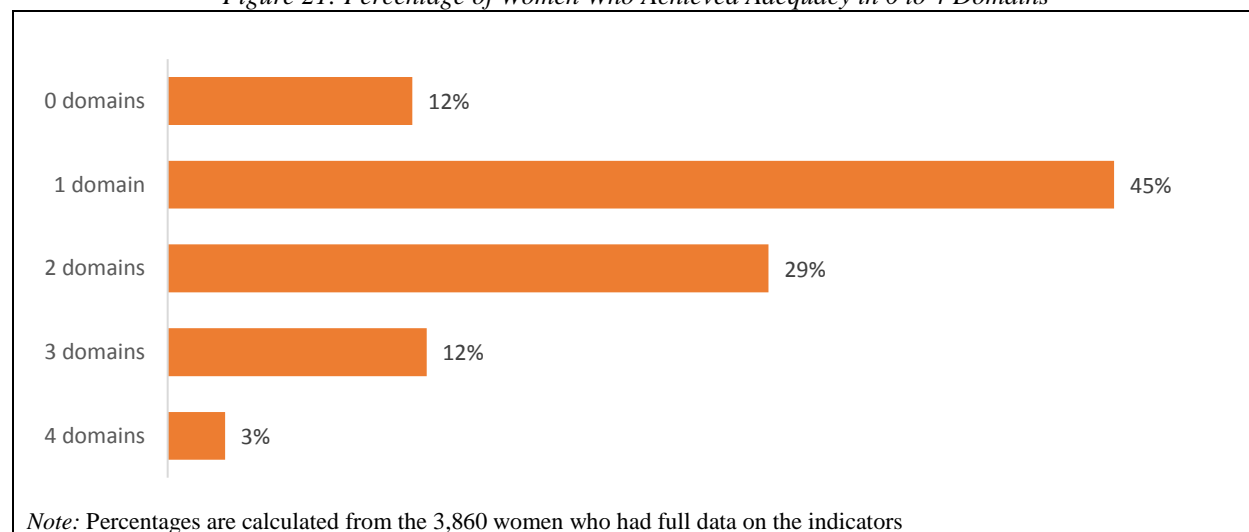
The original WEAI defines a person as empowered if that individual has achieved adequacy in 80% or more of the weighted indicators. However, because the FNLP baseline survey collected data on only 6 of the 10 indicators across just 4 of the 5 domains that are included in the original WEAI, it is not possible to calculate the WEAI according to the original methodology.

In order to establish how to best define empowerment, we first conducted a sensitivity analysis to identify an appropriate threshold to distinguish empowerment from disempowerment.

*Table 17: WEAI Indicators and Adequacy in the Impact Evaluation Baseline Survey*

WEAI Domains	Indicators included in baseline	Adequacy determined by...
<b>Production</b>	Input in productive decisions.	Achieving adequacy in input into productive decisions indicator.
<b>Resources</b>	Asset ownership, Rights over assets, Access to and decisions over credit	Achieving adequacy in at least two (out of the 3) indicators.
<b>Income</b>	Control over the use of income	Achieving adequacy in the control over use of income indicator.
<b>Time</b>	Workload	Achieving adequacy in the workload indicator.
<b>Leadership</b>	None included	Not applicable.

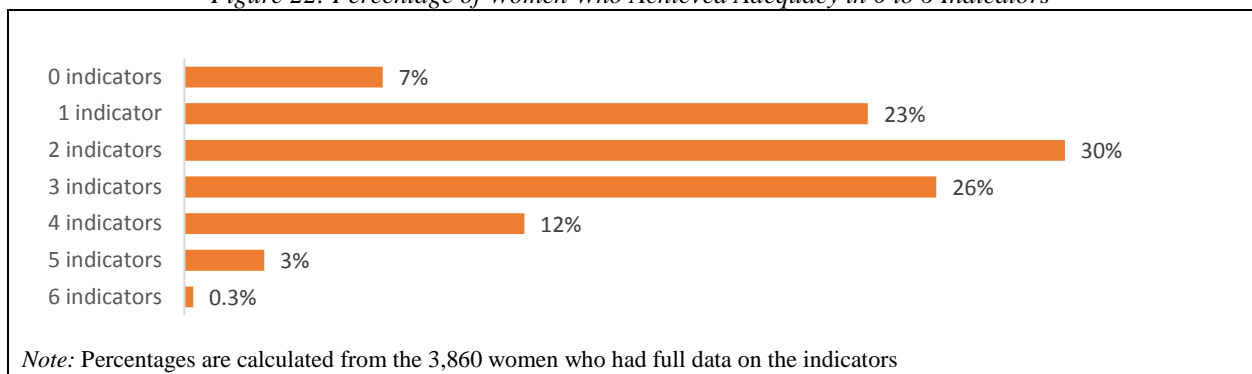
*Figure 21: Percentage of Women Who Achieved Adequacy in 0 to 4 Domains*



If we were to define empowerment as achievement of adequacy in 3 out of 4 domains then 15% of the sample of women would be defined as empowered.



Figure 22: Percentage of Women Who Achieved Adequacy in 0 to 6 Indicators



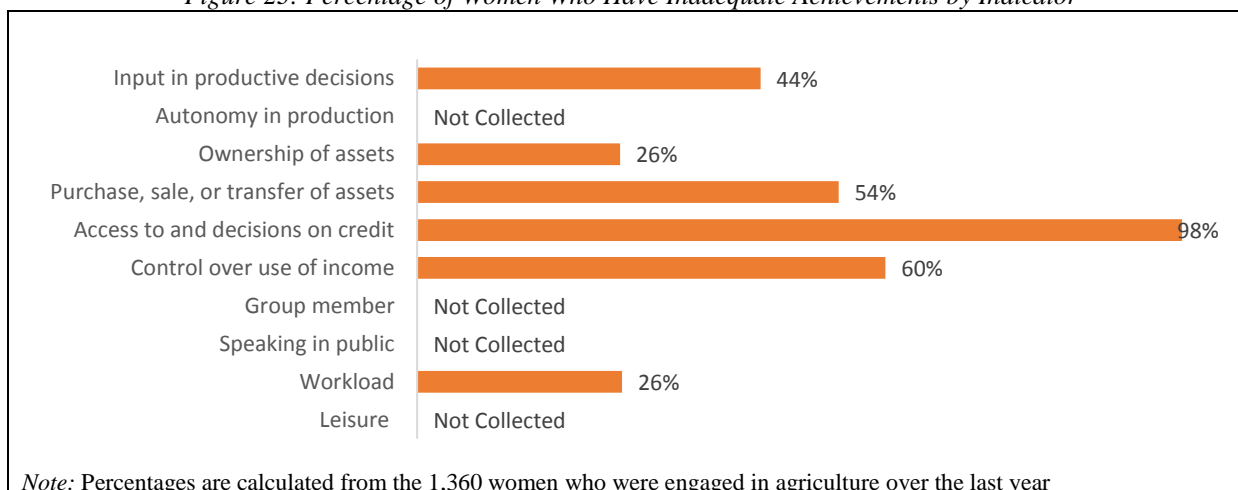
Similarly, if we were to define empowerment to require adequacy in at least 4 out of 6 indicators then 14.6% of the sample of women would be defined as empowered.

The sensitivity analysis suggests that the chosen threshold can have big implications on the reported empowerment levels of the study sample. The level of women's empowerment in the study sample defined by the two chosen definitions above is 15%. Any empowerment impacts from the Feed the Future program will be analyzed across different definitions of empowerment.

#### 5.10.11 Women Engaged in Crop Cultivation and Livestock Raising

The following analysis restricts the study sample to the 36% of women (1,360 women) in the sample who said they were involved in either food crop farming, cash crop farming or livestock raising over the past 12 months.

Figure 23: Percentage of Women Who Have Inadequate Achievements by Indicator



As one would expect, those women who are actually involved in farming practices have better decision-making outcomes for the input in productive decisions indicator: 56% of women who are involved in agriculture had adequate achievements in this indicator versus just 21% of the whole sample of women. We cannot be sure on the direction of causality - women may be more empowered because they work in agriculture, or they may work in agriculture, outside the house, because they are empowered. Control over the use of income was slightly better for women in farming but 60% still had inadequate achievements in the indicator. Lack of access to credit and rights over assets still contribute considerably to disempowerment for women in agriculture.

## 5.10.12 Decision-Making Indicators

In the baseline survey, we included a number of decision-making questions. For each question, we assess the percentage of women who stated that they have inadequate achievements in the particular decision out of a total of 14 decisions. Inadequacy could be associated with the household not being involved in the particular activity or the woman not having any input into the decision. Follow-up data collection will look to identify the areas where the women's input into decisions might change as a result of the program.

Table 18: Decision-Making Questions Included in the Baseline Survey

Section	Decision-Making Questions
Labor	Who in your household decides on the use of these earnings?
Enterprises	Who in your household decides on the use of the earnings from this enterprise?
Credit	Who made the decision to borrow from this institution?
	Who makes the decision about what to do with the money/item borrowed?
Agriculture	Who in the household makes the most decisions on this plot?
	Who in the household can decide whether to rent out this plot?
	Who in the household decides on the use of the earnings from the sale of these crops?
	Who in your household controlled the earnings from agricultural by-products?
Household Assets	Who in the household owns this item?
	Who would you say can decide whether to sell, give away, mortgage, rent item?
	Who would you say can decide whether to purchase a new item most of the time?
Agricultural Assets	Who in the household owns this item?
	Who would you say can decide whether to sell, give away, mortgage, rent item?
	Who can decide whether to purchase a new item most of the time?

Figure 24: Percentage of Women Who Have Inadequate Achievements in Each Decision



These decision-making indicators suggest there are multiple areas where the women's input into decisions could be impacted as a result of the Feed the Future program services. Changes in each component will be analyzed when looking at dynamics over time.

## 5.11 Poverty Profile

The following analysis looks at the poverty status of the sample at the time of the baseline survey. The poverty profile and empowerment assessment were conducted to assign a pre-program level for the sample in the study for which we will measure a treatment impact.

### 5.11.1 Poverty Line

The two international poverty lines presented in the analysis are the **USD 1.25/day** and the **USD 1.90/day** lines. The World Bank updated the international poverty line in October 2015 to USD 1.90/day from USD 1.25/day to reflect changes in the cost of living. In the following analysis, we present tables for the USD 1.90/day poverty line but also present the equivalent USD 1.25/day level. The USD 1.25/day poverty line identifies **85% of households as “very poor”** and the USD 1.90/day poverty line identifies **92% of households as “very poor”**. The decision rule in classifying a household as “very poor” (and the “not-very-poor”) is whether per capita daily expenditures of a household fall below (or above) the poverty line.

*Table 19: International Poverty Lines and the Nigerian Naira Equivalents*

Poverty lines per person per day	Value (NGN)
USD 1.25/day	107.4
USD 1.90/day	163.3

*Note: Purchasing Power Parity (PPP) for Nigeria fixed in October 2015 NGN 85.9 per USD 1.*

### 5.11.2 Measuring Daily Income and Expenditures

Throughout the analysis, we adopt three measures of income/expenditures:

- **Daily wage per capita:** calculated from the Labor section, we sum all the wage information of all household members and divide by the total number of household members.<sup>15</sup>
- **Daily income per capita:** calculated from Aspirations section, we obtain the reported present annual income of the household and divide this by the total number of household members.<sup>16</sup>
- **Daily expenditures per capita:** calculated from Food and Non-Food Expenditure sections, we sum all the expenditures and divide by the total number of household members.<sup>17</sup>

<sup>15</sup> The labor section was included in the household survey and asked all household members above the age of 15 years information about their participation in employment over the past 30 days. The daily wage measure is constructed by adding up all the daily wages of the “last payment” that was received by each household member. Only 30% of households reported a non-zero daily wage. Variables were winsorized at 0.25%.

<sup>16</sup> The aspirations section was included in the household survey and asked the respondents about their aspirations for future income and includes a question on present annual income. Within this section of the questionnaire, the present annual income of the household is recorded and then divided by the estimated number of working days in the year (240) to get an approximate daily level.

<sup>17</sup> The food and non-food expenditure sections were included in the household survey and ask expenditure questions covering the past 7 days, the past 30 days, and the past 6 months. Total expenditures of the household sum across all items. Variables were winsorized at 0.25% of the cumulative distribution.

The daily expenditure per capita measure is cited throughout this document as the preferred measure of poverty. We also discuss the limitations of each measure in section 5.11.4 below.

### 5.11.3 Average Income and Expenditure for the Baseline Sample

The PPP adjusted average expenditure per capita is just USD 0.74/day, which falls below both the USD 1.25/day and USD 1.90/day poverty lines. The sample consists of households that can be considered very poor in Nigeria, by international standards.

*Table 20: Average Daily Income and Expenditure Per Capita (PPP \$)*

Average Income / Expenditure per capita	PPP \$	
	Mean	SD
Daily wage per capita	0.86	4.0
Daily income per capita	0.41	1.2
Daily expenditures per capita	0.74	2.0
PPI Score (Number of points)	46.78	7.67
Observations	[3976]	

*Note: Nigeria PPP conversion factor of NGN 85.92 per USD 1. Nigeria current exchange rate of NGN 200 to USD 1. Conversion factor and exchange rate was fixed on October 1st 2015.*

The values presented in Table 20 shows that the average daily wage per capita for the whole sample is USD 0.86/day which is about twice the average of the daily income per capita of USD 0.41/day measure of poverty, while the average of the daily expenditures per capita is USD 0.74/day.

The average PPI score of the total sample of households is 46.78 points with a standard deviation of 7.67. Within the sample, the household with the lowest possible score has 24 points (least vulnerable) while the household with the highest score has 80 points (most vulnerable).

Table 21 below displays the different poverty measures by vulnerability category. The values presented in Panel A are simply an average of the sample from the baseline survey for EV, VV and ML and have not been reweighted to adjust for the original sampling design. Since the EV, VV and ML categories were originally classified *within each ward* then there could potentially have been some households with a certain PPI score that were classified as VV in one ward but ML in a different ward. Therefore, we would expect to see some overlap in the outcomes across the three vulnerability categories when analyzing the entire sample and this could potentially help to explain why it is difficult to identify significant differences in the figures of Panel A between the three categories.

Panel B in Table 21 presents the standardized values of the poverty measures which gives us a clearer view of the dispersion of the data within the groups. Intuitively, the means for the EV category do not vary as much as the means for the VV and ML categories. The dispersion of the data for the households within the category ML varies more than for those in the EV category, especially for the outcomes of income and expenditures.

Finally, in the last row of Table 21, we present the scores from the Progress out of Poverty Index (PPI) for the three vulnerability categories. The PPI score is a tool used to determine the likelihood that a particular household is living below the poverty line. The PPI is comprised of a number of indicators of vulnerability and while it is expected to be correlated with the poverty measures, they should not be expected to be exact substitutes. The average PPI score for EV category is 51 points with a higher variation (4.61 SD) than the VV and ML categories (the higher the PPI score, the more vulnerable the household).

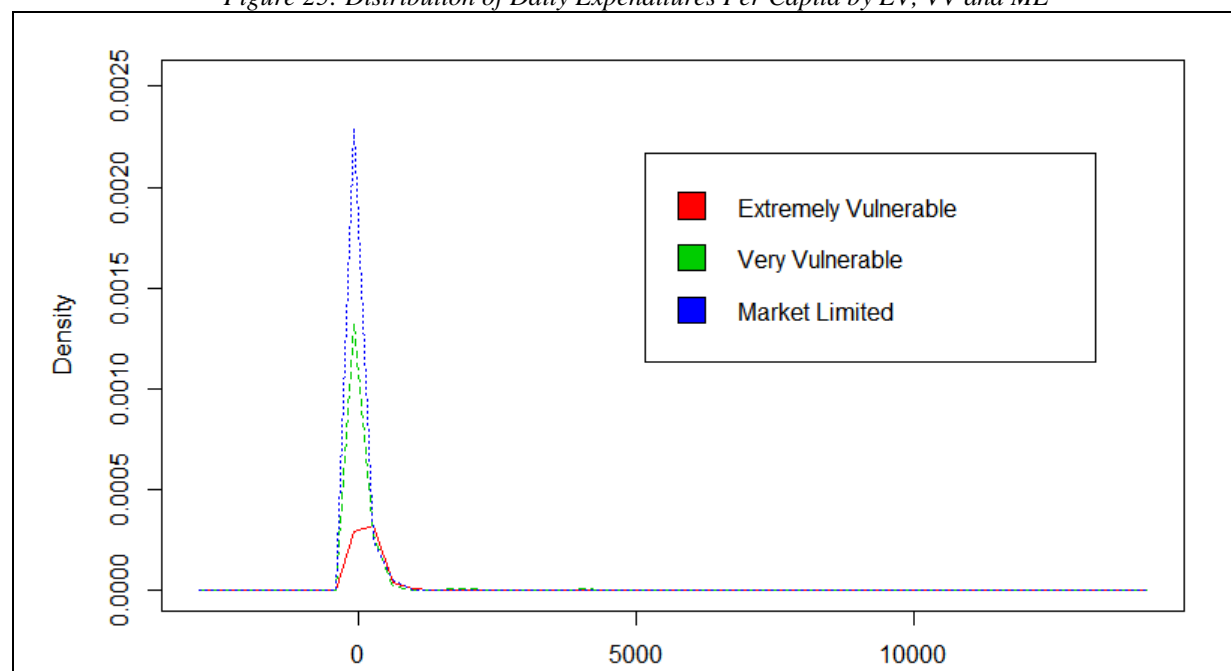
Table 21: Average Daily Income and Expenditure Per Capita by Vulnerability Category (PPP \$)

	<b>Extremely Vulnerable</b>		<b>Very Vulnerable</b>		<b>Market Limited</b>	
<b>Panel A. USD (PPP)</b>	<i>Mean</i>	<i>SD</i>	<i>Mean</i>	<i>SD</i>	<i>Mean</i>	<i>SD</i>
Daily wage per capita	0.82	4.0	1.00	3.9	0.79	4.2
Daily income per capita	0.39	1.0	0.44	1.4	0.54	2.3
Daily expenditures per capita	0.70	1.7	0.82	2.4	0.88	3.2
<b>Panel B. Standardized variables</b>	<i>Mean</i>	<i>SD</i>	<i>Mean</i>	<i>SD</i>	<i>Mean</i>	<i>SD</i>
Daily wage per capita	-0.01	1.0	0.04	1.0	-0.02	1.0
Daily income per capita	-0.02	0.8	0.03	1.2	0.10	1.9
Daily expenditures per capita	-0.02	0.8	0.04	1.2	0.07	1.6
PPI Score (Number of points)	50.72	4.61	39.64	3.72	30.1	2.34
N	[2772]		[958]		[246]	

Note: Nigeria PPP conversion factor of NGN 85.92 per USD 1. Nigeria current exchange rate of NGN 200 to USD 1. Conversion factor and exchange rate were fixed on October 1st 2015.

The measure of daily per capita expenditures, in USD (PPP) terms, shows the least variation across the full sample of vulnerable households. The kernel density plots in Figure 25 (axis not drawn to scale) show that there is an aggregation of daily expenditures per capita around zero and any variation in the measure is mainly found along the tail of the distribution. Therefore, these indicators of income or consumption at one point in time are not sufficient as a standalone to determine the potential variation in poverty across the sample.

Figure 25: Distribution of Daily Expenditures Per Capita by EV, VV and ML



#### 5.11.4 Consumption as the Preferred Measure of Poverty

Despite the limitations discussed above about using income and consumption to measure poverty, we trust consumption as the better indicator for poverty measurement than income. For the income measures of poverty, the daily wage per capita measure is USD 0.86 versus USD 0.41 for the daily income per capita

measure. This large discrepancy suggests that income measures are prone to seasonality, recall and definition issues.

The daily wage measure is constructed by adding up all the daily wages of the “last payment” that was received by each household member. Around 30% of the households (1183 observations) reported a non-zero daily wage, which suggests that these households are unlikely to be representative of the total sample of households where wage employment is limited. From the sample of households that reported a non-zero daily wage; 67% belong to the EV category, 28% belong to the VV category and 5% of the households are part of the ML category. The daily wage households differ significantly with the households that do not report a daily wage because, on average:

- The primary decision-maker is younger
- There is a lower proportion of married households
- There is a lower proportion of households with female as the primary decision-maker
- There is a greater percentage of polygamous households
- There is a greater percentage of households where the primary decision-maker attended school and knows how to read and write.
- There is a greater number of household members
- There is a greater number of agriculture plots owned by household
- There is a greater proportion of households that faced the situation where there was not enough food to feed the household in the past 12 months

The daily income measure is likely to suffer from lump-sum recall issues since this measure is calculated from a question that asks the respondent for the present annual income of the household. Measures of income over longer periods, such as a year, are likely to face recall bias issues.

The daily expenditure per capita measure is USD 0.74 (PPP). Consumption expenditures are likely to be better measured than income: because the sample is largely made up of farming households, income flows are likely to fluctuate during the year due to the seasonality of farming practices. The questionnaire poses questions about both food and non-food expenditures in the past 7 days, past 30 days, and past 6 months and we believe this gives the respondent an anchor to think about all expenditures, however small, and allows for a better measure of the wellbeing of the household. Although the consumption measure is going to be seasonal (for example, to the extent that there are fasting periods, or that some products are/not available for consumption, etc.) there is likely to be more smoothing than with income or wages. Both measures are likely to suffer if there are shares of income or consumption that are not be easily monetized due to households consuming their own production or exchanging it for some other goods. However, relative to income we believe consumption expenditures provide a better picture of actual standards of living than current income, especially when income fluctuates considerably. We refer to the daily expenditure per capita measure throughout the following analysis. One thing to note is that the measure of income and consumption levels is reflective only of the period of seasonality in which the baseline data was collected and is not necessarily representative of the entire year. It will therefore be important to collect endline information in the same season as the baseline survey.

## 5.11.5 Number of Poor Households: The Household Count

For the household count ratio, we count the number of households that are below the poverty line. The calculation for the USD 1.90/day poverty line is equivalent to per capita expenditures being less than NGN 163.25/day based on the PPP-adjusted exchange rate. At these values, the USD 1.90/day poverty line based on daily expenditures per capita identifies 92% of households as “very poor”. These households are indeed among the most vulnerable in the region as targeted by the program.

Table 22: Households below Poverty Line

Indicator	Households below poverty line	
	<i>n</i>	%
Daily wage per capita	3,590	90.3
Daily income per capita	3,757	94.5
Daily expenditures per capita	3,639	91.5
Total Sample	3,976	

Note: Poverty is defined as USD 1.90/day

Table 23 presents the number of households below the USD 1.90/day poverty line across the three vulnerability categories; we find no notable differences in the household count ratio for EV, VV and ML.

Table 23: Households below Poverty Line by Vulnerability Category

Indicator	EV		VV		ML	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
Daily wage per capita	2,531	91.3	839	87.6	222	90
Daily income per capita	2,613	94.3	908	94.8	236	96
Daily expenditures per capita	2,533	91.4	876	91.4	230	94
<b>Total observations by category</b>	2,772		958		246	

Note: Poverty is defined as USD 1.90/day

The poverty statistics within the study sample are slightly worse than those reported by the National Bureau of Statistics (NBS) who reported that Sokoto State's poverty rate was at 86.4% in 2010 based on the USD 1.25/day poverty line.<sup>18</sup> Estimates for the poverty rate in Kebbi State are not available from the NBS, however, since Sokoto State is neighboring Kebbi we provide this NBS estimate on the assumption that they have comparable poverty rates.

## 5.11.6 Size of the Poverty Gap: The Poverty Gap Index

The poverty gap is the mean shortfall from the poverty line (where we count the non-poor as having zero shortfall), expressed as a percentage of the poverty line. This measure reflects the depth of poverty as well as its incidence. The poverty gap index estimates the depth of poverty by considering how far, on average, the poor are from that poverty line. We find, on average, the poor have an expenditure shortfall of 74% of the USD 1.90/day poverty line. We also find, on average, the poor have an expenditure shortfall of 66% of the USD 1.25/day poverty line.

<sup>18</sup> Data source: Nigeria's National Bureau of Statistics ([www.bbc.com/news/world-africa-17015873](http://www.bbc.com/news/world-africa-17015873))

Table 24: Depth of Poverty: Income/Expenditure Shortfall below the Poverty Line

Indicator	Poverty gap index			
	EV	VV	ML	Overall
Daily wage per capita	84.03%	79.81%	84.04%	83.01%
Daily income per capita	82.13%	81.86%	82.32%	82.1%
Daily expenditures per capita	73.50%	73.54%	74.89%	73.59%

Note: Poverty is defined as USD 1.90/day

### 5.11.7 Poverty differences across the LGAs

We find a difference in the depth of poverty measurement across the two LGAs. On average, the poor have an expenditure shortfall of 65% of the USD 1.90/day poverty line in Birnin Kebbi versus 81% in Danko Wasagu. The poverty differences between the LGAs could be attributed to Danko Wasagu being less well-connected than Birnin Kebbi, which has better access to Sokoto State.

Table 25: Depth of Poverty: Expenditure Shortfall below the Poverty Line by LGA

Indicators	Birnin Kebbi LGA	Danko Wasagu LGA
Daily expenditures per capita	64.8%	81.4%

Note: Poverty is defined as USD 1.90/day

### 5.11.8 Poverty differences across Gendered Household Type

As one would expect, the poor in female adult-only households have a greater expenditure shortfall from the USD 1.90/day poverty line at 82%, versus 72% for dual adult (male and female) households. For the USD 1.25/day poverty line, the poor in female adult-only households have an expenditure shortfall of 75% versus 64% for dual adult households.

Table 26: Depth of Poverty: Expenditure Shortfall below the Poverty Line by HH Type

Poverty Gap Index Type of Household	Dual adult	Female adult only
Daily expenditures per capita	71.8%	81.4%

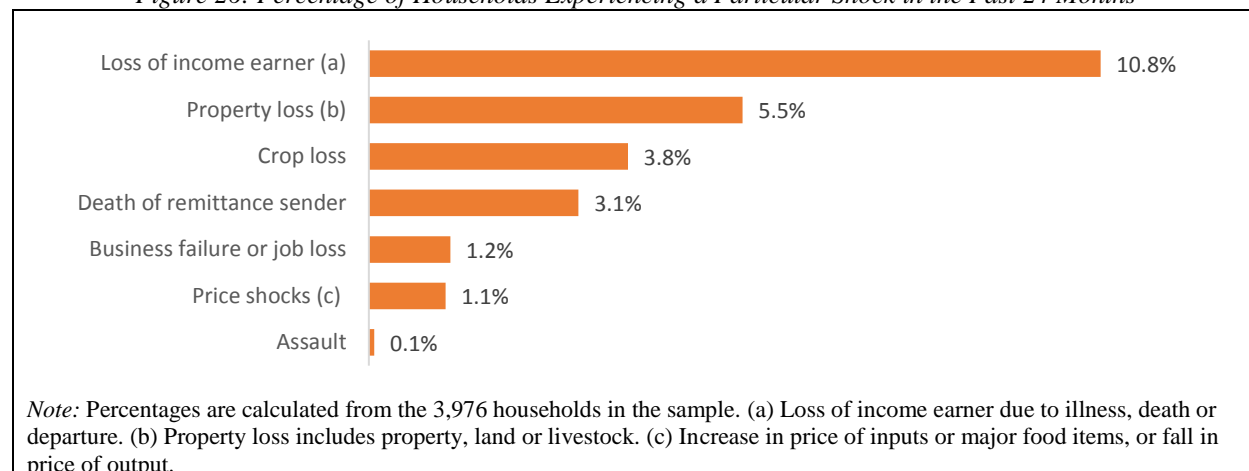
Note: Poverty is defined as USD 1.90/day

### 5.11.9 Income Shocks faced by Vulnerable Households

Since the sample consists largely of farming households, their incomes are expected to vary a great deal over the year. The theory that receiving cash transfers at different points in the farming season could have different implications for expenditure decisions relies on the assumption that households are more cash and credit constrained at particular times of the year. The baseline survey was completed at one specific time during the farming season and we expect shorter consumption surveys to help us better track variability in income. Along these lines, 26% of households in the sample reported experiencing an income shock in the past 24 months, where income shock was simply defined as whether any of the events happened (see Figure 26). Although more than a quarter of households experienced economic shocks, just 1% of households (32 households) reported receiving money or in-kind benefits from any safety net program over the last year.



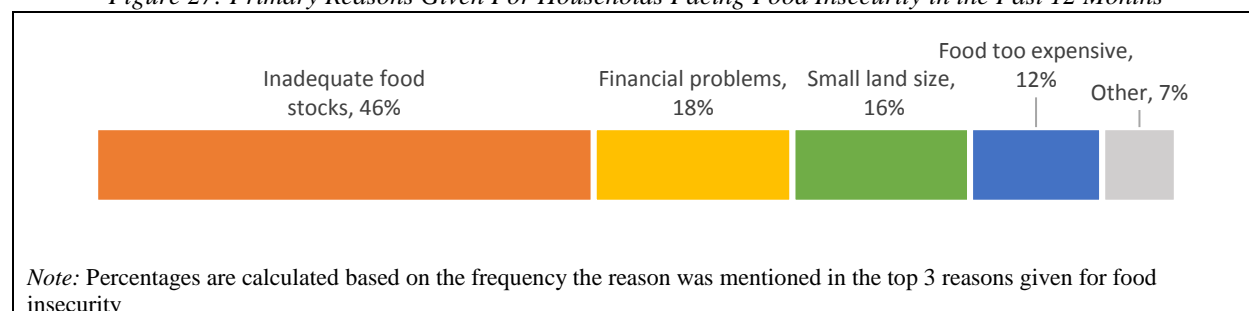
Figure 26: Percentage of Households Experiencing a Particular Shock in the Past 24 Months



#### 5.11.10 Food Security

Poverty is conventionally measured by the income or expenditure level that can sustain a bare minimum standard of living. However, other dimensions such as health, nutrition, life expectancy, access to clean water, and food security are also central to welfare. Consumption-based measures are therefore complemented with measures of food security to produce a more dimensional understanding of household welfare.

Figure 27: Primary Reasons Given For Households Facing Food Insecurity in the Past 12 Months



Nineteen percent of households reported that in the past 12 months, they have faced a situation where there was not enough food to feed the household. The reasons for food insecurity are expressed in terms of having inadequate household farm-derived food stocks, with 64% of the food insecure households suggesting that lack of food security was due to small landholdings or poor farming conditions (lack of rain, lack of other inputs, or post-harvest crop loss).

## 6 Summary

The Feed the Future Nigeria Livelihoods Project impact evaluation seeks to measure the impact of the agricultural-led program on the livelihoods of vulnerable households. This baseline survey established baseline indicators for background characteristics, primary and secondary outcomes, and confirmed that the sample is made up of rural, farming households with 80% of the working population engaged in crop and animal production as their primary income activity. The finding that treatment and comparison groups are balanced along observable characteristics at baseline adds credibility to the randomization process so any differences emerging after the program can be attributed to the treatment. Commensurate with program targeting criteria, the majority of households in the study sample fall below the USD 1.90/day poverty line with 92% of households defined as “very poor” based on a measure of daily expenditures per capita. On average, the poor in the sample have an expenditure shortfall of 74% of the USD 1.90/day poverty line. The average household has five people, three of whom are children. Nineteen percent of households said they faced food insecurity within the past 12 months with households suggesting they were unable to generate enough food stocks from the land. Labor force participation is low, with 37% of the sample reporting no persons within their household having worked at income-generating activities in the 30 days prior to the baseline survey; however, this finding could be related to the season in which the survey was conducted. Schooling outcomes show that just 12% of the adults in the sample attended any formal school and self-reported literacy rates were at 40%. Fifty-five percent of households owned at least one plot of agricultural land with self-reported average land size of 3.3 hectares. Access to finance is very low with just 1% of adults owning a bank account. Based on a measure of the adapted WEAI, only 15% of women in the sample were deemed empowered; women mainly lack control over the use of income and access to and decisions on credit.



*Note: FNLP beneficiaries at a community gathering (August 2016). Photo Credit: GIL team.*

## Appendix A: List of Attachments

#	Attachment Name	Description	File Name
1	Birnin Kebbi LGA Map	High resolution map of Birnin Kebbi LGA, with FNLP locations marked	Attachment 1--Birnin Kebbi LGA Map.pdf
2	Danko Wasagu LGA Map	High resolution map of Danko Wasagu LGA, with FNLP locations marked	Attachment 2--Danko Wasagu LGA Map.pdf
3	Baseline Survey Training Manual	Consists of data collection protocols and explanation of key terms	Attachment 3--Feed the Future Nigeria - Field Interviewers Manual.pdf
4	Baseline Questionnaire	Main baseline survey instrument, including Agriculture Roster and Women's Survey	Attachment 4--FtF Nigeria Livelihoods Baseline Questionnaire.pdf
5	PPI Questionnaire	Progress out of Poverty Index (PPI) survey instrument	Attachment 5--PPI_Kebbi_final_11Dec2014.pdf
6	Community Questionnaire	Survey instrument administered to each village during the HTC meeting	Attachment 6--FtF Community Survey.pdf

## Appendix B: Balance Tables

### Table B1: Comparing Feed the Future Villages with non-Feed the Future Villages

The randomization process, when comparing households in the Feed the Future treatment villages and Feed the Future control villages (Table B1), produced balanced groups at baseline. Treatment and control villages are balanced along observable covariates, with two exceptions: treatment households are (at the 10% level of statistical significance) less likely to be female headed and are more likely to have literate household heads. The extent to which more literate or dual adult households could take better advantage of program services could introduce bias into estimates and we can control for this at endline when identifying the impact of the interventions. A joint test of significance (chi-squared) of mean differences demonstrates overall balance.

### Table B2: Comparing Caseworker and No-caseworker Households

Table B2 gives results of the randomization balance check between the caseworker households and the no caseworker households in the Feed the Future villages. On average, randomization created balance between caseworker and no caseworker groups on observed characteristics. In a joint test of all variables, we cannot reject the hypothesis that the baseline characteristics of the caseworker and no caseworker samples are statistically identical.

### Table B3: Monthly vs No Cash Transfer in Feed the Future Villages

Monthly cash transfer and No cash transfer groups in Feed the Future villages are balanced along observable baseline characteristics, with two exceptions: Monthly cash transfer households are significantly more likely to have literate household heads and have a lower mean level of daily per capita expenditures. A joint test of significance (chi-squared) of mean differences demonstrates overall balance.

### Table B4: Quarterly vs No Cash Transfer in Feed the Future Villages

Quarterly cash transfer and No cash transfer groups in Feed the Future villages are balanced along observable baseline characteristics, with one exception: Quarterly cash transfer households have on average a larger number of plots than no cash transfer households, significant at the 5% level. A joint test of significance (chi-squared) of mean differences demonstrates overall balance.

### Table B5: All (Monthly + Quarterly) vs No Cash Transfer in Feed the Future Villages

All cash transfer households and No cash transfer groups in Feed the Future villages are balanced along observable baseline characteristics, with three exceptions: All cash transfer households are significantly more likely to have literate household heads, have on average a larger number of plots and are less likely to have no land ownership than No cash transfer households. The agricultural differences could suggest that the cash transfer households may have better opportunities to diversify their risk with higher land ownership either with their own production or with purchases made possible due to increased income from the program. A joint test of significance (chi-squared) of mean differences demonstrates overall balance.

### Table B6: Monthly vs No Cash Transfer in Control Villages

Monthly cash transfer and No cash transfer groups in non-Feed the Future villages are balanced along observable baseline characteristics, with one exception: Monthly cash transfer households are significantly

(at the 10% level) less likely to be married. A joint test of significance (chi-squared) of mean differences demonstrates overall balance.

Table B7: Quarterly vs No Cash Transfer in Control Villages

Quarterly cash transfer and No cash transfer groups in non-Feed the Future villages are balanced along observable baseline characteristics, with two exceptions: Quarterly cash transfer household heads are significantly less likely to be married and more likely to be in polygamous relationships. A joint test of significance (chi-squared) of mean differences demonstrates overall balance.

Table B8: All (Monthly + Quarterly) vs No Cash Transfer in Control Villages

All cash transfer households and no cash transfer groups in non-Feed the Future villages are balanced along observable baseline characteristics, with one exception: All cash transfer households are significantly less likely to be married. A joint test of significance (chi-squared) of mean differences demonstrates overall balance.

Table B9: All Cash Transfer Households in All Villages vs No Cash Transfer Households in All Villages

The randomization process, when comparing households receiving cash transfers (monthly and quarterly) to no cash transfers pooled across both treatment and control villages (Table B9), produced balanced groups at baseline. All cash transfer households and no cash transfer households are balanced along observable covariates, with two exceptions: cash transfer households are significantly less likely to be married and less likely to have no land ownership. A joint test of significance (chi-squared) of mean differences demonstrates overall balance.

Table B10: All Cash Transfer Households in Feed the Future Villages vs All Cash Transfer Households in Control Villages

The randomization process, when comparing cash transfer households in the Feed the Future treatment villages and control villages (Table B10), did not produce balanced groups at baseline; with four of the sixteen key variables being significantly different. In addition, in a joint test of all observables, we reject the hypothesis that the baseline characteristics of the cash transfer households in treatment and control villages are statistically identical. Although individual poverty measures were balanced, household agricultural land ownership variables showed significant imbalances where cash transfer households in treatment villages were more likely to own land greater than one hectare, have a higher number of plots and are less likely to have no land ownership. The agricultural differences could suggest that the cash transfer households in treatment villages may have better opportunities to diversify risk either with their own production on different plots or with purchases made possible due to increased income from the program. The randomization of the cash transfers in treatment villages and control villages was done separately and so we should not expect to find balance. However, if we wish to compare these 2 groups it will be important to control for variables not adequately controlled for by randomization as treatment effects may be biased. With an endline survey planned in 2018, the quantitative survey aims to support the evaluation of project impact on outcomes and the research team will control for any observed differences in the estimation approach.

Table B1: Balance between treatment and control villages

Indicators	Mean full sample	Treatment mean	Control mean	Mean difference
<b>Socio-demographic characteristics of Household Head</b>				
<b>Age</b>				
Age of Household Head	45.58 (16.27)	45.84 (15.97)	45.33 (16.54)	1.13 (0.96)
<b>Marital status</b>				
Percent who are married	0.84 (0.36)	0.86 (0.35)	0.83 (0.38)	-0.01 (0.02)
Percent in polygamous marriage	0.23 (0.42)	0.26 (0.44)	0.19 (0.39)	0.04 (0.04)
<b>Education and literacy</b>				
Attended School	0.36 (0.48)	0.44 (0.5)	0.28 (0.45)	0.05 (0.04)
Can read and write in any language	0.39 (0.49)	0.48 (0.5)	0.31 (0.46)	0.08* (0.05)
<b>Household Characteristics</b>				
<b>Household Size</b>				
Average household size	4.97 (2.62)	5.20 (2.67)	4.75 (2.55)	0.09 (0.16)
Number of offspring	2.97 (2.38)	3.16 (2.38)	2.79 (2.36)	0.11 (0.15)
<b>Household Type</b>				
Percent of female headed households	0.18 (0.38)	0.17 (0.38)	0.19 (0.39)	-0.04* (0.02)
<b>Poverty</b>				
Daily per capita expenditures, mean (Naira)	69.43 (306.4)	85.85 (413.54)	53.88 (142.76)	11.12 (17.11)
Percent of HHs with per capita consumption less than \$1.25-a-day	0.85 (0.36)	0.83 (0.37)	0.87 (0.34)	-0.03 (0.02)
Percent of HHs with per capita consumption less than \$1.90-a-day	0.92 (0.28)	0.90 (0.29)	0.93 (0.26)	-0.01 (0.02)
<b>Food Security</b>				
Faced situation where not enough food to feed HH in past 12months	0.19 (0.39)	0.19 (0.39)	0.19 (0.39)	0.01 (0.02)
<b>Agricultural Land Ownership</b>				
Total number of agricultural plots owned	0.67 (0.76)	0.75 (0.82)	0.60 (0.7)	0.09 (0.05)
Total area of plots owned or cultivated (ha)	1.81 (12.99)	1.87 (8.56)	1.75 (16.1)	-0.29 (0.69)
Percent of households with no land ownership	0.45 (0.5)	0.41 (0.49)	0.49 (0.5)	-0.04 (0.04)
Percent of households with agricultural land greater than 1 hectare	0.35 (0.48)	0.38 (0.48)	0.33 (0.47)	-0.04 (0.05)
Joint test p-value				0.38
<b>Number of Households</b>	<b>3976</b>	<b>1934</b>	<b>2042</b>	

\* significant at 10% level \*\* significant at 5% level \*\*\* significant at 1% level

(1) Columns (1), (2) and (3) report means with standard deviations in parentheses.

(2) Column (4) reports the test of differences of means across columns (2) and (3) for households in Feed the Future treatment villages and Feed the Future control villages. We report OLS regressions which include ward-infrastructure stratification fixed effects and standard errors are clustered by village. Sampling weights are employed in the regressions to correct for the differential sampling probabilities across the EV, VV and ML vulnerability categories.

(3) The percent of households with agricultural land greater than 1 hectare is conditional on the household owning land i.e. the percentage is calculated for the 2180 households who own land.

(4) Joint test is the Chi-Sq Statistic, which is computed by jointly estimating a system of seemingly unrelated regressions where the explanatory variable is a dummy for treatment with standard errors adjusted for within village correlation and the regressions include stratification dummies.

Table B2: Balance between caseworker and no caseworker households

Indicators	Mean full sample	Caseworker mean	No caseworker mean	Mean difference
<b>Socio-demographic characteristics of Household Head</b>				
<b>Age</b>				
Age of Household Head	45.58 (16.27)	46.52 (16.16)	45.17 (15.75)	0.74 (0.87)
<b>Marital status</b>				
Percent who are married	0.84 (0.36)	0.85 (0.35)	0.86 (0.35)	0.00 (0.02)
Percent in polygamous marriage	0.23 (0.42)	0.26 (0.44)	0.27 (0.44)	-0.01 (0.02)
<b>Education and literacy</b>				
Attended School	0.36 (0.48)	0.46 (0.5)	0.42 (0.49)	0.01 (0.03)
Can read and write in any language	0.39 (0.49)	0.49 (0.5)	0.47 (0.5)	0.00 (0.03)
<b>Household Characteristics</b>				
<b>Household Size</b>				
Average household size	4.97 (2.62)	5.29 (2.73)	5.11 (2.62)	0.20 (0.15)
Number of offspring	2.97 (2.38)	3.25 (2.45)	3.07 (2.32)	0.16 (0.14)
<b>Household Type</b>				
Percent of female headed households	0.18 (0.38)	0.18 (0.38)	0.17 (0.37)	0.02 (0.02)
<b>Poverty</b>				
Daily per capita expenditures, mean (Naira)	69.43 (306.4)	103.03 (542.74)	68.95 (221.56)	61.70 (45.91)
Percent of HHs with per capita consumption less than \$1.25-a-day	0.85 (0.36)	0.82 (0.39)	0.85 (0.36)	-0.04 (0.02)
Percent of HHs with per capita consumption less than \$1.90-a-day	0.92 (0.28)	0.90 (0.3)	0.91 (0.29)	-0.03 (0.02)
<b>Food Security</b>				
Faced situation where not enough food to feed HH in past 12months	0.19 (0.39)	0.19 (0.39)	0.19 (0.39)	0.02 (0.02)
<b>Agricultural Land Ownership</b>				
Total number of agricultural plots owned	0.67 (0.76)	0.73 (0.78)	0.78 (0.86)	-0.01 (0.05)
Total area of plots owned or cultivated (ha)	1.81 (12.99)	2.03 (9.88)	1.72 (7.03)	-0.10 (0.39)
Percent of households with no land ownership	0.45 (0.5)	0.41 (0.49)	0.41 (0.49)	-0.02 (0.03)
Percent of households with agricultural land greater than 1 hectare	0.35 (0.48)	0.37 (0.48)	0.39 (0.49)	-0.06 (0.04)
Joint test p-value				0.14
<b>Number of Households</b>	<b>3976</b>	<b>975</b>	<b>959</b>	

\* significant at 10% level \*\* significant at 5% level \*\*\* significant at 1% level

- (1) Columns (1), (2) and (3) report means with standard deviations in parentheses.
- (2) Column (4) reports the test of differences of means across columns (2) and (3) for households in caseworker households and no caseworker households in Feed the Future treatment villages. We report OLS regressions which include ward-infrastructure and vulnerability category (EV, VV and ML) stratification fixed effects and standard errors are clustered by village. Sampling weights are employed in the regressions to correct for the differential sampling probabilities across the EV, VV and ML vulnerability categories.
- (3) The percent of households with agricultural land greater than 1 hectare is conditional on the household owning land i.e. the percentage is calculated for the 2180 households who own land.
- (4) Joint test is the Chi-Sq Statistic, which is computed by jointly estimating a system of seemingly unrelated regressions where the explanatory variable is a dummy for treatment with standard errors adjusted for within village correlation and the regressions include stratification dummies.

Table B3: Balance between monthly cash transfers and no cash transfer households in treatment villages

Indicators	Mean full sample	Monthly CT mean	No CT mean	Mean difference
<b>Socio-demographic characteristics of Household Head</b>				
<b>Age</b>				
Age of Household Head	45.58 (16.27)	45.90 (16.34)	46.32 (16.21)	-0.38 (1.06)
<b>Marital status</b>				
Percent who are married	0.84 (0.36)	0.83 (0.38)	0.83 (0.37)	0.00 (0.02)
Percent in polygamous marriage	0.23 (0.42)	0.29 (0.45)	0.29 (0.45)	0.00 (0.03)
<b>Education and literacy</b>				
Attended School	0.36 (0.48)	0.45 (0.5)	0.45 (0.5)	0.01 (0.02)
Can read and write in any language	0.39 (0.49)	0.50 (0.5)	0.46 (0.5)	0.06** (0.03)
<b>Household Characteristics</b>				
<b>Household Size</b>				
Average household size	4.97 (2.62)	5.27 (2.93)	5.19 (2.6)	0.10 (0.24)
Number of offspring	2.97 (2.38)	3.22 (2.53)	3.17 (2.28)	0.07 (0.2)
<b>Household Type</b>				
Percent of female headed households	0.18 (0.38)	0.21 (0.41)	0.22 (0.41)	-0.01 (0.03)
<b>Poverty</b>				
Daily per capita expenditures, mean (Naira)	69.43 (306.4)	51.75 (82.38)	80.73 (280.55)	-27.24* (15.11)
Percent of HHs with per capita consumption less than \$1.25-a-day	0.85 (0.36)	0.84 (0.36)	0.82 (0.39)	0.02 (0.03)
Percent of HHs with per capita consumption less than \$1.90-a-day	0.92 (0.28)	0.93 (0.25)	0.90 (0.3)	0.03 (0.02)
<b>Food Security</b>				
Faced situation where not enough food to feed HH in past 12months	0.19 (0.39)	0.22 (0.41)	0.19 (0.4)	0.03 (0.03)
<b>Agricultural Land Ownership</b>				
Total number of agricultural plots owned	0.67 (0.76)	0.81 (0.88)	0.71 (0.84)	0.09 (0.06)
Total area of plots owned or cultivated (ha)	1.81 (12.99)	1.92 (7.6)	1.80 (8.42)	0.16 (0.65)
Percent of households with no land ownership	0.45 (0.5)	0.38 (0.49)	0.45 (0.5)	-0.07 (0.05)
Percent of households with agricultural land greater than 1 hectare	0.35 (0.48)	0.38 (0.49)	0.37 (0.48)	0.00 (0.04)
Joint test p-value				0.98
<b>Number of Households</b>	<b>3976</b>	<b>309</b>	<b>581</b>	

\* significant at 10% level \*\* significant at 5% level \*\*\* significant at 1% level

- (1) Columns (1), (2) and (3) report means with standard deviations in parentheses.
- (2) Column (4) reports the test of differences of means across columns (2) and (3) for households receiving the monthly cash transfer and those receiving no cash transfers in Feed the Future treatment villages. We report OLS regressions which include ward-infrastructure stratification fixed effects and standard errors are clustered by village.
- (3) The percent of households with agricultural land greater than 1 hectare is conditional on the household owning land.
- (4) Joint test is the Chi-Sq Statistic, which is computed by jointly estimating a system of seemingly unrelated regressions where the explanatory variable is a dummy for treatment with standard errors adjusted for within village correlation and the regressions include stratification dummies.



Table B4: Balance between quarterly cash transfer and no cash transfer households in treatment villages

Indicators	Mean full sample	Quarterly CT mean	No CT mean	Mean difference
<b>Socio-demographic characteristics of Household Head</b>				
<b>Age</b>				
Age of Household Head	45.58 (16.27)	46.74 (15.78)	46.32 (16.21)	0.42 (0.98)
<b>Marital status</b>				
Percent who are married	0.84 (0.36)	0.84 (0.37)	0.83 (0.37)	0.01 (0.02)
Percent in polygamous marriage	0.23 (0.42)	0.25 (0.43)	0.29 (0.45)	-0.04 (0.03)
<b>Education and literacy</b>				
Attended School	0.36 (0.48)	0.45 (0.5)	0.45 (0.5)	0.01 (0.02)
Can read and write in any language	0.39 (0.49)	0.48 (0.5)	0.46 (0.5)	0.03 (0.03)
<b>Household Characteristics</b>				
<b>Household Size</b>				
Average household size	4.97 (2.62)	5.10 (2.66)	5.19 (2.6)	-0.10 (0.2)
Number of offspring	2.97 (2.38)	3.12 (2.35)	3.17 (2.28)	-0.06 (0.17)
<b>Household Type</b>				
Percent of female headed households	0.18 (0.38)	0.18 (0.39)	0.22 (0.41)	-0.03 (0.02)
<b>Poverty</b>				
Daily per capita expenditures, mean (Naira)	69.43 (306.4)	112.19 (590.66)	80.73 (280.55)	33.34 (33.57)
Percent of HHs with per capita consumption less than \$1.25-a-day	0.85 (0.36)	0.81 (0.39)	0.82 (0.39)	-0.01 (0.03)
Percent of HHs with per capita consumption less than \$1.90-a-day	0.92 (0.28)	0.87 (0.34)	0.90 (0.3)	-0.03 (0.02)
<b>Food Security</b>				
Faced situation where not enough food to feed HH in past 12months	0.19 (0.39)	0.17 (0.38)	0.19 (0.4)	-0.02 (0.03)
<b>Agricultural Land Ownership</b>				
Total number of agricultural plots owned	0.67 (0.76)	0.82 (0.89)	0.71 (0.84)	0.10** (0.05)
Total area of plots owned or cultivated (ha)	1.81 (12.99)	1.34 (4.63)	1.80 (8.42)	-0.37 (0.47)
Percent of households with no land ownership	0.45 (0.5)	0.38 (0.49)	0.45 (0.5)	-0.06 (0.04)
Percent of households with agricultural land greater than 1 hectare	0.35 (0.48)	0.40 (0.49)	0.37 (0.48)	0.03 (0.05)
Joint test p-value				0.60
<b>Number of Households</b>	<b>3976</b>	<b>295</b>	<b>581</b>	

\* significant at 10% level \*\* significant at 5% level \*\*\* significant at 1% level

- (1) Columns (1), (2) and (3) report means with standard deviations in parentheses.
- (2) Column (4) reports the test of differences of means across columns (2) and (3) for households receiving the quarterly cash transfer and those receiving no cash transfers in Feed the Future treatment villages. We report OLS regressions which include ward-infrastructure stratification fixed effects and standard errors are clustered by village.
- (3) The percent of households with agricultural land greater than 1 hectare is conditional on the household owning land.
- (4) Joint test is the Chi-Sq Statistic, which is computed by jointly estimating a system of seemingly unrelated regressions where the explanatory variable is a dummy for treatment with standard errors adjusted for within village correlation and the regressions include stratification dummies.

Table B5: Balance between all cash transfer and no cash transfer households in treatment villages

Indicators	Mean full sample	All CT (Monthly + Quarterly) mean	No CT mean	Mean difference
<b>Socio-demographic characteristics of Household Head</b>				
<b>Age</b>				
Age of Household Head	45.58 (16.27)	46.31 (16.06)	46.32 (16.21)	0.00 (0.79)
<b>Marital status</b>				
Percent who are married	0.84 (0.36)	0.83 (0.37)	0.83 (0.37)	0.00 (0.02)
Percent in polygamous marriage	0.23 (0.42)	0.27 (0.44)	0.29 (0.45)	-0.02 (0.03)
<b>Education and literacy</b>				
Attended School	0.36 (0.48)	0.45 (0.5)	0.45 (0.5)	0.01 (0.02)
Can read and write in any language	0.39 (0.49)	0.50 (0.5)	0.46 (0.5)	0.05* (0.02)
<b>Household Characteristics</b>				
<b>Household Size</b>				
Average household size	4.97 (2.62)	5.19 (2.8)	5.19 (2.6)	0.00 (0.19)
Number of offspring	2.97 (2.38)	3.17 (2.44)	3.17 (2.28)	0.01 (0.15)
<b>Household Type</b>				
Percent of female headed households	0.18 (0.38)	0.20 (0.4)	0.22 (0.41)	-0.02 (0.02)
<b>Poverty</b>				
Daily per capita expenditures, mean (Naira)	69.43 (306.4)	81.27 (417.71)	80.73 (280.55)	1.97 (12.26)
Percent of HHs with per capita consumption less than \$1.25-a-day	0.85 (0.36)	0.83 (0.38)	0.82 (0.39)	0.01 (0.02)
Percent of HHs with per capita consumption less than \$1.90-a-day	0.92 (0.28)	0.90 (0.3)	0.90 (0.3)	0.00 (0.02)
<b>Food Security</b>				
Faced situation where not enough food to feed HH in past 12months	0.19 (0.39)	0.20 (0.4)	0.19 (0.4)	0.00 (0.03)
<b>Agricultural Land Ownership</b>				
Total number of agricultural plots owned	0.67 (0.76)	0.82 (0.88)	0.71 (0.84)	0.10** (0.05)
Total area of plots owned or cultivated (ha)	1.81 (12.99)	1.64 (6.33)	1.80 (8.42)	-0.12 (0.53)
Percent of households with no land ownership	0.45 (0.5)	0.38 (0.49)	0.45 (0.5)	-0.06* (0.04)
Percent of households with agricultural land greater than 1 hectare	0.35 (0.48)	0.39 (0.49)	0.37 (0.48)	0.02 (0.04)
Joint test p-value				0.66
<b>Number of Households</b>	<b>3976</b>	<b>604</b>	<b>581</b>	

\* significant at 10% level \*\* significant at 5% level \*\*\* significant at 1% level

- (1) Columns (1), (2) and (3) report means with standard deviations in parentheses.
- (2) Column (4) reports the test of differences of means across columns (2) and (3) for households receiving cash transfers (both monthly and quarterly CTs) and those receiving no cash transfers in Feed the Future treatment villages. We report OLS regressions which include ward-infrastructure stratification fixed effects and standard errors are clustered by village.
- (3) The percent of households with agricultural land greater than 1 hectare is conditional on the household owning land.
- (4) Joint test is the Chi-Sq Statistic, which is computed by jointly estimating a system of seemingly unrelated regressions where the explanatory variable is a dummy for treatment with standard errors adjusted for within village correlation and the regressions include stratification dummies.

Table B6: Balance between monthly cash transfer and no cash transfer households in control villages

Indicators	Mean full sample	Monthly CT mean	No CT mean	Mean difference
<b>Socio-demographic characteristics of Household Head</b>				
<b>Age</b>				
Age of Household Head	45.58 (16.27)	47.04 (18.34)	45.36 (16.58)	1.76 (1.19)
<b>Marital status</b>				
Percent who are married	0.84 (0.36)	0.78 (0.42)	0.82 (0.39)	-0.04* (0.02)
Percent in polygamous marriage	0.23 (0.42)	0.19 (0.39)	0.18 (0.39)	0.01 (0.02)
<b>Education and literacy</b>				
Attended School	0.36 (0.48)	0.23 (0.42)	0.27 (0.44)	-0.04 (0.03)
Can read and write in any language	0.39 (0.49)	0.27 (0.45)	0.31 (0.46)	-0.03 (0.02)
<b>Household Characteristics</b>				
<b>Household Size</b>				
Average household size	4.97 (2.62)	4.57 (2.42)	4.70 (2.51)	-0.15 (0.12)
Number of offspring	2.97 (2.38)	2.70 (2.26)	2.76 (2.34)	-0.08 (0.13)
<b>Household Type</b>				
Percent of female headed households	0.18 (0.38)	0.22 (0.41)	0.19 (0.39)	0.03 (0.02)
<b>Poverty</b>				
Daily per capita expenditures, mean (Naira)	69.43 (306.4)	54.44 (107.63)	50.96 (87.26)	3.92 (4.12)
Percent of HHs with per capita consumption less than \$1.25-a-day	0.85 (0.36)	0.86 (0.35)	0.87 (0.33)	-0.01 (0.02)
Percent of HHs with per capita consumption less than \$1.90-a-day	0.92 (0.28)	0.91 (0.29)	0.93 (0.26)	-0.02 (0.01)
<b>Food Security</b>				
Faced situation where not enough food to feed HH in past 12months	0.19 (0.39)	0.19 (0.4)	0.22 (0.41)	-0.02 (0.03)
<b>Agricultural Land Ownership</b>				
Total number of agricultural plots owned	0.67 (0.76)	0.56 (0.64)	0.57 (0.71)	-0.01 (0.03)
Total area of plots owned or cultivated (ha)	1.81 (12.99)	2.93 (27.18)	1.27 (9.32)	1.71 (1.43)
Percent of households with no land ownership	0.45 (0.5)	0.51 (0.5)	0.51 (0.5)	0.00 (0.03)
Percent of households with agricultural land greater than 1 hectare	0.35 (0.48)	0.31 (0.46)	0.31 (0.46)	0.01 (0.04)
Joint test p-value				0.79
<b>Number of Households</b>	<b>3976</b>	<b>331</b>	<b>689</b>	

\* significant at 10% level \*\* significant at 5% level \*\*\* significant at 1% level

- (1) Columns (1), (2) and (3) report means with standard deviations in parentheses.
- (2) Column (4) reports the test of differences of means across columns (2) and (3) for households receiving the monthly cash transfer and those receiving no cash transfers in Feed the Future control villages. We report OLS regressions which include ward-infrastructure stratification fixed effects and standard errors are clustered by village.
- (3) The percent of households with agricultural land greater than 1 hectare is conditional on the household owning land.
- (4) Joint test is the Chi-Sq Statistic, which is computed by jointly estimating a system of seemingly unrelated regressions where the explanatory variable is a dummy for treatment with standard errors adjusted for within village correlation and the regressions include stratification dummies.

Table B7: Balance between quarterly cash transfer and no cash transfer households in control villages

Indicators	Mean full sample	Quarterly CT mean	No CT mean	Mean difference
<b>Socio-demographic characteristics of Household Head</b>				
<b>Age</b>				
Age of Household Head	45.58 (16.27)	45.25 (16.27)	45.36 (16.58)	-0.13 (0.96)
<b>Marital status</b>				
Percent who are married	0.84 (0.36)	0.77 (0.42)	0.82 (0.39)	-0.04** (0.02)
Percent in polygamous marriage	0.23 (0.42)	0.22 (0.42)	0.18 (0.39)	0.04** (0.02)
<b>Education and literacy</b>				
Attended School	0.36 (0.48)	0.26 (0.44)	0.27 (0.44)	-0.01 (0.02)
Can read and write in any language	0.39 (0.49)	0.30 (0.46)	0.31 (0.46)	-0.01 (0.02)
<b>Household Characteristics</b>				
<b>Household Size</b>				
Average household size	4.97 (2.62)	4.60 (2.42)	4.70 (2.51)	-0.08 (0.13)
Number of offspring	2.97 (2.38)	2.72 (2.28)	2.76 (2.34)	-0.02 (0.14)
<b>Household Type</b>				
Percent of female headed households	0.18 (0.38)	0.22 (0.42)	0.19 (0.39)	0.04 (0.03)
<b>Poverty</b>				
Daily per capita expenditures, mean (Naira)	69.43 (306.4)	56.75 (121.79)	50.96 (87.26)	4.95 (7.2)
Percent of HHs with per capita consumption less than \$1.25-a-day	0.85 (0.36)	0.84 (0.36)	0.87 (0.33)	-0.03 (0.03)
Percent of HHs with per capita consumption less than \$1.90-a-day	0.92 (0.28)	0.93 (0.25)	0.93 (0.26)	0.01 (0.02)
<b>Food Security</b>				
Faced situation where not enough food to feed HH in past 12months	0.19 (0.39)	0.21 (0.41)	0.22 (0.41)	-0.01 (0.02)
<b>Agricultural Land Ownership</b>				
Total number of agricultural plots owned	0.67 (0.76)	0.59 (0.72)	0.57 (0.71)	0.01 (0.05)
Total area of plots owned or cultivated (ha)	1.81 (12.99)	1.22 (6.59)	1.27 (9.32)	-0.06 (0.46)
Percent of households with no land ownership	0.45 (0.5)	0.49 (0.5)	0.51 (0.5)	-0.03 (0.03)
Percent of households with agricultural land greater than 1 hectare	0.35 (0.48)	0.27 (0.45)	0.31 (0.46)	-0.04 (0.04)
Joint test p-value				0.33
<b>Number of Households</b>	<b>3976</b>	<b>334</b>	<b>689</b>	

\* significant at 10% level \*\* significant at 5% level \*\*\* significant at 1% level

- (1) Columns (1), (2) and (3) report means with standard deviations in parentheses.
- (2) Column (4) reports the test of differences of means across columns (2) and (3) for households receiving the quarterly cash transfer and those receiving no cash transfers in Feed the Future control villages. We report OLS regressions which include ward-infrastructure stratification fixed effects and standard errors are clustered by village.
- (3) The percent of households with agricultural land greater than 1 hectare is conditional on the household owning land.
- (4) Joint test is the Chi-Sq Statistic, which is computed by jointly estimating a system of seemingly unrelated regressions where the explanatory variable is a dummy for treatment with standard errors adjusted for within village correlation and the regressions include stratification dummies.

Table B8: Balance between all cash transfer and no cash transfer households in control villages

Indicators	Mean full sample	All CT (Monthly + Quarterly) mean	No CT mean	Mean difference
<b>Socio-demographic characteristics of Household Head</b>				
<b>Age</b>				
Age of Household Head	45.58 (16.27)	46.14 (17.34)	45.36 (16.58)	0.79 (0.82)
<b>Marital status</b>				
Percent who are married	0.84 (0.36)	0.77 (0.42)	0.82 (0.39)	-0.04** (0.02)
Percent in polygamous marriage	0.23 (0.42)	0.21 (0.4)	0.18 (0.39)	0.03 (0.02)
<b>Education and literacy</b>				
Attended School	0.36 (0.48)	0.24 (0.43)	0.27 (0.44)	-0.03 (0.02)
Can read and write in any language	0.39 (0.49)	0.29 (0.45)	0.31 (0.46)	-0.02 (0.02)
<b>Household Characteristics</b>				
<b>Household Size</b>				
Average household size	4.97 (2.62)	4.59 (2.42)	4.70 (2.51)	-0.11 (0.1)
Number of offspring	2.97 (2.38)	2.71 (2.27)	2.76 (2.34)	-0.05 (0.12)
<b>Household Type</b>				
Percent of female headed households	0.18 (0.38)	0.22 (0.41)	0.19 (0.39)	0.03 (0.02)
<b>Poverty</b>				
Daily per capita expenditures, mean (Naira)	69.43 (306.4)	55.60 (114.88)	50.96 (87.26)	4.52 (4.36)
Percent of HHs with per capita consumption less than \$1.25-a-day	0.85 (0.36)	0.85 (0.35)	0.87 (0.33)	-0.02 (0.02)
Percent of HHs with per capita consumption less than \$1.90-a-day	0.92 (0.28)	0.92 (0.27)	0.93 (0.26)	0.00 (0.01)
<b>Food Security</b>				
Faced situation where not enough food to feed HH in past 12months	0.19 (0.39)	0.20 (0.4)	0.22 (0.41)	-0.02 (0.02)
<b>Agricultural Land Ownership</b>				
Total number of agricultural plots owned	0.67 (0.76)	0.57 (0.68)	0.57 (0.71)	0.00 (0.03)
Total area of plots owned or cultivated (ha)	1.81 (12.99)	2.07 (19.74)	1.27 (9.32)	0.80 (0.7)
Percent of households with no land ownership	0.45 (0.5)	0.50 (0.5)	0.51 (0.5)	-0.01 (0.02)
Percent of households with agricultural land greater than 1 hectare	0.35 (0.48)	0.29 (0.45)	0.31 (0.46)	-0.01 (0.03)
Joint test p-value				0.72
<b>Number of Households</b>	<b>3976</b>	<b>665</b>	<b>689</b>	

\* significant at 10% level \*\* significant at 5% level \*\*\* significant at 1% level

- (1) Columns (1), (2) and (3) report means with standard deviations in parentheses.
- (2) Column (4) reports the test of differences of means across columns (2) and (3) for households receiving cash transfers (both monthly and quarterly CTs) and those receiving no cash transfers in Feed the Future control villages. We report OLS regressions which include ward-infrastructure stratification fixed effects and standard errors are clustered by village.
- (3) The percent of households with agricultural land greater than 1 hectare is conditional on the household owning land.
- (4) Joint test is the Chi-Sq Statistic, which is computed by jointly estimating a system of seemingly unrelated regressions where the explanatory variable is a dummy for treatment with standard errors adjusted for within village correlation and the regressions include stratification dummies.

Table B9: Balance between all cash transfer and no cash transfer households in both treatment and control villages

Indicators	Mean full sample	All CT (Monthly + Quarterly) mean	No CT mean	Mean difference
<b>Socio-demographic characteristics of Household Head</b>				
<b>Age</b>				
Age of Household Head	45.58 (16.27)	46.22 (16.74)	45.80 (16.41)	0.41 (0.57)
<b>Marital status</b>				
Percent who are married	0.84 (0.36)	0.80 (0.4)	0.82 (0.38)	-0.02* (0.01)
Percent in polygamous marriage	0.23 (0.42)	0.24 (0.42)	0.23 (0.42)	0.00 (0.02)
<b>Education and literacy</b>				
Attended School	0.36 (0.48)	0.34 (0.47)	0.35 (0.48)	-0.01 (0.01)
Can read and write in any language	0.39 (0.49)	0.39 (0.49)	0.38 (0.48)	0.01 (0.02)
<b>Household Characteristics</b>				
<b>Household Size</b>				
Average household size	4.97 (2.62)	4.87 (2.62)	4.93 (2.56)	-0.06 (0.1)
Number of offspring	2.97 (2.38)	2.93 (2.36)	2.95 (2.32)	-0.02 (0.09)
<b>Household Type</b>				
Percent of female headed households	0.18 (0.38)	0.21 (0.41)	0.20 (0.4)	0.01 (0.02)
<b>Poverty</b>				
Daily per capita expenditures, mean (Naira)	69.43 (306.4)	67.82 (300.08)	64.58 (200.8)	3.21 (6.08)
Percent of HHs with per capita consumption less than \$1.25-a-day	0.85 (0.36)	0.84 (0.37)	0.85 (0.36)	-0.01 (0.02)
Percent of HHs with per capita consumption less than \$1.90-a-day	0.92 (0.28)	0.91 (0.28)	0.91 (0.28)	0.00 (0.01)
<b>Food Security</b>				
Faced situation where not enough food to feed HH in past 12months	0.19 (0.39)	0.20 (0.4)	0.21 (0.41)	-0.01 (0.02)
<b>Agricultural Land Ownership</b>				
Total number of agricultural plots owned	0.67 (0.76)	0.69 (0.79)	0.64 (0.78)	0.04 (0.03)
Total area of plots owned or cultivated (ha)	1.81 (12.99)	1.86 (14.94)	1.52 (8.92)	0.33 (0.45)
Percent of households with no land ownership	0.45 (0.5)	0.44 (0.5)	0.48 (0.5)	-0.04* (0.02)
Percent of households with agricultural land greater than 1 hectare	0.35 (0.48)	0.34 (0.47)	0.34 (0.47)	0.00 (0.02)
Joint test p-value				0.94
<b>Number of Households</b>	<b>3976</b>	<b>1269</b>	<b>1270</b>	

\* significant at 10% level \*\* significant at 5% level \*\*\* significant at 1% level

- (1) Columns (1), (2) and (3) report means with standard deviations in parentheses.
- (2) Column (4) reports the test of differences of means across columns (2) and (3) for households receiving cash transfers (both monthly and quarterly CTs) and those receiving no cash transfers across Feed the Future treatment and control villages. We report OLS regressions which include ward-infrastructure stratification fixed effects and treatment village stratification fixed effects and standard errors are clustered by village. Sampling weights are employed in the regressions to correct for the differential sampling probabilities across the EV categories in treatment and control villages.
- (3) The percent of households with agricultural land greater than 1 hectare is conditional on the household owning land.
- (4) Joint test is the Chi-Sq Statistic, which is computed by jointly estimating a system of seemingly unrelated regressions where the explanatory variable is a dummy for treatment with standard errors adjusted for within village correlation and the regressions include stratification dummies.

Table B10: Balance between all cash transfer households in treatment villages and all cash transfer households in control villages

Indicators	Mean full sample	All CT (Monthly + Quarterly) Treatment Villages mean	All CT (Monthly + Quarterly) Control Villages mean	Mean difference
<b>Socio-demographic characteristics of Household Head</b>				
<b>Age</b>				
Age of Household Head	45.58 (16.27)	46.31 (16.06)	46.14 (17.34)	-0.29 (1.18)
<b>Marital status</b>				
Percent who are married	0.84 (0.36)	0.83 (0.37)	0.77 (0.42)	0.05 (0.03)
Percent in polygamous marriage	0.23 (0.42)	0.27 (0.44)	0.21 (0.4)	0.05 (0.03)
<b>Education and literacy</b>				
Attended School	0.36 (0.48)	0.45 (0.5)	0.24 (0.43)	0.08 (0.05)
Can read and write in any language	0.39 (0.49)	0.50 (0.5)	0.29 (0.45)	0.13** (0.06)
<b>Household Characteristics</b>				
<b>Household Size</b>				
Average household size	4.97 (2.62)	5.19 (2.8)	4.59 (2.42)	0.34 (0.22)
Number of offspring	2.97 (2.38)	3.17 (2.44)	2.71 (2.27)	0.20 (0.17)
<b>Household Type</b>				
Percent of female headed households	0.18 (0.38)	0.20 (0.4)	0.22 (0.41)	0.01 (0.03)
<b>Poverty</b>				
Daily per capita expenditures, mean (Naira)	69.43 (306.4)	81.27 (417.71)	55.60 (114.88)	16.29 (13.65)
Percent of HHs with per capita consumption less than \$1.25-a-day	0.85 (0.36)	0.83 (0.38)	0.85 (0.35)	-0.03 (0.03)
Percent of HHs with per capita consumption less than \$1.90-a-day	0.92 (0.28)	0.90 (0.3)	0.92 (0.27)	-0.02 (0.02)
<b>Food Security</b>				
Faced situation where not enough food to feed HH in past 12months	0.19 (0.39)	0.20 (0.4)	0.20 (0.4)	-0.05 (0.03)
<b>Agricultural Land Ownership</b>				
Total number of agricultural plots owned	0.67 (0.76)	0.82 (0.88)	0.57 (0.68)	0.17** (0.07)
Total area of plots owned or cultivated (ha)	1.81 (12.99)	1.64 (6.33)	2.07 (19.74)	-0.48 (0.71)
Percent of households with no land ownership	0.45 (0.5)	0.38 (0.49)	0.50 (0.5)	-0.08* (0.04)
Percent of households with agricultural land greater than 1 hectare	0.35 (0.48)	0.39 (0.49)	0.29 (0.45)	0.14*** (0.04)
Joint test p-value				0.00
<b>Number of Households</b>	<b>3976</b>	<b>604</b>	<b>665</b>	

\* significant at 10% level \*\* significant at 5% level \*\*\* significant at 1% level

- (1) Columns (1), (2) and (3) report means with standard deviations in parentheses.
- (2) Column (4) reports the test of differences of means across columns (2) and (3) for households receiving cash transfers (both monthly and quarterly CTs) in Feed the Future treatment villages and households receiving cash transfers (both monthly and quarterly CTs) in Feed the Future control villages. We report OLS regressions which include ward-infrastructure stratification fixed effects and treatment village stratification fixed effects and standard errors are clustered by village. Sampling weights are employed in the regressions to correct for the differential sampling probabilities across the EV categories in treatment and control villages.
- (3) The percent of households with agricultural land greater than 1 hectare is conditional on the household owning land.
- (4) Joint test is the Chi-Sq Statistic, which is computed by jointly estimating a system of seemingly unrelated regressions where the explanatory variable is a dummy for treatment with standard errors adjusted for within village correlation and the regressions include stratification dummies.

## Appendix C: Agro-climatic Context

Before the baseline survey, the research team conducted in-field observations in Kebbi in the two LGAs where the study is taking place and found the two LGAs differ in their farming landscape (see Table 27). The in-field observations were provided by Tijjani Ahmad, a program manager from Diamond Development Initiative (DDI). DDI is the civil society organization (CSO) supervising the implementation of the Feed the Future Nigeria agriculture interventions in Kebbi. The program manager has extensive experience and knowledge working in the region and understands the farming climate/seasons in Kebbi State. These observations were only obtained for learning purposes by the research team in preparation for data collection activities.

Table 27: Farming Landscape across the Two LGAs

Characteristics	Birnin Kebbi	Danko Wasagu
<b>Climate</b>	Birnin Kebbi is semi-arid (partially dry and moist). The rainy season is slightly shorter in Birnin Kebbi than in Danko Wasagu, starting in May and ending in October.	Danko Wasagu receives rain slightly earlier than Birnin Kebbi because their weather is Northern Guinea Savanna (more humid, less dry). The land is more fertile and more productive than Birnin Kebbi.
<b>Most important crops</b>	The most important crops in Birnin Kebbi are millet, rice, and cowpea. Millet is a dry land crop, hence its popularity in Birnin Kebbi. There is one crop rotation and the agricultural cycle is short.	Sorghum is a key crop in Danko Wasagu, with 100% of farmers cultivating it, whereas in Birnin Kebbi, less than 3% of farmers cultivate sorghum. Maize, cowpea, rice, groundnut, sugarcane and soybeans are also important crops in Danko Wasagu. There is one crop rotation and the agricultural cycle is short.
<b>Who in the household participates in agriculture?</b>	Birnin Kebbi is comprised mostly of Muslim households that restrict women's mobility; hence, men do the farming in the field, while women process crops mainly in their localities.	In Danko Wasagu there are mixed-religion families: Muslims and Christians can coexist in the same family, and limitations on women's mobility are less, so both the men and women participate in farming activities.
<b>Animal farming</b>	Little animal farming takes place in Birnin Kebbi, because 2 months after harvest, the grass is typically consumed and the land becomes empty. This requires farmers in Birnin Kebbi to buy animal feed for the remainder of the year, which is very costly.	Grazing land is better in Danko Wasagu relative to Birnin Kebbi. In Danko Wasagu, abundant natural food is available for 6 months out of the year; as a result, animals in Danko Wasagu are fat and healthier than animals in Birnin Kebbi.
<b>Crop Sale Prices</b>	Crop sale prices are lower in Danko Wasagu than Birnin Kebbi so farmers come to sell in Birnin Kebbi.	