

FEED THE FUTURE
INDICATORS FOR UPPER
EAST REGION, GHANA 2015

DISTRICT BASELINE ESTIMATES

USAID METSS

JULY 2016

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List of Acronyms

5DE	5 Domains Empowerment
BMI	Body Mass Index
CDC	Center for Disease Control
DANIDA	Danish International Development Agency
DRIC-UCC	Directorate of Research, Innovation & Consultancy-University of Ghana
EA	Enumeration Area
EU	European Union
FANTA	Food and Nutrition Technical Assistance
FAO	Food and Agricultural Organization
FHI360	Family Health International 360
FTF	Feed the Future
FTFMS	Feed the Future Monitoring System
GHS	Ghana Health Service/Ghanaian cedi
GIZ	Gesellschaft für Internationale Zusammenarbeit
GLSS6	Ghana Living Standards Survey 6
GoG	Government of Ghana
GPI	Gender Parity Index
GSS	Ghana Statistical Services
HHS	Household Hunger Scale
IMF	International Monetary Fund
IPs	Implementing Partners
JICA	Japan International Cooperation Agency
KSU	Kansas State University
LSMS	Living Standards Measurement Survey
MDG	Millennium Development Goals
MDD-W	Women's Minimum Dietary Diversity
MDG	Millennium Development Goal
METSS	Monitoring Evaluation and Technical Support Services
MoFA	Ministry of Food and Agriculture
PBS	Population Based Survey
PPP	Purchasing Power Parity
PSU	Primary Sampling Unit

SD	Standard Deviation
SSU	Secondary Sampling Unit
UCC	University of Cape Coast
UNDP	United Nations Development Program
UNICEF	United Nations Children’s Emergency Fund
USAID	United States Agency for International Development
USD	United States Dollar
USG	United States Government
WEAI	Women’s Empowerment in Agriculture Index
WDDS	Women’s Dietary Diversity Score
WHO	World Health Organization
ZOI	Zone of Influence

Introduction and Background

In 2009, the U.S. Government launched its Feed the Future initiative in response to pressing global hunger and food security challenges. The Feed the Future initiative aims to sustainably reduce global hunger and poverty. The initiative tackles their root causes and employs proven strategies for achieving large scale and lasting impacts. It encourages improved agricultural productivity by supporting better government response to anticipated climate change, improved women's and children's nutrition, and enhanced economic development through gender equity and regional balance. Improvements in the livelihoods of participating households are measured by their economic wellbeing; hunger and dietary diversity; women and children anthropometry; and women's empowerment (Zereyesus et al. 2016).

In Ghana, the initiative started in mid-2011 in Northern Region, Upper East Region, Upper West Region, and selected areas in Brong Ahafo Region lying above the Latitude 8°N. This area, referred to as the USAID Zone of Influence (ZOI), was selected because of the relatively higher incidences of poverty, malnutrition, and stunting among children aged less than five years compared to the rest of the country (Zereyesus et al. 2016).

Feed the Future seeks to bring about positive changes in the economic, food security and nutritional status in the ZOI in Ghanaian households. By implementing activities in northern Ghana where prevalence of poverty, underweight, and stunting among children below five years of age are higher than the national average, USAID aims to bring significant changes in the population. USAID|Ghana has already engaged some Implementing Partners (IPs) to execute activities in the Feed the Future ZOI. The IPs undertake activities to contribute to the achievement of the high level Feed the Future indicators at the goal and first level objectives. These indicators are: prevalence of stunted, wasted and underweight children under five years of age; prevalence of underweight women; prevalence of poverty (percent of people living on less than \$1.25/day); daily per capita expenditure (as a proxy for income) in U.S. (USG) assisted areas; and Women's Empowerment in Agriculture Index (USAID 2014).

USAID leads the execution of the Feed the Future initiative by leveraging the resources and capabilities of other U.S. Government agencies to achieve the initiative's objectives. Some of the U.S. Government agencies involved in the Feed the Future initiative are the Department of State, Peace Corps, Millennium Challenge Corporation, Department of Treasury, U.S. Trade Representative, Overseas Private Investment Corporation, U.S. African Development Foundation, and the U.S. Department of Agriculture. USAID|Ghana is also working closely with the Government of Ghana, local non-governmental organizations, private sector organizations, and international development partners (World Bank, World Health Organization (WHO), the International Monetary Fund (IMF), the German Organization for International Cooperation (GIZ- Gesellschaft für Internationale Zusammenarbeit), the Danish International Development

Agency (DANIDA), European Union (EU) Micro Project, and the Japan International Cooperation Agency (JICA)) to efficiently achieve the objectives of the Feed the Future initiative by avoiding duplications in efforts and activities. To monitor the initiative's activities in the ZOI at the household level, it became important to collect district level data.

Purpose of this Report

This report is designed to provide point estimates of the Feed the Future indicators at the district level for the Feed the Future ZOI. The document provides information that could be used to assess progress of Feed the Future interventions, primarily aimed at achieving its poverty reduction and food security enhancement objectives at the district level where the relevant indicators have not been adequately analyzed and reported before. District level reports are prepared for all the districts in the four regions involved in the Feed the Future initiative. This report focuses on districts in Upper East Region.

Profile of Upper East Region

Upper East Region is located in the north-eastern corner of the country. It lies at Latitude 10°15' and 10°10'N, Longitude 0° and 1°4'W (MOFA n.d.). It is bordered to the north by Burkina Faso, the east by the Republic of Togo, the west by Sissala District in Upper West and the south by Mamprusi District in Northern Region (Modern Ghana 2016). It is the second smallest region in Ghana (IFAD 2006) with a total land area of 8,842km² (3.7 percent of Ghana's total landmass) (Annora, et al. 2009, MOFA 2011).

Upper East Region is the second poorest region of Ghana with 88 percent of its population living in poverty (Ghana Statistical Service 2014). The region is also the second least populated region estimated at 1.1 million (Ghana Statistical Service 2014) and has the highest population density in the country (115 persons/km²) (IFAD 2006). 80 percent of its population is employed in agriculture (MOFA n.d.). In addition, 84.3 percent of the region's population is primarily rural (MOFA 2011). The Sex demographic structure generally shows that there are more females than males (MOFA n.d.).

Crop and livestock farming is the main economic activity (Annora, et al. 2009). Agriculture is mainly on smallholder basis and primarily employs the traditional farming system with little or no mechanization (MOFA n.d.). The major crops include rice, maize, millet, sorghum and vegetables (Annora, et al. 2009) while the major livestock is cattle, sheep, goats and poultry (MOFA n.d.).

The natural vegetation is the savannah woodland, with scattered drought-resistant trees (Annora, et al. 2009, MOFA n.d.). The most common economic trees are the sheanut, dawadawa,

boabab and acacia (Modern Ghana 2016). The soil is shallow and low in soil fertility, weak with low organic matter content, and mainly coarse textured. (MOFA n.d.). The region is also prone to soil erosion (IFAD 2007).

The climatic regime of Upper East Region is semi-arid with annual rainfall of about 700 – 1,200 mm (IFAD 2006). It has one rainy season from May/June to September/October (Modern Ghana 2016). The dry season from October to April is associated with dry harmattan winds with low humidity and temperatures making the area suitable for the growing of horticultural crops like tomatoes pepper onions, watermelons, okro and other leafy vegetables (MOFA n.d.)

The region is divided into 6 administrative districts (capital Bolgatanga) which largely correspond to tribal groupings. The major ethnic groups are under the broad categories of Mole Dagbon (74.5 percent), Grusi (8.5 percent), Mande-Busanga (6.2 percent) and Gurma (3.2percent) (Modern Ghana 2016). Islam is the major religion in Upper East accounting for 55.7% of the population (Ghana Statistical Service 2014). Other religions are Christianity and traditional beliefs.

This document is organized into eight sections, this background section (Section 1), a survey methods section (Section 2), and household demographics and dwelling characteristics (Section 3). The following four sections are devoted to each of the principal indicator groups: Household Economic Status Indicators; Hunger and Dietary Diversity Indicators; Nutrition Status of Children and Women; Women’s Empowerment in Agriculture. The last section (Section 8) provides the summary and conclusions.

Survey Method

Survey Design

The practical demand for representative district level data has been the main driving force for the collection of the district level data and analysis. To meet this demand, the interim PBS 2015 was framed to allow collection of representative samples at the district level. This was done by calculating the required sample of households using the prevalence of poverty indicator as the primary survey design indicator. Other indicators are not considered as design indicators at the district level due to the required large number of sample sizes and the ensuing high cost implications. This implies that individual level indicators such as stunting and wasting will only be included in the analyses and reported if statistically reliable number of observations are available in the data.

In order to arrive at the effective sample size at the district level, standard sample size calculation was adopted. A two stage sampling design was followed with the designation of the EA (Enumeration Area) as the primary sampling units (PSU) and the households as the secondary sampling units (SSU). The following assumptions were made with respect to the variables used to determine the sample size:

1. A poverty prevalence rate of 20 percent at the household level (this is the mean value of the poverty indicator estimated based on the average FTF 2015 target using 2012 baseline values).
2. A 10 percent margin of error
3. A design effect of 2.37 (based on the 2012 PBS ZOI Deff)
4. A significance level of 95 percent
5. A 5 percent non-response rate

With the forgoing assumptions, the computational formula used in determining the district level required sample size for the poverty indicator is given by equation 2 as follows:

$$N = Deff \frac{(Z_{\alpha/2})^2 (p(1-p))}{M^2} \quad (1)$$

Where N is the sample size, $Deff$ is the design effect, $Z_{\alpha/2}$ is the Z value (1.96 for 95% confidence level), p is the proportion of poverty and M is the proportion margin of error. The mean value of M for the poverty indicator is estimated based on the average Feed the Future 2015 target.

Based on the assumptions, and using equation 1, the sample size was calculated to be 150 as shown in Table 1.

Table 1: Effective Sample Sizes for Poverty Indicator in Each District

Design Indicator	Mean	Margin of Error (M)	DEFF	Nominal N	5 % Non-Response Inflation Rate	Effective N
Poverty	0.20	0.10	2.37	143	7	150

Source: District Level Survey Data, Ghana 2015.

Survey Implementation

The survey field work was conducted by the Directorate of Research, Innovation and Consultancy of the University of Cape Coast (DRIC-UCC) supported by Kansas State University (KSU) and USAID- METSS staff. Listing and respondent verification support were provided by the GSS. District assembly representatives and staff facilitated community entry for enumerators, improving household participation and response rates.

As mentioned in the survey design section, the implementation of the district level data collection was coordinated together with the interim PBS 2015 data collection exercise. Since the sampling design for at the ZOI level and not at the district level, the allocation of households in each district is not uniform. While some districts have been allocated with more than 150 households, others have been allocated with less than 150 households. The implementation strategy of the district level data collection is to ensure that at least 150 households are allocated in each district. Thus, once the baseline households were interviewed, non-baseline households were added, if needed, to ensure that at least 150 households were interviewed in each district. However, there will be districts that have more than 150 households because of the sampling design for the interim PBS 2015. The sample sizes in each of the districts, actual responses and response rates, is shown in Table 2. The list of districts shown is based on the recent administrative classification and shows a total of 12 districts.

Table 2: Sample Size, Sample Responses, and Response Rate by District

District	Sample Size	Responses	Response Rates
Bawku Municipal	150	113	75.3
Bawku West	150	149	99.3
Binduri	^	20	^
Bolgatanga Municipal	150	113	75.3
Bongo	150	139	92.7
Builsa North	^	76	^
Builsa South	150	55	36.7
Garu-Tempene	150	143	95.3
Kassena Nankana East	150	140	93.3
Kassena Nankana West	150	156	104.0
Pusiga	^	20	^
Talensi/Nabdum	150	130	86.7

^ Data not available for newly formed or newly split districts.

Source: District Level Survey Data, Ghana 2015.

Challenges and Limitations

The problem of household head's names differing from their official names on record, encountered in 2012, remained a challenge in the 2015 verification process for the 2012 households. Although this was not a problem for the new districts, this problem re-emerged because the corrected names collected during the 2012 baseline survey did not become the official names in the Ghana Statistical Service's records and these records were the ones used for the listing and verification of households. Enumerators ended up using multiple identification characteristics to confirm or re-confirm household identities, delaying the commencement of interviews and putting pressure on enumerators. Also, not all households had been verified because there were instances where households had moved away from the community or where people had died. In fact, one enumeration team walked into the funeral of a household head who had died the day before its arrival. These uncomfortable situations were addressed as respectfully and gracefully as possible.

The electricity problem identified during the 2012 survey remained a challenge during 2015. Cognizant of this challenge, the management team provided extra computers to supervisors as well as cash so that they could bring computers with depleted power to neighboring towns to be recharged and returned to enumerators. As a final backstop to the power problem, enumerators were provided with copies of the paper questionnaires to use in case their computer failed and they could not get access to another computer.

There are a couple of challenges worth noting regarding the survey implementation. First, the sampling of non-baseline households followed a simple random sampling rather than a two stage sampling. Because of the difference in the sampling approach between the baseline and non-baseline households, it is not possible to safely apply sampling weights while reporting estimates. Because of this, the district report is prepared without the application of sampling weights. Second, the listing of households in the field for the purpose of sampling was implemented using 'old' districts' administrative classification. This has imposed shortage of sample size for those newly formed districts as well as those districts that are split into two. The low and irregular number of households reported in Table 2 are as a result of such limitations.

Household Demographics and Dwelling Characteristics

Household Demographics

Table 3 presents demographic characteristics in Upper East Region by district. These sub-population categories correspond to the disaggregates for the Feed the Future indicators, which encompassed children by specific age range and women of reproductive age (15 to 49 years old). The average household size has been found to be 5.5 members. The range is between 3.9 in Builsa North District to 6.2 in Bawku Municipal, Bongo and Garu Tempene Districts. Districts with household size averaging less than five are Builsa North, Builsa South and Kassena Nankana East. The estimated population in the Upper East Region for adult females ranges from 46.4 percent in Builsa South District to 58.0 percent in Garu Tempene District. Households in Garu Tempene District have been found to have as many as about 3 children in this age range.

Table 3: Household Size and Age Distribution by District

District	Size	Child <2 years	Child 0 to 4 years	Child 5 to 17 years	Adult ¹ females	Percent of adult females	n ²
Bawku Municipal	6.2	0.3	0.8	2.2	1.5	50.9	113
Bawku West	5.8	0.3	0.8	2.3	1.4	51.9	149
Binduri	^	^	^	^	^	^	^
Bolgatanga Municipal	5.0	0.2	0.7	1.6	1.4	51.8	113
Bongo	6.2	0.2	0.5	2.5	1.7	55.0	139
Builsa North	3.9	0.1	0.3	1.3	1.1	52.6	76
Builsa South	4.2	0.1	0.5	1.5	1.1	46.4	55
Garu Tempene	6.2	0.2	0.7	2.8	1.6	58.0	143
Kassena Nankana East	4.8	0.1	0.3	1.4	1.1	52.9	140
Kassena Nankana West	5.0	0.1	0.4	1.5	1.2	49.4	156
Pusiga	^	^	^	^	^	^	^
Talensi Nabdam	5.7	0.4	0.8	2.0	1.5	51.3	130
Upper East Region	5.5	0.2	0.6	2.0	1.4	52.3	1214

^ Results not statistically reliable, n<30.

¹ An adult is defined as an individual age 18 or older. Females age 15-17 are of reproductive age, but are not considered adults by this definition.

² Sample n is the unweighted count of all households that responded to the survey.

Source: District Level Survey Data, Ghana 2015.

Table 4 presents the distribution of adult respondents by their educational level and district. Approximately three-quarters of the members (77.3 percent on average) have received no formal education. Bolgatanga Municipal and Builsa North are the only districts with rates below 70 percent. Garu Tempene has the highest prevalence of people who have no formal education at 86.1 percent. For primary level education level, the rates range from 5.8 percent in Bawku West District to 14.4 percent in Bolgatanga Municipal District. The rates for secondary

education range from 7.2 percent in Garu Tempene District to 32.9 percent in Bolgatanga Municipal.

Table 4: Adult Educational Attainment by District

District	Adult's Education Attainment			n
	No education	Primary Level	Secondary Level	
Bawku Municipal	78.2	7.8	12.5	111
Bawku West	84.8	5.8	9.4	146
Binduri	^	^	^	^
Bolgatanga Municipal	51.4	14.4	32.9	104
Bongo	78.8	8.4	12.7	137
Builsa North	65.2	11.6	23.2	66
Builsa South	78.3	9.0	12.7	53
Garu Tempene	86.1	5.9	7.2	143
Kassena Nankana East	74.0	7.4	18.7	108
Kassena Nankana West	76.9	9.7	12.6	135
Pusiga	^	^	^	^
Talensi Nabdam	82.8	7.7	9.3	128
Upper East Region	77.3	8.3	13.9	1131

^ Results not statistically reliable, n<30.

Source: District Level Survey Data, Ghana 2015.

Household Dwelling Characteristics

Table 5 shows dwelling characteristics of the households in Upper East Region. The characteristics of the households are evaluated based on sources of water, energy, waste disposal, cooking fuel source, and number of people per sleep room.

The survey results show that, on average, 95.4 percent, 17.7 percent, and 38.4 percent of households have access to improved water sources, sanitation and electricity, respectively. Access to improved water sources ranges between 81.0 percent in Builsa South District to 100 percent in Bongo and Builsa North Districts. Households' use of improved sanitation is lowest in Builsa South District at 2.4 percent and highest Bolgatanga Municipal District at 41.7 percent. The average room occupancy is about 2.0 persons per sleeping room. Bongo District has the highest number of people per sleeping room (2.8 persons) across Upper East Region. Almost all households use solid fuel sources for cooking (96.3 percent of the households). This includes charcoal, wood, crop residues and/or animal waste. Access to electricity is most widespread in Bolgatanga Municipal District where 69.9 percent of households have access.

Table 5: Dwelling Characteristics by District

District	Water source ¹	n	Sanitation ²	n	Persons per sleep room ³	n	Solid fuel ⁴	n	Electricity	n
Bawku Municipal	97.7	86	24.1	83	1.3	86	97.7	86	51.2	86
Bawku West	95.5	110	19.4	108	1.8	110	98.1	108	28.2	110
Binduri	^	^	^	^	^	^	^	^	^	^
Bolgatanga Municipal	98.8	82	41.7	84	2.2	79	88.1	84	69.9	83
Bongo	100.0	132	16.7	132	2.8	132	93.1	131	34.8	132
Builsa North	100.0	62	28.3	60	1.8	57	96.7	61	33.9	62
Builsa South	81.0	42	2.4	42	1.7	35	97.6	42	28.6	42
Garu Tempone	93.6	109	14.7	109	1.4	109	100.0	109	26.6	109
Kassena										
Nankana East	96.9	129	11.7	128	2.0	129	94.6	129	57.8	128
Kassena										
Nankana West	92.2	141	13.5	141	1.9	141	99.3	141	26.2	141
Pusiga	^	^	^	^	^	^	^	^	^	^
Talensi Nabdam	92.2	115	10.4	115	2.4	115	96.5	115	40.0	115
Upper East Region	95.4	1008	17.7	1002	2.0	993	96.3	1006	38.4	1008

[^] Results not statistically reliable, n<30.

¹ Improved water sources include *piped water into the dwelling, piped water into the yard, a public tap/standpipe, a tube well/borehole, a protected dug well, a protected spring, and rainwater* (WHO and UNICEF 2006). The proportion of the population with sustainable access to an improved water source is the 2015 MDG indicator #30 (UNDP 2003); however, as in most major international survey programs, the measure reported here reflects only access to an improved water source, and not the sustainability of that access.

² Improved sanitation facilities are those that separate human excreta from human contact and include the categories *flush to piped sewer system, flush to septic tank, flush/pour flush to pit, composting toilet, ventilated improved pit latrine, and a pit latrine with a slab*. Because shared and public facilities are often less hygienic than private facilities, shared or public sanitation facilities are not counted as improved (WHO and UNICEF 2006). The proportion of the population with access to improved sanitation is the 2015 MDG indicator #31 (UNDP 2003).

³ The average number of persons per sleeping room is a common indicator of crowding (UNDP 2003).

⁴ Solid fuel is defined as *charcoal, wood, animal dung, and agriculture crop residue*. The proportion of the population using solid fuels is MDG indicator #29 (UNDP 2003). The *other* and *no food cooked in household* categories are removed from percentages.

Source: District Level Survey Data, Ghana 2015.

Household Economic Status Indicators

Household economic status is measured by per capita household expenditures and the prevalence of poverty, using the consumption expenditure method. The Household Consumption Expenditure modules of the population-based survey questionnaire were used to collect the data necessary to calculate the per capita expenditures and prevalence of poverty indicators. These modules are similar to those in the Living Standards Measurement Survey (LSMS) of the World Bank. The modules collect information on households' consumption expenditure on various food and non-food items as a proxy for household income. Deaton (2008) has argued that expenditure data are less prone to error, easier to recall in survey situations, and more stable over time than income data. These observations are valid and using expenditures as a proxy for income may be fairly accurate for poor people because the income elasticity of consumption is near unity. However, the effectiveness of the proxy deteriorates as incomes increase and the income elasticity of consumption ceases to be unity. After estimating total household expenditure on an annual basis, it is converted into a daily and per capita basis by dividing by 365 days and then by the number of household members.

Daily Per Capita Expenditure in 2010 USD Constant Prices.

The indicator developed to provide the primary information on household economic well-being in the report is the average daily per capita expenditure¹ expressed in 2010 U.S. dollars (USD) after adjusting for the 2005 Purchasing Power Parity (PPP)². Estimates on this indicator are shown in Table 6 specifically as the average household daily per capita expenditure for all districts in Upper East Region. The average household daily per capita expenditure for districts in Upper East Region ranges from a minimum of \$1.89 in Pusiga District to \$6.81 in Bongo District. The average household daily per capita expenditure is \$3.90.

¹ Note that expenditure data are not collected at the individual level but rather at the household level. Individual's per capita expenditures are then derived by dividing total household expenditures by the number of household members

² Adjustments are made according to PPP conversions. These conversions are established by the World Bank to allow currencies to be compared across countries in terms of how much an individual can buy in a specific country. The \$1.25 in 2005 PPP means that \$1.25 could buy the same amount of goods in another country as \$1.25 could in the United States in 2005.

Table 6: Mean Daily Per Capita Expenditure (in 2010 USD) by District

District	Per Capita Expenditure	n
Bawku Municipal	3.62	110
Bawku West	3.17	142
Binduri [†]	2.74	20
Bolgatanga Municipal	5.31	109
Bongo	6.81	127
Builsa North	3.34	73
Builsa South	2.86	53
Garu Tempene	3.95	143
Kassena Nankana East	3.92	130
Kassena Nankana West	2.76	149
Pusiga [†]	1.89	20
Talensi Nabdam	3.43	123
Upper East Region	3.90	1199

[†] Results not statistically reliable, n<30.

Source: District Level Survey Data, Ghana 2015.

Prevalence and Depth of Poverty

International Poverty Line

The international poverty line of \$1.25 USD in 2005 PPP represents extreme poverty and is used to estimate the prevalence of poverty and the depth of poverty (World Bank 2011). The prevalence of poverty, sometimes called the poverty headcount ratio, is measured by determining the proportion of individuals (households) living below an established poverty threshold. For this study, the poverty threshold is set at \$1.25 in 2005 PPP. The \$1.25 is, in effect, the extreme poverty threshold and represents the poverty line typical of the world's poorest countries (World Bank 2011).

Table 7 presents the overall poverty prevalence estimates at the \$1.25 per day (2005 PPP) threshold and the overall depth of poverty for the districts in Upper East Region. Maps representing the geographical distribution of poverty prevalence and depth of poverty rates by district in presented in the Appendix A.2. Overall prevalence of poverty ranges from 10.9 percent in Bawku Municipal District to 39.6 percent in Kassena Nankana West District. The prevalence of poverty is higher than the regional average in Bongo, Builsa North, Builsa South, Kassena Nankana East and Kassena Nankana West Districts. Builsa North, Builsa South, Kassena Nankana East and Kassena Nankana West Districts are among the Districts with the lowest daily per capita expenditures. The average depth of poverty is 9.1 percent, with the lowest rate (3.3 percent) in Bawku Municipal and Talensi Districts and the highest (18.6 percent) in Builsa South District.

Table 7: Poverty at the \$1.25 (2005 PPP) by District

District	Prevalence of Poverty ¹		Depth of Poverty ²	
	Percent of Population	n	Percent of Poverty line	n
Bawku Municipal	10.9	110	3.3	110
Bawku West	23.2	142	6.1	142
Binduri ³	25.0	20	4.9	20
Bolgatanga Municipal	14.7	109	5.6	109
Bongo	32.3	127	13.0	127
Builsa North	31.5	73	10.9	73
Builsa South	37.7	53	18.6	53
Garu Tempene	23.1	143	9.0	143
Kassena Nankana East	30.8	130	9.9	130
Kassena Nankana West	39.6	149	15.6	149
Pusiga ³	30.0	20	7.4	20
Talensi Nabdam	17.1	123	3.3	123
Upper East Region	25.8	1159	9.1	1159

[^] Results not statistically reliable, n<30.

¹ The prevalence of poverty is the percentage of households living below the national poverty line. Poverty prevalence is sometimes referred to as the poverty incidence or poverty headcount ratio.

² The depth of poverty, or poverty gap, is the average consumption shortfall multiplied by the prevalence of poverty.

³ Results not statistically reliable, n < 30. For poverty prevalence and depth, districts with n < 30 were considered for possible future case analysis. Source: District Level Survey Data, Ghana 2015.

National Poverty Line

National poverty lines for Ghana are based on the Ghana Living Standards Survey 6 (GLSS6), which was conducted in 2012/2013 by the Ghana Statistical Service (GSS). It makes use of a consumption-based standard of living measure as is the practice in many country statistics services. An absolute poverty line can be defined as that value of consumption necessary to satisfy minimum subsistence needs. In the case of food consumption, nutritional requirements in terms of daily calorie intake can be used as a guide. GSS (2014) calculated the average expenditure of the food consumption basket for the bottom 50 percent of individuals ranked by the standard of living measure, and derived the amount of calories in this basket. The price of one calorie was then calculated by dividing the adult equivalent expenditure of the food basket by the amount of adult equivalent calories provided by the basket. This calorie price was representative of the price paid by a typical household in the bottom 50 percent. This price was then multiplied by 2,900 calories, which was used to calculate the poverty lines for the 2012/13 survey. Expenditure on non-food consumption, determined by household whose total food expenditure was at or near the level of the extreme poverty line (10 percent of individuals below and above the line), was added to the poverty line.

Two nutritionally-based national poverty lines are:

- The national extreme poverty line: This is the lower poverty line of GHS 792.05 per adult equivalent per year. It corresponds to GHS 2.17 per day per adult equivalent expenditure.

It focuses on what is needed to meet the nutritional requirements of household members. Individuals whose total expenditure falls below this line are considered to be in extreme poverty. They are unable to purchase or consume enough food to supply them with the minimum daily per-capita energy requirement for a good healthy life. If they allocated their entire budget to food, they would not be able to meet their minimum nutrition requirements (which Ghana selected to be 2,900 calories). These are also the individuals who do not have enough resources to consume or purchase both adequate food and non-food items and are forced to sacrifice food items to obtain essential non-food items. GSS placed this line as 27 percent of the mean consumption level in 2012/13.

- The national absolute poverty line: This is the upper poverty line of GHS 1,314 per adult equivalent per year. This corresponds to GHS 3.60 per day per adult equivalent expenditure. This line incorporates both essential food and non-food consumption. Individuals consuming above this level may be considered able to purchase enough food to meet their nutritional requirements and their basic non-food needs. This line is 45 percent of the mean consumption level in 2012/13.

Table 8: Poverty at the National Absolute Threshold of GHS 3.60 (2012/13) by District

District	Prevalence of Poverty ¹		Depth of Poverty ²	
	Percent of Population	n	Percent of Poverty line	n
Bawku Municipal	50.9	110	18.5	110
Bawku West	59.9	142	24.7	142
Binduri ³	60.0	20	26.0	20
Bolgatanga Municipal	45.9	109	18.4	109
Bongo	63.8	127	31.7	127
Builsa North	57.5	73	28.8	69
Builsa South	62.3	53	34.8	53
Garu Tempene	67.1	143	29.7	143
Kassena Nankana East	44.6	130	27.8	101
Kassena Nankana West	57.0	149	32.8	130
Pusiga ³	90.0	20	38.8	20
Talensi Nabdam	60.2	123	21.5	123
Upper East Region	57.6	1159	26.8	1107

[^] Results not statistically reliable, n<30.

¹ The prevalence of poverty is the percentage of households living below the national poverty line. Poverty prevalence is sometimes referred to as the poverty incidence or poverty headcount ratio.

² The depth of poverty, or poverty gap, is the average consumption shortfall multiplied by the prevalence of poverty.

³ Results not statistically reliable, n < 30. For poverty prevalence and depth, districts with n < 30 were considered for possible future case analysis. Source: District Level Survey Data, Ghana 2015.

Using the national absolute poverty line as described above, the percentage of households below the GHS3.60 daily per capita expenditure threshold ranges from 44.6 percent in Kassena Nankana East to 67.1 percent in Garu Tempene (Table 8), with a regional average of 57.6 percent. The six districts above the average are Bawku West, Bongo, Builsa South, Garu Tempene, Kassena Nankana West and Talensi Nabdam. The depth of poverty averages 26.8 percent of the

national absolute poverty line. Bolgatanga Municipal District has the lowest rate (18.4 percent) while Builsa South has the highest rate (34.8 percent).

Extreme National Poverty Line

The estimates of the prevalence of poverty and depth of poverty based on the extreme national poverty lines, i.e., 2.17 GHS per adult per day measured in 2012/13, are shown in Table 9. The rates based on the national poverty lines generally seem to give higher estimates compared to rates based on the international poverty lines. The ranking of districts by prevalence rates also remains to be similar to that based on the international poverty line. The percentage of households below the GHS 2.17 daily per capita expenditure threshold range from 21.8 percent in Bawku Municipal District to 44.1 percent in Bongo District (Table 9), with a regional average of 33.1 percent. The six districts above the average are Bongo, Builsa North, Builsa South, Garu Tempene, Binduri and Kassena Nankana West. The depth of poverty averages 12.3 percent of the national extreme poverty line. Bawku Municipal District has the lowest rate (5.7 percent) and Builsa South District has the highest rate (22.0 percent).

Table 9: Poverty at the National Extreme Threshold of GHS 2.17 (2012/13) by District

District	Prevalence of Poverty ¹		Depth of Poverty ²	
	Percent of Population	n	Percent of Poverty line	n
Bawku Municipal	21.8	110	5.7	110
Bawku West	31.7	142	9.4	142
Binduri ³	35.0	20	9.0	20
Bolgatanga Municipal	22.9	109	8.4	109
Bongo	44.1	127	18	127
Builsa North	35.6	73	14.4	69
Builsa South	37.7	53	22	53
Garu Tempene	37.1	143	12.8	143
Kassena Nankana East	29.2	130	13.6	101
Kassena Nankana West	38.3	149	17.2	130
Pusiga ³	60.0	20	16.0	20
Talensi Nabdam	26.8	123	6.7	123
Upper East Region	33.1	1159	12.3	1107

[^] Results not statistically reliable, n<30.

¹ The prevalence of poverty is the percentage of households living below the national poverty line. Poverty prevalence is sometimes referred to as the poverty incidence or poverty headcount ratio.

² The depth of poverty, or poverty gap, is the average consumption shortfall multiplied by the prevalence of poverty.

³ Results not statistically reliable, n < 30. For poverty prevalence and depth, districts with n < 30 were considered for possible future case analysis. Source: District Level Survey Data, Ghana 2015.

Hunger and Dietary Diversity Indicators

Household Hunger Scale

The Household Hunger Scale (HHS) is used to calculate the prevalence of households experiencing moderate or severe hunger. The HHS was developed by the USAID-funded Food and Nutrition Technical Assistance II Project (FANTA-2/FHI 360) in collaboration with the United Nations Food and Agriculture Organization. It has been cross-culturally validated to allow comparison across different food-insecure contexts. The HHS is used to assess, geographically target, monitor, and evaluate settings affected by substantial food insecurity. The HHS is used to estimate the percentage of households affected by three different severities of household hunger: little to no household hunger (HHS score 0-1); moderate household hunger (HHS score 2-3); and severe household hunger (HHS score 4-6). The HHS should be measured at the same time each year, and ideally at the most vulnerable time of year (such as right before the harvest or during the dry season) (Deitschler et al. 2011)³.

The results for households with moderate to severe hunger are presented in Table 10. The prevalence of moderate to severe hunger averages 49.6 percent. The district with the lowest moderate to severe hunger is Builsa North (26.1 percent). Districts above the average are Bawku Municipal, Bawku West, Bongo, Garu Tempene, Kassena Nankana West and Talensi Nabdam.

Table 10: Percentage of Households with Moderate to Severe Hunger by District

District	Moderate to Severe Hunger (%)	n
Bawku Municipal	51.9	81
Bawku West	57.3	96
Binduri	^	^
Bolgatanga Municipal	41.3	75
Bongo	56.9	130
Builsa North	26.1	69
Builsa South	31.7	41
Garu Tempene	50.9	114
Kassena Nankana East	39.5	124
Kassena Nankana West	51.1	135
Pusiga	^	^
Talensi Nabdam	67.9	106
Upper East Region	49.6	971

[^] Results not statistically reliable, n<30.

Source: District Level Survey Data, Ghana 2015.

³ For further description of the household hunger indicator and its calculation, please refer to the Feed the Future Indicator Handbook, available at <http://feedthefuture.gov/resource/feed-future-handbook-indicator-definitions>.

Dietary Diversity in Women

Two indicators are used to measure women’s dietary diversity: Women’s Dietary Diversity Score (WDDS) and Women’s Minimum Dietary Diversity (MDD-W). The WDDS is based on nine food groups: (1) Grains, roots, and tubers; (2) Legumes and nuts; (3) Dairy products; (4) Organ meat; (5) Eggs; (6) Flesh food and small animal protein; (7) Vitamin A-rich dark green leafy vegetables; (8) Other vitamin A-rich vegetables and fruits; and (9) Other fruits and vegetables. A woman’s score is based on the sum of different food groups consumed in the 24 hours prior to the interview. The mean of this count across respondents produces the average WDDS. The WDDS is an indicator of the micronutrient adequacy of women’s diets based on the diversity of the diet (FAO 2011).

Women’s Minimum Dietary Diversity (MDD-W) represents the proportion of women consuming a minimum of five food groups out of the possible ten food groups based on their dietary intake within the 24 hours preceding the survey interview (FAO and FHI 360 2016). Table 11 represents the differences between the food groups for WDDS and MDD-W.

Table 11: Differences in Food Groups between WDDS and MDD-W

WDDS	MDD-W
Group 1: Starchy staple	Group 1: All starchy staple foods
Group 2: Legumes, nuts and seeds	Group 2: Beans and peas Group 3: Nuts and Seeds
Group 3: Milk and milk products	Group 4: Dairy
Group 4: Meat and Fish Group 5: Organ Meat	Group 5: Flesh Foods
Group 6: Eggs	Group 6: Eggs
Group 7: Dark green leafy vegetables	Group 7: Vitamin A-rich dark green leafy vegetables
Group 8: Other Vitamin A-rich vegetables and fruits	Group 8: Other Vitamin A-rich vegetables and fruits
Group 9: Other vegetables and fruits	Group 9: Other vegetables Group 10: Other fruit

Adapted from FAO 2011 and FAO and FHI 360 2016

Women’s Dietary Diversity Score

The mean and median values for Women’s Dietary Diversity Score (WDDS) by district for women of reproductive age are presented in Table 12. The mean WDDS across the districts averages 3.2. It ranges from 2.6 in Bawku West District and Talensi Nabdam District to 4.0 in Bawku Municipal District and Garu Tempene District. All other districts are below the average except Bawku Municipal, Bolgatanga Municipal and Garu Tempene. The median WDDS for the region is 3.0

Table 12: Women's Dietary Diversity Score by District

District	Mean	Median	n
Bawku Municipal	4.0	3.0	89
Bawku West	2.6	2.0	120
Binduri	^	^	^
Bolgatanga Municipal	3.6	4.0	78
Bongo	3.1	3.0	167
Builsa North	2.9	3.0	37
Builsa South	3.1	3.0	30
Garu Tempene	4.0	4.0	112
Kassena Nankana East	3.2	3.0	87
Kassena Nankana West	3.0	3.0	109
Pusiga	^	^	^
Talensi Nabdam	2.6	2.0	114
Upper East Region	3.2	3.0	943

^ Results not statistically reliable, n<30.

Source: District Level Survey Data, Ghana 2015.

Women's Minimum Dietary Diversity

Table 13 shows the percentage of all women of reproductive age in the districts of Northern Region who have achieved the minimum dietary diversity threshold. The table shows that overall MDD-W are below 50 percent in all districts. MDD-W ranges from 12.3 percent in Talensi Nabdam District to 44.9 percent in Bolgatanga Municipal District. Districts with the highest MDD-W in Upper East Region are Bolgatanga Municipal (44.9 percent), Garu Tempene (42.0 percent) and Kassena Nankana East (39.1 percent).

Table 13: Women's Minimum Dietary Diversity by District

District	Percent of women	n
Bawku Municipal	32.6	89
Bawku West	20.0	120
Binduri	^	^
Bolgatanga Municipal	44.9	78
Bongo	30.5	167
Builsa North	27.0	37
Builsa South	33.3	30
Garu Tempene	42.0	112
Kassena Nankana East	39.1	87
Kassena Nankana West	31.2	109
Pusiga	^	^
Talensi Nabdam	12.3	114
Upper East Region	30.0	943

^ Results not statistically reliable, n<30.

Source: District Level Survey Data, Ghana 2015.

Health Status of Women and Children

The nutritional status of children and women are measured by four indicators, three indicators for children and one for women. The three anthropometric measurements used for children measures the prevalence of stunted, wasted and underweight children under 6 years old. Standardized Z-scores for these measurements have been developed in reference to a healthy population of children, which took into account age and gender. If the Z-score of the measurements are below -2 standard deviations (<-2 SD) of the median z-score measurement for the reference group, then a child is considered as stunted, wasted and underweight, respectively. Severe stunting, wasting or underweight are associated with measurement below -3 standard deviations (<-3 SD). A mean Z-score of less than 0 (i.e., a negative value for stunting, wasting, or underweight) suggests that the distribution of an index has shifted downward and, on average, children in the population are less well-nourished than the reference group (WHO 2006). The Appendix has maps presenting the geographical distribution of stunted, wasted and underweight children by district.

Stunted Children

Stunting, or height-for-age, is an indicator of linear growth retardation, most often due to a prolonged inadequate diet and poor health. Reducing the prevalence of stunting among children, particularly age 0-23 months, is important because linear growth deficits accrued early in life are associated with cognitive impairments, poor educational performance, and decreased work productivity as adults (Black et al. 2008, Victora et al. 2008).

The prevalence of stunting by district in Upper East Region is shown in Table 14. The average has been found to be 19.3 percent, with the lowest in Kassena Nankana West District (11.8 percent) and the highest in Garu Tempene District (34.0 percent). Districts above the regional average are Garu Tempene and Talensi Nabdam. The regional average for severely stunted children is 7.5 percent, with the lowest rate in Bawku West District and Talensi Nabdam District (5.1 percent) and the highest rate in Garu Tempene District (34 percent). Other districts above the average are Bolgatanga Municipal and Kassena Nankana West. The Mean Z-scores average -0.65 and range between -0.97 in Garu Tempene and -1.12 in Kassena Nankana West.

Wasted Children

Wasting, or low weight-for-height, is an indicator of acute malnutrition. Children who are malnourished face a higher risk of mortality than well-nourished children (ICF Macro 2010). This indicator also provides the prevalence rate for children with a high weight-for-height measurement, and are considered overweight and obese.

Table 14: Prevalence of Stunting among Children under 5 Years Old by District.

District	% Stunted (<-2 SD)	% Severely stunted (<-3 SD)	Mean Z Score	n
Bawku Municipal	17.9	5.4	-0.581	56
Bawku West	17.7	5.1	-0.762	79
Binduri	^	^		^
Bolgatanga Municipal	15.2	12.1	-0.727	33
Bongo	18.2	7.3	-0.769	55
Builsa North	^	^		^
Builsa South	^	^		^
Garu Tempene	34.0	12.8	-0.974	47
Kassena Nankana East	^	^		^
Kassena Nankana West	11.8	8.8	-0.12	34
Pusiga	^	^		^
Talensi Nabdam	20.5	5.1	-0.47	78
Upper East Region	19.3	7.5	-0.65	382

^ Results not statistically reliable, n<30.

Source: District Level Survey Data, Ghana 2015.

The prevalence of wasting by district is shown in Table 15. The average has been found to be 15.1 percent, with the lowest rate in Bolgatanga Municipal District (6.3 percent) and the highest in Talensi Nabdam District (20.8 percent). Bawku Municipal, Bongo, Kassena Nankana West and Talensi Nabdam Districts are above the regional average. The regional average for severely wasted children is 5.7 percent, with the lowest rate in Garu Tempene District (zero percent) and the highest in Bawku Municipal District (8.9 percent). Overweight averages 7.0 percent and ranges from 3.6 percent in Bawku Municipal District to 20.4 percent in Bongo District. Cases of obesity average 4.7 percent and range from 1.3 percent in Bawku West and Talensi Nabdam Districts to 16.7 percent in Bongo District. The Mean Z-scores range from -0.8 to 0.3 for wasting.

Underweight Children

Underweight, or weight-for-age, is a reflection of acute and/or chronic undernutrition. This indicator measures the percentage of children 0-59 months who are underweight (<-2SD) and severely underweight (<-3SD) are presented along in Table 16 with their mean Z-scores.

The prevalence of underweight by district is shown in Table 16. The average of underweight children in Upper East Region has been found to be 15.2 percent. The lowest is in Kassena Nankana West District (5.9 percent) and the highest is in Bawku Municipal District (17.9 percent). The districts above the regional average for underweight children are Bawku Municipal, Bawku West, Bongo, Garu Tempene and Talensi Nabdam. Severe underweight has not found in Kassena Nankana West District. The highest rate of severely underweight children is 8.5 percent in Garu Tempene District. All districts have negative z-scores, ranging between -1.0 and -0.1.

Table 15: Prevalence of Wasting among Children under 5 Year Olds by District

District	% Wasted (<-2 SD)	% Severely wasted (<-3 SD)	% Overweight (>+2 SD)	% Obese (>+3 SD)	Mean Z Score	n
Bawku Municipal	17.9	8.9	3.6	3.6	-0.5	56
Bawku West	13.9	5.1	3.8	1.3	-0.8	79
Binduri	^	^	^	^		^
Bolgatanga Municipal	6.3	6.3	15.6	12.5	0.1	32
Bongo	18.5	7.4	20.4	16.7	0.3	54
Builsa North	^	^	^	^		^
Builsa South	^	^	^	^		^
Garu Tempene	8.5	0.0	6.4	4.3	-0.4	47
Kassena Nankana East	^	^	^	^		^
Kassena Nankana West	15.2	6.1	9.1	3.0	-0.3	33
Pusiga	^	^	^	^		^
Talensi Nabdam	20.8	5.2	3.9	1.3	-0.7	77
Upper East Region	15.1	5.7	7.0	4.7	-0.5	378

^ Results not statistically reliable, n<30.

Source: District Level Survey Data, Ghana 2015.

Table 16: Prevalence Underweight among Children Under 5 Years Old by District

District	% Underweight (<-2 SD)	% Severely Underweight (<-3 SD)	Mean Z Score	n
Bawku Municipal	17.9	5.4	-0.6	56
Bawku West	17.7	3.8	-0.8	79
Binduri	^	^		^
Bolgatanga Municipal	12.5	3.1	-0.7	33
Bongo	16.7	5.6	-0.8	55
Builsa North	^	^		^
Builsa South	^	^		^
Garu Tempene	17.0	8.5	-1.0	47
Kassena Nankana East	^	^		^
Kassena Nankana West	5.9	0.0	-0.1	34
Pusiga	^	^		^
Talensi Nabdam	16.7	2.6	-0.5	78
Upper East Region	15.2	4.0	-0.7	382

^ Results not statistically reliable, n<30.

Source: District Level Survey Data, Ghana 2015.

Anthropometry for Women of Reproductive Age

An individual's health can be assessed by her Body Mass Index (BMI), which is a simple, unobtrusive and inexpensive anthropometric measure. BMI is defined as the ratio of an individual's weight in kilograms to her height in meters squared (kg/m^2) (WHO 2014, CDC 2014). BMI is a reliable measure of body composition and it is used widely in health screenings of adults to identify potential health problems associated with body weight. An individual can be classified into four different body mass composition categories based on their BMI score: (1) underweight

(BMI <18.5); (2) normal weight (18.5 ≤ BMI < 25.0); (3) overweight (25.0 ≤ BMI < 30.0); and (4) obese (BMI ≥ 30.0).

Estimates for all non-pregnant women aged 15-49 years are presented in Table 17. They average 9.2 percent, 67.0 percent, 18.3 percent and 5.5 percent for underweight, normal weight, overweight and obese, respectively. The average BMI is 23.0 and ranges from 21.7 in Bawku West District to 25.0 in Bolgatanga Municipal District among non-pregnant women. The prevalence of underweight women ranges from 1.2 percent in Kassena Nankana East District to 15.5 percent in Talensi Nabdam District. The percentage of women with normal weight is the lowest in Bolgatanga Municipal District (58.3 percent). It is highest in Bawku West District (77.4 percent). The prevalence of overweight women in Bongo has been found to be the highest at 29.4 percent. Five districts have overweight rates above the regional average of 18.3 percent. Obesity rates are the lowest in Kassena Nankana West District (1.8 percent) and the highest in Bolgatanga Municipal District (13.9 percent).

Table 17: Prevalence of Underweight, Normal Weight, Overweight and Obese Women by District

District	Mean BMI	Body Mass Index (BMI) Category (%)				n
		Under-weight	Normal	Over-weight	Obese	
Bawku Municipal	23.2	9.6	60.6	20.2	9.6	94
Bawku West	21.7	13.0	77.4	6.1	3.5	115
Binduri	^	^	^	^	^	^
Bolgatanga Municipal	25.0	1.4	58.3	26.4	13.9	72
Bongo	23.6	6.9	59.4	29.4	4.4	160
Builsa North	24.0	6.1	63.6	24.2	6.1	33
Builsa South	22.7	5.9	76.5	14.7	2.9	34
Garu Tempane	22.1	15.1	67.2	12.6	5.0	119
Kassena Nankana East	24.4	1.2	66.7	21.4	10.7	84
Kassena Nankana West	22.3	8.9	73.2	16.1	1.8	112
Pusiga	^	^	^	^	^	^
Talensi Nabdam	22.3	15.5	70.0	11.8	2.7	110
Upper East Region	23.0	9.2	67.0	18.3	5.5	933

^ Results not statistically reliable, n<30.

Source: District Level Survey Data, Ghana 2015.

Women's Empowerment in Agriculture

Women play a prominent role in agriculture. Yet they face persistent economic and social constraints. Women's empowerment is a main focus of Feed the Future in order to achieve its objectives of inclusive agriculture sector growth and improved nutritional status. The WEAI is comprised of two weighted sub-indexes developed by Alkire et al (2013): 5 Domains Empowerment Index (5DE) and Gender Parity Index (GPI). The 5DE examines the five domains of empowerment: production, resources, income, leadership and time. The GPI compares the empowerment of women to the empowerment of their male counterpart in the household. Data collected in this district level survey allows for calculation of the ten individual empowerment indicators in the 5DE for both primary adult female and adult men decision markers⁴. This section presents the results from these empowerment indicators of the 5DE.

The *Production* domain assesses the ability of individuals to provide input and autonomously make decisions about agricultural production. The *Resources* domain reflects individuals' control over and access to productive resources. The *Income* domain monitors individuals' ability to direct the financial resources derived from agricultural production or other sources. The *Leadership* domain reflects individuals' social capital and comfort speaking in public within their community. The *Time* domain reflects individuals' workload and satisfaction with leisure time (Zereyesus et al. 2016).

The production domain includes activities ranging from food and cash crop farming, livestock rearing, fishing, to nonfarm economic activities such as wage and salaried employment. The income domain addresses whether there is a sole or joint control over income and expenditure. Table 18 summarizes the results for the production domain. The production domain includes activities in food and cash crop farming, livestock rearing and fishing. It also includes nonfarm economic activities, wage and salaried employment. Table 18 gives the percentage of women who perceive they have input in decision making, autonomy in production, and control over the use of income. This is compared with the men displayed in the same table. The percent of women in Upper East districts who perceive they have input in decision making on these activities average 82.8 percent compared to the men who have 86.8 percent. Bolgatanga Municipal District has the lowest rate (70.9 percent for women) compared to 73.2 percent in Kassena Nankana East District for men. Bawku West District has the highest rate (91.5 percent for women) and Talensi Nabdram District (97.7 percent) for men. Four districts are below the average and five are above the regional average. Kassena Nankana East interestingly has a higher

⁴ The primary adult decision-makers are individuals age 18 or older who are self-identified as the primary male or female decision-maker during the collection of the household roster. These primary decision-makers in the households may not be representative of the entire female and male populations in the surveyed area.

proportion of women reporting themselves to have an input in production decisions than men. Approximately sixty-five percent of women and 68.9 percent of men in Upper East Region perceive to have autonomy in production. Along all the districts men present higher rates of autonomy in production than women except in Garu Tempane, Kassena Nankana East, and Kassena Nankana West, where women rates are slightly higher than men's. Talensi Nabdam District has the highest rate for women (92.1 percent) and the highest rate for men (97.4 percent). Kassena Nankana East is the district with the lowest autonomy in production for both women and men, 38.0 percent and 20.4 percent, respectively. Those who feel they have control over income average 52.3 percent for women and 76.0 percent for men. The lowest rates for women on income control are in Garu Tempane District (42.3 percent) and the highest in Kassena Nankana East (63.4 percent). Results from Binduri, Builsa South and Pusiga are regarded as statistically unreliable. It should be noted that in the rest of the domains these three regions remained excluded because their sample size is below the required 30 for this analysis.

Table 18: Production and Income Domains by District

District	Input in Production Decisions				Autonomy in Production				Control over Use of Household Income			
	Women	n	Men	n	Women	n	Men	n	Women	n	Men	n
Bawku Municipal	79.2	72	89.7	58	73.2	71	83.1	59	56.9	72	88.1	59
Bawku West	91.5	82	92.2	77	79.1	86	82.3	79	59.3	86	83.3	78
Binduri	^	^	^	^	^	^	^	^	^	^	^	^
Bolgatanga Municipal	70.9	55	76.9	52	57.7	52	77.1	48	50.0	56	70.6	51
Bongo	86.6	97	88.5	87	71.4	91	85.2	81	51.6	95	67.5	83
Builsa North	84.8	33	^	^	^	^	^	^	52.9	34	^	^
Builsa South	^	^	^	^	^	^	^	^	^	^	^	^
Garu Tempane	78.9	71	84.1	69	67.1	73	66.2	68	42.3	71	76.8	69
Kassena Nankana East	76.5	85	73.2	56	38.0	92	20.4	54	63.4	82	72.7	55
Kassena Nankana West	87.6	89	91.8	73	42.6	94	39.7	68	44.8	87	80.6	72
Pusiga	^	^	^	^	^	^	^	^	^	^	^	^
Talensi Nabdam	89.0	91	97.7	86	92.1	89	97.4	78	49.5	91	68.6	86
Upper East Region	82.8	675	86.8	558	65.2	648	68.9	535	52.3	674	76.0	553

^ Results not statistically reliable, n<30.

Source: District Level Survey Data, Ghana 2015.

Results for the resource domain are in Table 19. The resource domain includes three indicators: asset ownership; decision making power over productive resources such as land, livestock, agricultural equipment, consumer durables and credit or loans; and access to credit. The percent of women who have ownership of assets average 69.4 percent in Upper East Region. For men it is 91.5 percent. Those women who perceive themselves as adequate in purchase, sell and transfer assets average 74.6 percent compared to the men who average 82.5 percent. The

percentage of women who perceive they have adequacy in access to credit average 15.3 percent. The men average 21.3 percent. The lowest rate in access to credit is 2.0 percent for women in Bongo District, and 2.3 percent in Bongo District for men. The highest credit access rate for women is 39.4 percent in Bawku West District. Bawku West also has the highest rate for men (45.2 percent). Five districts are below the average and five are above the average for women's access to credit. In Bolgatanga Municipal District, the proportion of women who perceive adequacy in access to credit is slightly higher than that of men.

Table 19: Resource Domain by District

District	Asset Ownership				Right to purchase, sell, and transfer assets				Access to and Decision on Credit			
	Women	n	Men	n	Women	n	Men	n	Women	n	Men	n
Bawku Municipal	72.9	118	97.8	46	77.5	111	97.7	43	19.4	134	23.5	51
Bawku West	72.6	168	97.4	77	78.9	161	86.3	73	39.4	137	45.2	62
Binduri	^	^	^	^	^	^	^	^	^	^	^	^
Bolgatanga Municipal	77.7	112	88.2	51	58.9	107	69.6	46	12.5	96	12.2	41
Bongo	71.4	168	88.5	78	86.5	170	88.6	79	2.0	100	2.3	44
Builsa North	63.6	66	^	^	81.5	65	^	^	7.1	70	^	^
Builsa South	67.3	49	^	^	85.7	49	^	^	3.3	60	^	^
Garu Tempane	72.1	122	92.5	53	71.2	125	72.2	54	7.3	124	11.6	43
Kassena												
Nankana East	63.6	154	84.2	57	56.1	155	70.2	57	17.4	138	22	50
Kassena												
Nankana West	66.7	162	88.4	69	72.2	169	85.1	74	18.7	150	26.2	65
Pusiga	^	^	^	^	^	^	^	^	^	^	^	^
Talensi Nabdram	66.3	187	95.3	85	77.5	187	90.6	85	26.0	104	27.7	47
Upper East Region	69.4	1306	91.5	516	74.6	1299	82.5	511	15.3	1113	21.3	403

^ Results not statistically reliable, n<30.

Source: District Level Survey Data, Ghana 2015.

The leadership domain defines membership in economic or social groups such as agriculture producers', water users, credit or microfinance, mutual help, trade, local government, civic and religious groups. It also defines the level of comfort when speaking in public on issues affecting their communities. Results for the leadership domain are summarized in Table 20.

An average of 76.0 percent of the women in the region perceive they achieve adequacy in expressing their views on community issues compared to 91.9 percent for the men. Builsa North District has the lowest rate (58.1 percent) while the highest adequacy level of speaking out is in Bawku West District (88.9 percent) for women. An average of 73.8 percent of the women report belonging to a group in the districts of Upper East compared to 66.8 percent for men. Garu Tempane District and Talensi District have the lowest (65.7 percent) and highest (85.2 percent) levels, respectively for women. In seven out of the eight districts, the proportion of women achieving adequacy in group membership is higher than that of men.

Table 20: Leadership Domain by District

DISTRICT	Group Membership				Public Speaking			
	Women	n	Men	n	Women	n	Men	n
Bawku Municipal	66.1	59	72.3	47	75.0	72	84.2	57
Bawku West	73.3	75	72.1	68	88.9	81	92.1	76
Binduri	^	^	^	^	^	^	^	^
Bolgatanga Municipal	74.1	54	67.4	46	85.7	56	98.1	52
Bongo	82.4	91	70.9	79	75.8	95	97.5	80
Builsa North	^	^	^	^	58.1	31	^	^
Builsa South	^	^	^	^	^	^	^	^
Garu Tempene	65.7	67	55.2	58	77.8	72	93.1	72
Kassena Nankana East	73.6	72	62.8	43	77.5	80	90.4	52
Kassena Nankana West	69.6	79	60.6	66	68.6	86	83.1	71
Pusiga	^	^	^	^	^	^	^	^
Talensi Nabdam	85.2	88	73.2	82	76.4	89	96.3	81
Upper East Region	73.8	585	66.8	489	76.0	662	91.9	541

^ Results not statistically reliable, n<30.

Source: District Level Survey Data, Ghana 2015.

The time domain is comprised of two indicators workload and leisure time. Table 21 presents adequacy level for workload and available leisure time. Workload is measured by determining the time allocation to various activities including; sleeping, personal care, working at a business, farming, watching television, social and activities and hobbies and domestic work.

An average of 61.1 percent of the women in the region perceive they enjoy adequate leisure time. For men it is 69.5 percent. This ranges from 37.8 percent in Bongo District to 76.1 percent in Bawku Municipal District for women. Four districts are below the regional average rate for both women and men. Bawku Municipal District and Bawku West District have a larger proportion of women reporting satisfaction with leisure time than men. With regards to workload, 72.8 percent of women perceive that they achieve adequacy in their workload compared to 77.0 percent of men. The district with the lowest adequacy perception rate for workload among women is Talensi Nabdam (60.9 percent), while Builsa North has the highest level (83.3 percent). The district with the lowest adequacy perception rate for workload among men is Kassena Nankana East (68.3 percent) while Kassena Nankana West has the highest level (91.2 percent). In Kassena Nankana East District, more women report being satisfied with time allocated for workload than men.

Table 21: Time Domain by District

District	Satisfaction with Workload				Satisfaction with Leisure Time			
	Women	n	Men	n	Women	n	Men	n
Bawku Municipal	68.3	60	70.6	51	76.1	71	75.9	58
Bawku West	71.6	67	72.7	55	71.8	85	66.7	78
Binduri	^	^	^	^	^	^	^	^
Bolgatanga Municipal	77.8	45	82.9	41	52.5	59	61.5	52
Bongo	76.7	73	78.8	52	37.8	98	46.7	90
Builsa North	83.3	30	^	^	47.1	34	^	^
Builsa South	^	^	^	^	^	^	^	^
Garu Tempene	65.0	60	74.5	55	50.7	71	64.4	73
Kassena Nankana East	80.0	75	68.3	41	71.6	95	85.7	63
Kassena Nankana West	71.8	78	91.2	57	71.9	96	79.7	79
Pusiga	^	^	^	^	^	^	^	^
Talensi Nabdam	60.9	69	76.6	64	70.0	90	75.6	86
Upper East Region	72.8	557	77.0	416	61.1	699	69.5	579

^ Results not statistically reliable, n<30.

Source: District Level Survey Data, Ghana 2015.

Summary and Conclusions

The focus of this district-level assessment was to provide a frame of reference to track the performance of initiatives to reduce poverty and hunger and improve health and nutrition in Upper East Region, which is part of the study area for Feed the Future Initiative in Ghana. The total number of households involved in this study was 1214. The study assessed indicators from four major groups: (1) household economic status; (2) hunger and diet diversity; (3) health status of women and children; and (4) women's empowerment. The major findings from this study include:

- The average household size has been found to be 5.5 while the estimated proportion for adult females is 52.3 percent. Children between the ages of 5 to 17 years comprise majority of the children between ages zero to 17 years.
- Approximately three-quarters of the adult respondents have been found to have received no formal education. For primary level education level, the rates range from 5.8 percent in Bawku West District to 14.4 percent in Bolgatanga Municipal District. For secondary education, the rates range from 7.2 percent in Garu Tempene District to 32.9 percent in Bolgatanga Municipal.
- On average, the proportion of households having access to improved water sources, sanitation and electricity are 95.4 percent, 17.7 percent and 38.4 percent, respectively.
- The average room occupancy is about 2.0 persons per sleeping room and almost all households use solid fuel sources for cooking
- The average daily per capita household expenditure is \$3.90. It ranges from a minimum of \$1.89 in Pusiga District to \$6.81 in Bongo District.
- The prevalence of poverty at \$1.25 per day (2005 PPP) in Upper East Region is 25.8 percent. It ranges from 10.9 percent in Bawku Municipal to 39.6 percent in Kassena Nankana West District. The average poverty depth in the region is 9.1 percent.
- Using the national absolute poverty line, the percentage of households below the GHS3.60 daily per capita expenditure threshold averages 57.6 percent and the depth of poverty averages 26.8 percent.
- The average prevalence of poverty at the national extreme threshold is 33.1 percent while the regional average depth of poverty is 12.3 percent.
- The prevalence of moderate to severe hunger average 49.6 percent.
- On average, the women of reproductive age consume 3.2 out of the nine food groups of the WDDS. In addition, all the districts present rates below 50 percent of MDD-W threshold.
- The prevalence of stunting averages 19.3 percent, with the lowest in Kassena Nankana West District (11.8 percent) and the highest in Garu Tempene District (34.0 percent).

- The prevalence of wasting by district averages 15.1 percent, with the lowest in Bolgatanga Municipal District (6.3 percent) and the highest in Talensi Nabdam District (20.8 percent).
- The prevalence of underweight children is 15.2 percent. Kassena Nankana West District has zero rate of severe underweight.
- The regional average BMI for women is 23.0 while 9.2 percent, 67.0 percent, 18.3 percent and 5.5 percent are the averages for underweight, normal weight, overweight and obesity, respectively.
- The percent of women in the Upper East districts who perceive adequacy in input in decision making average 82.8 percent compared to 86.8 percent for men. Women's perception and men's perception on autonomy in production are slightly different, 65.2 percent of women perceive adequacy in this subdomain in contrast with 68.9 percent of men. Approximately 50 percent of women perceive to have adequacy in control over use of income in contrast with 76.0 percent of men.
- Almost seventy percent of women perceive to have ownership of assets adequacy compared to 91.5 percent of men. Men possess higher rates of adequacy in right to purchase, sell and transfer assets (82.5 percent) in contrast with only 74.6 percent of women. The number of women who perceive they have access to credit averages 15.3 percent while for men, it averages 21.3 percent. Access to credit is therefore the domain with the least reported rates of adequacy in the Upper East Region.
- An average of 76.0 percent of the women in the region perceive they achieve adequacy in expressing their views on community issues compared to 91.9 percent for the men. More women than men report belonging to a group. That is, an average of 73.8 percent for women compared to 66.8 percent of men.
- An average of 61.1 percent of the women in the region perceive to enjoy adequate leisure time compared to 69.5 percent for men. With regard to workload, 72.8 percent of women perceive that they achieve adequacy in their workload compared to 77.0 percent of the men.

The indicators in this report are structured to provide a frame of reference to assess and evaluate the impact of current and future initiatives' outcomes and their contributions in achieving the stated objectives of the Feed the Future programs in Ghana's Northern regions. These benchmark results also may enable implementing partners to identify factors that influence these indicator results and can contribute to effective evaluation of project performance in current and planned interventions.

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Appendix

Table A.I provides the major findings of the principal indicators and some household demographic and dwelling characteristics in Upper East Region. The table provides the overall regional averages for the indicators. District level results are also presented for the districts that exhibit the minimum and maximum values for these indicators and these values are in parentheses.

AI: Summary of Key Findings in Upper East Region

Characteristic	Upper East Region	District - Min. Value	District - Max. Value	n
Demographics				
Household Size	5.5	Builsa North (3.9)	Bawku Municipal, Bongo, Garu Tempane (6.2)	1131
<i>Adult's educational attainment (%)</i>				
No Education	77.3	Bolgatanga Municipal (51.4)	Garu Tempane (86.1)	1131
Primary	8.3	Bawku West (5.8)	Bolgatanga Municipal (14.4)	1131
Secondary	13.9	Garu Tempane (7.2)	Bolgatanga Municipal (32.9)	1131
Dwelling				
Water Source (%)	95.4	Builsa South (81.0)	Bongo, Builsa North (100)	1008
Sanitation (%)	17.7	Builsa South (2.4)	Bolgatanga Municipal (41.7)	1002
Persons per Sleep Room	2.0	Bawku Municipal (1.3)	Bongo (2.8)	993
Solid Fuel (%)	96.3	Bolgatanga Municipal (88.1)	Garu Tempane (100)	1006
Electricity (%)	38.4	Kassena Nankana West (26.2)	Bolgatanga Municipal (69.9)	1008

AI: Summary of Key Findings in Upper East Region (Cont'd)

Characteristic	Upper East Region	District - Min. Value	District - Max. Value	n
Economic Status				
Daily per capita expenditure (in 2010 USD)	3.90	Pugisa (1.89)	Bongo (6.81)	1199
Prevalence of poverty (\$1.25 2005 PPP)	25.8	Bawku Municipal (10.9)	Kassena Nankana West (39.6)	1159
Depth of poverty (\$1.25 2005 PPP)	9.1	Bawku Municipal, Talensi Nabdam (3.3)	Builsa South (18.6)	1159
Prevalence of poverty (GHS 3.60)	57.6	Pugisa (90)	Garu Temppane (67.1)	1159
Depth of poverty (GHS 3.60)	26.8	Bolgatanga Municipal (18.4)	Pugisa (38.8)	1107
Prevalence of poverty (GHS 2.17)	33.1	Bawku Municipal (21.8)	Pugisa (60)	1159
Depth of Poverty (GHS 2.17)	12.3	Bawku Municipal (5.7)	Kassena Nankana West (17.2)	1107
Hunger and Dietary diversity				
Prevalence of Severe to Moderate Hunger (%)	49.6	Builsa North (26.1)	Talensi Nabdam (67.9)	971
Women's Dietary Diversity Score	3.2	Bawku West, Talensi Nabdam (2.6)	Bawku Municipal, Garu Temppane (4.0)	943
Women's Minimum Dietary Diversity (%)	30.0	Talensi Nabdam (12.3)	Bolgatanga Municipal (44.9)	943
Health Status of Children (%)				
Stunting	19.3	Kassena Nankana West (11.8)	Garu Temppane (34.0)	382
Wasting	15.1	Bolgatanga Municipal (6.3)	Talensi Nabdam (20.8)	378
Underweight	15.2	Kassena Nankana West (5.9)	Bawku Municipal (17.9)	382

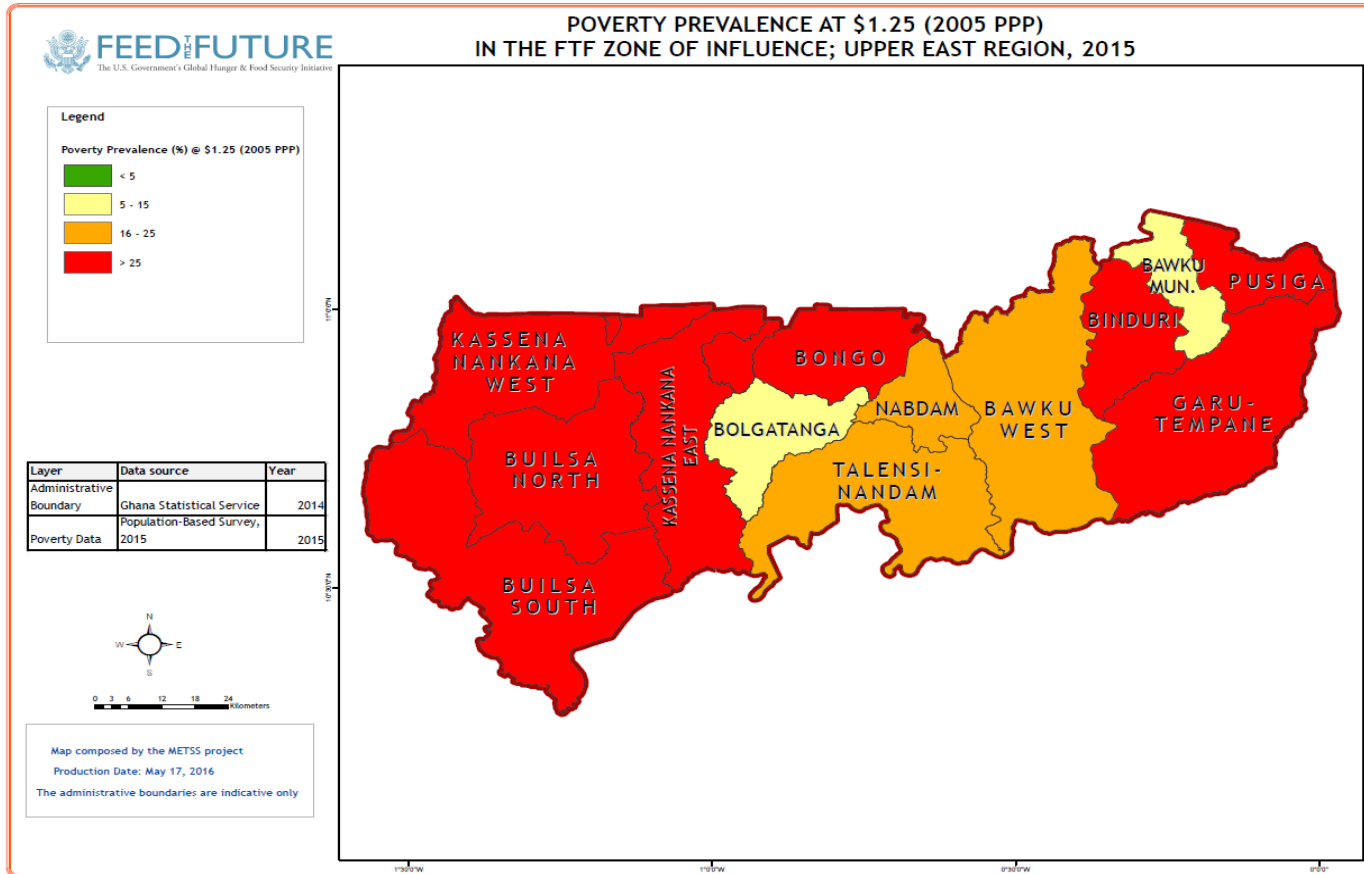
AI: Summary of Key Findings in Upper East Region (Cont'd)

Characteristic	Upper East Region	District -	Min. Value	District -	Max. Value	n
Anthropometry for Women of Reproductive Age						
BMI	23	Bawku West	(21.7)	Bolgatanga Municipal	(25.0)	933
Underweight (%)	9.2	Kassena Nankana East	(1.2)	Talensi Nabdam	(15.5)	933
Normal Weight (%)	67.0	Bolgatanga Municipal	(58.3)	Bawku West	(77.4)	933
Overweight (%)	18.3	Bawku West	(6.1)	Bongo	(29.4)	933
Obese (%)	5.5	Kassena Nankana West	(1.8)	Bolgatanga Municipal	(13.9)	933
Women's Empowerment in Agriculture Index (%)						
<i>Production</i>						
Input Decision Making	82.8	Bolgatanga Municipal	(70.9)	Bawku West	(91.5)	675
Autonomy in Production	65.2	Kasena Nankana East	(38.0)	Talensi Nabdam	(92.1)	648
<i>Income</i>						
Control over Use of Income	52.3	Garu Tempene	(42.3)	Kassena Nankana East	(63.4)	674
<i>Resources</i>						
Asset Ownership	69.4	Builsa North, Kassena Nankana East	(63.6)	Bolgatanga Municipal	(86.5)	1306
Purchase, Sale or Transfer of Assets	74.6	Kassena Nankana East	(56.1)	Bongo	(86.5)	1299
Access and Decision to Credit	15.3	Bongo	(2.0)	Bawku West	(39.4)	1113
<i>Leadership</i>						
Public Speaking	76.0	Builsa North	(58.1)	Bawku West	(88.9)	662
Group Membership	73.8	Garu Tempene	(65.7)	Talensi Nabdam	(85.2)	585
<i>Time</i>						
Leisure Time	61.1	Bongo	(37.8)	Bawku Municipal	(76.1)	699
Work Load	72.8	Talensi Nabdam	(60.9)	Builsa North	(83.3)	557

Source: District Level Survey Data, Ghana 2015

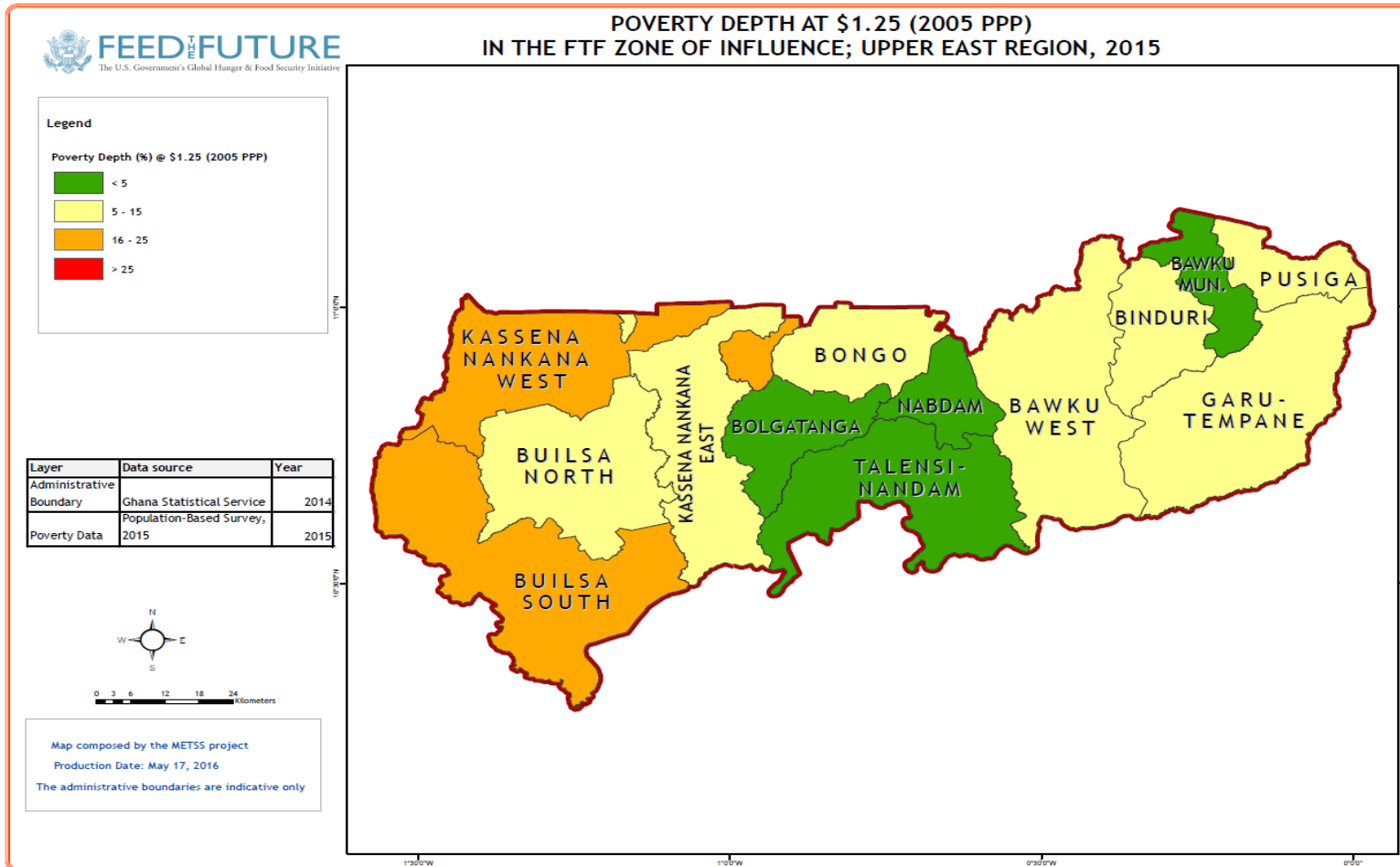
Appendix 2: Geographical Distribution of Poverty and Children's Health Status

Figure 1: Poverty Prevalence at \$1.25 (2005 PPP) by District



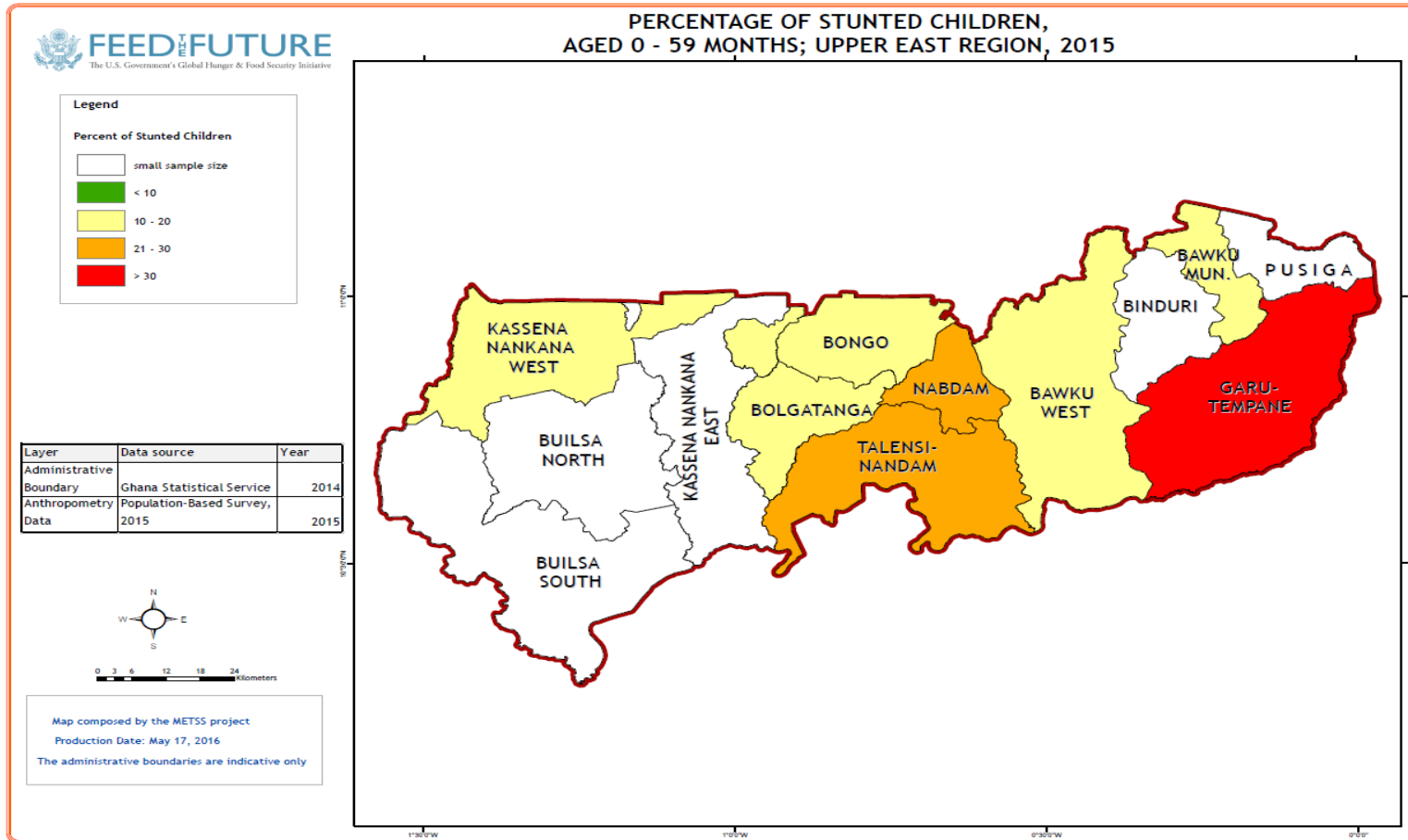
Source: District Level Survey Data, Ghana 2015.

Figure 2: Poverty Depth at \$1.25 (2005 PPP) by District



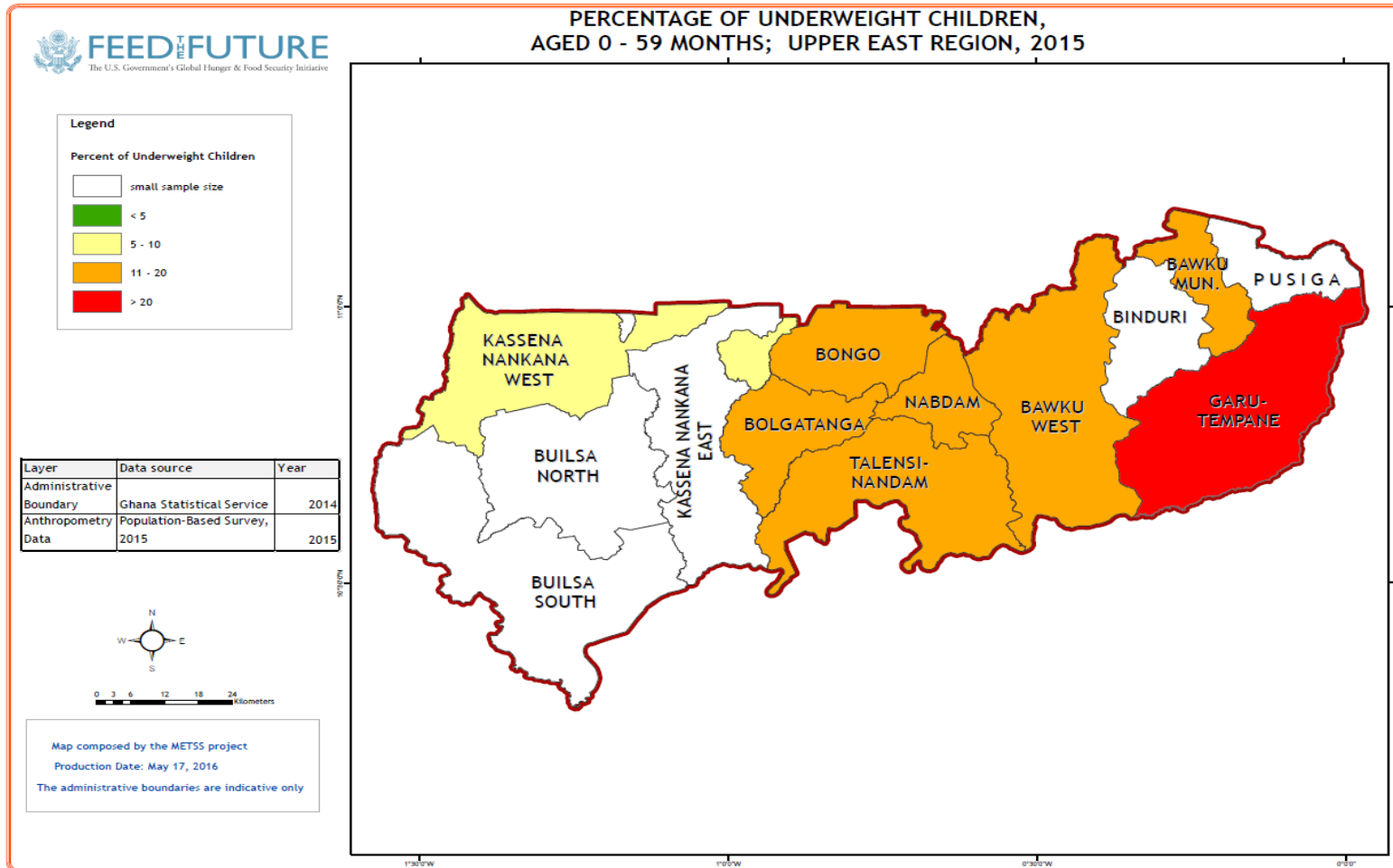
Source: District Level Survey Data, Ghana 2015.

Figure 3: Percentage of Stunted Children (0-59 months) by District



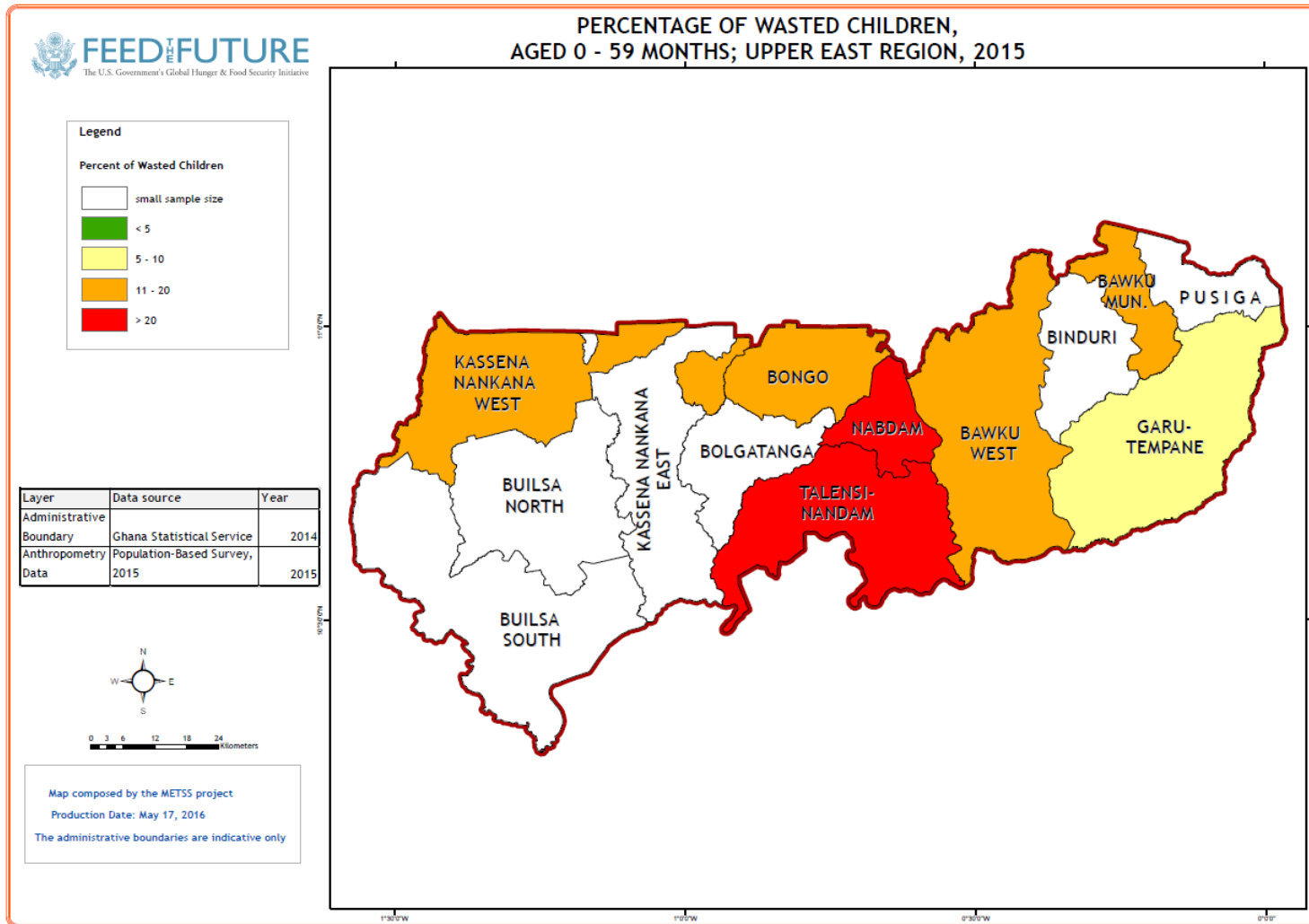
Source: District Level Survey Data, Ghana 2015.

Figure 4: Percentage of Wasted Children (0-59 months) by District



Source: District Level Survey Data, Ghana 2015.

Figure 5: Percentage of Underweight Children (0-59 months) by District



Source: District Level Survey Data, Ghana 2015.

