URBAN FOOD SECURITY & NUTRITION ASSESSMENT

Bor Town, Jonglei

Conducted by the World Food Programme in Collaboration with FAO, UNICEF and National Bureau of Statistics, Government of South Sudan

June 2017

(Data collected from 28th March to 10th April 2017)

Table of Contents

EXECUTIVE SUMMARY

Urban food insecurity in South Sudan has been of increasing concern in recent years since the outbreak of the conflict and the economic crisis causing hyperinflation and thus making many urban households vulnerable to food insecurity and malnutrition. After the studies in Juba, this assessment was conducted in order to understand the household food security and nutrition situation in the urban areas of Bor. The assessment is based on a survey of 625 households in 29 enumeration areas provided by the National Bureau of Statistics.

Following are the key findings of the study:

- A very high level of food insecurity was found with 85 percent of the households being food insecure; 44 percent of them severely food insecure and another 41 percent moderately food insecure. The depreciation of the South Sudanese Pound and the resulting hyperinflation, has seriously impacted the purchasing power of the households thus making them extremely vulnerable. This was reflected by the finding that households on average were spending about 78% of their monthly expenditure on food.
- Critical levels of malnutrition were found with a global acute malnutrition (GAM) of 25.7 percent, and high severe acute malnutrition (SAM) prevalence of 6.4 percent thus suggesting urgent nutrition interventions.
- Hyperinflation has been the major cause of household food insecurity. The price of white sorghum has increased ten fold compared to the same month one year ago.
- There was a significant deterioration in the livelihood in the past two years, with higher proportion of households now relying on unstable sources of income such as casual labour or sale of natural resources. The income was not commensurate with the hyperinflation in the markets and thus households were spending 78 percent of their monthly expenditure on food.
- Households with unstable sources of income such as casual labour, IDPs and returnee households, and those living with host families or temporary shelters were found to be relatively more food insecure than others.

A number of recommendations have been made based on the findings of the study. These including implementation of programmes to address acute malnutrition, cash and or voucher programmes to support household food security, livelihood support and support for improved sanitation.

CONTEXT AND BACKGROUND

The food security and nutrition situation in South Sudan has been deteriorating in recent years due to outbreak of conflicts, poor production, disruption of markets, rapid rise in prices, diseases and natural disasters such as floods and drought in parts of the country. With the ongoing macroeconomic crisis including the rapid depreciation of the South Sudanese Pound, hyper-inflation and thus the huge surge in food prices, the urban food insecurity has been of particular concern. Assessment of urban food security and nutrition was conducted in Juba in 2015 and 2016, which showed the vulnerability of urban households in the face of this overall crisis. The Juba urban assessment in 2016 showed that about half of the surveyed households were food insecure, thus demonstrating a real need to address urban food insecurity and malnutrition, and the need for periodic monitoring of the situation. This led to the joint initiative to conduct such assessments in other urban areas of the country. The Bor study is one conducted as part of this plan to meet the information needs for urban food security and nutrition situation in South Sudan. Further rollout of the urban assessments will continue in other urban centres within the country.

Objectives, scope and coverage

The main **objective** of the study is to generate baseline information on food security and nutrition along with vulnerability status of urban population that would be useful for informed decision making in prioritizing the resource allocations. The **specific objectives** of the assessment are to:

- Assess the current food security situation of the households;
- Assess household expenditure pattern;
- Identify urban livelihood pattern and assess the types of vulnerabilities among the households;
- Assess the possession of assets and households coping mechanisms;
- Estimate the prevalence of acute malnutrition among children aged 6-59 months and women of reproductive aged 15 to 49 year;
- Assess the water, hygiene and sanitation situation;
- Assess proxy Infant and Young Child Feeding (IYCF) practices among children aged 0-23 months.
- Analyse the markets and price situation and its likely impact on food security.

Methodology

Administratively, Bor town comprises of 30 Enumeration Areas (EAs) with a total population of approximately 60,000. The study adopted two-stage sampling strategy. The first stage comprises all Enumeration Areas (EAs) as Primary Sampling Unit (PSU). Large EAs were divided into sub-EAs for the purpose of the study[1]. All the EAs were well demarcated and a sketch map was developed with the help of local teams. The second stage of sampling comprised of households as Secondary Sampling Unit (SSU). Household listing was done in each cluster and selection of households was done after randomly identifying the first household and then subsequent households were identified from the listing by adding the sampling interval. A total of 18 households were planned in each of these 48 clusters. The population figures in each EA was provided by the office of Relief and Rehabilitation Commissioner (RRC) Jonglei-Bor. A total of 625 households from 42 clusters were covered during the actual field survey (details provided in Annex I) conducted from 28th March to 10th April 2017 using mobile devices. These provided statistically representative data for the population in Bor town.

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[1] An EA containing more than 350 HHs was divided into two sub-EAs, whereas 3 sub-EAs were formed within any EA with more than 500 HHs, Thus a total of 48 EAs and sub-EAs (clusters) were formed.

MEASURING FOOD SECURITY AND NUTRITION

Food security prevails when all people, at all times, have physical and economic access to sufficient, safe and nutritious food which meets their dietary needs and food preferences for an active and healthy life (FAO, 1996). The definition Food Security is based on three dimensions, which are **Availability, Access and Utilization of food.**

Food insecurity can be transitory or chronic in nature. Transitory food insecurity is of a temporary nature and caused by a negative event such as conflict, insecurity, economic crisis and illness of household member. Loss of employment, lack of roads and other infrastructure, and seasonality in food production are other factors. Chronic food insecurity is the persistent inability of a household to meet its dietary needs over a long period. Its main underlying cause is protracted conflict, insecurity, poverty and poor health and hygiene practices. Transitory food insecurity can lead to chronic food insecurity.

Nutrition

Malnutrition is not a simple problem, with a single cause and silver bullet solution. Its immediate causes are inadequate dietary intake and illness which can create a vicious circle: a malnourished child is more susceptible to illness and inversely a child suffering from illness is more prone to becoming malnourished. Children entering this cycle can fall into a potentially fatal spiral as one condition perpetuates the other. These immediate causes of malnutrition have underlying causes themselves, such as inadequate access to food in a household, insufficient health services, an unhealthy living environment and inadequate care for women and children.

In human life, the critical period is the first thousand days of a child's life. When deprived of nutritious food, a child's physical development is impaired and he or she matures into an adult that is less likely to reach his or her optimal cognitive development and is more prone to disease. This adult will be less productive with a far greater likelihood of being stuck in poverty, thereby perpetuating the cycle of food insecurity and malnutrition.

There are several methodologies to measure or judge food security and nutritional status, which provide insights into different aspects of consumption and nutrition. The nutritional status of a population can be assessed by anthropometric measurements of the most vulnerable i.e., children under the age of five and women.

The food security and nutrition indicators

Following are the key household indicators.

Food Consumption Score: This combines food diversity and food frequency (the number of days each food group is consumed) weighted by the relative nutritional importance of different food groups. Cereals, tubers and root crops are assigned a weightage of 2; pulses as 3; vegetables and fruits as 1; meat, eggs, fish and dairy as 4; sugar, oils, fats and butter as 0.5. The household level of Food Consumption Scores (FSC) so obtained is then divided into three groups: poor (FSC <= 21), borderline (FSC >21-35) and acceptable (FSC > 35) food consumption levels.

Food Expenditure Share: Food expenditure is an indicator to measure economic vulnerability, when survey data cannot generate poverty line. This indicator is essentially a ratio of total food expenditures to total household expenditure. The ratio is then divided into four groups: food secure (<50%), marginally food secure (50-<65), moderately food insecure (65%-<75%) and severely food insecure (=>75%).

Livelihoods-based Coping Strategies: The livelihoods-based coping strategies are used to better understand longer-term households' behaviours on how likely they will meet challenges of food shortage in adapting crises, such as selling productive assets. This provides insights into the difficulty of their situation. Livelihood strategies

have been grouped into three categories; stress strategies, crisis strategies and emergency strategies. More details are provided in the annex.

Consolidated Approach to Reporting Indicators of Food Security (CARI): The CARI console combines above three food security indictors and reports an overall food security situation. In the first step, an average of coping strategies and four classification of food expenditure is calculated. In the second step, it combines with Food Consumption Score 4 points classification. As per the CARI console, households are grouped into four categories; food secure, marginally food secure, moderately food insecure and severely food insecure.

Individual-level indicators

Sex of children: Gender was recorded as male or female.

Birth date or age in months for children 0-59 months: The exact date of birth (day, month, year) was recorded from either a child health card or birth notification, if available. If no reliable proof of age was available, age was estimated in months using a local event calendar or by comparing the selected child with a sibling whose ages were known, and was recorded in months on the questionnaire. If the child's age could absolutely not be determined by using a local events calendar or by probing, the child's length/height was measured and a cut off between 65-110 cm was used for inclusion.

Age of women 15-49 years: Reported age was recorded in years.

Weight of children 6-59 months: Measurements were taken to the nearest 100 grams using an electronic scale. Clothes were removed during weighing although where necessary, light undergarments were allowed.

Height/Length of children 6-59 months: Children's height or length was taken to the closest millimetre using a wooden height board. Height was used to decide whether a child should be measured lying down (length) or standing up (height). Children less than 87cm were measured lying down, while children ≥ 87cm were measured standing up.

Oedema in children 6-59 months: The presence of bilateral oedema was determined by applying gentle thumb pressure on to the tops of both feet of the child for three seconds. If a shallow indent remained in both feet, oedema was recorded as present. The survey coordinators verified all oedema cases reported by the survey teams.

MUAC of children 6-59 months and women 15-49 years (PLWs only): Mid Upper Arm Circumference (MUAC) was measured at the mid-point of the left upper arm between the elbow and the shoulder and taken to the closest millimetre using standard tapes.

Infant and young child feeding practices in children 0-23 months: Infant and young child feeding practices were assessed based on standard WHO recommendations (WHO 2007).

Annex I provides the methodological details employed in the field survey for this study.
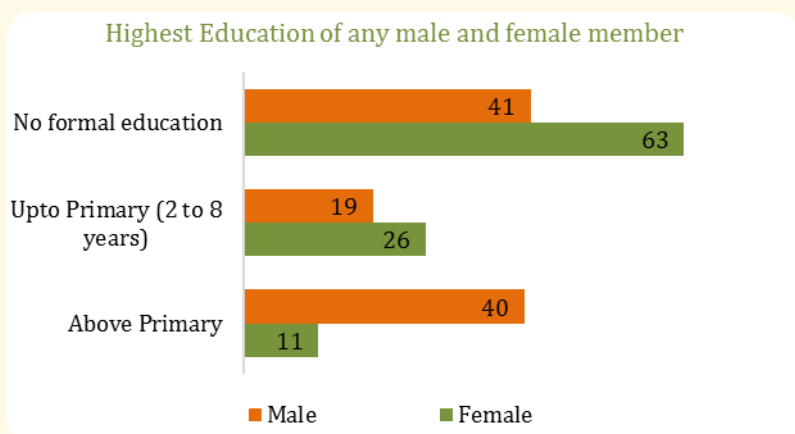
Household Profile

A total of 625 households were surveyed, out of which 73 percent were headed by men and 27 percent by women. The average age of the head of household is 41 years. Most household heads (61 percent) have no formal education, whereas 15 percent have had primary education and 24 percent have more than primary education. A noticeable educational disparity exits across genders of household members, for instance, above primary as highest education attainment among men is 40 percent, whereas the same for women is only 11 percent (see below graph). Around 40 percent of the school age (5 to 15 years) children are out of schools. This proportion is 42 percent for girls and 37 percent for boys. The dominant reasons of children not going to school are: parents unable to afford school expenses and children are taking care of their siblings.

The average household size is found to be 8.2. Around half of the surveyed households have been residing in Bor for longer than 5 years while the remaining half have less than 5 years' residency, among them 10 percent are IDPs and returnees. A significant number of respondents (27 percent) reported at least one of the household members have migrated outside of their regular place of residence. This includes migration to other urban centres in the country (38 percent), other rural areas of the country (27percent), neighbouring countries (32percent) and other countries (4percent). The main reasons for their migration are to attend school (30percent), in search of job (11percent) and insecurity (11percent). Some 15 percent of households had at least one physically disabled member, while 12 percent of households had one chronical ill member and 3 percent of households at least one mentally disable member. Around 27 percent of households are hosting at least one orphan.

Average HH Size		8.2
Gender of HH Head	Male	73%
	Female	27%
HH residing in Bor since	Less than 5 years	51%
	5 or above years	49%
HH have at least one member	physically disabled	10%
	mentally disabled	3%
	chronically ill	12%
HH hosting an orphan		17%
IDPs and returnees HHs		10%
HH's any member migrated in 12 months		27%
House Ownership	Own	74%
	Temporary shelter/hosting by someone	19%
	Rented	4%
	Others	7%
Average time (hours) to fetch drinking water		3.2
Type of toilet	Traditional pit latrine	77%
	Open defecation	20%
	Other type of latrine	4%

Around 74 percent of households reside in their own houses. Around 10 percent of them are hosted by someone, 9 percent are living in temporary shelters, 4 percent in rented accommodation, while 3 percent are living with their relatives (in-laws or parents). The housing structure shows that walls of 53 percent of houses are made of earth followed by 23 percent of semi-permanent martial, whereas most of the roofs (79 percent) are made of straw or wood. Around 6 percent of households have no living room, 14 percent of households have one living room, and the majority of households (59percent) have two to three rooms. The main source of light is provided by torches (74 percent) and the main source of energy for cooking is collected firewood (78percent) and charcoal (17percent).

Highest Education of any male and female member

	Male	Female
No formal education	41	63
Upto Primary (2 to 8 years)	19	26
Above Primary	40	11

The main source of drinking water for 95 percent of households are deep boreholes. Most of the households consider their drinking water as safe, thus 81 percent of households do not treat their drinking water. Only 1percent of households have source of drinking water in their homes. Other households spent around 20 minutes to commute (two way) to the water source and wait for up to 3 hours for their turn for water collection. Around 77 percent of households have traditional pit latrines, whereas 20 percent of household members have no latrine and have to go for open defecation.

Food Security Overview

As per the Consolidated Approach to Reporting Indicators (CARI) approach, food security is calculated by considering the food consumption score, food expenditure share and livelihood coping strategies. The overall food security situation is alarming with 85 percent of households being food insecure; 44 percent of them severely food insecure and another 41 percent moderately food insecure. The household food insecurity situation has been heavily impacted by the purchasing power, which has eroded due to a persistent economic crisis in the country. The results show that even among the richest quintile among the surveyed households, 22 percent households are severely food insecure; while this figure is 59 percent and 47 percent among the poorest and the second poorest quintiles respectively. Furthermore, the results show a correlation between education levels of head of households and food security, particularly for women heads of households. While 75 percent of households are severely food insecure where none of the female members is educated, 5 percent of households were found to be severely food insecure where households had at least one female member with a primary level of education.

A slightly higher percentage of male headed households (84 percent) was found to be food insecure compared to female headed households (81 percent). It is likely to assume that residents have more economic access to food than IDPs and returnees. Displacement is another factor of food insecurity as 42 percent severely food insecure households' at least one member is displaced as compared to 36 percent of households in which none of the member were displaced. Food security situation also varied with the residential status as 40 percent of households who are resident are severely food insecure compared to 65 percent and 62 percent of IDP and returnee households respectively.

		Moderately food insecure	Severely food insecure
Sex of the household head	Male	40.5%	44.0%
	Female	42.1%	39.1%
Female Education	No formal education	36.3%	48.9%
	Up to Primary	58.2%	25.9%
	Above Primary	42.1%	37.1%
Residence status	Residents	42.6%	40.4%
	IDPs	31.3%	65.3%
	Returnees	22.4%	61.8%
Household any member displaced	Yes	41.6%	42.2%
	No	34.5%	36.3%
House ownership	Own	39.9%	42.3%
	Hosted by someone	31.3%	62.1%
	Temporary shelter	46.7%	35.4%
Main income activity	Agriculture and livestock	36.1%	43.0%
	Causal labor	47.8%	36.9%
	Skilled/Salary work	44.4%	39.1%
	Petty trade	40.0%	32.5%
	Assistance/ borrowing/ support	34.8%	50.0%
	Sale of natural resources	43.4%	46.5%
HH usually cultivates	Yes	32.3%	50.6%
	No	41.9%	41.8%
HH owns livestock	Yes	49.9%	24.2%
	No	40.1%	44.3%

Moreover, households who are engaged in unstable economic activities are more prone to food insecurity. 88 percent of households are food insecure among those dependant on sale of natural resources (firewood, charcoal etc) followed by 85 percent among those dependant on casual labour, On the other hand, this proportion is 73 percent among petty traders and 75 percent among households engaged in agriculture and livestock.

Food Security and Wealth Quintiles

Overall Food Security


Education and Severe Food Insecurity
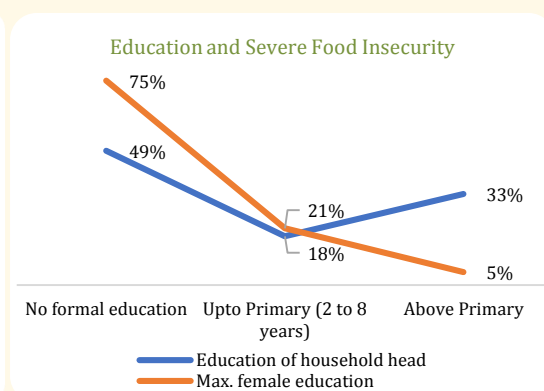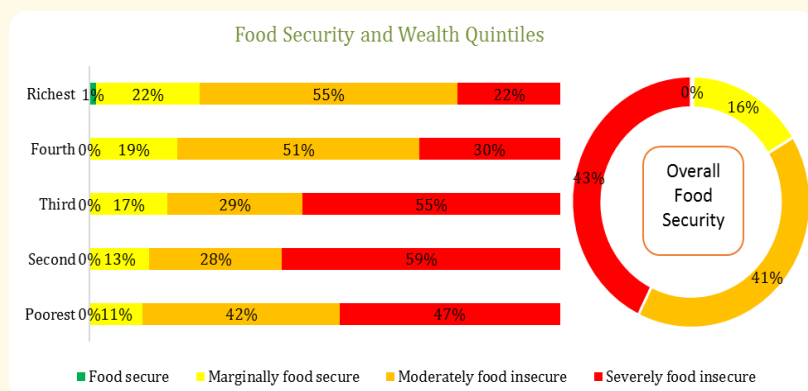
Food Consumption

Among the surveyed households, only 23 percent had acceptable food consumption, while 35 percent were found to have poor food consumption and 42 percent were classified as having a borderline food consumption. The poor food consumption is found most prevalent in households in which the head of household, or women in particular, have no education, households with fewer members, IDPs, households with no living room and households belonging to poorer wealth quintiles.

It is observed that households with the poorest consumption pattern tend to consume almost no milk and other dairy products, fruits, meat and nutrient-rich foods. Those showing a borderline food consumption do eat meat, vegetables and legumes and nuts more than a day per week on average. Households belonging to acceptable food consumption level, eat meat, milk and legumes at a frequency of approximately 3 days per week. Overall, consumption of fruits is negligible across all food consumption categories. The results from food consumption nutrition module also confirm that around 61 percent of households did not consume any iron while 35 percent did not consume any vitamin-A rich food y during seven days prior to the survey.

The results further show that, on average, an adult member of household was eating only 1.5 meals per day, while children (6-12 years) were eating 1.6 meals per day and children (2-5 years) were eating 2 meals per day.

As per the household hunger scale, the majority of households (86 percent) fall under moderate hunger, whereas 3 percent of households are at severe scale of hunger. Around 9 percent of households face no hunger, while 2 percent of households have slight hunger.

Number of days food groups consumed by food sconsumption groups
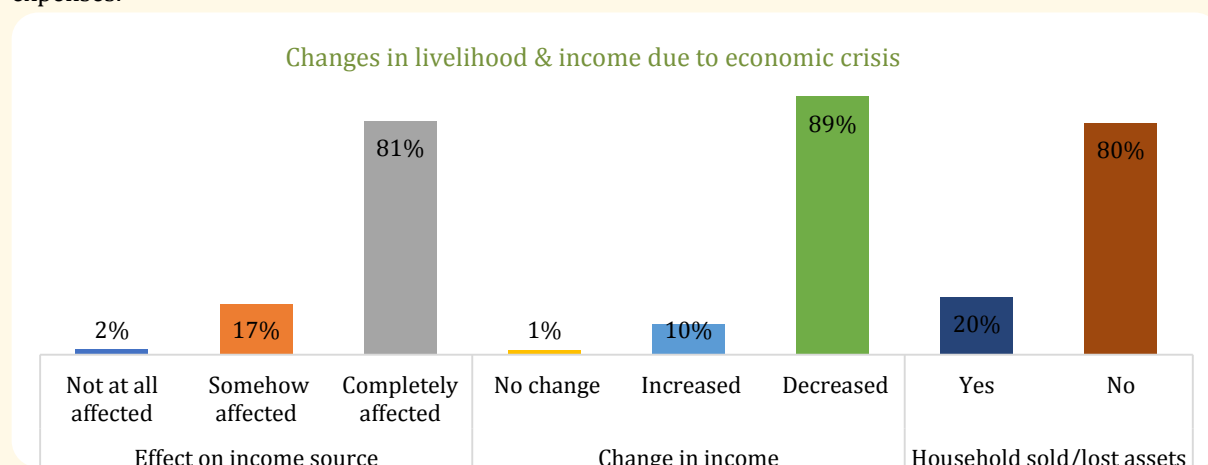

Food Consumption Score-Nutrition
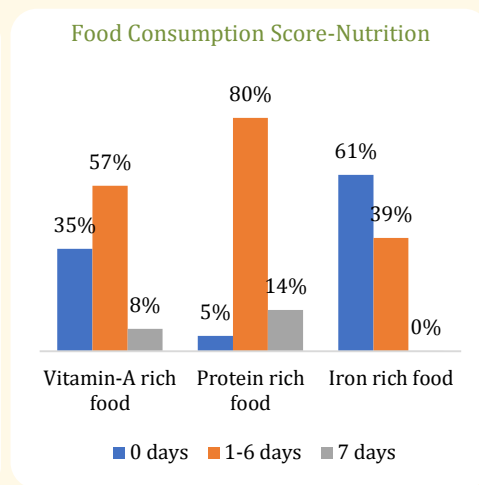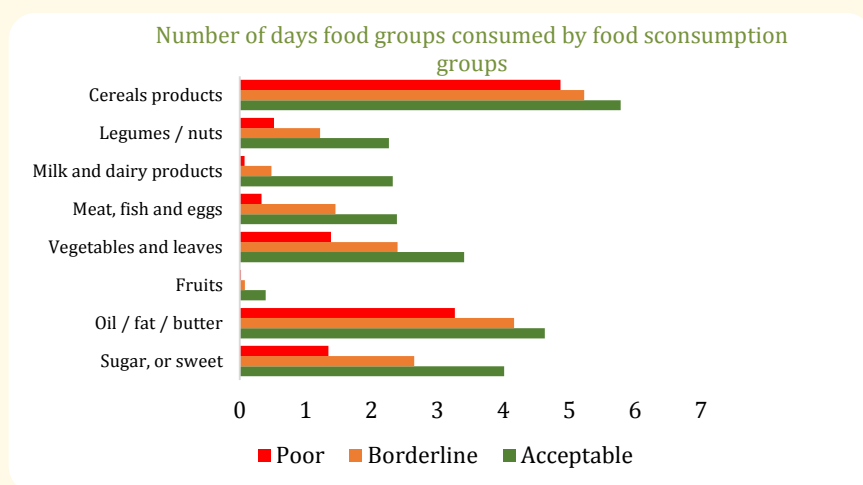
Livelihoods and income

The persistent economic crisis in the country that started in 2015, has severely impacted livelihoods and income of the households. Overall inflation has sky-rocketed over the past two years. Beside other factors such as low local production, high transportation costs and disruption of supplies due to conflict, the main driver of the inflation is local currency depreciation.

The survey results show that average monthly income of households in US dollar terms has decreased from $495 to $24, which is about 20 times less than what they were earning before the economic crisis[2]. Presently, 38 percent of households are dependent on salaried/skilled work as the main livelihood source, followed by either assistance, borrowing or support from relatives. Proportion of households with agriculture and livestock has been found to be 8 percent, down from 19 percent before the economic crisis. Furthermore, more than half of households (55 percent) have changed their main livelihood source (see table). This livelihood change has adversely affected women and children. More women and children are working now compared to before the crisis. Assets depletion is also observed and results show that on average a household lost three assets.

The survey results further reveal that almost all (98 percent) households' main source of income has been affected. Among those, 81 percent of households' main income source is completely affected and for 17 percent of households is partially affected. Due to this change, 38 percent of working household members continue to do the same work but earn less, 20 percent work less than before and 20 percent are unemployed. Some 89 percent of households reported their income has decreased. Despite the reduction of income and even loss of livelihood source, only 20 percent of households were found to have sold or lost their assets. It is likely that these poor households might have very narrow and poor asset base with almost no market worth or they already exhausted their assets. Among the households who sold their assets, 50 percent reported they sold their assets to buy food. Around 30 percent of households reported their assets were destroyed or looted during the war, while 27 percent reported selling assets to pay for health-related expenses and 25 percent for children's school expenses.

		At present	Before economic crisis
Main livelihood Source	Skilled/Salary work	38%	31%
	Assistance/borrowing/ support from relatives	28%	31%
	Sale of firewood/poles, charcoal, grass, stones	10%	7%
	Causal labor	9%	6%
	Agriculture and livestock	8%	19%
	Petty trade	7%	6%
	Others	0%	0%
Percentage of households changed their main livelihood source due to economic crisis		55%	
Average household income (SSP)		2,633	1,732
Average household income (USD)		24	495
Average number of HH members in livelihoods	Men	0.51	0.84
	Women	0.68	0.35
	Children	0.57	0.44
Average assets holding		18.2	21.2

Changes in livelihood & income due to economic crisis

Effect on income source			Change in income			Household sold/lost assets	
Not at all affected	Somehow affected	Completely affected	No change	Increased	Decreased	Yes	No
2%	17%	81%	1%	10%	89%	20%	80%

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[2] Even though the average income in local currency has increased from SSP 1,732 to 2,633 per month, this signifies a huge decrease in real terms due to massive depreciation of the local currency.

Expenditure

An average household's monthly estimated expenditure was found to be SSP 10,970 (about US$ 100 at the exchange rate during the time of the survey) as reported by the respondents. Out of the total expenditure, 78 percent (SSP 8,513) was spent on food. Such a high proportion of expenditure on food is an indication of the households' vulnerability to food insecurity.

Among the amount spent on the food, 60 percent was spent on cereal and tuber, while 10 percent was spent on oil, 9 percent on meat and 8 percent on pluses. Similarly, households spent 2.1 percent on milk and 1.6 percent on vegetables, while the expenditure on fruits was negligible. Thus households are consuming mainly macro-dense food in order to get energy, while they had very little or no consumption of micro-nutrient-rich food. Among the non-food expenditure, major shares go to health (20 percent), education (15 percent), house reparation (10percent), celebrations and social events (10percent) and firewood and charcoal for cooking (10percent). Due to continuous depreciation of the South Sudanese Pound and poor purchasing power of the households, traders would be less willing to offer credit. The results show that households had on average 8 percent of their total expenditure on credit. Share of credit in expenditure on food stands at 5 percent, and for non-food items at 15 percent.

Average monthly expenditures			
	Cash	Credit	Total
Cereals and Tubers	4,750	330	5,080
Pulses and sesame	641	11	652
Roots	4	-	4
Eggs	4	-	4
Milk	162	15	177
Sugar	540	21	560
Vegetables	131	5	136
Fruits	1	-	1
Meat	704	17	721
Oil	853	31	884
Drinks	29	14	43
Other food	242	9	251
Total Food expenditure	8,060	453	8,513
Total Non-Food	2,079	378	2,457
Total Expenditure	10,139	831	10,970

The survey results show that around 2.5 percent of households are exchanging their goods for goods (bartering). Around 42 percent of households have borrowed money during the past 12 months. Among those 80 percent borrowed from their parents/friends, followed by 18 percent from local lenders. Some 53 percent of households said that there is less chance of getting food on credit compared to 2 years ago, whereas 17 percent reported no chances of getting food on credit. 84 percent of households conveyed the main reasons of less food on credit as high prices, followed by 22 percent who view the reason as traders having less cash available. Some 79 percent of households stated the main purpose of borrowing is food, 9 percent for health and 7 percent for education.

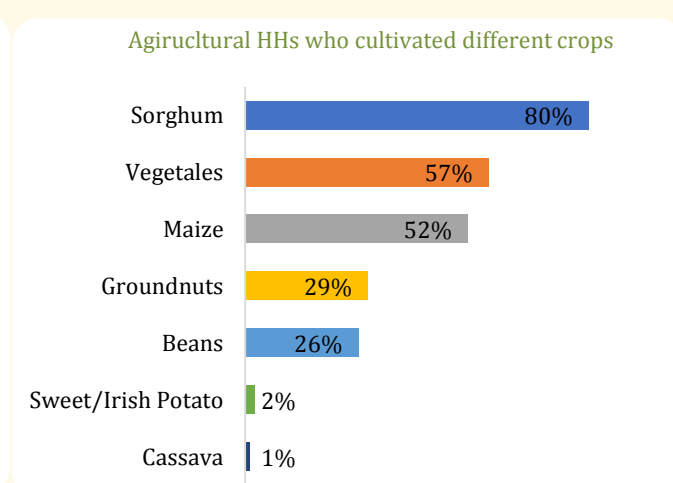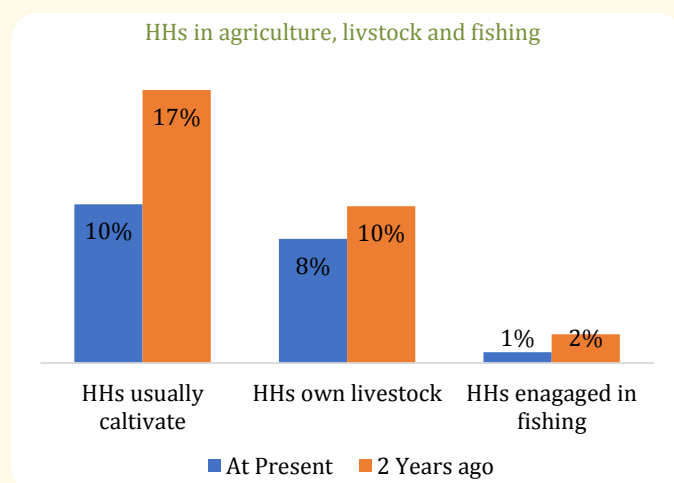Food Expenditure Share

Food Exenditure Share
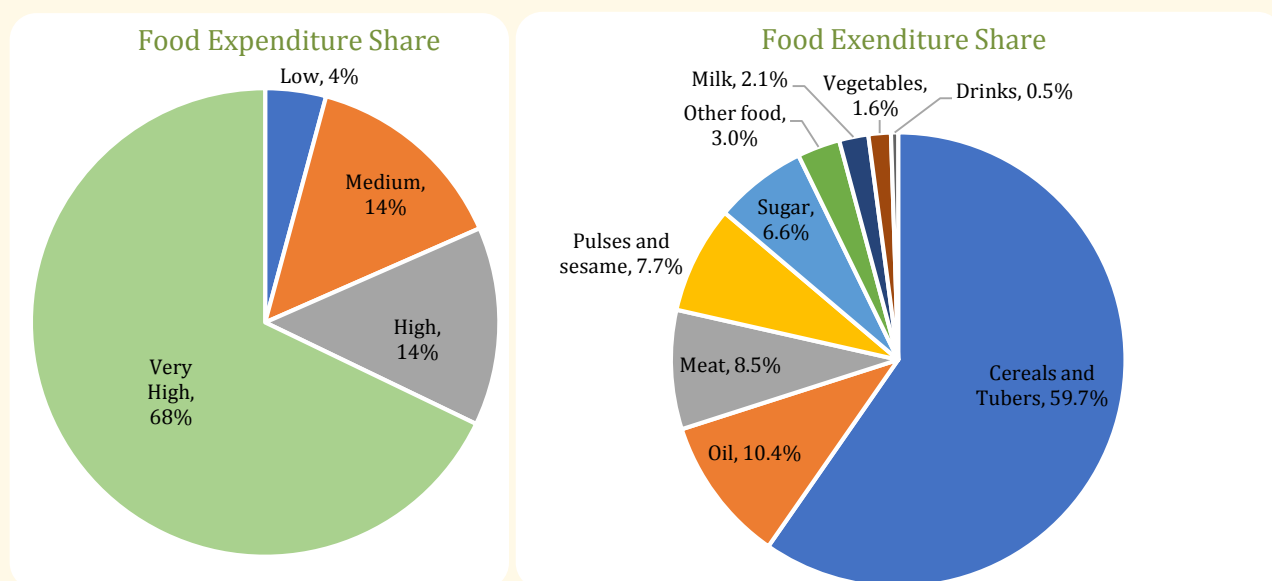
Agriculture and Livestock

About 10 percent of households reported they usually cultivate their lands, whereas 17 percent used to cultivate their land before economic crisis. Similarly, around 2 percent less households own livestock and households engaged in fishing were now 1percent less compared to before the economic crisis.

Among the households cultivating land, most are subsistence farmers, with 70 percent of them cultivating less than half *Feddan*[3] and 20 percent cultivating 0.5 to 1 *Feddan*, and 10% were cultivating more than 1 *Feddan*. It was found that the proportion of households cultivating more than 0.5 *Feddan* decreased by more than half compared to two years ago, while proportion of those cultivating less than 0.5 *Feddan* increased. Furthermore,

due to the economic crisis, more burden of agricultural activities has shifted to women and girls. For an average household, 1.4 female members are involved in agricultural activities compared to one male member. Most households (80 percent) cultivated sorghum and more than half also cultivated vegetables and maize (57 percent and 52 percent respectively). Households reported that on average, their cereal production is sufficient to meet their own consumption needs for 2 months in a year. Main challenges for farming cited were floods (28 percent), pests and diseases (20 percent) and shortage of agriculture tools (19 percent). Some 9 percent of households also reported insecurity as the main challenge for farming.

		At Present	2 Years ago
HH cultivated Feddans	< 0.5 Feddan	70.4%	38.1%
	0.5 – 1 Feddan	20.1%	50.0%
	> 1 Feddan	9.5%	11.9%
HH members were involved in agriculture activities	Men	1.0	1.3
	Women	1.4	1.4
	Boys	0.7	0.7
	Girls	0.9	0.7
Average number of livestock HH owns	Cattle	4.0	12.5
	Sheep	0.8	1.1
	Goats	4.8	8.6
	Poultry	2.9	5.8
Tropical Livestock Unit (TLU)		3.4	9.8
Livestock holding (TLU)	No livestock	92.3%	90.0%
	Negligible (<0.5 TLU)	1.7%	0.1%
	Low (0.5 to 1 TLU)	0.9%	0.5%
	Medium (>1 to 4 TLU)	3.2%	2.2%
	High (> 4 TLU)	1.9%	7.1%

Livestock is an important contributor to household food security in South Sudan. A significant reduction in livestock

holding is noted. The average Tropical Livestock Unit (TLU)[4] per household was 9.8 two years ago which has now reduced to 3.4. On average, a household lost 7.5 cattle, 2 goats, 3 poultry birds and 0.3 sheep during this period. Around 49 percent of households reported lack of veterinary services as the main challenge for livestock keeping, followed by pests and diseases (35%) and conflict and insecurity (10%).

HHs in agriculture, livstock and fishing

Agiruacltural HHs who cultivated different crops

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[3] Feddan is a measure of area used in South Sudan, 1 feddan = 0.42 hectare
[4] TLU (Tropical Livestock Unit) values are: Camel=1, cattle=0.7, goat/sheep=0.1 and poultry=0.01. Source FAO (1987), Livestock Production in tropical Africa
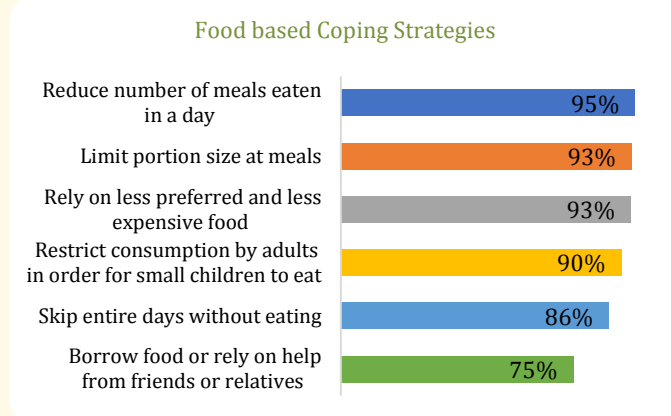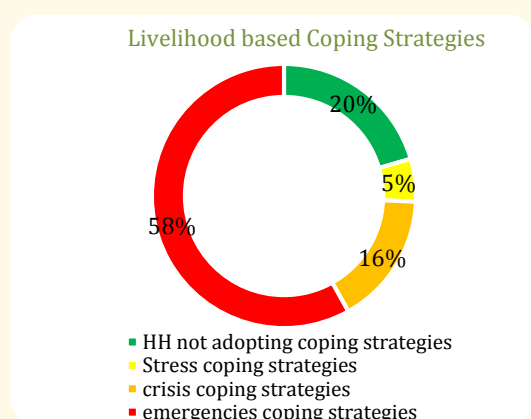
Household shocks and coping

Households were asked whether they experienced any shock during the past six months. Almost all households (93 percent) reported depreciation of the local currency as the main shock, followed by unusual price hike (76 percent), insecurity/violence/theft (58 percent), and reduction in household income (54 percent). It is thus clear that household shocks were mainly related to economics crisis. Households affected by shocks, particularly those from poor and vulnerable sections of society face difficulties to meet the household food requirements.

Families vulnerable to food insecurity and malnutrition use a variety of coping strategies when they are confronted with a shock. These include limiting food intake, shifting to less nutritious/less desirable food, borrowing money/taking up loans, and in the most severe cases, selling productive assets in order to feed family members - thereby further decreasing resilience to future shocks. More than 90 percent of households reported that they reduced the number of daily meals, limited portion size of the meals and relied on less preferred and less expensive food as coping strategies. Around 90 percent of households reported that adults in the households were consuming less to feed children. The reduced coping strategies index shows that only 3 percent of households are not adopting any food based coping strategy, whereas 12 percent of households were exercising high level coping strategies, 36 percent medium and 49 percent low level food based coping.

Main household Shocks	
Depreciation of SSP	92.9%
Unusually high food prices	76.0%
Unusually high prices of fuel/transport and other non-food prices	58.4%
Insecurity/violence/theft	58.3%
Reduced income of a household member(s)	54.4%
Loss or reduced employment for HH member(s)	38.5%
Unusually high level of crop pests and disease	20.3%
Theft of productive resources	19.4%
Serious illness or accident of HH member(s)	17.5%
Drought/irregular rains, prolonged dry spell	11.6%
Epidemics	9.0%
Death of head of household/Spouse	6.6%
Death of working HH member(s)	6.1%
Others	1.7%

Furthermore, about 80 percent of households were found to be resorting to livelihood based coping strategies such as reducing expenses on health and education, borrowing money or purchasing food on credit (75 percent), withdrawing children from school (73 percent), spending savings (66 percent), and sending household member away (64 percent). Further categorizing different livelihood-based coping strategies into stress, crises and emergency strategies[5], revealed that more than half (58 percent) of households adopted emergency coping strategies while 16 percent were adopting crisis and 5 percent were adopting stress coping strategies. Only 20 percent of households did not adopt any of these livelihood-based coping strategies.

Livelihood based Coping Strategies

- 20%
- 5%
- 58%
- 16%

■ HH not adopting coping strategies
■ Stress coping strategies
■ crisis coping strategies
■ emergencies coping strategies

Food based Coping Strategies

Reduce number of meals eaten in a day	95%
Limit portion size at meals	93%
Rely on less preferred and less expensive food	93%
Restrict consumption by adults in order for small children to eat	90%
Skip entire days without eating	86%
Borrow food or rely on help from friends or relatives	75%

[5] Stress strategies include sending household members to eat elsewhere, spending saving or selling more animals than usual, selling household assets such as furniture of utensils, and borrowing money or purchasing food on credit. Crisis strategies include withdrawing children from school, selling productive assets or means of transport and reducing essential non-food expenses such as health and education. Emergency strategies include migration of entire household, engaging in degrading job or risky income generating activities and begging.

MALNUTRITION

Out of 716 children included in the analysis, 25.7 percent were acutely malnourished. This finding is rather shocking as earlier assessments in Bor showed GAM prevalence around 10 percent, although those assessments included rural areas of Bor as well. This is the first assessment conducted exclusively in Bor urban areas. In addition, the most recent SMART surveys in Bor were conducted in the harvest period, while this assessment was conducted in April, the beginning of the lean season. This partly explain the discrepancies in GAM. Furthermore, in all urban assessments that have been conducted in South Sudan, GAM is higher than that in corresponding rural areas. This has often been related mainly to child care; the kind of livelihood/income earning activities common in urban areas encroach on time for child care/feeding.
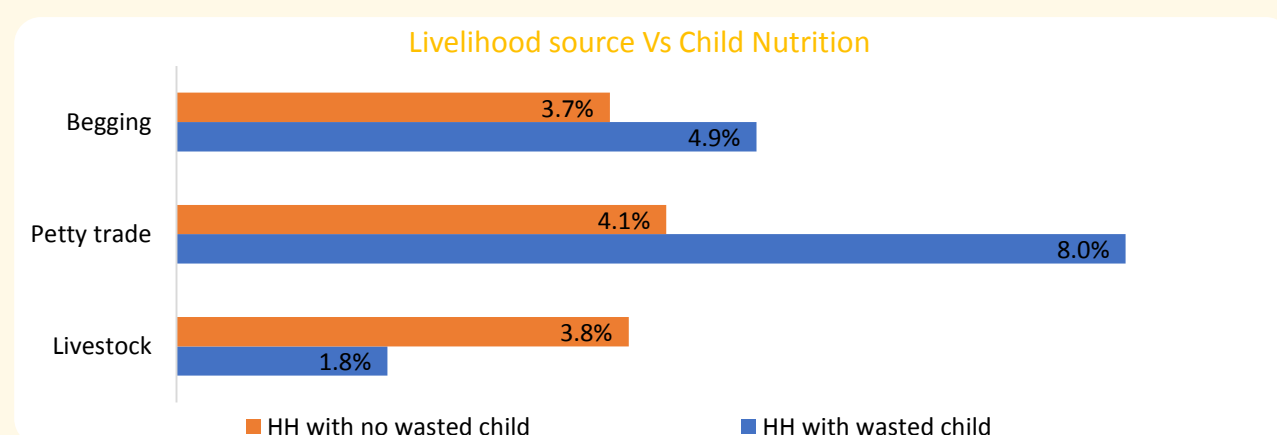
Results highlight some important factors related to the nutrition situation in the surveyed area. The most important underlying factor from the statistical analysis for the child nutrition status is the nutrition status of the mother. The nutrition status of mothers predicted the nutrition status of child. Children whose mothers were wasted (MUAC less than 23cm) were 8 times more likely to be wasted than those belonging to non-wasted mothers. Findings indicate that 16 percent of women assessed are wasted and wasting does not differ significantly between pregnant and non-pregnant women.

WHZ	All (% 95% CI) n = 716	Boys (% 95% CI) n = 339	Girls (% 95% CI) n = 377
Global Acute malnutrition (<-2 z-score and/or oedema)	**25.8 %** (21.9 - 30.2)	31.0 % (25.6 - 36.9)	21.2 % (17.0 - 26.2)
Moderate Acute Malnutrition (<-2 z-score and >=-3 z-score, no oedema)	19.4 % (16.2 - 23.1)	21.8 % (17.4 - 27.0)	17.2 % (13.7 - 21.5)
Severe Acute Malnutrition (<-3 z-score and/or oedema)	6.4 % (4.4 - 9.2)	9.1 % (6.2 - 13.3)	4.0 % (2.2 - 7.1)
MUAC	**All** **n = 739**	**Boys** **n = 353**	**Girls** **n = 386**
Global Acute Malnutrition (< 125 mm and/or oedema)	8.0 % (5.6 - 11.2)	9.3 % (5.9 - 14.6)	6.7 % (4.2 - 10.6)
Moderate Acute malnutrition (< 125 mm and >= 115 mm, no oedema)	7.7 % (5.4 - 10.8)	9.3 % (5.9 - 14.6)	6.2 % (3.8 - 10.0)
Severe Acute Malnutrition (< 115 mm and/or oedema)	0.3 % (0.1 - 1.1)	0.0 % (0.0 - 0.0)	0.5 % (0.1 - 2.1)

Child nutrition status is influenced by key socio-economic factors that impact household food access. Findings reveal a startling demographic of an average household size of 9 persons while the national average household size in urban areas is estimated at 7.16. More compellingly, excess dependency[7] is registered in these households. About 61 percent of household members are either under 15 or over 65 years (constituting the dependent group) when, for instance, in the assessment conducted in urban Juba area in 2015, it was estimated at 40 percent, posing a strain on households in terms of meeting food needs. It is

Livelihood source Vs Child Nutrition

- Begging: HH with no wasted child 3.7%, HH with wasted child 4.9%
- Petty trade: HH with no wasted child 4.1%, HH with wasted child 8.0%
- Livestock: HH with no wasted child 3.8%, HH with wasted child 1.8%

■ HH with no wasted child   ■ HH with wasted child

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[6] National baseline household survey, National Bureau of statistics, Report for South Sudan, 2012
[7] Dependency Ratio is the ratio of the population 0 to 14 years added to the population aged 65 years and above to the population 15 to 65 years old

not surprising, therefore, that households with more members consumed significantly less meals (p=0.01, OR=1.075).

An important role of livelihoods in child nutrition is clearly displayed by the findings. Households with children with better nutrition statuses had better access to livestock, signifying better access to milk and meat, whilst income sources like petty trade and begging were higher among households with malnourished children. Moreover, children from households with livestock had increased odds of having better nourished children. (P=0.064, OR=1.837). Also, households with wasted women were less likely to rely on crop production, implying that they tend to rely more on food purchases, which is getting increasingly constrained by reducing purchasing power. The Bor urban population relies mostly on salaried work, food assistance, kinship and sale of natural resources. Some studies have demonstrated that women engagement in agricultural labor increases household dietary diversity and child and maternal nutrition due to contribution of agriculture to the household diet[8].

Related to food access issues highlighted above is the precarious child feeding status. Less than 10 percent of the children received the recommended feeding quality; 1.1, 9 and 0 percent received the recommended minimum dietary diversity, meal frequency and acceptable diet, respectively. Child feeding in urban areas is strongly influenced by the absence of mothers as they fend for households. Results also show that children in households that consumed better diets had increased odds of better feeding.

Results show that households have good access to public health services while access to WASH is more challenging. Some 94 percent of the children surveyed received measles vaccination, 96 percent received vitamin A supplementation while 90 percent slept under a mosquito net the night before that assessment. Some gaps were observed in the deworming levels where 67 percent of children received deworming treatment. Nearly all households (96 percent) reported accessing drinking water from protected water sources while 78 percent of the households surveyed own toilets. These levels are higher than those observed in many parts of South Sudan. In turn, morbidity prevails within modest levels (diarrhoea 28 percent, fever/malaria 31 percent and acute respiratory infections 19 percent). However, only 17 percent treat drinking water before drinking. Ownership of a toilet was seen to significantly influence morbidity (p-value=0.029, OR=1.519).

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[8] Hitomi Komatsu, Hazel Jean L. Malapit, Sophie Theis. IFPRI Discussion Paper 01486, December 2015. How Does Women's Time in Reproductive Work and Agriculture Affect Maternal and Child Nutrition?. Evidence from Bangladesh, Cambodia, Ghana, Mozambique, and Nepal

DIMENSIONS OF FOOD SECURITY

Food availability

Own Production, Market availability

About 10 percent of the households were found to be cultivating their own land and their production helped meet their food consumption needs partially. For instance, in average their cereal production was sufficient to meet the household consumption needs for about 1.8 months of the year. This sufficiency was 2 months during the last year. Around 53 percent of households perceive that availability of food commodities in the market is higher compared to pre-economic crisis, while 46 percent perceive the opposite. Furthermore, households were asked about availability of food commodities in the market as per their needs. Results show that around 60 percent of the households think that food is not sufficient in the market, whereas 26 percent households reported sufficient food availability in the market. Only 6.5 percent report food is not at all available in the market.

About 63 percent of households reported that sorghum, which is the main staple in the country, is available in their nearest market. Similarly, 59 and 62 percent of households reported that wheat flour and maize, respectively, are available in the market. Availability of sugar and cooking oil is relatively higher (74 percent and 72 percent respectively) than other food items.

Food Availability in Market

Commodity	Percent
Wheat flour	59%
Maize	62%
Sorghum	63%
Beans	69%
Maize Flour	69%
Cooking oil	72%
Sugar	74%
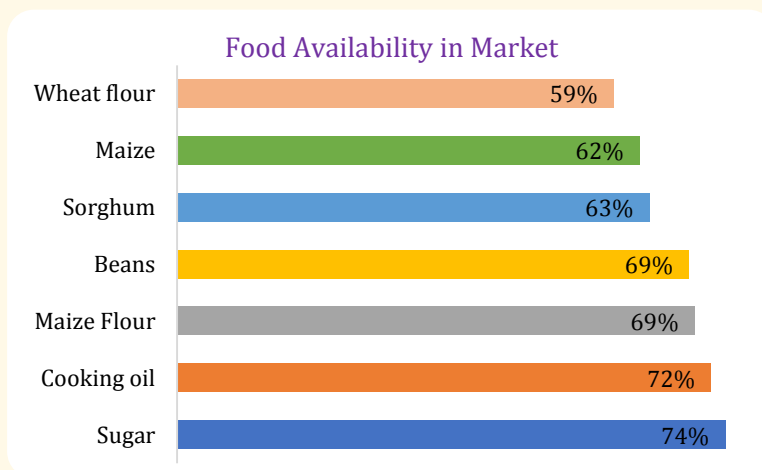
Food Assistance

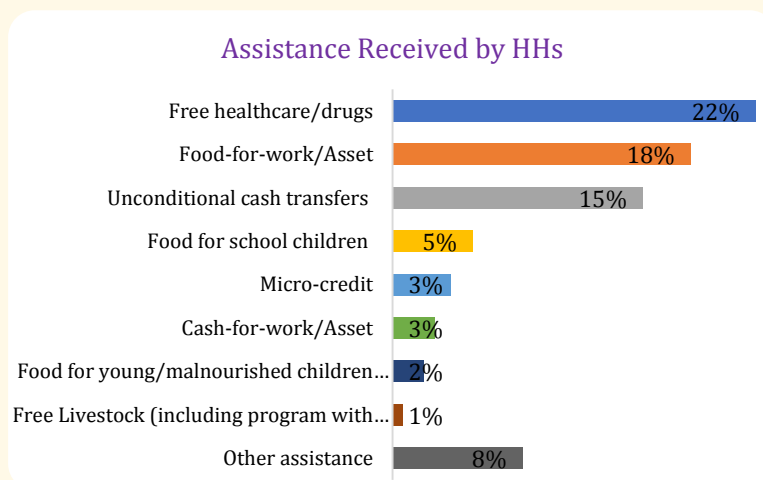Some 27 percent of households reported receiving humanitarian assistance over three months prior to the survey. Among the households receiving assistance, 22 percent received free healthcare/drugs, followed by food for work/asset (18 percent), unconditional cash transfer (18 percent) and food for children attending school (5 percent). Around 8 percent of households reported receiving other types of assistance that mainly includes conditional and unconditional food.

The survey asked for households' preferences for transfer modalities of possible future humanitarian assistance. Two third (68 percent) of households prefer food assistance, 7 percent prefer vouchers and 3 percent prefer cash assistance, while remaining 23 percent of households prefer a combination of food and cash assistance. The reported reasons for preferring food assistance are high food price in the market (35 percent), followed by the perception that food they receive is better for nutrition (17 percent) and meeting the food shortage (7 percent). Dominant reason for cash preference is that cash can be used to buy preferred food (83 percent) . There is a variety of reasons for cash and food as combination. Among the reasons, 49 percent of households reported both (food and cash) have advantages at different periods of the year in order to meet different seasonal needs. Around 27 percent of households viewed that the food and cash combination gives multiple options to diversify diets, whereas 13 percent thought that it minimizes risks of losing all cash and receiving poor quality food..

Assistance Received by HHs

Category	Percent
Free healthcare/drugs	22%
Food-for-work/Asset	18%
Unconditional cash transfers	15%
Food for school children	5%
Micro-credit	3%
Cash-for-work/Asset	3%
Food for young/malnourished children…	2%
Free Livestock (including program with…	1%
Other assistance	8%

Households' access to food

There are a number of factors that determine access to food of an individual or a household. Market access and food prices are the most important limiting factor in South Sudan. Purchasing capacity is highly dependent on prices of food commodities; indebtedness, sources of livelihoods, and income.

Market access and prices

Bor market gets its supply of food and non-food commodities largely from Juba town. Almost all staple food commodities are imported from neighbouring countries. The rapid depreciation of the local currency has implications on the purchasing power of market dependent poor households, mainly the urban poor. On the other hand, the overall slowdown of the economic activities impeded the income generating opportunities of urban households who largely depend on non-farming activities. The scarcity of fuel has also contributed to high transportation costs and prices of commodities in the market. The disruption of agricultural activities in traditional food source states (Western, Central and Eastern Equatoria states), that led to a below-average production during the last harvest, has heavily impacted the prices to remain at elevated levels even during the main harvest season of the year (October – November).

Similar to other markets in South Sudan, Bor market has also suffered from the economic crisis. The prices of staples have gone far beyond affordability levels of many poor and very poor households. Since the beginning of 2016, the monthly average growth rate of food items showed dramatic increases: the monthly growth rates of prices in Bor were in the range of 16-21 percent for white sorghum, white maize, wheat flour, vegetable oil and maize flour. The monthly price growth rates of field bean and petrol were 8 percent and 12 percent, respectively. In nominal terms, the daily wage of unskilled labour has grown at a rate of 17 percent. Despite the observed

growth rate of unskilled wage, the stability of casual labour opportunities is the major concern for wage dependent households to earn minimum incomes to meet households' food and non-food requirements.

As depicted in the graph, the nominal retail prices of main staple cereal, white sorghum stood far above the 2016 levels and a five-year average. In 2017, the price of white sorghum has increased by more than ten times compared to the same months in 2016. Other substitute commodities to sorghum such as maize flour and wheat flour that are consumed largely by the urban households have shown similar trends. Field beans, one source of protein, also recorded a price increase by about six times as compared to the same months last year.

Trends of white sorghum prices, SSP/malua
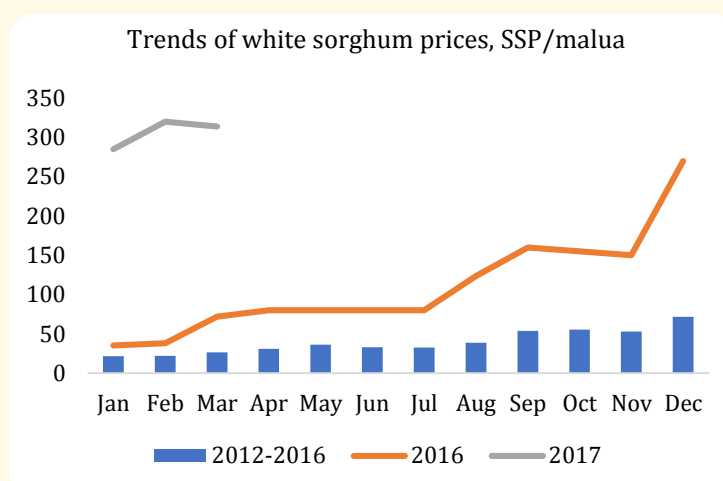
The retail prices of staple food commodities are continuously increasing. The instability of prices led market stakeholders to take irrational decision that further exacerbated the volatility of prices. As the staple food commodities are imported, the impact of exchange rates is clearly observed on retail prices. The analysis showed that the prices of staple food commodities are strongly correlated to currency exchange rates.

Household debt

Household debt is another proxy indicator for vulnerability regarding economic access to food. According to the survey results, about 45 percent of households had borrowed cash to meet the food needs in the past year. The majority of households (80 percent) borrowed money from parents and/or friends, whereas about 18 percent of the households borrowed money from local lenders. Buying food on credit would be a very common coping strategy in normal economic situation. However, it is very difficult for households to get food on credit when the local currency is depreciating rapidly, as it has been the case over the past two years. Some 53 percent of households reported chances of getting food on credit have decreased as compared to two years ago, and another 27 percent households reported that traders have completely refused to give food on credit. The main reason of credit unavailability reported by 84 percent of households is that food prices are rising too fast and thus traders are not willing to sell food on credit. About 22 percent of households opine that traders were lamenting for less cash availability. The majority of the households (79 percent) borrowed money to purchase food, followed by 9 percent of households who borrowed money to meet health needs, and 8 percent to meet education expenses.

Food utilisation

Food utilization is one important pillar of food security, and refers to the assimilation of food taken by the individual. Even if food is made available and accessible, inefficient absorption of food by the body will lead to malnutrition. Once food is obtained by a household, a variety of factors affect the quality of food consumed by the members of household. Food safety (or food quality), clean water, health and sanitation and access to health care affect the food utilization. Food assimilation may be affected by the preparation, cooking and processing methods, the way it is stored or preserved, endemic disease, unsafe drinking water, poor sanitation, child feeding practices, as well as nutritional knowledge. Education, particularly education of women, has an important impact on general awareness, food habits and care practices, which in turn affects food utilisation.

Drinking water and sanitation

Inadequate access to safe and improved sources of drinking water is a major limitation to food security and nutrition. The inability to access safe drinking water leaves households vulnerable and susceptible to waterborne diseases that can be severely detrimental to the overall health of individuals and their food utilization capability.

The survey results show that around 95 percent of households get their drinking water from deep borehole fitted with a hand pump, which is outside their homes. Households spend around 20 minutes for a round trip to the water collection point. Furthermore, they queue for about 3 hours at the water collection point. Most likely those water sources are safe but carrying and storing the water in jerry cans makes the water unsafe to drink untreated.

Poor sanitation is another factor that can lead to illness and disease, which affects a person's ability to absorb the required nutrients from the consumed foods and/or suppresses appetite, eventually leading to malnutrition. The survey results show 20 percent households do not have access to toilets and they go for open defecation, whereas 77 percent are using traditional pit latrines.

Care practices

Continued breast feeding of children, especially until the age of two, is very important for the overall health and growth of children. The survey found that breast feeding practices among children 6-23 months of age is relatively good, with 70 percent of such children being currently breastfed.

RECOMMENDATIONS

The food security and nutrition situation of the urban households have been found very alarming and are likely to deteriorate further with the continuing economic crisis. Thus, the findings suggest a strong need for an urban response, particularly for vulnerable households. The analysis suggests that prevalence of food insecurity is higher in households' dependant on unstable livelihood sources such as sale of natural resources such as firewood or charcoal and casual labour, IDPs and returnees, and those living in host families.

Based on the findings of the study, the following recommendations are made:

- The Global Acute Malnutrition (GAM) is at critical level. Therefore, it is important to continue scaling up programmes for treatment of malnutrition as well as the common public health measures such as vaccination, deworming, supplementation and water and sanitation. The nutrition programme should consider both children as well as pregnant and nursing mothers.
- A programme should be implemented to address the alarming levels of household food insecurity. Since the food availability in the market is generally not a problem, the assistance could be in the form of cash or voucher or a combination of both, instead of in-kind food assistance.
- A livelihood support programme is recommended in order to support household income, particularly for those with unstable sources of livelihood. This is important to improve resilience of the households in the face of continued shocks.
- Some 20 percent of the households were practising open defecation, and thus sanitation programme should be considered in ordered to improve the hygeine condition, which affects overall food security and nutrition.
- An integrated approach of programme response is recommended, including livelihood support, health, sanitation, and training on lifee skills, health and nutrition.
- Given the hyperinflation that has continued to affect the economy, continuous monitoring of the market situation and the cost of food basket versus income levels is needed to understand the depth of the income gap and the likely implications to food and nutrition security particularly for poor households.

ANNEX 1

METHODOLOGICAL NOTES

Sampling Methodology

Administratively, Bor town comprises 30 Enumeration Area (EAs) with approximately 60,000 people. The study adopted a two-stage sampling strategy. The first stage comprises all EAs as Primary Sampling Unit (PSU). Further, large EAs were divided into sub-EAs for the purpose of the study[9]. All the EAs are well demarcated and a sketch map developed with the help of local teams. The second stage of sampling comprises of households as Secondary Sampling Unit (SSU). Each household was selected based on the systematic selection with a random start of the first household and then applying the household interval. The cluster size was 18 households and sampling interval was calculated based on the number of household in each EA provided by the office of Relief and Rehabilitation Commissioner (RRC) Jonglei-Bor. One block was dropped because it has only few households and mostly offices. The household numbers in each EA were also used for sampling weight. The sample distribution by EA and their respective sampling weights are provided below:

S.No	Block name	Planned HHs	Actual HHs	Estimated number of HHS	Sampling weight
1	Block 01	18	10	383	38.30
2	Block 02	36	9	367	40.78
3	Block 03	18	13	341	26.23
4	Block 04	18	12	246	20.50
5	Block 05	18	18	289	16.06
6	Block 06	36	43	293	6.81
7	Block 07	18	12	339	28.25
8	Block 08	36	30	432	14.40
9	Block 09	18	11	261	23.73
10	Block 10	18	19	308	16.21
11	Block N	18	9	100	11.11
12	Block M	18	9	163	18.11
13	Block O	18	5	105	21.00
14	Hai Negil	54	53	574	10.83
15	Hai Machour	36	29	423	14.59
16	Lek yak	36	36	487	13.53
17	Hai Fangak	18	17	210	12.35
18	Lang Baar A	36	30	392	13.07
19	Lang Baar B	36	31	406	13.10
20	Acheieng deir	54	51	587	11.51
21	Leu deir A	18	13	392	30.15
22	Leu deir B	18	15	406	27.07
23	Marol	18	15	230	15.33
24	Hai Salaam	36	36	391	10.86
25	Malou	36	32	507	15.84
26	Hai Sura	18	15	50	3.33
27	Hai Refrendum	18	15	172	11.47
28	Pakuau	18	18	309	17.17
29	Tebek	18	19	359	18.89
	Total	756	625	9,522	

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[9] If an EA contains more than 350 HHs was divided into two sub-EAs, whereas more than 500 HH, 3 sub-EAs were formed. The total 48 EAs and sub-EAs were formed.

Food Consumption Score

Food consumption score (FCS) is one of the main indicators for analysing food security at the household level. It is derived from frequency (number of days) of food items eaten during the period of one week (7 days prior to the survey date) within the household. Food items are grouped into nine categories based on their nutritional characteristics and each of these food groups has a standard weight as follows:

Food items included in the 9 food groups used to calculate food consumption score

Sr. No.	Food group	Food items	Weight
1	Cereals	Wheat, rice, maize, millet, bread	2
2	Legumes/nuts	Beans, Peas, lentils and nuts	3
3	Milk and other dairy products	Milk yogurt and other dairy	4
4	Meat, fish and eggs	Beef, goat, poultry, eggs and fish	4
5	Vegetables	Vegetables, leaves	1
6	Fruits	Fruits	1
7	Oil	Oils, fats and butter	0.5
8	Sugar	Sugar and sugar products, honey	0.5
9	Condiments	Spices, tea, coffee, salt, fish power, small amount of milk for tea	0

These food groups and the corresponding weights have been standardized based on research in many countries. The FCS is computed by multiplying the frequency (number of days) each of these food groups have been consumed by the corresponding weight, and recording a total of this value for all food groups consumed in the one-week period. Based on the value of FCS, households are classified into different levels of food consumption. The thresholds used for such classifications are decided by considering country specific context; in South Sudan, the classifications are: poor (1-21); borderline (>21-35); and acceptable (>35).

Coping Strategies Index

Coping Strategy Index (CSI) is an indicator used to compare the hardship faced by households. The CSI measures the frequency and severity of the behaviours of households engage in when they face with food shortages. Coping strategies are divided into two types: those that affect food consumption and those that affect the livelihoods. These types are separated with different recall periods, 7 days and 30 days respectively.

The livelihoods-based coping strategies module is used to better understand longer-term household coping capacities. In broad terms, household livelihood and economic security is determined by income, expenditures and assets. Understanding the behaviours of households engage in to adapt to recent crises (such as selling productive assets) provides insights into the difficulty of their situation, and how likely they will be to meet challenges in the future. Livelihood strategies have been grouped into three categories; stress strategies, crisis strategies and emergency strategies. Table below shows type of each strategy.

Livelihood based coping strategies

Coping Strategies	Category
Sent household members to eat elsewhere	Stress
Spent saving or sold more animals than usual	Stress
Sold household assets e.g furniture, utensils	Stress
Borrow money/ purchase food on credit	Stress
Withdraw child(ren) from school	Crisis
Sold productive assets or means of transport e.g. sewing machines, wheel barrows, etc)	Crisis
Reduced essential non-food expenses such as health, education, etc	Crisis
Entire household migrated	Emergency
Engaged in degrading jobs or risky income generating activities	Emergency
Begged	Emergency

Households were asked to respond for each strategy against four pre-coded responses: "Yes" household adopting particular strategy (=1), "No" because Household did not face a shortage of food (=0), "No", because household already sold those assets, in the last 12 months, or have engaged in this activity and cannot continue to do it (=1) and Not applicable (=0)

The sum of these recoded values yields the livelihoods Coping Strategies Index (CSI). Households are grouped according to their most extreme coping strategy. Stress, crisis and emergency strategies are ranked as 2, 3, and 4 respectively. Households not using any of these strategies are in group 1, or food secure.

Acute malnutrition based on MUAC

In order to assess the nutritional status of children 6-59 months age and mothers (pregnant and lactating), the Mid-Upper Arm Circumference (MUAC) module is used. MUAC is the circumference of the left upper arm, measured at the mid-point between the tip of the shoulder and the tip of the elbow (olecranon process and the acromium).

MUAC measurements are taken for children 6-59 months old and the following thresholds are used for making interpretations of acute malnutrition (see tables below). The reference values are per national CMAM (Community Management of Acute Malnutrition) program guidelines.

Interpretation of MUAC values for children 6-59 months

MUAC Value	Interpretation
< 115 mm	Severe acute malnutrition
115 - <125 mm	Moderate acute malnutrition
> 125 mm	No acute malnutrition

Interpretation of MUAC values for pregnant and lactating women

MUAC	Interpretation
< 21.5	Malnutrition
> = 21.5	Not malnutrition

Plausibility check for:

Standard/Reference used for z-score calculation: WHO standards 2006

(If it is not mentioned, flagged data is included in the evaluation. Some parts of this plausibility report are more for advanced users and can be skipped for a standard evaluation)

Overall data quality

Criteria	Flags*	Unit	Excel.	Good	Accept	Problematic	Score
Flagged data	Incl	%	0-2.5	>2.5-5.0	>5.0-7.5	>7.5	
(% of out of range subjects)			0	5	10	20	**5** (3.1 %)
Overall Sex ratio	Incl	p	>0.1	>0.05	>0.001	<=0.001	
(Significant chi square)			0	2	4	10	**0** (p=0.225)
Age ratio(6-29 vs 30-59)	Incl	p	>0.1	>0.05	>0.001	<=0.001	
(Significant chi square)			0	2	4	10	**4** (p=0.004)
Dig pref score - weight	Incl	#	0-7	8-12	13-20	> 20	
			0	2	4	10	**0** (3)
Dig pref score - height	Incl	#	0-7	8-12	13-20	> 20	
			0	2	4	10	**2** (8)
Dig pref score - MUAC	Incl	#	0-7	8-12	13-20	> 20	
			0	2	4	10	**0** (6)
Standard Dev WHZ	Excl	SD	<1.1	<1.15	<1.20	>=1.20	
.			and	and	and	or	
.	Excl	SD	>0.9	>0.85	>0.80	<=0.80	
			0	5	10	20	**0** (1.07)
Skewness WHZ	Excl	#	<±0.2	<±0.4	<±0.6	>=±0.6	
			0	1	3	5	**0** (-0.17)
Kurtosis WHZ	Excl	#	<±0.2	<±0.4	<±0.6	>=±0.6	
			0	1	3	5	**0** (-0.13)
Poisson dist WHZ-2	Excl	p	>0.05	>0.01	>0.001	<=0.001	
			0	1	3	5	**5** (p=0.000)
OVERALL SCORE WHZ =			0-9	10-14	15-24	>25	**16** %

The overall score of this survey is 16 %, this is acceptable.

ANNEX 2: STATISTICAL APPENDIX

		Food security console				Livelihood Coping Strategies				Food Consumption Score		
		Food secure	Marginally food secure	Moderately food insecure	Severely food insecure	HH not adopting coping strategies	Stress coping strategies	crisis coping strategies	emergencies coping strategies	Acceptable	Borderline	Poor
Overall		**.3%**	**16.1%**	**40.9%**	**42.7%**	**20.5%**	**5.2%**	**16.2%**	**58.1%**	**23.0%**	**42.3%**	**34.7%**
Sex of the household head	Male	.2%	15.4%	40.5%	44.0%	19.6%	5.9%	13.5%	61.0%	22.8%	40.4%	36.8%
	Female	.5%	18.2%	42.1%	39.1%	22.7%	3.5%	23.6%	50.2%	23.5%	47.4%	29.1%
Age of the household head	18 to 35 years	0.0%	17.1%	43.2%	39.7%	25.1%	4.9%	17.3%	52.7%	23.9%	44.5%	31.6%
	35 to 45 years	.4%	15.4%	38.4%	45.9%	18.1%	6.3%	12.7%	62.9%	22.5%	43.4%	34.2%
	Above 45 years	.5%	16.1%	41.7%	41.7%	18.3%	4.2%	19.7%	57.7%	22.6%	38.3%	39.0%
Education of the HH head	No formal education	.5%	14.3%	36.3%	48.9%	16.1%	5.2%	17.5%	61.2%	21.2%	40.8%	38.0%
	Upto Primary (2 to 8 years)	0.0%	15.9%	58.2%	25.9%	30.4%	8.5%	20.2%	40.9%	18.1%	46.5%	35.5%
	Above Primary	0.0%	20.8%	42.1%	37.1%	25.3%	3.3%	10.7%	60.7%	30.3%	43.5%	26.2%
Highest education of any female member	No formal education	.2%	14.5%	34.9%	50.4%	17.7%	5.9%	15.2%	61.2%	20.4%	42.4%	37.1%
	Upto Primary (2 to 8 years)	.5%	14.5%	51.0%	34.0%	21.9%	5.0%	19.1%	54.0%	24.9%	38.7%	36.4%
	Above Primary	0.0%	26.7%	54.3%	19.0%	31.1%	1.3%	17.4%	50.2%	33.9%	45.0%	21.1%
Household size	Up to 5 members	.7%	12.0%	40.6%	46.7%	22.8%	4.9%	15.7%	56.7%	17.4%	43.4%	39.3%
	6 to 8 members	.4%	15.6%	36.3%	47.7%	18.7%	4.6%	14.8%	61.9%	23.2%	40.5%	36.3%
	9 to 12 members	0.0%	19.1%	43.6%	37.3%	17.7%	6.6%	18.5%	57.2%	24.7%	43.8%	31.5%
	More tahn 12 members	0.0%	18.2%	50.5%	31.3%	28.1%	4.9%	16.8%	50.3%	27.6%	43.0%	29.5%
At least one child upto age of 5	No	.8%	17.0%	46.4%	35.7%	13.9%	2.0%	25.8%	58.4%	23.2%	45.7%	31.0%
	yes	.2%	16.0%	39.8%	44.0%	21.7%	5.9%	14.4%	58.0%	22.9%	41.6%	35.5%
Residence status of the household	Residents	.3%	16.7%	42.6%	40.4%	21.1%	5.7%	16.6%	56.6%	23.5%	43.3%	33.2%
	IDPs	0.0%	3.4%	31.3%	65.3%	13.4%	0.0%	0.0%	86.6%	14.0%	23.6%	62.4%
	Returnees	0.0%	15.7%	22.4%	61.8%	15.7%	0.0%	20.3%	64.0%	20.8%	38.0%	41.2%
	Migrants	0.0%	0.0%	100.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%	100.0%	0.0%
HH residing in Bor since	Less than 5 years	0.0%	13.8%	44.7%	41.5%	20.3%	3.3%	22.0%	54.4%	20.8%	44.9%	34.2%
	5 or above years	.6%	18.5%	37.1%	43.9%	20.6%	7.2%	10.3%	61.9%	25.2%	39.6%	35.2%
HH displaced since December 2013	Yes	.3%	15.9%	41.6%	42.2%	20.5%	5.6%	16.7%	57.2%	23.2%	43.4%	33.5%
	No	0.0%	29.2%	34.5%	36.3%	26.0%	0.0%	19.0%	55.1%	26.5%	34.5%	39.0%
House ownership	Own	.2%	17.6%	39.9%	42.3%	17.9%	4.5%	17.9%	59.7%	24.7%	42.6%	32.7%
	Hosted by someone	0.0%	6.5%	31.3%	62.1%	6.8%	6.3%	8.3%	78.5%	19.9%	33.7%	46.4%
	Temporary shelter	0.0%	17.8%	46.7%	35.4%	48.5%	14.5%	12.4%	24.6%	14.3%	36.4%	49.3%
	Other	2.0%	12.6%	58.3%	27.1%	31.4%	0.0%	14.7%	53.9%	20.1%	58.8%	21.0%

		Food security console				Livelihood Coping Strategies				Food Consumption Score		
		Food secure	Marginally food secure	Moderately food insecure	Severely food insecure	HH not adopting coping strategies	Stress coping strategies	crisis coping strategies	emergencies coping strategies	Acceptable	Borderline	Poor
Type of toilet HHs are using	Traditional pit latrine	.4%	16.1%	41.9%	41.6%	21.2%	5.7%	14.8%	58.3%	24.4%	41.7%	33.8%
	Other type of latrine	0.0%	16.2%	47.5%	36.2%	13.6%	0.0%	29.2%	57.2%	26.4%	51.5%	22.0%
	Open defecation	0.0%	16.3%	35.7%	48.0%	18.8%	4.3%	19.6%	57.3%	16.7%	42.8%	40.6%
Main income activity	Agriculture and livestock	1.7%	19.3%	36.1%	43.0%	20.7%	2.3%	18.8%	58.2%	28.0%	33.1%	38.9%
	Causal labor	0.0%	15.4%	47.8%	36.9%	21.3%	1.7%	36.8%	40.2%	16.7%	47.8%	35.5%
	Skilled/Salary work	.4%	16.2%	44.4%	39.1%	20.9%	4.4%	15.7%	59.0%	26.1%	41.6%	32.2%
	Petty trade	0.0%	27.5%	40.0%	32.5%	19.0%	2.1%	21.0%	57.9%	25.4%	60.9%	13.7%
	Assistance	0.0%	15.2%	34.8%	50.0%	18.1%	6.4%	11.2%	64.3%	21.5%	40.5%	38.0%
	Sale of firewood/poles, charcoal, grass, stones	0.0%	10.2%	43.4%	46.5%	25.8%	12.2%	8.9%	53.1%	14.8%	41.1%	44.1%
	Others	0.0%	0.0%	45.3%	54.7%	0.0%	0.0%	54.7%	45.3%	45.3%	0.0%	54.7%
Wealth Quintiles	Poorest	0.0%	11.2%	41.9%	46.9%	21.4%	8.3%	16.3%	54.0%	18.3%	39.8%	42.0%
	Second	0.0%	12.7%	28.2%	59.1%	16.6%	3.0%	13.3%	67.1%	17.1%	35.4%	47.5%
	Third	0.0%	16.5%	28.8%	54.7%	19.1%	4.7%	20.2%	56.0%	19.5%	42.0%	38.4%
	Fourth	0.0%	18.7%	51.3%	30.0%	19.0%	4.6%	18.2%	58.3%	25.2%	44.5%	30.3%
	Richest	1.4%	22.0%	54.8%	21.8%	26.6%	5.7%	12.9%	54.8%	35.4%	50.7%	13.9%
HH usually cultivates	Yes	1.4%	15.8%	32.3%	50.6%	14.5%	7.6%	13.4%	64.5%	17.8%	47.5%	34.7%
	No	.2%	16.2%	41.9%	41.8%	21.1%	5.0%	16.5%	57.4%	23.6%	41.7%	34.7%
HH owns livestock	Yes	0.0%	25.9%	49.9%	24.2%	17.1%	14.9%	23.0%	45.0%	38.9%	41.8%	19.3%
	No	.3%	15.3%	40.1%	44.3%	20.7%	4.4%	15.6%	59.2%	21.6%	42.3%	36.1%