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BRACE Impact Evaluation Baseline – Northern Bahr el Ghazal and Warrap States, South Sudan

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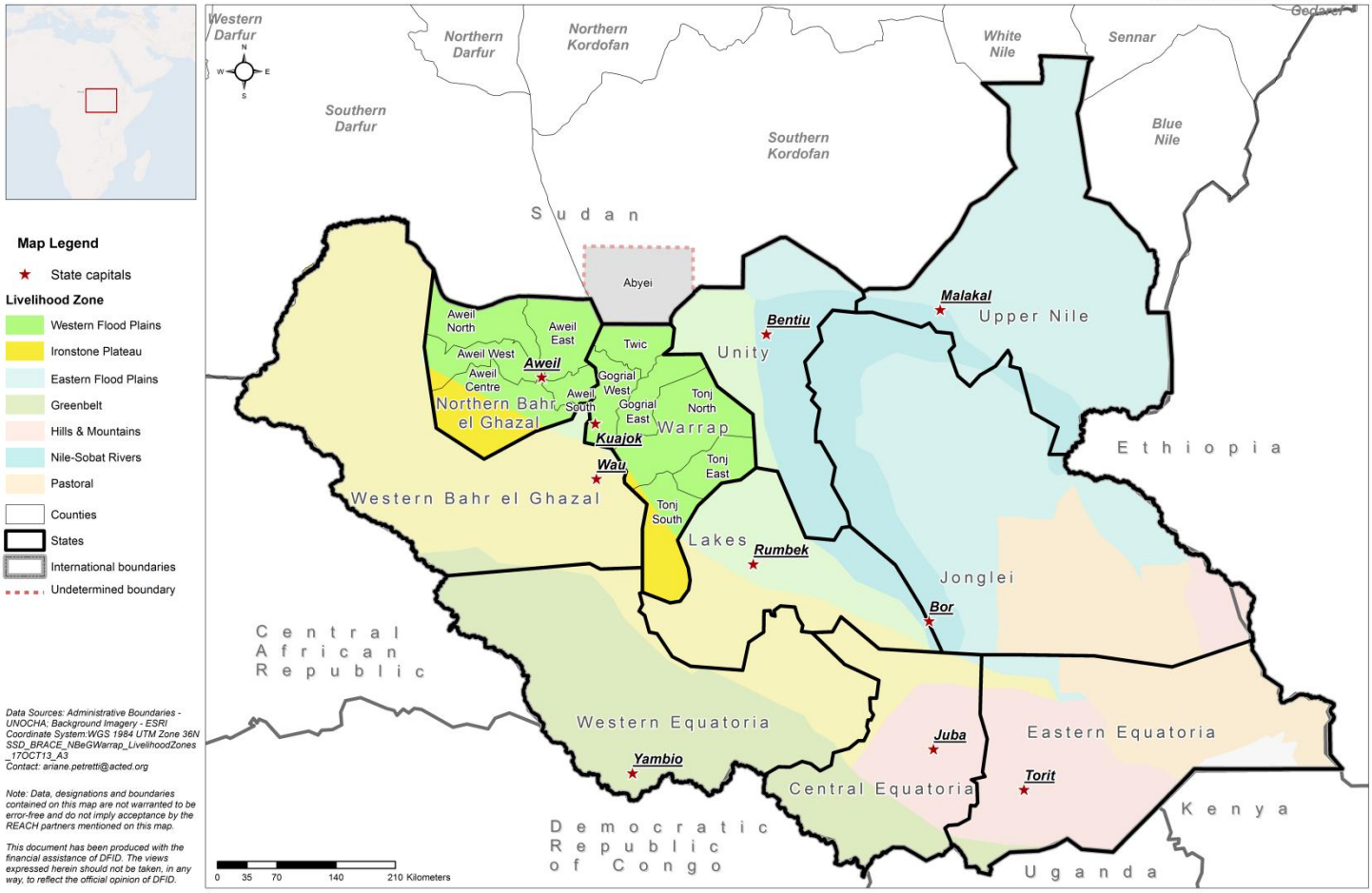

EVALUATING FOOD SECURITY AND THE IMPACT OF DFID BRACE

FOOD FOR ASSET ACTIVITIES

DRY SEASON BASELINE REPORT

NORTHERN BAHR EL GHAZAL & WARRAP STATES

OCTOBER 2013

REACH Informing more effective humanitarian action

IMPACT Initiatives

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ACTED

The baseline data collection and analysis for this report was conducted by IMPACT Initiatives in partnership with ACTED and REACH during February – April 2013. This dry season baseline for Northern Bahr el Ghazal and Warrap States is the first step in a quasi-experimental study aiming to evaluate impact of World Food Programme (WFP) Food for Asset (FFA) projects that are funded through the DFID BRACE Programme.

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THE BRACE PROJECT

The "Building Resilience through Asset Creation and Enhancement" (BRACE) programme provides food and cash transfers to households, while building skills, physical assets and knowledge – with the aim of strengthening household and community resilience. The programme is implemented through the World Food Programme (WFP) and Non-Governmental Organisation (NGO) partners with a range of Food For Asset (FFA) activities across three states in South Sudan – Northern and Western Bahr el Ghazal and Warrap.

An Impact Evaluation will be conducted of BRACE to evaluate the impact of its activities on food security and resilience, by comparing households and communities that participate in FFA with those that do not. The evaluation is employing two parallel methods to first establish a baseline against which impact will be assessed: (1) a quasi-experimental approach, implemented by IMPACT initiatives, where data is predominantly collected through household surveys; and (2) the Household Economy Analysis (HEA) approach, implemented by the Food Economy Group (FEG), where focus group discussions is the main mode of data collection. The HEA establishes baseline parameters for wealth according to livelihood zones that are applied to the household level data gathered during the quasi-experimental component, where these parameters allow for comparison between poorer and wealthier households, while controlling for difference in livelihoods opportunities across the States where BRACE is implemented.

The present study outlines the quasi-experimental baseline findings from Northern Bahr el Ghazal and Warrap States in the Western Flood Plains livelihood zone.

For access to BRACE data and mapping go to: www.southsudan-braceproject.org

CONTENTS

ACRONYMS & ABBREVIATIONS

ACTED	Agency for Technical Cooperation and Development
ANLA	Annual Needs and Livelihood Analysis
ARI	Acute Respiratory Infection
BRACE	Building Resilience through Asset Creation and Enhancement
CFSAM	Crop and Food Security Assessment Mission
DFID	Department for International Development
FAO	Food and Agriculture Organisation
FEG	Food Economy Group
FSMS	Food Security Monitoring System
FFA	Food for Assets
GFD	General Food Distribution
GoSS	Government of South Sudan
HEA	Household Economy Analysis
HeRYSS	Help Restore Youth South Sudan
NBeG	Northern Bahr el Ghazal
NBS	National Bureau of Statistics
SSDP	South Sudan Development Plan
SMOAF	South Kordofan State Ministry of Agriculture and Forestry
WFP	World Food Programme
WBeG	Western Bahr el Ghazal
WVI	World Vision International

Note – REACH and IMPACT initiatives are not acronyms

ADMINISTRATIVE UNITS

Boma	Lowest level of local government administration
Payam	Intermediate administrative level including several Bomas
County	Primary administrative level below the State including several Payams
State	Administration of local government including several Counties

EXECUTIVE SUMMARY

The "Building Resilience through Asset Creation and Enhancement" (BRACE) programme provides food and cash transfers to households, while building skills, physical assets and knowledge – with the aim of strengthening household and community resilience. The programme is implemented through the World Food Programme (WFP) and Non-Governmental Organisation (NGO) partners with a range of Food For Asset (FFA) activities across three states in South Sudan – Northern and Western Bahr el Ghazal and Warrap. An Impact Evaluation will be conducted of BRACE to evaluate the impact of its activities on food security and resilience, by comparing households and communities that participate in FFA with those that do not. The present study outlines the dry season baseline findings from Northern Bahr el Ghazal and Warrap states against which impact of FFA activities will be assessed through future surveys.[1]

A preceding Household Economic Analysis (HEA) baseline[2]determined parameters of wealth for four groups –"Very Poor", "Poor", "Middle" and "Better-off" – for the Western Flood Plains livelihood zone that covers most of the two states. The HEA parameter used in this report to categorise households according to wealth was household expenditure on livelihoods. The food insecurity rating used in this report, is a composite index developed for the WFP-led Food Security Monitoring System (FSMS). The index is based on Food Consumption Score; percentage spent on food; reliability and sustainability of income sources; and Coping Strategy Index score. Households in Northern Bahr el Ghazal State were more likely to be categorised as Very Poor (68%) compared to Warrap (64%). They were also more likely to be categorised as moderately or severely food insecure (51%) compared to households in Warrap (38%). The impact evaluation aims to explore these variations in wealth and food security, amongst other indicators, to identify factors that underpin resilience in the two states.[3]

The BRACE programme overview and impact evaluation methodology are outlined in sections 1 and 2 of this report. The baseline findings (section 3) begin by assessing State, wealth, demographics and FFA participation against the composite food insecurity index. The index is then deconstructed to assess each individual component – exploring food consumption, expenditure, income sources and coping strategy use in more detail. Finally, other resilience indicators are assessed, including education, health, water and sanitation. The main findings from the respective sections of the report are outlined below.

COMPOSITE FOOD INSECURITY INDEX

State and wealth – Households that had participated in FFA were more likely to have a better food security rating when comparing households within the same wealth group and State. *Future rounds of surveying will assess whether this correlation is due to FFA participation contributing to improved food security – or whether households that are more food secure are more likely to be selected for FFA.*

- There was a significant positive correlation between FFA participation and household food security when comparing households within the same wealth groups and states. The strongest effect was seen amongst Poor households where 31% of FFA households were food insecure, compared to 38% of non-FFA households. In the Middle/Better-off group, 23% of FFA households were food insecure compared to 29% of non-FFA households. The smallest effect was seen in the Very Poor group, where 49% of FFA households were food insecure, compared to 53% of non-FFA households. The effect remained when comparing households within states – households participating in FFA were less likely to be food

[1] The dry season baseline will be followed first by a wet season baseline, also during 2013, to enable control for seasonal differences.
[2] See 'Household Economic Analysis (HEA) Livelihoods Profiles Report – South Sudan: Western Flood Plains & Ironstone Plateau (Final Report, April 2013) Food Economy Group.
[3] Out of the target 6,080 household level interviews, 4,308 were achieved for the dry season baseline in Northern Bahr el Ghazal and Warrap states. This diversion from the target was mainly due to difficulties faced by field teams in accessing some locations and some households due to insecurity and long distances between households and communities. The target of 95% level of confidence and an error margin of +/– 5% was met when disaggregating by FFA/Non-FFA (95/2.1%); by state (95/2.1%); and by FFA and State (95/3%). After applying the HEA wealth group parameters to the sample, the better-off group was found to represent a statistically insignificant 2% of individuals and households respectively. Therefore, the Middle and Better-off wealth groups were combined to form one group of wealthier households, forming 15% of the total sample.

insecure in both Northern Bahr el Ghazal (50% compared to 53%) and Warrap (36% compared to 41%). Receipt of GFD was not significantly correlated with food security when comparing households within the same wealth group.

- The poorest households were least likely to have benefitted from FFA or GFD interventions. Amongst ''Very Poor'' households, 49% had not taken part in any intervention, compared to 47% of ''Poor'' households and 44% of ''Middle/Better-off'' households. ''Middle/Better-off'' households were most likely to have taken part in FFA (37%) – compared to 29% of ''Very Poor'' and 27% of ''Poor'' households.

- Households with longer distance to markets – usually located in the village centre where beneficiary selection meetings are held – were found less likely to have participated in FFA and/or GFD. This effect was partly mitigated by wealth – while no difference in participation was found between wealth groups when comparing households living less than 30 minutes away, a higher proportion of middle/better-off living more than one hour away (52%) had participated compared to poor (45%) and very poor (41%) households living more than one hour away.

Demographics – FFA participation had no effect on food security rating when comparing households within the same wealth group that also had the same number of members and proportion of dependents. Food insecure households were more likely to have a high proportion of dependents, small household size and kinship network; and to have a female household head. *Future rounds of surveying will assess whether the lack of effect of FFA is due to FFA participation aligning food security levels of those that participate with those that do not.*

- When considering household members aged less than 15 or more than 50 as age-dependents, food security was not correlated with proportion of age-dependents. However, a positive correlation with food security was found when only considering children aged less than five years of age as dependents – **food secure households were found to contain on average fewer (20.2%) children under five than moderately (21.3%) and severely (22.5%) food insecure households.**

- **Smaller households were more likely to be food insecure when comparing households within the same wealth group and with the same proportion of dependents.** While 50% of households with 1-6 members were food insecure, the proportion dropped to 35% of households with 10 or more members. FFA did not have a significant effect on food security when controlling for wealth group, household size and proportion of dependents.

- **Female headed households (FHH) were more likely to be food insecure (57%) than male headed households (MHH 48%).** They were also more likely to belong to a poorer wealth group, regardless of whether they had participated in FFA. While 71% of FHH non-FFA households were Very Poor, the proportion dropped to 69% of those who participated in FFA. But it was still higher than the proportion of Non-FFA MHH (58%) and FFA MHH (54%).

- **Households related by kinship to fewer households in their boma were more likely to be food insecure.** Those with no ties were most likely for be food insecure (53%), while the proportion dropped to 48% for those with ties to more than 20 households. This effect remained when comparing households within the same wealth groups – those with fewer ties were less food secure than households within the same wealth group that had ties to more households. Almost a third of households (28%) were related to more than 20 other households by kinship.

- **There was no significant difference in food insecurity when comparing Host, Returnee and IDP households.**[4] FFA households were more likely to be headed by Returnees (6.5%) compared to 3.3% of non-FFA households. The majority of household heads were categorised as Hosts – 90% of FFA households and 92% of non-FFA households were headed

[4] Note that a South Sudanese returnee becomes a resident (host) after residing for 12 months in South Sudan; hence household heads that had returned to their boma more than 12 months ago were categorized as Hosts during the survey.

by host community members. Very few Refugee (0.2%), Migrant (0.1%) and Nomad (0.1%) household heads were identified during the survey.

- **Dinka Rek households were found to be less food insecure than Dinka Malual in Northern Bahr el Ghazal, while on the other hand being more food insecure in Warrap State.** Hence other factors may underpin food insecurity rather than tribe, including characteristics specifically relating to each state. In addition to being comparatively more food secure, Dinka Rek were also more likely to be categorised in a wealthier group compared to other tribes. While 18% of Dinka Rek households were found to be Middle/Better-off, the proportion dropped to 13% amongst Dinka Malual and only 5% for the non-Dinka tribe households.

DECONSTRUCTING THE FOOD INSECURITY INDEX

Food Consumption Score – FFA participation had a small positive effect on food consumption scores. Returnee household headship; long distances to markets and low expenditure on food in real terms, each had a negative effect on food consumption scores. *Future surveys will assess whether the positive correlation between FFA participation and food consumption scores is due to FFA participation contributing to improved food consumption scores – or to households with better food consumption scores being more likely to be selected for FFA participation.*

- **Returnee households were more likely to have a borderline or poor food consumption score** (36%) compared to IDP households (28%) and Host households (25%).[5]

- **Households spending more on food in real terms were found to have a higher food consumption score.** Every additional 10 SSP spent on food increased the food consumption score by on average 0.72.

- **Households that lived further away from markets were found to have a poorer food consumption score.** Amongst households that lived less than 30 minutes by foot from the nearest market, 68% had a poor food consumption score. This figure rose to 89% of households that lived more than 2 hours away from the nearest market.

- **Households in Warrap state were more likely to have a borderline or poor food consumption score** (27%) compared to Northern Bahr el Ghazal (23%).

- **Wealthier households had higher food consumption scores.** Middle/better-off households scored on average 8.8 points higher than the Very Poor.[6] Receipt of GFD had no significant effect on food consumption score when comparing households within the same wealth groups, while FFA had a small positive effect increasing scores on average by 1.2 points. Gender of household head had no significant effect when controlling for wealth group.

Food Access Scores and income sources – FFA participation and wealth had a positive effect on food access scores. Wealthier households and those participating in GFD were more likely to report reliable and sustainable primary sources of incomes. Two thirds of household members contributing to an income source were women. *Future surveys will assess whether FFA participation positively affects food access scores – or whether households with better food access scores are more likely to be selected for FFA participation.*

- **FFA households were more likely to receive better food access scores when compared with households within the same wealth groups.** Amongst Middle/Better-off FFA households, 77% had a Good food access score, compared to 69% of non-FFA households in the same wealth group and 46% of Very Poor non-FFA households.

[5] It was noted above that returnee households did not have worse overall food security rating compared to other households. This was because although they were more likely to have poor food consumption scores, which contributed to a poorer food security rating, they were more likely to have higher income reliability and sustainability score and a lower level of coping strategy use, improving the overall food security rating.
[6] Food consumption scores of 0<=21 are considered Poor, while >21 to 35 are Borderline and >35 are Acceptable

- **Very Poor non-FFA households were significantly more likely than FFA households in the same wealth group to be relying on sale of natural resources (29% compared to 25%) during the most recent dry season.** Casual agricultural labour replaced sale of natural resources as the most common main income source during the most recent wet season across all wealth groups – providing a main income for 48-51% of households in all wealth groups.

- **Given high level of reliance on income sources considered less reliable and sustainable, poorer households were more likely to have a lower income reliability and sustainability score.**[7] FFA did not have a significant effect, unlike GFD. Hence only 39% of Middle/Better-off households participating in GFD had a Poor income score compared to 48% of non-GFD households in the same wealth group and 56% of non-GFD households amongst the Very Poor.

- **Returnee households were significantly more likely to be relying on sale of natural resources (30%) than IDP (28%) and Host (26%) households.** Returnee households were also more likely to be relying on sale of alcohol (23%) compared to IDP (12%) and Host (11%) households – as were female headed households (21%) compared to male headed households (12%)

- **Households in Northern Bahr el Ghazal were more likely to have less reliable and sustainable incomes** than those in Warrap state, with 56% achieving a Poor income score compared to 50% in Warrap.

- **Households citing aid as their main income source were most likely to sell alcohol as their secondary income (30%).** Trading or other business was the second income for 20%, followed by 19% that sold natural resources. Proportionally, those also relying on salaried work reported that aid contributed on average 60% of total for the two incomes, compared to 83% for those who relied on sale of crops as their second income.

- **The overall ratio of female to male contribution to up to two income sources was 1.45:1 – hence for every two men, three women were contributing to an income.** Women conducted most of the labour contributing to the two most common income sources – sale of alcohol (80%) and sale of natural resources (61%).

Expenditure – Sale of crops as primary source of income had a negative effect on level of expenditure while households relying on begging, borrowing and aid had the highest average expenditure per capita. As expected, although wealthier households spent a smaller proportion on food, their expenditure in real terms was higher than that of other wealth groups, especially on non-staple foods.

- **Households relying on sale of crops had the on average lowest level of overall household expenditure per capita compared to other income sources – by 41 SSP less per month on food in particular.** The highest level of monthly household expenditure was recorded for households relying on begging (119 SSP) and borrowing (204 SSP). Those selling crops spent on average 28 SSP less on foods compared to other income sources, while those selling alcohol spent on average 14 SSP more and those relying on aid spent the most – by on average 23SSP more than other income sources.

- **Very Poor households spent a higher proportion of their expenditure on food, especially on staple foods although the amount they spent in real terms was lower than for wealthier households.** Middle/Better off households were able to spend more than twice as much on average (113 SSP) on protein rich foods such as meat, fish, poultry, eggs and milk than Very Poor households (49 SSP)**.** The average proportion spent on food was 52% amongst Very Poor households, compared to 44% amongst Poor households and 37% amongst Middle/Better-off households.

- **Households in Northern Bahr el Ghazal spent on average a higher proportion (21%) on staple foods than households in Warrap state (15%), although in real terms there was no significant difference in average monthly**

[7] Income reliability scores of 1-3 are considered Poor, while 4-5 are Medium and 6+ are Good

expenditure (459 SSP; 463 SSP). Market reliance was higher in Northern Bahr el Ghazal than Warrap for purchases of maize (56% compared to 33%); vegetables (70% compared to 46%); eggs (74% compared to 40%); fish (74% compared to 48%); milk (74% compared to 46%); sugar (70% compared to 49%) and other items including condiments (72% compared to 52%).

- **Households relied in the majority of cases on markets for their food purchases - on average 55% of all foods were bought at the market.** Own production still accounted for a significant proportion of food sourcing in February and March, providing on average 34% of foods. Food interventions were the third most commonly reported food source, accounting for 5% of all foods – with FFA more commonly cited in Northern Bahr el Ghazal and GFD more commonly reported in Warrap. [8]

- **Types of livelihood expenditure differed depending on wealth group and gender of the household head.** Middle/Better-off households spent a vast majority of their input on livestock purchases, with the average being higher in Northern Bahr el Ghazal (892.9 SSP) than Warrap State (778.1 SSP) for the wealthiest group. The Poor wealth group spent the largest share on seeds, again with a higher average in Northern Bahr el Ghazal (128.0 SSP) than Warrap State (87.2 SSP). The Very Poor were most likely to have spent the largest share on tools, here with a higher average in Warrap (35.6 SSP) compared to Northern Bahr el Ghazal (27.7 SSP). Male headed households spent almost three times more than female headed households on livestock – 234 SSP compared to 90 SSP on average over the 12 months preceding the survey.

Coping Strategy Index – FFA households were less likely than non-FFA households to have used a coping strategy. Coping strategy use was otherwise found to be more likely amongst households reporting income sources with low reliability and sustainability scores but was also, surprisingly, more frequently reported amongst wealthier households. *Future rounds of surveys will assess whether FFA participation contributes to lower coping strategy use – or whether households with lower coping strategy use are more likely to be selected for FFA participation.*

- Wealthier households were found more likely to have used coping strategy (56%) than Poor (54%) and Very Poor (48%) households. **FFA households were slightly less likely (49%) than non-FFA (51%) households to have used a coping strategy**. This finding may reflect that wealthier households may in fact have access to coping strategies that poorer households do not have – sale of animals as a coping strategy is only accessible by households that own livestock.

- **Households relying on begging and borrowing used a high or medium level of coping strategies in 92% and 77% of cases respectively.** The corresponding proportion was lowest amongst households relying on salaried work (13%) or sale of crops (11%).

Correlation between Food Consumption Score, Food Access Score and Coping Strategy Index – While Food Consumption Scores and Food Access Scores (including income reliability and sustainability scores and percentage spent on food) were positively correlated, the Coping Strategy Index showed no correlation with food consumption or percentage spent on food.

- **Food consumption scores, percentage of expenditure on food and income reliability and sustainability were all found to be correlated.** More reliable sources of income were associated with an increase and diversification of food consumption. Reliable incomes also lead to a decrease in percentage spent on food. Similarly, an increase in percentage expenditure on food lead to a decrease in food consumption score, reflecting the lower real amounts spent by households that spent a large percentage of their expenditure on food.

[8] Households were here asked to specify the sources of food relied on during 7 days preceding the survey.

- **The coping strategy index was found to be correlated with income reliability but not with food consumption and percentage expenditure on food.** More reliable incomes were associated with a decrease in severity and frequency of coping strategy use. But variation in coping strategy index did not lead to a change in food consumption or percentage spent on foods. This casts further doubt on the internal validity of the coping strategy index and thus usefulness as an indicator of resilience.[9]

OTHER RESILIENCE INDICATORS

Education – Households participating in FFA participation contained a higher proportion of household members attending primary school, when comparing households in the same wealth group. Higher education levels were in turn positively associated with more reliable and sustainable incomes. Consequently, wealthier households reported on average higher levels of expenditure on education and proportion of educated household members, especially women. *Future surveys will assess whether FFA participation contributes to higher levels of primary school attendance – or whether households with higher primary school attendance are more likely to participate in FFA.*

- **Reliance on unreliable and unsustainable incomes was associated with lower household member education.** Reliance on sale of natural resources was found to be associated with lower primary school completion, relied on by 28% of households where no member had completed primary school, compared to just 13% of households where at least two members had completed primary school. Salaried work was also more frequently cited as a main income source by households where two or more members had completed primary school (13%), compared to those where no member had completed primary school (6%).

- **Very Poor households were least likely to contain members that had completed any level of education.** Poor households contained on average 1.5% more members that had completed any education and the proportion was 2.1% higher amongst Middle/Better-off households. There was no significant variation in completion depending on FFA or GFD participation.

- **Returnee and IDP households and male headed households were more likely to contain members that had completed primary school** – 19% of returnee households contained at least one member that had completed primary school, compared to 14% of IDP households and 11% of host households. Similarly, only 10% of female headed households included members that had completed primary school, compared to 14% of male headed households.

- **FFA household members were more likely to be attending primary school (20.1%) compared to non-FFA members (18.7%).** Secondary school was attended by 1.2% of FFA household members and 1.1% of non-FFA household members. There was no significant difference in completion of any level of education. The effect remained after controlling for wealth – household members in FFA households were more likely to attend primary school compared to others in the same wealth group who did not participate in FFA. GFD participation did not have a significant effect on either attendance or completion rates.

- **Women and girls were much less likely to have completed or be attending any level of education than their male counter parts, especially if they lived in a poorer household.** Primary school attendance was 48 girls for every 100 boys amongst Very Poor households, a proportion which rose to 60 girls for every 100 boys amongst the Middle/Better-off.

[9] In order to explore the validity of the coping strategy index, future rounds of surveying will measure use of an expanded set of 'strategies' identified by the HEA and will in addition measure use amongst all households as opposed to only those that said they did not have enough to eat over the 7 days preceding the survey. The objective will be to a) assess the importance of current coping strategy categories against additional strategies and b) test correlation between variables other than the perceived sufficiency of food and coping strategies.

- **Very Poor households containing children and young adults spent the least on education.** Poor households spent on average 6.5 SSP per capita more on education and Middle/Better-off households spent on average 9.1 SSP more per capita on education than the Very Poor. There was no significant difference in proportion spent on education depending on wealth group.

- **Distance to primary school did not have a significant effect on attendance**. While 33.6% of households were located in communities with less than 30 minutes by foot to the nearest primary school, 36.7% were located more than two hours from the nearest school.

Health – Poorer, food insecure households spent less on medical costs even though members in poorer households were more likely to fall ill.

- **Food insecure households devoted a smaller amount and proportion of their expenditure to medical costs.** While food secure households spent on average 9.5% of their expenditure on medical costs, the corresponding figure for moderately food insecure households was 4.9% and 2.8% for severely food insecure households.

- **Poorer households were more likely to spend nothing on medical costs.** Amongst Very Poor households, 47% reported no expenditure on medical, while the proportion was 33% amongst the Poor and 22% amongst Middle/Better-off households.

- **Very Poor households were most likely to contain household members that had fallen ill** over the most recent two weeks preceding the survey (36% of households), compared to Poor (24%) and Middle/Better-off (19%). Diarrhoea incidence was higher amongst children aged less than 5 amongst Very Poor and Poor households (5% of children) than Middle/Better-off households (4%). Overall household members were likely to obtain treatment when ill regardless of wealth group – 89% of ill household members in Very Poor households obtained treatment, compared to 92% in other households.

- **Children were more likely to suffer from symptoms of illness in Warrap than Northern Bahr el Ghazal state.** In Warrap, 15% of children aged less than 5 had suffered from symptoms of malaria during the two weeks preceding the survey, compared to 13% of children in Northern Bahr el Ghazal. Similarly, 6% had suffered from diarrhoea and 4% from Acute Respiratory Infection (ARI) in Warrap, compared to 5% and 3% respectively in Northern Bahr el Ghazal.

- **Child sickness was not associated with type of toilet facility used; type of drinking water source; the time taken to reach the source; and the proportion of female household members contributing an income.**

Water and sanitation – Shorter distances to drinking water source and use of toilet facilities were positively associated with food security.

- **Shorter distance to nearest water source was positively correlated with food security, especially amongst female headed households.** Food secure female headed households were significantly more likely to live less than 30 minutes from a water source (57%) than moderately (53%) and severely (44%) food insecure. The effect of distance was not as marked amongst male headed households, with 49% of food secure or moderately food insecure households and 44% of severely food insecure households reporting a distance of less than 30 minutes. The majority of households were found to use a borehole with pump (76%), followed by 11% that used a protected dug well and 9% that used a pond, river or stream.

- **Food insecure households were less likely to use toilet facilities.** Use of toilet facilities was slightly higher amongst food secure households (8%) compared to moderately food insecure (5%) and severely food insecure (5%) households. The overwhelming majority of households reported using no toilet facility. Amongst those who used a toilet facility,

communal pit latrines were most often used by severely food insecure households (42%), while moderately food insecure and food secure households most often used pit latrines in their compound (38% and 52% respectively).

1. BUILDING RESILIENCE THROUGH ASSET CREATION AND ENHANCEMENT (BRACE)

1.1. PROGRAMME OVERVIEW

South Sudan is one of the most food insecure countries in the world. Food insecurity and malnutrition are yearly occurrences in South Sudan, with at least one in three people are affected by hunger even in a good year. In 2012 alone emergency levels of malnutrition were reported in 15, mainly border, counties. Coping capacities are also very low, as the direct and indirect effects of a long conflict and years of insufficient harvests have left the population with few assets to draw upon in times of need. Livelihoods strategies which worked well when movement was less restricted have been affected by border closure and continued inter community conflict. The relative neglect first by the government in Khartoum and now due to the low capacity of the South Sudanese government has stalled the implementation of structural changes needed to bring development and alternative livelihoods. All this has been compounded by social and cultural norms such as care and hygiene practices which still leave the population (and specifically children) particularly vulnerable to malnutrition. Yearly variations in levels of food insecurity are due to more proximate causes such as poor rains, local conflicts, lack and timing of inputs such as seeds.

To date, the international community's approach to food insecurity in South Sudan has consisted primarily of humanitarian interventions that target the consequences, not the underlying causes, of food insecurity and malnutrition. While humanitarian food responses have helped keep people alive they have not helped addressing chronic vulnerability to food insecurity. Responses have primarily targeted immediate needs rather than providing productive assets or protection of livelihoods. Even the seed and tool distributions that have occurred regularly have had limited impact as they often occurred only after populations had already lost their assets. To tackle the underlying causes of food insecurity, more focus should be placed on the provision of more dependable, predictable transfers that builds community resilience by enabling the restoring of productive assets. .

The "Building Resilience through Asset Creation and Enhancement" (BRACE) programme aims to "promote the restoration of livelihoods through the creation and rehabilitation of productive assets in order to enhance the resilience of the target communities to future shocks". . The programme aims to facilitate a transition from reactive emergency responses towards interventions that support communities' and households' own efforts and plans to reduce hunger. BRACE provides food and cash transfers to vulnerable groups, including female headed households and returnees. The intended impact of the programme is to build resilience of communities to have the skills, physical assets and knowledge to survive multiple risks and future challenges. Its intended outcome is sustained increases in food security during the hunger period for up to 175,000 beneficiaries through:

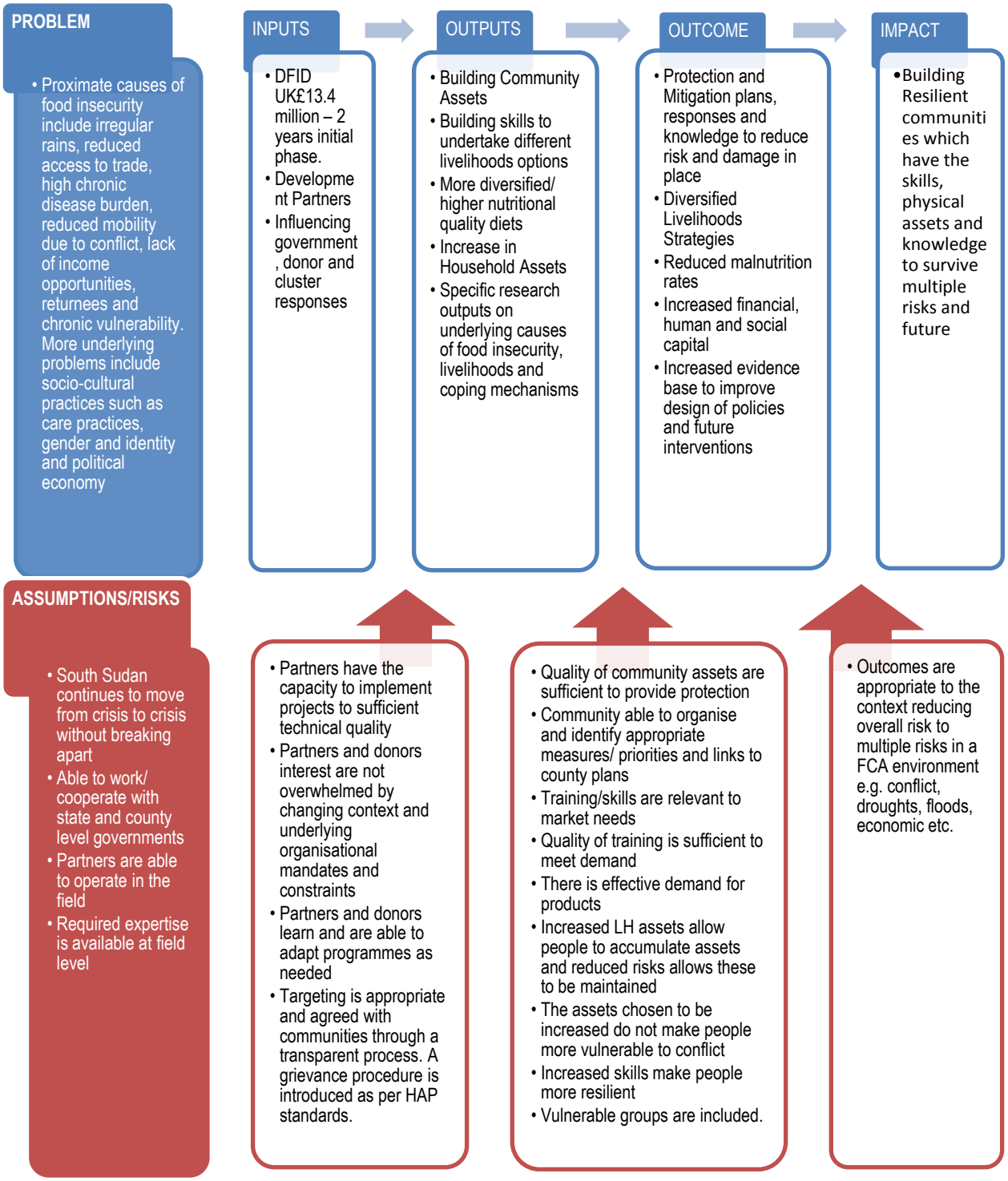
- Protection and mitigation plans, responses and knowledge to reduce risk and damage in place
- Diversified livelihoods strategies
- Reduced malnutrition rates
- Increased financial, human and social capital

The outputs that will contribute to the stated outcome and impact are:

- building community assets;
- building skills to undertake different livelihood options
- increasing household assets

The theory of change for this intervention is outlined in Figure 1 below.

Figure 1: BRACE Theory of Change



BRACE is coordinated by the World Food Programme (WFP) and implemented through national and international NGO partners working with local government. BRACE will support up to 50,000 rural households in three states – Northern and Western Bahr-el Ghazal and Warrap States – in building their resilience to food insecurity. These states were selected for the following reasons: the high incidence of poverty, the large number of returnees, the population and population density, consistent high levels of food insecurity and malnutrition, relative security, agricultural potential of the area and the complementarity with other donor development interventions The target communities have also shown readiness and willingness to participate in community projects. The three states are host to a large influx of returnees, who have shown greater interest to recovery/development oriented interventions over free food distribution.

BRACE will be implemented in two phases. A total of 11 counties were targeted in Phase I during 2012 and three further counties will be targeted in Phase II during 2013. The targeting of counties takes into consideration the food security situation; presence of potential projects; capacity of the local government and partners; security situation and readiness of the communities and local government.

Table 1: States and counties selected for the implementation of BRACE

States	Counties	No
WARRAP	Gogrial East and West, Twic, Tonj East , Tonj North and Tonj South	6
NORTHERN BAHR EL GHAZAL	Aweil North, South, Central, West and East	5
WBEG	Jur River, Wau and Raga	3
Total counties to be targeted during Phase I and II		**14**

1.2. IMPACT EVALUATION

1.2.1. Overview

To promote the replication of best practices and dissemination of lessons learnt, BRACE also aims to increase knowledge among key international and national stakeholders, on the impact interventions have in reducing hunger and poverty in South Sudan. BRACE therefore includes an impact evaluation component in its target areas. Evaluation findings will be used to influence GoSS policies and programmes and future donor programming within and beyond South Sudan. Data collected through the impact evaluation will also be used to pilot a food security information system in the country. System design and set-up is part of a larger global initiative aimed at designing and piloting effective methodologies to measure impact of food security interventions.

The impact evaluation is conducted by ACTED, in partnership with IMPACT Initiatives and the Food Economy Group (FEG) and in the framework of the REACH Initiative. The overall objective of BRACE is, as noted above, to "promote the restoration of livelihoods through the creation and rehabilitation of productive assets in order to enhance the resilience of the target communities to future shocks". For the purposes of the evaluation, resilience is defined as, "a community or household's ability to rely on a variety of coping measures through increased assets and skills to, at a minimum, maintain their living standards despite shocks and stresses".

1.2.2. Methodology

The BRACE impact evaluation component aims to evaluate the impact of BRACE Food For Asset (FFA) activities on food security and community and household resilience. The present baseline establishes a benchmark against which to measure change throughout the course of FFA implementation. This report therefore outlines the current situation in two Phase I states, Warrap and Northern Bahr el Ghazal, focusing on parameters that are particularly relevant for food security and subsequently, resilience. With data collected in February and March 2013, it establishes a dry season baseline for the two states. A dry season baseline will also be established in a forthcoming report covering Phase II state Western Bahr el Ghazal in addition to Upper Nile state, where data was gathered during April and May 2013. The two dry season baselines will be followed by a wet season baseline during 2013, when data is gathered in Northern and Western Bahr el Ghazal states, to ensure control for seasonal differences.[10] Dry season and wet season endlines will follow with data collection during 2015, the final implementation year of the BRACE project.

The evaluation is employing two parallel approaches: (1) a quasi-experimental approach implemented by IMPACT initiatives using a combination of quantitative quasi-experimental methods (household surveys) and qualitative non-experimental participatory

[10] Warrap and Upper Nile states will be excluded from the wet season baseline given inaccessibility of large parts of the states during the wet season. Upper Nile State was originally scheduled for inclusion in BRACE programme implementation and is hence included in the BRACE Impact Evaluation, although funding for FFA project activities in the state is being undertaken by other parties.

appraisal methods including, focus group discussions and key informant interviews, using the Most Significant Change technique, and (2) the Household Economy Analysis (HEA) approach, implemented by FEG. The HEA approach is using a representative sampling technique inherent to the approach, while the quasi-experimental portion of the evaluation is using a statistically significant sample of households in communities that participate in FFA interventions which are matched with an equal sized sample drawn from non-FFA communities – including households that have not participated in FFA but may have received general food distributions (GFD) or no food distributions at all. A total target of 12,160 households will be evaluated as part of this study. The HEA baseline data is used to inform disaggregation of households during the quasi-experimental analysis, allowing for comparison and triangulation of results and synergies between the two approaches.

The impact evaluation builds on the implementation schedule of BRACE. The baseline data collected at Phase I and II sites during January – June 2013, will provide a reference point to which midterm and endline data can be compared in order to assess impact. In addition to primary data collection through surveys, the evaluation team will regularly collect and analyze data from WFP as well as external data (population fluctuations, economy, rainfall) in order to control for endogeneity.

1.2.2.1. Sampling methodology

The sampling methodology for the quasi-experimental approach was designed to enable comparison of impacts on various food security indicators, between households undertaking FFA project activities; those participating in GFD; and those that have not taken part in any food support programmes.[11] The approach enables statically significant generalisations across the project sites of South Sudan, while supporting a better understanding of what has been impacted, of the amplitude of impacts, and what variables contributed to these impacts. To account for external factors, the results are disaggregated according to household wealth groups, allowing differentiation between poorer and wealthier households as well as livelihood zones. Findings will support an evidence-based approach to informing food security programs, as well as an evaluation of the impacts of BRACE.

The sampling methodology enables analysis on the wealth group level in each livelihood zone, for non-FFA and FFA groups respectively, with the aim of a 95% level of confidence and an error margin of +/– 5%[12][13]. Given that Phase I covers two livelihood zones; two states; and up to four different wealth groups across the non-FFA and FFA target groups, the resulting sampling requirement is 6,080 surveys for each –baseline and endline survey respectively.

Table 2: Target sample size for BRACE Phase I sites

Northern Bahr el Ghazal & Warrap States	FFA	Non-FFA
Western Floodplains Livelihood Zone	**1,520**	**1,520**
Wealth Group 1 Wealth Group 2 Wealth Group 3 Wealth Group 4	380 x 4	380 x 4
Ironstone Plateau Livelihood Zone	**1,520**	**1,520**
Wealth Group 1 Wealth Group 2 Wealth Group 3 Wealth Group 4	380 x 4	380 x 4
Sub-total	**3,040**	**3,040**
TOTAL	**6,080**	

[11] Note that the BRACE impact evaluation is independent and is not at any stage involved with beneficiary selection – or any other programme implementation – process.
[12] It is possible that the distribution of households by wealth groups is not linear in each of the livelihood zones. In this situation, the margin of error may increase or decrease slightly. Alternatively, the results will also enable for testing of the wealth groups determined in a previous study and could allow for realignment later.
[13] A 95% level of confidence and +-5% margin of error means in practice that we can be 95% confident that averages or proportions observed in the sample, are true in the population of interest, within a range of +/- 5%.

To reflect a normative sample within each FFA project site and community, a target of 20 household surveys is set to be undertaken in each of the non-FFA and FFA communities. This meant a target of 152 FFA communities and 152 non-FFA communities were selected for the entire Phase I baseline. To support data collection, due to difficult terrain and transportation in South Sudan, a cluster based approach was used to select households for interview. FFA project sites were first randomly selected, using a random number generator, from the full list of BRACE project locations obtained from WFP for the two states, including 260 project locations in total. In addition to the selected FFA-beneficiary communities, communities within the same Payam that had not been involved in FFA project activities were identified by data collection teams in the field.[14] These non-FFA communities act as a control group, ensuring that external factors that contribute to food security are controlled for, including access to transport and volatile market prices.

1.2.2.2. Limitations – Northern Bahr el Ghazal and Warrap states baseline

Out of the target 6,080 household level interviews, 4,308 were achieved for the dry season baseline in Northern Bahr el Ghazal and Warrap states. This diversion from the target was mainly due to difficulties faced by field teams in accessing some locations and some households due to insecurity – particularly in southern Warrap. In some cases the extreme distances between households at certain locations required data collectors to walk for several hours during the day in order to reach households selected for interviews, which reduced the number of interviews achieved at those locations. This was particularly the case in Northern Bahr el Ghazal, where households often form relatively isolated homesteads far apart. How does the below-target sample size affect statistical significance of findings? The target of 95% level of confidence and an error margin of +/– 5% was met when disaggregating by FFA/Non-FFA (95/2.1%); by state (95/2.1%); and by FFA *and* State (95/3%).[15] Map 1 below shows livelihood zones and locations where baseline data was collected.

Once coordinates for sampled Phase I project locations had been gathered, it became clear that the vast majority of project location sites in Northern Bahr el Ghazal and Warrap states were located on the Western Flood Plains, hence the disaggregation by livelihood zone was abandoned for the Phase I analysis.[16] This does not impact on the reliability of findings; it simply means that the population of interest – i.e. the households that participate in FFA in Northern Bahr el Ghazal and Warrap states – are largely located on the Western Floodplains in the two states. They therefore face the same opportunities and constraints regarding livelihoods.[17] Comparison with the Ironstone Plateau will however take place once Phase II data becomes available for analysis as this is being gathered from Western Bahr el Ghazal (WBeG), a state which is almost entirely located on the Ironstone Plateau.[18]

After applying the HEA wealth group parameters to the sample, the better-off group was found to represent a statistically insignificant 2% of individuals and households respectively. Therefore, the Middle and Better-off wealth groups were combined to form one group of wealthier households, forming 15% of the total sample.

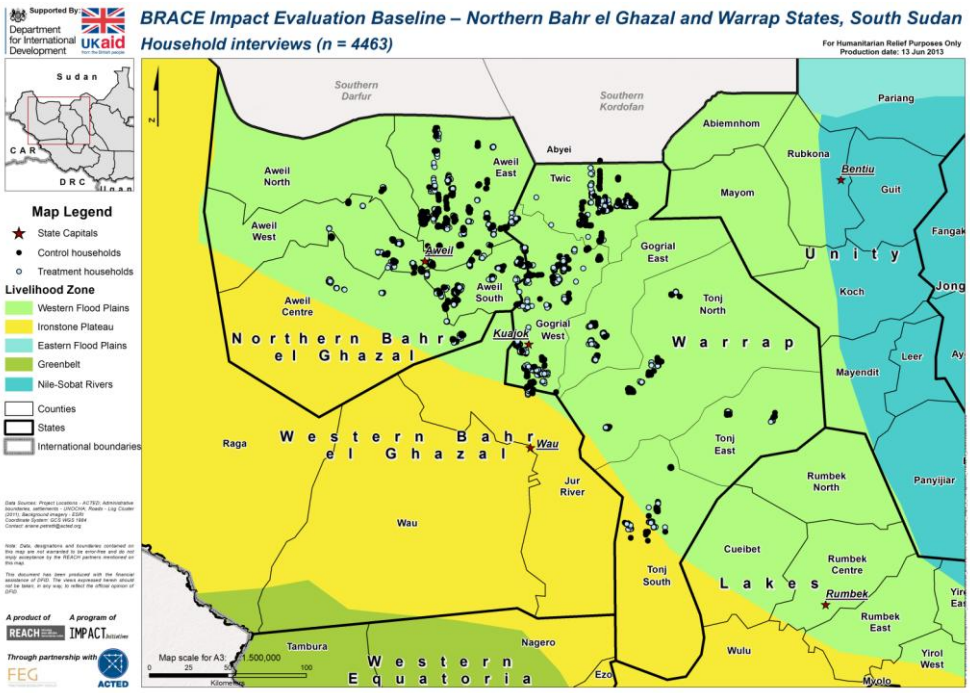
[14] Project locations were often found to consist of a *Boma* – an administrative unit consisting of one or more villages. The next level identified by the South Sudan National Bureau of Statistics (2010) is the *Payam*, which consists of several Bomas. Each *County* includes several payams and finally, each *State* includes several counties.
[15] The effect on statistical significance when disaggregating by wealth group is explored further below (see section 1.2.2.4).
[16] Coordinates for project locations were not known at the time of sampling while Payam boundaries remain undetermined throughout South Sudan – hence the exact location of each site could only be determined once coordinates had been gathered during the baseline data collection.
[17] See section 1.2.4. below for further detail on the livelihood zone
[18] For further information on the sampling methodology, please see Sampling Methodology Notes.

1.2.2.3. Livelihood zones

The northern part of Northern Bahr el Ghazal and Warrap States are located on the Western Floodplains livelihood zone, while the southern part of both states fall on the Ironstone Plateau. A Household Economic Analysis (HEA) completed by the Food Economy Group (FEG) in partnership with ACTED during November and December, 2012, assessed the two zones. Each zone harbours unique characteristics that determine how households can make a living. While the Ironstone Plateau is largely focused on agriculture, the Western Floodplains are dominated by agro-pastoral communities.[19]

The baseline sample for each state was calculated to include project locations from both livelihood zones as these cover both states – hence 3,040 household interviews was set as a target for each state, as there was a large population of beneficiaries in each state rendering the need for statistical significant sampling by (a) livelihood zone, (b) states, and (c) wealth group. Once coordinates for sampled project locations had been gathered, it became clear that the number of project location sites on the Ironstone Plateau was limited.[20] As locations had been selected randomly from the site list, it was concluded that FFA project location sites in the vast majority of cases were located on the Western Floodplains and the disaggregation by livelihood zone was abandoned for the Phase I analysis. This does not impact on the reliability of findings; it simply means that the population of interest – i.e. the households that participate in FFA in Northern Bahr el Ghazal and Warrap states – are largely located on the Western Floodplains in the two states. They therefore face the same opportunities and constraints regarding livelihoods. Comparison with the Ironstone Plateau will however take place once Phase II data becomes available for analysis as this is being gathered from Western Bahr el Ghazal (WBeG), a state which is almost entirely located on the Ironstone Plateau.[21] The final sample size for the two states was 4,308 – 1,982 in Northern Bahr el Ghazal 2,326 in Warrap – totalling 34,040 household members.

Map 1: Households interviewed in Northern Bahr el Ghazal and Warrap States with livelihood zones[22]



[19] See 'Household Economic Analysis (HEA) Livelihoods Profiles Report – South Sudan: Western Flood Plains & Ironstone Plateau (Final Report, April 2013) Food Economy Group.

[20] Coordinates for project locations were not known at the time of sampling while Payam boundaries remain undetermined throughout South Sudan – hence the exact location of each site could only be determined once coordinates had been gathered during the baseline data collection.

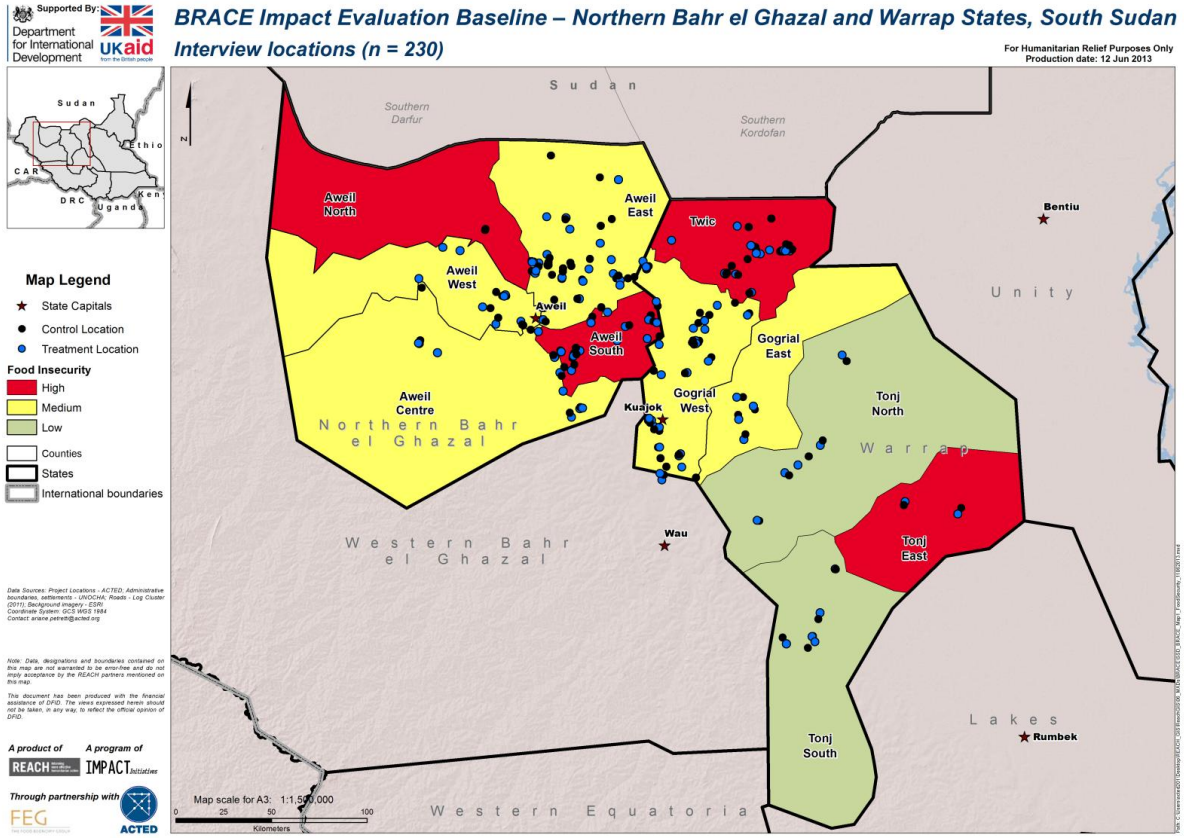
[21] For further information on the sampling methodology, please see Sampling Methodology Notes.

[22] 4,463 households were interviewed but the final sample size was reduced to 4,308 when it was discovered that some households that were interviewed at control locations had participated in FFA. Filter questions have subsequently been added to survey tools to ensure this is avoided in future round of surveying.

1.2.2.4. FSMS Food insecurity index rating

In addition to livelihood zones, sampling was originally designed to allow for a second disaggregation – based on the food insecurity rating which guides the WFP targeting process on the county level.[23] The index has been developed by the WFP Food Security Monitoring System (FSMS) and is applied to the household level data that is gathered by the FSMS three times per year (February, June and October). The FSMS data is relied on by studies assessing food insecurity, including the yearly WFP-led Annual Needs and Livelihood Analysis (ANLA) and the FAO/WFP-led Crop and Food Security Assessment Mission (CFSAM). The latest round of FSMS data collection was conducted around the same time as BRACE data collection – during February 2013. Map 2 below shows locations where baseline data collection was conducted in addition to the 2013 FSMS county-level food insecurity rating.

Map 2: Sampled locations in Northern Bahr el Ghazal and Warrap States with county-level food insecurity index rating



[23] See Annex A for details on composite food insecurity index that calculated by the FSMS, which is derived from household level data gathered on food consumption, food access and coping strategies.

1.2.2.5. Wealth groups

In addition to livelihood zones and the FSMS food insecurity index rating, assessed households were classified according to 'wealth groups', to allow for comparison between poorer and wealthier households. The classification was based on the preceding HEA analysis, where wealth groups were identified according to a range of characteristics including: typical household size; size of land and type of crops cultivated; livestock and asset holdings; sources of food and income; and expenditure patterns. The main differentiating characteristic amongst wealth groups identified by the HEA was the typical level of expenditure on livelihood inputs. According to HEA findings, the level of household expenditure of livelihood inputs is a reliable indicator of wealth regardless of whether assets are sold or not, because of the costs incurred when maintaining assets. Cattle owners will for instance spend on drugs to treat sick animals and thus be categorised in a wealthier group, even where no animals are being sold. Four wealth groups were identified for the Western Flood Plains livelihood zone during the HEA baseline – the table below outlines the main characteristics for each group.

Table 3: Wealth group characteristics for the Western Flood Plains livelihood zone identified by the HEA baseline[24]

Wealth Group	Proportion of population belonging to Wealth Group (HEA estimate)	Livelihoods expenditure (SSP/12 months)	HH Size	Land Area Cultivated	Crops Cultivated	Livestock/Asset Holding
Very Poor	40%	0-162	3-5	0-1 feddan	Sorghum, groundnut, sesame, okra and pumpkin	0-2 goats, 1-3 hens, 0-2 fishing nets, 0-1 hooks
Poor	25%	163-378	4-10	0.5-1 feddan	Sorghum, groundnut, sesame, okra and pumpkin	3-5 cattle, 3-4 sheep, 4-6 goats, 4-8 hens, 0-2 fishing nets, 0-1 hooks
Middle	20%	379-2700	7-11	1-2 feddan	Sorghum, groundnut, sesame, okra and pumpkin	20-30 cattle, 10-30 goats, 10-18 sheep, 10-14 hens, 2-4 fishing nets, 2-4 hooks
Better-off	15%	2701-5635	10-14	1.75-2.75 feddan	Sorghum, groundnut, sesame, okra and pumpkin	50-70 cattle, 36-56 goats, 20-40 sheep, 16-24 hens, 4-8 fishing nets, 4-8 hooks

1 feddan = 0.42 hectare

After gathering information on livelihoods expenditure during the quasi-experimental baseline, all 4,308 households interviewed were classified according to the wealth groups identified by the HEA. The tables below list number of households and individuals surveyed by wealth group; county-level food insecurity index rating; and FFA/non-FFA group. The percentage of the sample classified to each wealth group is also specified. The HEA had estimated the proportion of Better-off individuals to include 15% of the Western Flood Plains population (see Table 3 above) but in the quasi-experimental sample, the group represented a statistically insignificant 2% of individuals and households respectively.

[24] See 'Household Economic Analysis (HEA) Livelihoods Profiles Report – South Sudan: Western Flood Plains & Ironstone Plateau (Final Report, April 2013) Food Economy Group.

Table 4: Households - by FFA participation, wealth group and county-level food insecurity rating

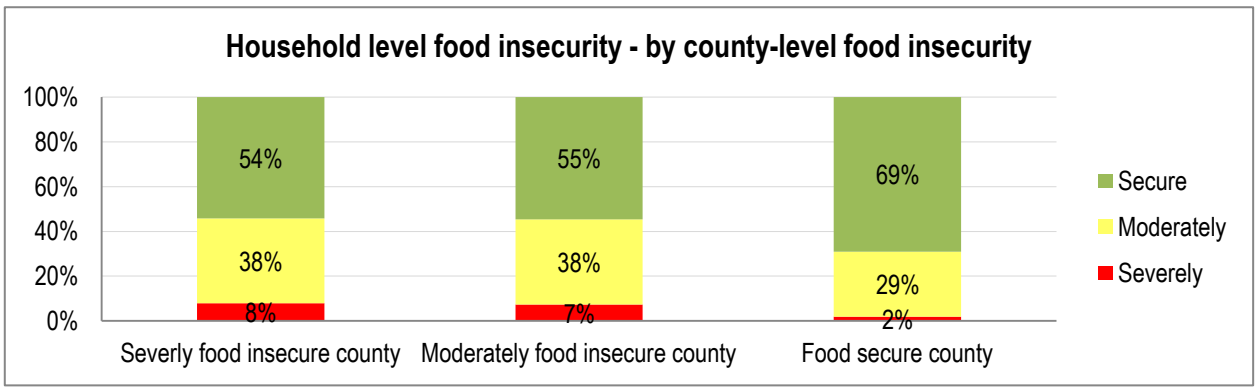
HOUSEHOLDS	Very Poor	Poor	Middle	Better-off	TOTAL
Severely food insecure county	**734**	**146**	**125**	**12**	**1,017**
Non-FFA	*369*	*69*	*58*	*6*	*502*
FFA	*365*	*77*	*67*	*6*	*515*
Moderately food insecure county	**1,881**	**572**	**409**	**47**	**2,909**
Non-FFA	*982*	*286*	*192*	*25*	*1,485*
FFA	*899*	*286*	*217*	*22*	*1,424*
Food secure county	**224**	**89**	**63**	**6**	**382**
Non-FFA	*121*	*50*	*22*	*3*	*196*
FFA	*103*	*39*	*41*	*3*	*186*
TOTAL	**2,839** (66%)	**807** (19%)	**597** (14%)	**65** (2%)	**4,308**

Table 5: Individuals - by FFA participation, wealth group and county-level food insecurity rating

INDIVIDUALS	Very Poor	Poor	Middle	Better-off	TOTAL
Severely food insecure county	**5,722**	**1,216**	**1,118**	**102**	**8,158**
Non-FFA	*2,879*	*573*	*506*	*60*	*4,018*
FFA	*2,843*	*643*	*612*	*42*	*4,140*
Moderately food insecure county	**1,731**	**765**	**573**	**60**	**3,129**
Non-FFA	*914*	*414*	*213*	*40*	*1,581*
FFA	*817*	*351*	*360*	*20*	*1,548*
Food secure county	**14,137**	**4,723**	**3,490**	**403**	**22,753**
Non-FFA	7,354	2,344	1,621	206	11,525
FFA	6,783	2,379	1,869	197	11,228
TOTAL	**21,590 (63%)**	**6,704 (20%)**	**5,181 (15%)**	**565 (2%)**	**34,040**

In addition, considerable variation in food insecurity rating was found amongst households within the counties with the same food insecurity index rating. The highest proportion of food insecure households was found in counties that were rated as severely or moderately food insecure (46% and 45% of households), followed by 31% of households in food secure counties.

Chart 1: Household food insecurity rating by WFP County food insecurity rating[25]



Given the significant variation in food insecurity within counties, the food insecurity index rating was applied to the household instead of county level to allow for better representation of the food security situation.[26] Also, due to the statistically insignificant proportion of Better-off households, the Middle and Better-off wealth groups were combined to form one group of wealthier households.

Table 6: FFA and non-FFA households - by wealth group and household-level food insecurity rating

HOUSEHOLDS	Very Poor	Poor	Middle/Better-off	TOTAL
Severely food insecure HH	**1,206**	**236**	**153**	**1,595**
Non-FFA	*643*	*127*	*82*	*852*
FFA	*563*	*109*	*71*	*743*
Moderately food insecure HH	**1,380**	**521**	**488**	**2,389**
Non-FFA	*695*	*248*	*214*	*1,157*
FFA	*685*	*273*	*274*	*1,232*
Food secure HH	**236**	**45**	**17**	**298**
Non-FFA	*125*	*28*	*7*	*160*
FFA	*111*	*17*	*10*	*138*
TOTAL	**2,822 (66%)**	**802 (19%)**	**658 (15%)**	**4,282**

Generalisations to the overall population of interest, when disaggregating by FFA/non-FFA and wealth groups, can be made with 95% level of confidence although the error margin for the Middle/Better-off wealth group (approximately +/-5.35%) is slightly wider than the target +/-5%.Change in wealth group and food insecurity index proportions will be monitored during future rounds of surveying, with the aim of detecting whether FFA leads to an increase in wealth and improvement in food security. Monitoring of wealth group proportions will also be conducted to identify change in labour dynamics. An increase in proportion of Middle/Better-off households may improve resilience in communities overall as this group provides labour opportunities for the poorer groups. Conversely, a decrease in the Middle/Better-off proportion may lead to loss of income earning opportunities for the poorer wealth groups, a scenario that has been highlighted by the HEA as the 'greatest threat' to the local economy.[27]

[25] The total percentage in some charts does not add up to 100% - this is due to the decision to avoid displaying decimals and hence improve readability of the charts.
[26] In some cases data was missing on type of income (one of three components that make up the food security index) – preventing food security classification at the household level. These cases were omitted from analysis that included the food insecurity index, yielding the slightly lower total sample size of 4,282 households for disaggregation at this level.
[27] See 'Household Economic Analysis (HEA) Livelihoods Profiles Report – South Sudan: Western Flood Plains & Ironstone Plateau (Final Report, April 2013) Food Economy Group. (p.25)

2. BASELINE FINDINGS

2.1. THE COMPOSITE FOOD INSECURITY RATING

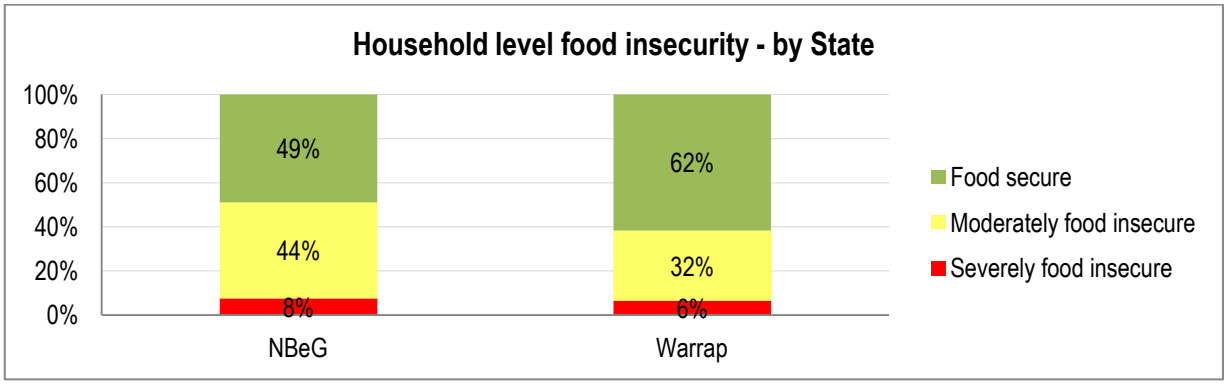
Main findings: Food insecure households were more likely to have a high proportion of dependents, small household size and kinship network; and to have a female household head. Residential status of the household head and tribal affiliation of the household did not have a significant effect on food security when controlling for State. FFA did not have a significant effect on food security when controlling for wealth group, household size and proportion of dependents. Further surveying will assess whether the lack of effect is due to FFA improving food security to the level of non-FFA households.

The food insecurity index developed by the FSMS has three components – Food Access Score based on income reliability and sustainability in addition to percentage of household expenditure spent on food; Coping Strategy Index; and Food Consumption Score. [28]The food insecurity index scoring system applied by the FSMS was applied to BRACE data to compare the results of the two data sets.

2.1.1. State and mode of intervention

Fewer households were found to be food insecure in Warrap (38%) compared to Northern Bahr el Ghazal (51%) state. FSMS data reported a higher proportion of food insecure households but similarly found that a larger share of households were food insecure in Northern Bahr el Ghazal (67%) compared to Warrap (43%) state.%).[29][30]

Chart 2: Households by food insecurity and State



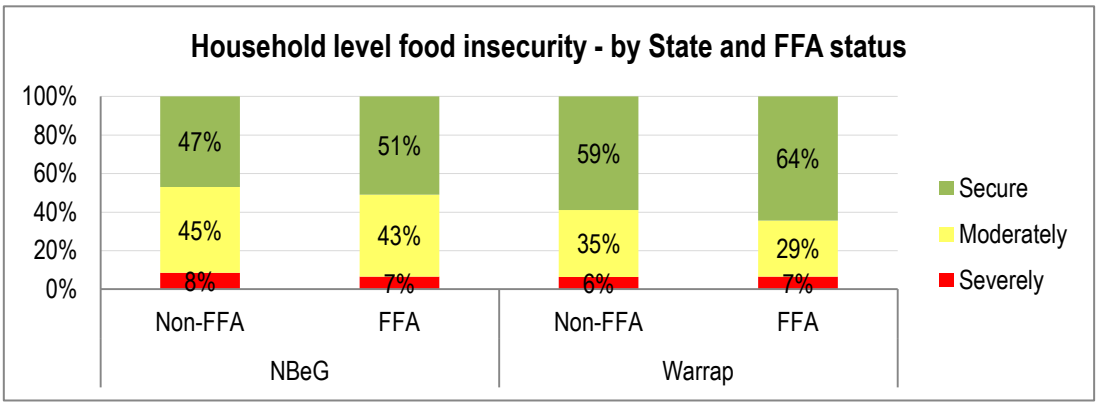
BRACE was more likely to score households as having low income source reliability, given that data was gathered on two as opposed to three income sources. This would then contribute to a comparatively higher food insecurity rate. On the other hand, BRACE was slightly more likely to give households a higher food consumption score, given that BRACE gathered data on 14 as opposed to 13 food types.[31] Food consumption scores were therefore slightly higher for BRACE data which in turn lowered the food insecurity rate.

One possible general explanation for the difference in results between the two data sets could be the different sample sizes, which affects generalisability of findings. While FSMS gathers data from on average 284 households per state, the BRACE baseline sample included 1,982 households in Northern Bahr el Ghazal State and 2,326 households in Warrap State. In addition, BRACE sampling was focused on WFP FFA project locations; hence the findings apply to this particular section of the population, while FSMS draws a sample from the entire state population.

[28] See Annex B for food security index calculation details.
[29] Findings are here reported as significant where they can be generalised to the site population overall with 95% confidence and a 5% error margin. P-values will therefore only be stated where findings with lower levels of confidence are reported.
[30] FSMS, Round 9, February 2013
[31] BRACE separated Roots and Tubers from Other Cereals while the two types were combined by the FSMS.

BRACE data collection covered both households that had participated in FFA (treatment) and those who had not (control) to assess difference in food security between the two types of households. Including both treatment and control households in the baseline enables a level of control for previous FFA participation, given the evaluation aim to detect impact generated during the limited time-frame of the BRACE project and the fact that food interventions have been widespread in South Sudan for several decades. By assessing change in food security amongst households that at the time of the baseline had either participated in FFA; had switched from FFA to GFD; had participated in GFD; or had not participated at all, difference in impact on households should be possible to identify depending on these four 'starting points.' Control (Non-FFA) group households were overall more likely to be food insecure (47%) than treatment (FFA) group households (42%). Significant variation in food insecurity was also seen between FFA and non-FFA households – and between states. In Warrap State, 41% of Non-FFA households were food insecure, compared to 36% of FFA households. In Northern Bahr el Ghazal, 53% of Non-FFA households were food insecure compared to 50% of FFA households.[32] Further rounds of surveying will assess whether the variation in food security depending on FFA is due to impact of FFA or whether households selected for FFA are more likely to be food secure.

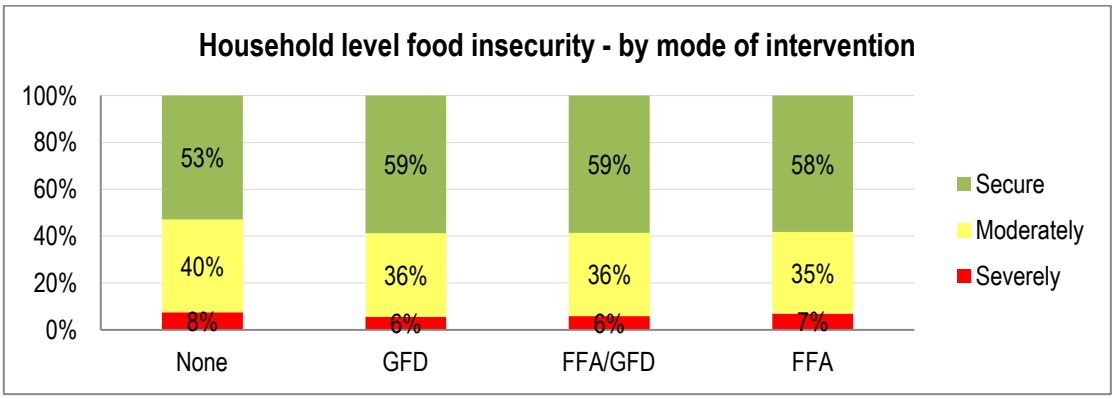
Chart 3: Households by food insecurity, State and FFA participation



In addition to participating in FFA, 39.6% of FFA households had also received GFD in the 12 months preceding the survey, while the figure was 6.6% amongst non-FFA households. GFD rations were larger than FFA rations. While GFD rations range from 535 – 615 grams per person per day the FFA ration is limited to 385 grams. But when comparing FFA and non-FFA households, significant variation in food insecurity was only found between households that had not taken part in any intervention at all and those that had. Amongst households that reported not taking part in any intervention, 48% were food insecure, compared to 42% of those who had partaken in either both FFA and GFD; GFD only; or FFA only. There was hence no significant difference between households depending on ration sizes.

[32] Variation in Northern Bahr el Ghazal was found at the slightly lower level of 6.6% significance (p=0.066).

Chart 4: Households by food insecurity and mode of intervention

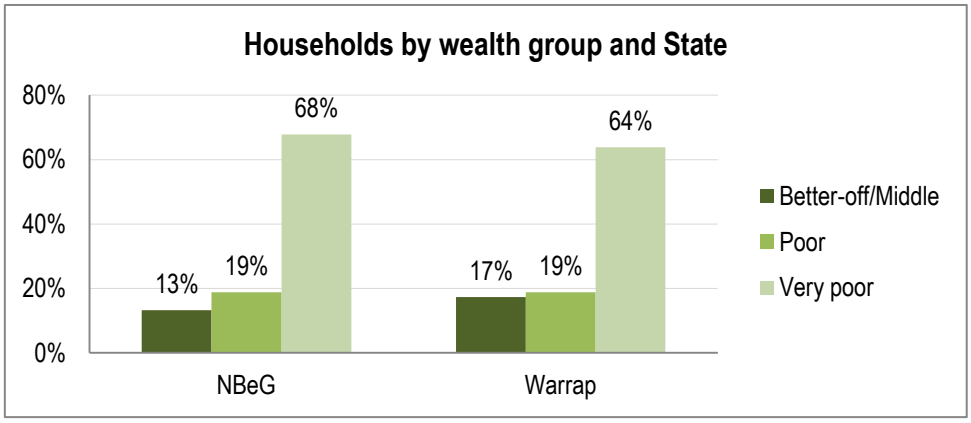


One consideration to bear in mind when reviewing the results is that households receiving GFD rations may be expected to share this resource with other kin, as it may be considered as a gift.[33] FFA rations may be less prone to be shared given that they are received in return for labour. Other factors are of course also likely to underpin the lack of variation, some of which will be explored in this report. Future rounds of surveying will go further and assess whether FFA and/or GFD contributes to improved food security, or whether households selected for food interventions are more likely to be food secure.

2.1.2. Wealth

A higher proportion of households in Northern Bahr el Ghazal State were classified as Very Poor (68%) compared to Warrap (64%). Fewer households in Northern Bahr el Ghazal were also classified as Middle/Better-off (13%) than in Warrap State (17%). The households in our sample were as mentioned above, classified by wealth group according to the amount they reported spending on livelihood inputs during the 12 months preceding the survey – a variable identified by the HEA as a particularly reliable indicator of wealth.[34]

Chart 5: Households by wealth group and State



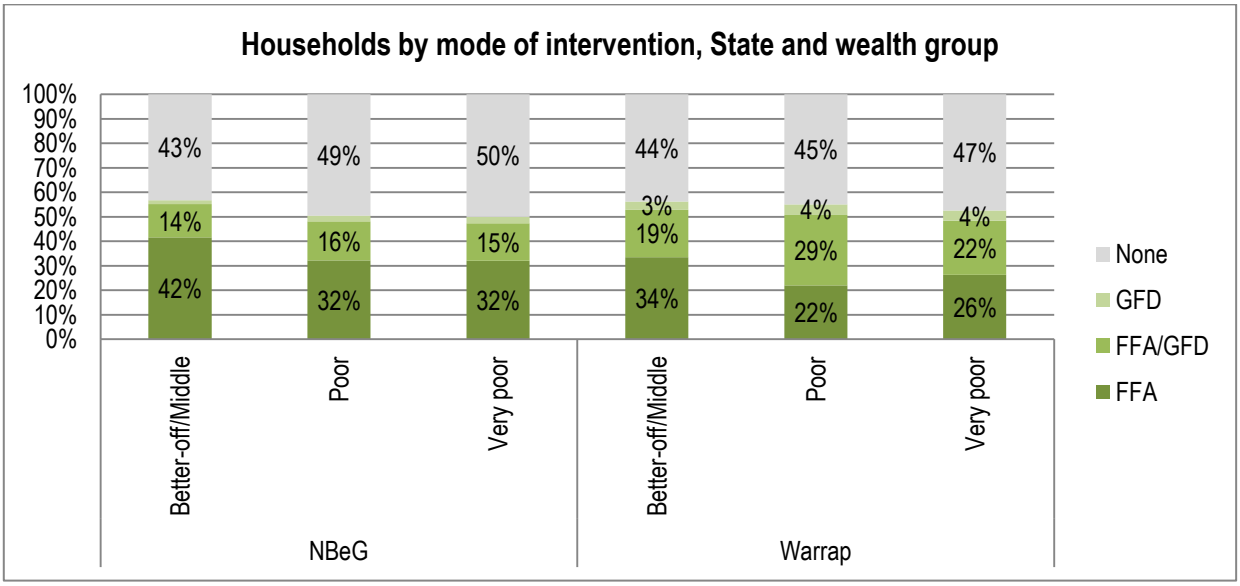
Households were overall more likely to have participated in a food intervention in Warrap (54%) compared to Northern Bahr el Ghazal (51%) state but participation also varied according to wealth group. Very Poor households were least likely to have

[33] See Maxwell, D. and Burns, J. (2008) 'Targeting in Complex Emergencies: South Sudan Country Case Study'; and World Vision (2010) 'Malnutrition and the Dinka of Southern Sudan the culture of sharing'; and Save The Children (1998) 'The Southern Sudan Vulnerability Study' – on complications in targeting of food distributions

[34] See 'Household Economic Analysis (HEA) Livelihoods Profiles Report – South Sudan: Western Flood Plains & Ironstone Plateau (Final Report, April 2013) Food Economy Group.

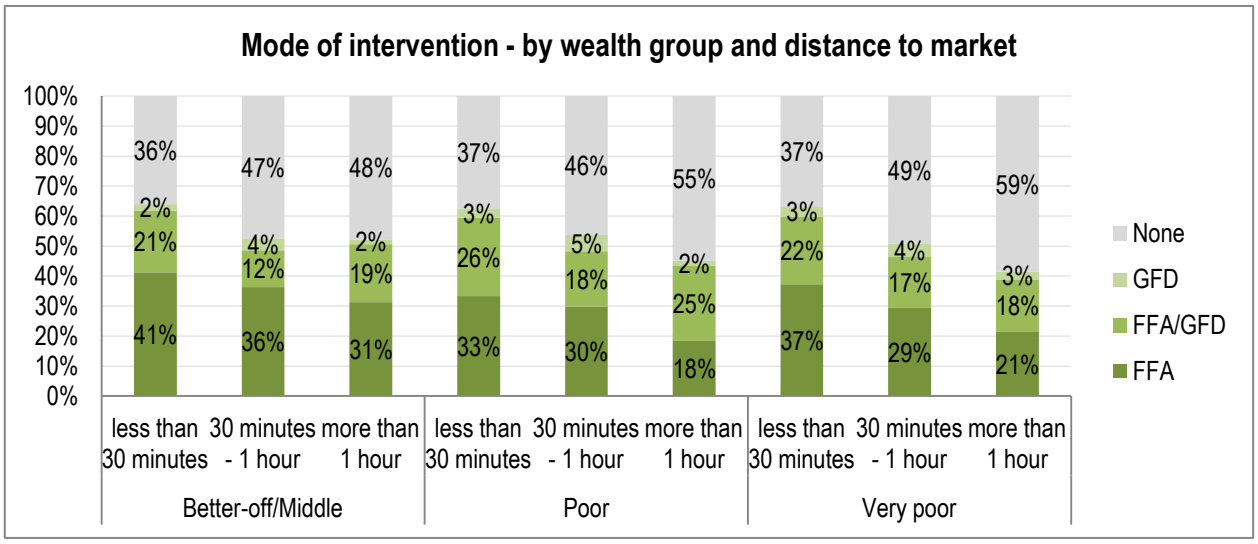
participated in FFA or GFD in both states – 50% of Very Poor households in Northern Bahr el Ghazal and 47% in Warrap state had received no intervention at all, compared to 49% and 45% of Poor households and 43% and 44% of Middle/Better-off households. Middle/Better-off households were most likely to have taken part in FFA (37% of households), followed by Very Poor (29%) and Poor (27%). Poor households were most likely to have switched from GFD to FFA (23%) followed by Very Poor (19%) and Middle/Better-off (17%). It could be the case that participation in FFA has enabled households to spend more on livelihoods, hence classifying them in the wealthier, more resilient group. Wealth proportions will be monitored in future rounds of surveys to assess whether the proportion of wealthier households is increasing amongst households that are participating in FFA.

Chart 6: Households by mode of intervention, State and wealth group



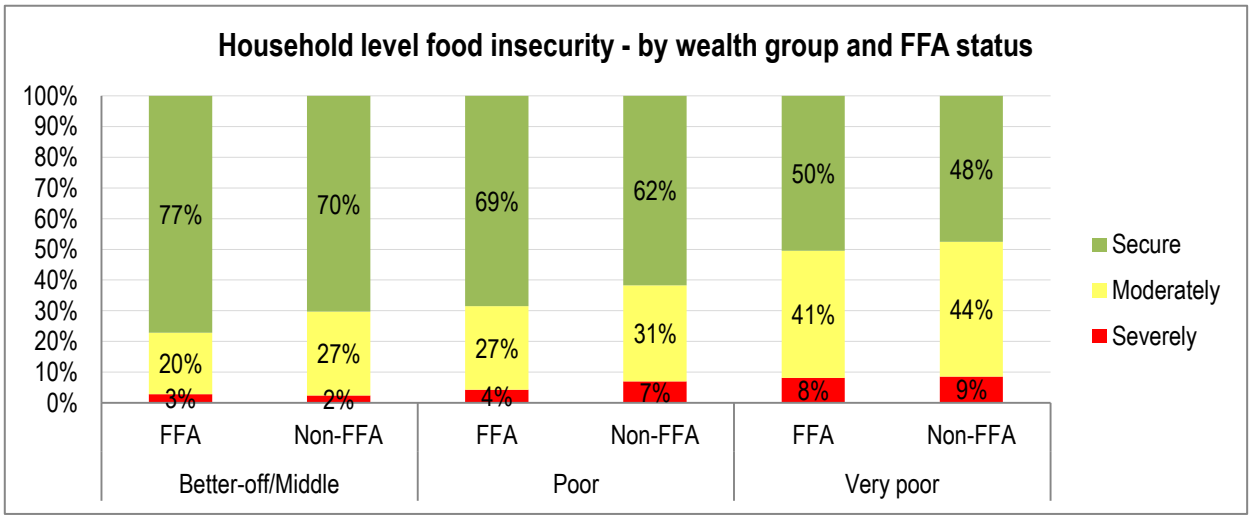
Distance to market – usually located in the village centre where meetings on beneficiary selection would be held – was identified as an underlying factor contributing to participation in FFA and GFD. While no difference was seen between wealth groups when comparing households living less than 30 minutes away, a higher proportion of middle/better-off living more than one hour away (52%) had participated compared to poor (45%) and very poor (41%) households living more than one hour away. Amongst households in the same wealth groups, those with longer distances to the market were less likely to have participated in an intervention. The most dramatic effect was seen amongst the very poor, where 63% of those living less than 30 minutes away had participated, while the corresponding figure for those living more than one hour away was 41%. Distance thus appeared to have had a stronger negative effect on household-level access to intervention amongst poorer than wealthier households.

Chart 7: Households by mode of intervention, wealth group and distance to market



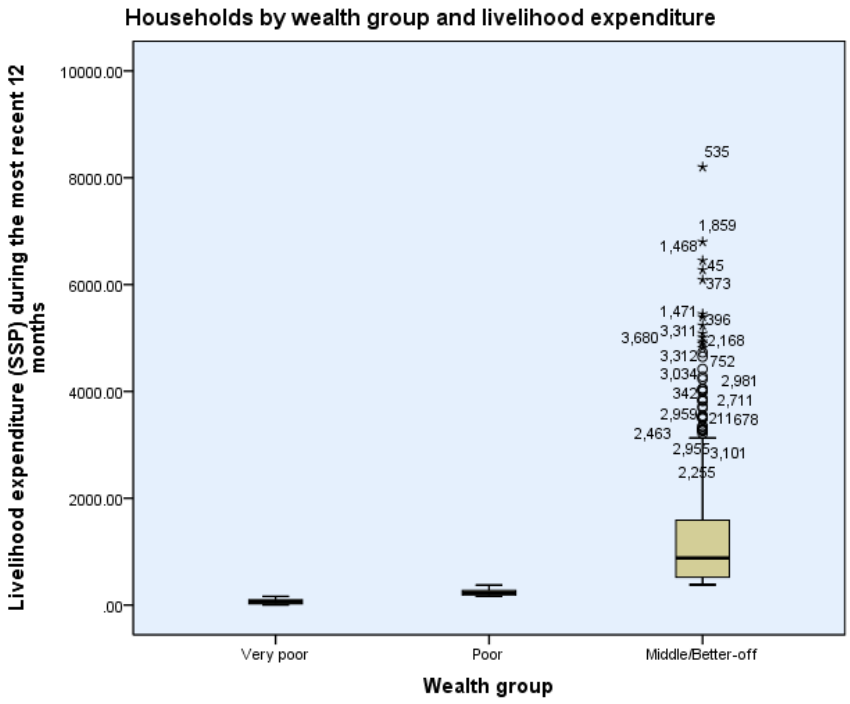
There was also significant variation in food security between wealth groups, with 51% of Very Poor households classified as severely food insecure, compared to 35% of Poor and 26% of Middle/Better-off households. Participation in FFA had a significant positive effect on household food insecurity rating when controlling for wealth group, particularly in the Poor wealth group. In the Poor group, 31% of FFA households were food insecure, compared to 38% of non-FFA households. In the Middle/better off group, 23% of FFA households were food insecure, compared to 29% of non-FFA households. The smallest effect was seen amongst the Very Poor, where 49% of FFA households were food insecure, compared to 53% of non-FFA households. It should be noted here, that when controlling for wealth group and FFA status, receipt of GFD did not have a significant effect on food security rating – hence households within each wealth group had on average the same food security rating, regardless of whether they had participated in GFD or not.

Chart 8: Households by food insecurity, wealth group FFA participation



Future rounds of surveying will assess whether the variation seen in food security depending on FFA participation is due to FFA contributing to improved food security – or due to households that are more food secure being more likely to be selected for FFA.

Figure 2: Households by wealth group and total livelihoods expenditure (SSP) over the most recent 12 months



This box plot shows the range in livelihood expenditure (the indicator used here to classify households according to wealth) within wealth groups.

The majority of households (85%) were categorised as Very Poor or Poor as they spent less than 379 SSP during the 12 months preceding the survey 10% of whom reported spending nothing at all.

The box plot shows significant variation within the Middle/Better-off group in livelihood spending. The lowest amount spent amongst Middle households was 379 while the highest spending amongst the Better-off was 8200 SSP.

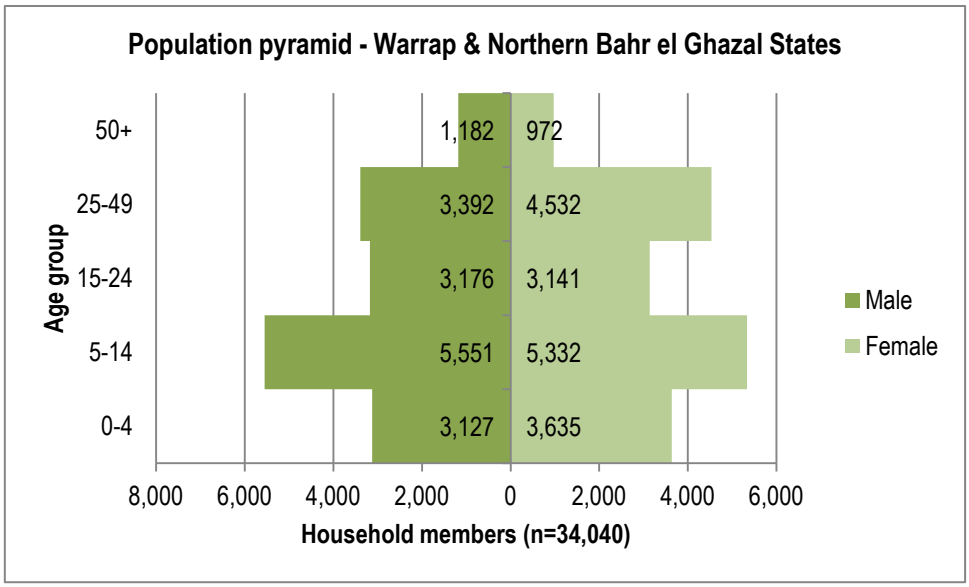
2.1.3. Demographics

Main finding: FFA participation was not significantly correlated with food security when controlling for wealth group, household size and proportion of dependents. Future rounds of surveying will assess whether the lack of correlation seen in the baseline is due to FFA affecting household level food security to align those that participate with those that do not. Food insecure households were also found more likely to have a high proportion of dependents, small household size and kinship network; and to have a female household head.

Overall baseline findings show that a high proportion of household members across all groups were aged less than 15 years (52.5%), this was higher than the national average reported by the most recent census (44.4%).[35] Children under 5 accounted for 20.8% of household members – again higher than the corresponding figure reported by the 2008 census (15.8%). The age-dependency ratio – the number of dependents (individuals aged less than 15 or more than 50) for each non-dependent (individuals aged 15 to 49) was on average 2:1 for non-FFA locations and 1.8:1 for FFA households.[36] This may reflect the requirement of FFA households to have at least one household member aged 18 and able to work. Women dominated in the 25-49 age group – perhaps an indication of high mortality or migration rate for men in this age group. Fewer women than men were aged 50 and over – a reflection of the lower life expectancy for women in South Sudan (61 compared to 62 for men in 2008). South Sudan is one of only six countries in the world where women have a lower life expectancy than men.[37]

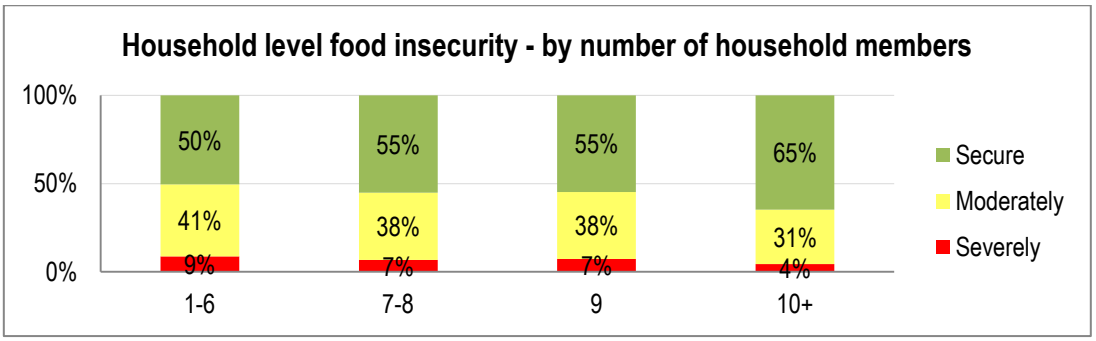
[35] See Southern Sudan Centre for Census, Statistics and Evaluation (2010) 'Statistical Yearbook for Southern Sudan' p.9
[36] It should be noted that data collectors suspected that respondents underestimated the age of adults in some cases.
[37] Botswana, Lesotho, Qatar, Swaziland, South Sudan and Zimbabwe were the only countries where women lived on average shorter lives than men in 2008 - the year of the most recent census data collection. Life expectancy was here calculated based on data downloaded from http://data.worldbank.org/indicator/SP.DYN.LE00.FE.IN/countries - which is sourced from (1) United Nations Population Division. World Population Prospects, (2) United Nations Statistical Division. Population and Vital Statistics Report (various years), (3) Census reports and other statistical publications from national statistical offices, (4) Eurostat: Demographic Statistics, (5) Secretariat of the Pacific Community: Statistics and Demography Programme, and (6) U.S. Census Bureau: International Database.

Chart 9: Population pyramid – household members by gender and age group



The average household size was 7.9, with non-FFA households slightly smaller in size (7.8) than FFA households (8). This is significantly higher than the average household size recorded during the most recent census, which was 5.5 members in Warrap and 5.2 in Northern Bahr el Ghazal.[38] Household size was positively correlated with food security, with smaller households found more likely to be food insecure. While 50% of households with 1-6 members were food insecure, the corresponding figure was 35% for households with 10 or more members. Amongst the largest households, 4% were severely food insecure, compared to 9% of the smallest.[39]

Chart 10: Household level food insecurity by household size



The positive correlation between household size and food security index rating remained when controlling for wealth group; each additional household member lead to a 0.022 increase in food security category, all else equal. This indicates that larger households were more food secure compared to smaller households in the same wealth group. FFA and GFD did not have a significant effect when comparing households with similar size in the same wealth groups.

[38] See Southern Sudan Centre for Census, Statistics and Evaluation (2010) 'Statistical Yearbook for Southern Sudan'
[39] The range of household members in each category represents 25% of the overall sample.

Table 7: Linear regression model estimating effect of household size and wealth group on household level food insecurity rating

Coefficients[a]								
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	1.238	.027		45.035	.000	1.184	1.291
	Total_HH_Members	.022	.003	.101	6.721	.000	.016	.028
	Poor	.173	.024	.108	7.051	.000	.125	.221
	Middle_Better_off	.287	.027	.166	10.779	.000	.235	.339
a. Dependent Variable: Food security index rating (0=Severely food insecure; 1=Moderately food insecure; and 2 = Food secure)								

When taking percentage of dependents into account – i.e. controlling for the age of household members – the proportion of dependents had no significant effect on food insecurity rating, when holding wealth group constant – i.e. comparing households within the same wealth groups.[40] Hence food security of a household does not seem to be affected depending on proportion of household members that are dependents, when comparing households within the same wealth group.

Table 8: Linear regression model estimating effect of household size; percentage of dependents; and wealth group on household level food insecurity rating

Coefficients[a]								
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	1.245	.044		28.293	.000	1.159	1.331
	Poor	.173	.024	.108	7.047	.000	.125	.221
	Middle_Better_off	.287	.027	.166	10.778	.000	.235	.339
	Percentage_Dependents	.000	.001	-.003	-.213	.831	-.001	.001
	Total_HH_Members	.022	.003	.101	6.668	.000	.016	.028
a. Dependent Variable: Food security index rating (0=Severely food insecure; 1=Moderately food insecure; and 2 = Food secure)								

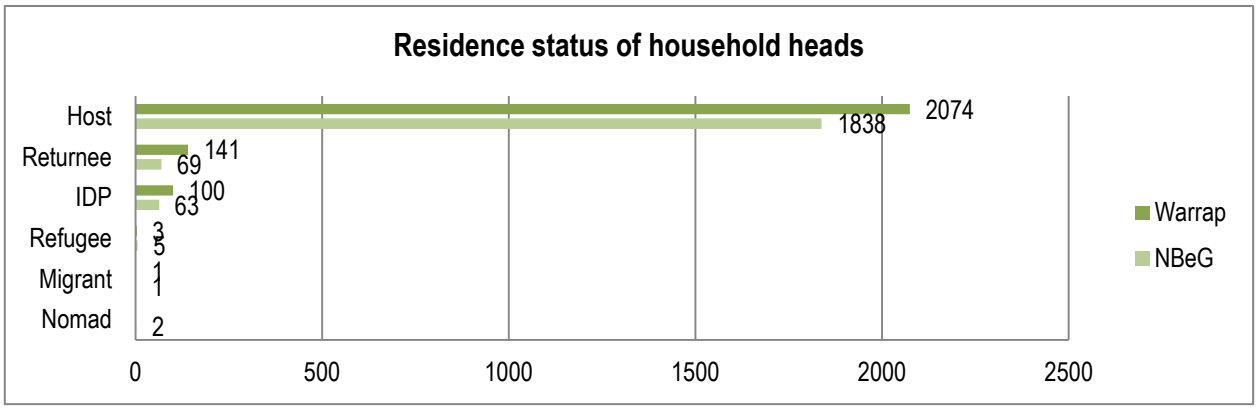
The lack of correlation between food security and number of dependants could be because household members that are categorised as dependents (i.e. aged less than 15 or more than 50) do in fact contribute both formal and informal labour to the household. Indeed, a negative correlation was found between food security and dependants when only considering children aged less than five – food secure households were found to contain an on average lower proportion (20.2%) children under five than moderately (21.3%) and severely (22.5%) food insecure households.

There was no significant variation in proportion of households containing pregnant or lactating women when comparing non-FFA and FFA households – on average 37% of both groups of households contained pregnant or lactating women. A higher proportion of Middle/Better-off households contained pregnant or lactating women (43.7%) compared with Poor (36.8%) or Very Poor (35.4%) households.

The majority of household heads[41] were part of the host community at the time of the assessment – 89.8 and 92.2% of FFA and non-FFA household heads respectively.[42] There was a slightly higher proportion of returnee (6.1%) and IDP (4.3%) heads of households in Warrap State compared to Northern Bahr el Ghazal (3.5% and 3.2% respectively).

[40] Percentage dependents remained non-significant when total household members was removed from the model
[41] Household head is here defined as the household member who is the final decision-maker on major issues such as weddings or relocation of the household
[42] Note that a South Sudanese returnee becomes a resident (host) after residing for 12 months in South Sudan.

Chart 11: Households by state and residence status of household head

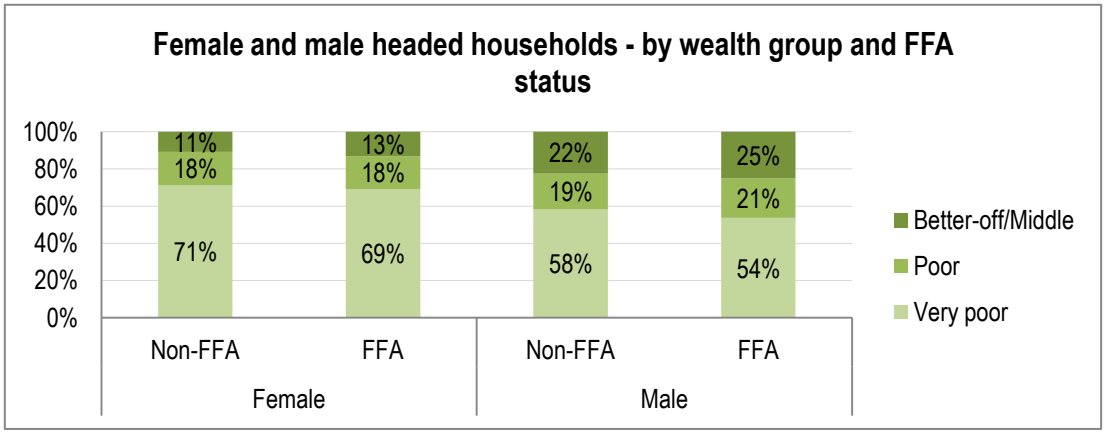


FFA heads of household were more likely to have returned to South Sudan within the 12 months preceding the survey – 6.5% were returnees compared to 3.3% of non-FFA households. There was no significant difference in food security when comparing returnee and host household heads in the two states.

In most households (89.8%), household members held the same residence status as the household head. But in 423 households, household members held a different status: 9.1% of host-community households contained members that were not part of the host community, while 10.7% of returnee households contained non-returnee members; and 32.3% of IDP households included non-IDPs.

Nation-wide FSMS data showed that female-headed households were on average more likely to be classified as food insecure (57%) compared to male-headed households (48%).[43] This trend was also seen in the BRACE data, where 47% of female-headed households were food insecure, compared to 38% of male-headed households. There was also variation between households depending on wealth group and participation in FFA programmes. Female-headed non-FFA households were more likely to be Very Poor or Poor (89%) compared to female-headed FFA households (87%). Male-headed households were wealthier than female-headed households regardless of FFA status. Non-FFA male headed households included 77% that were Poor or Very Poor – a proportion that dropped to 75% for male headed FFA households. Future rounds of surveying will assess whether the difference observed during the baseline is due to FFA participation leading to an increase in wealth – or alternatively, due to wealthier households being selected for FFA participation.[44]

Chart 12: Households by wealth group; gender of household head; and FFA participation



[43] FSMS, Round 9, February 2013

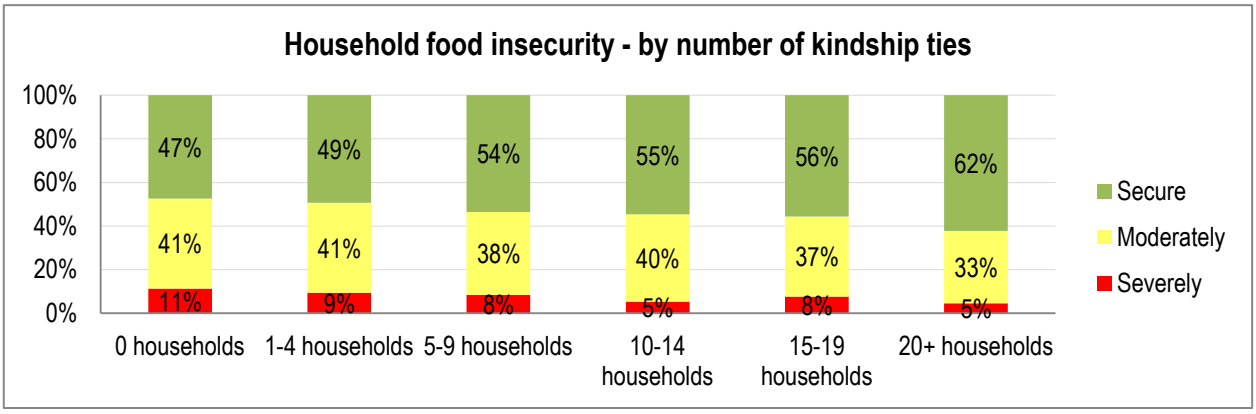
[44] It should be noted that respondent in some cases insisted on denoting their households as female headed also where the husband of the female head was present, this may reflect the tendency of agencies to favour female headed households during interventions.

A large proportion of households identified themselves as female headed (70%). The household head was here defined as the member living in the household who had the final say on major decisions such as weddings or relocation of the household. Wives whose husbands were not currently living in the household therefore identified themselves as household heads. The large proportion of female household heads was mirrored by the large proportion of male household heads (57%) who reported being married to more than one wife, including 25% who reported three or more wives.

To assess the potential impact of social networks on resilience, households were asked to specify how many other households in their Boma they were related to by kinship. The majority of households (28.3%) reported being related to more than 20 households.

Households without kinship ties in their Boma were most likely to be food insecure (53%) while those who had more than 20 ties were least likely to be food insecure (48%).

Chart 13: Households by food insecurity and number of kinship ties



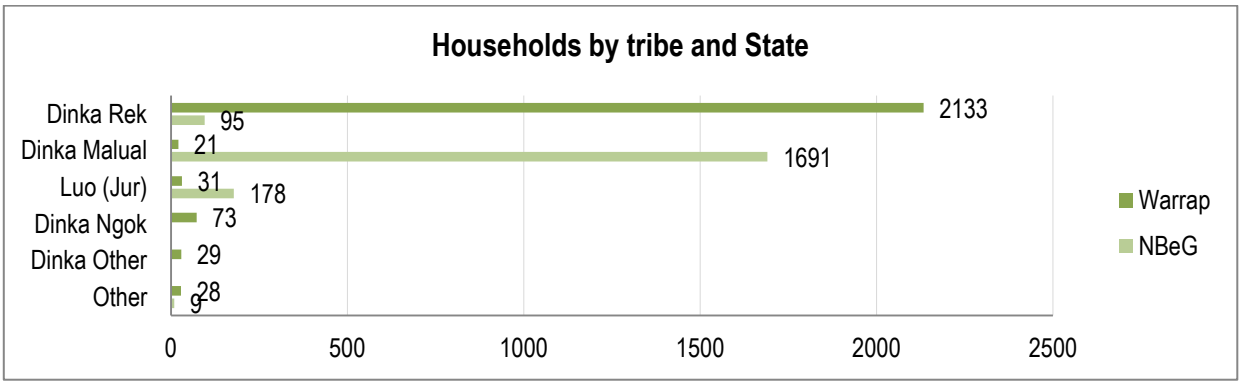
This effect remained after controlling for wealth group. Comparing households within the same wealth groups, those with fewer kinship ties were more likely to be food insecure.

Table 9: Linear regression model estimating effect of wealth group and kinship ties on household level food insecurity

Coefficients[a]								
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	1.431	.034		42.412	.000	1.365	1.498
	Very_Poor	-.189	.024	-.144	-7.711	.000	-.237	-.141
	Middle_Better_off	.128	.032	.074	3.959	.000	.065	.191
	1_8_Rel_HHs	.039	.006	.097	6.453	.000	.027	.051
a. Dependent Variable: Food security index rating (0=Severely food insecure; 1=Moderately food insecure; and 2 = Food secure)								

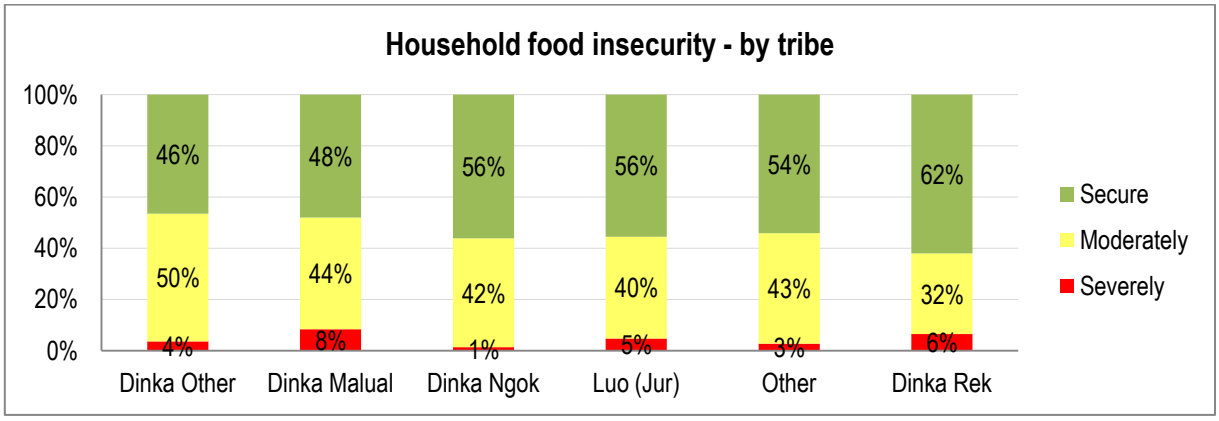
The majority of households in Warrap state reported belonging to Dinka Rek (92%) while Northern Bahr el Ghazal was dominated by Dinka Malual (86% of households in the state). Luo (Jur) was the third most common tribal affiliation, reported by 9% of Northern Bahr el Ghazal households. Dinka Ngok was the third most common Dinka sub-tribe –accounting for 3% of Warrap households. The remaining households either belonged to other Dinka sub-tribes (0.68% across both states), or to other main tribes (0.86% across both states) including Bongo, Shatt, and Balanda.

Chart 14: Households by State and tribal affiliation



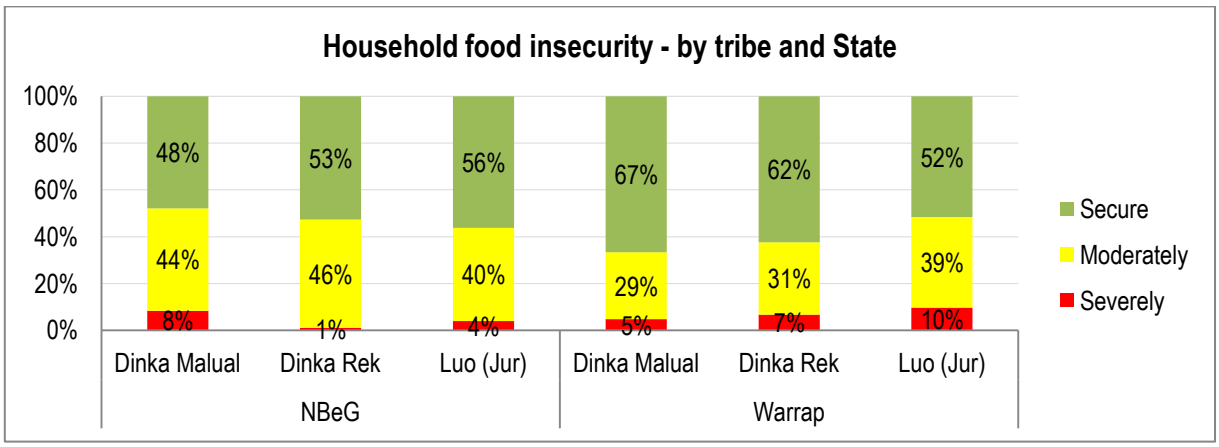
Households that belonged to Dinka Rek households, most common in Warrap State, were found the least likely to be severely or moderately food insecure (38%). Amongst Dinka Malual households on the other hand, that were mostly found in Northern Bahr el Ghazal, 52% were classified as moderately or severely food insecure.

Chart 15: Households by food insecurity and tribe



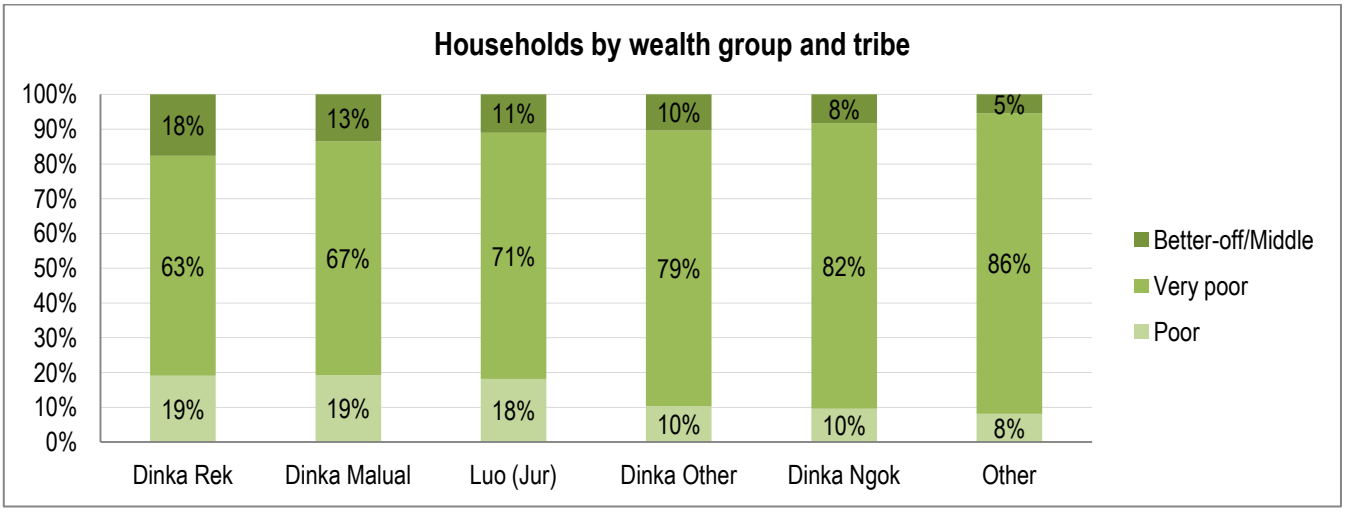
The most common tribal affiliation amongst households in both Warrap and Northern Bahr el Ghazal states were disaggregated by state, to assess whether difference in food security could be related to the higher level of food insecurity in Northern Bahr el Ghazal compared to Warrap. Dinka Rek were found to be less food insecure than Dinka Malual in Northern Bahr el Ghazal, while on the other hand being more food insecure in Warrap State. Hence other factors may underpin food insecurity rather than tribe, including characteristics specifically relating to each state.

Chart 16: Households by food insecurity, State and tribal affiliation



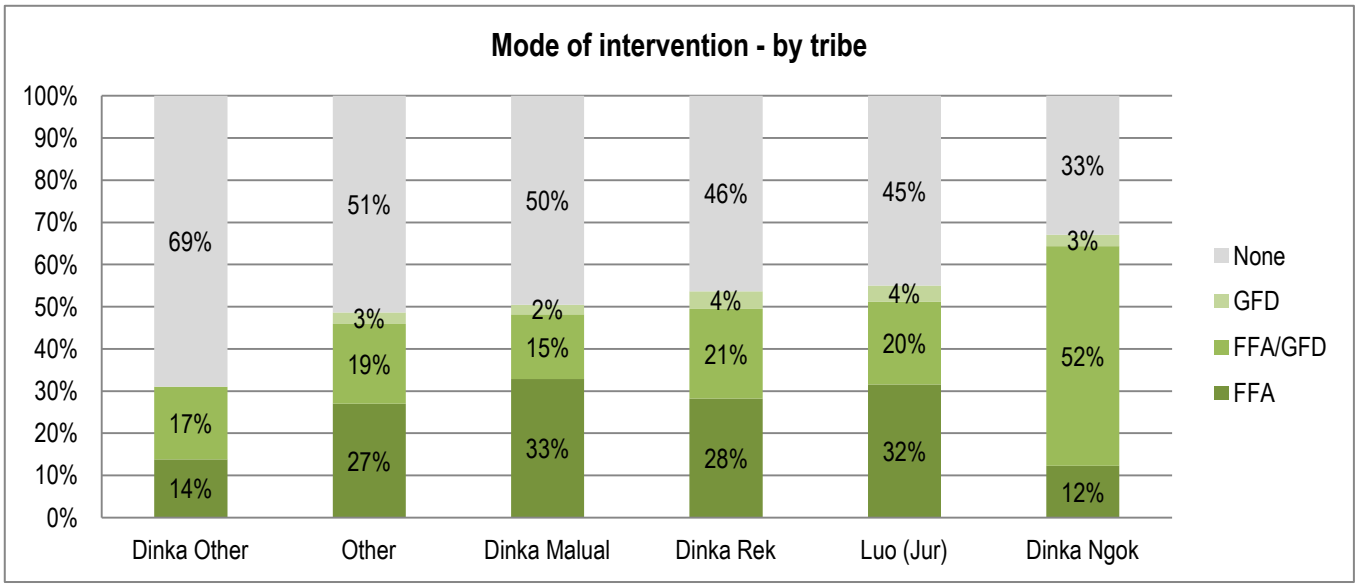
Dinka Rek households, who were overall most likely to be food secure, were also most likely to be categorised in a wealthier group compared to other tribes. While 18% of Dinka Rek households were found to be Middle/Better-off, the proportion dropped to 13% amongst Dinka Malual and only 5% for the non-Dinka tribes.

Chart 17: Households by wealth group and tribal affiliation



Participation in food interventions was higher amongst the comparatively more food secure Dinka Rek (54%) than amongst Dinka Malual (50%). Other Dinka sub-tribes were the least likely to have participated in any intervention (31%) while Dinka Ngok were most likely of all tribes to have participated in any intervention (66%) and more than twice as likely than other tribes to have participated in both FFA and GFD (52%).

Chart 18: Households by mode of intervention and tribal affiliation



2.2. DECONSTRUCTING FOOD INSECURITY RATING

2.2.1. Food Consumption Score

The Food Consumption Score – along with Food Access Score and Coping Strategy Index score – has been used to categorise households as either severely food insecure; moderately food insecure; or food secure. In order to explore mechanisms underpinning food insecurity in more detail, these categories will be deconstructed, beginning with food consumption. There was a significant difference in food consumption score when comparing BRACE and FSMS data which were both gathered in Warrap during February 2013 and in March (BRACE) and February (FSMS) in Northern Bahr el Ghazal. In Northern Bahr el Ghazal state, 23% of households were classified as having a borderline or poor food consumption score by BRACE compared to 36% reported by FSMS. In Warrap State, 27% were found with borderline or poor consumption score, compared to 37% reported by FSMS.[45]

The difference could be partly explained by the fact that the food consumption score awarded to households based on BRACE data, was slightly more likely to classify households as having a more acceptable food consumption score. This was because households had been asked about 14 as opposed to 13 food types – awarding individual scores to 'Other cereals' and 'Roots and tubers' while the FSMS awarded one score to 'Other cereals and tubers.' The food consumption score is obtained by multiplying the number of days a food type is consumed by a weight determined by its nutritional value. A score of 21 or below is considered poor, 22 to 35 is considered borderline while 36 and over is acceptable. The highest obtainable score is 112, should a household have eaten foods from every group on each of the most recent 7 days.

Table 10: Food Consumption Score groups by food consumption score range

Food Consumption groups	FCS Score	Colours
Poor	≤ 21	
Borderline	>21 to 35	
Acceptable	>35	

Receipt of GFD did not have a significant effect on food consumption score but participation in FFA had a small effect at the 6.4% level of significance (p=0.064) – generating on average a 1.2 point increase in score compared to other households, all else equal. Wealth group appeared to have a stronger effect, with Poor households scoring on average 5.2 points higher and Middle/Better-off households scoring on average 8.8 points higher than Very Poor. Gender of household head did not have a significant effect when comparing households within the same wealth groups. Future surveys will assess whether the effect observed for FFA participation is due to FFA contributing to improved food consumption scores, or whether households with better food consumption scores are more likely to be selected for FFA.

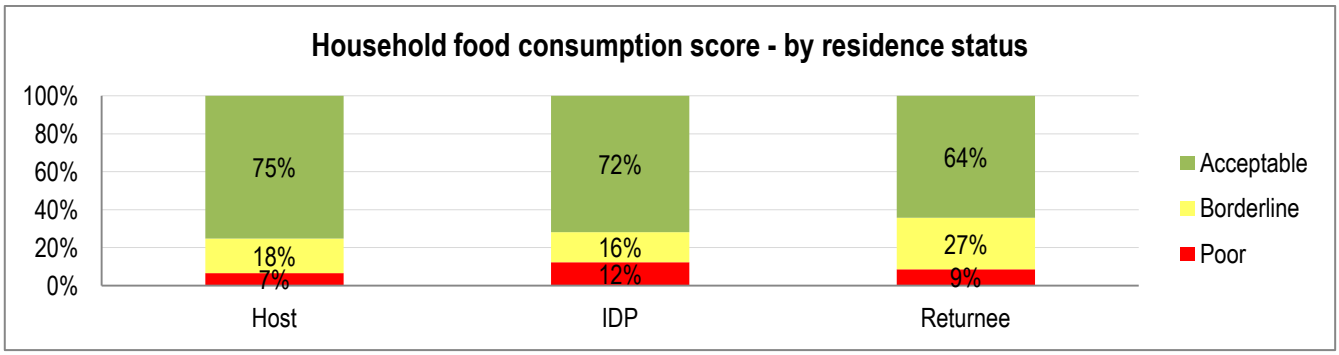
[45] FSMS, Round 9, February 2013

Table 11: Linear regression model estimating the effect of FFA participation and wealth group on food consumption score

Coefficients[a]								
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	48.235	.499		96.622	.000	47.256	49.214
	FFA	1.185	.639	.028	1.854	.064	-.068	2.437
	Poor	5.173	.836	.095	6.190	.000	3.535	6.812
	Middle_Better_off	8.822	.905	.150	9.749	.000	7.048	10.596
a. Dependent Variable: Food Consumption Score								

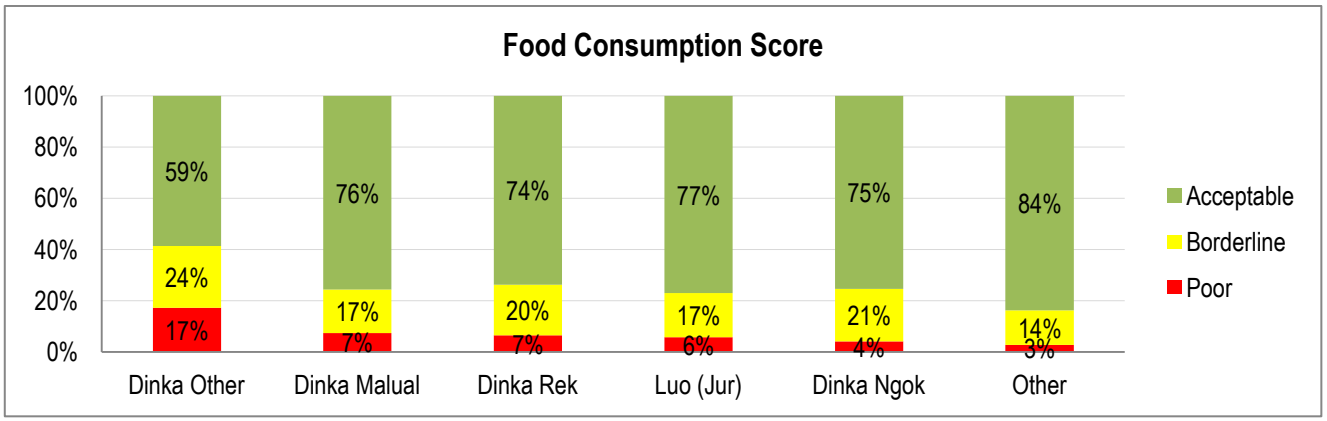
The ANLA 2012/2013 attributed poor nutrition to displacement – BRACE findings support this. Returnee households were most likely to have a borderline or poor food consumption score (36% of households), compared to IDP (28%) and host (25%) households.[46]

Chart 19: Households by Food Consumption Score and residence status of the household head



Minority Dinka sub-tribes were found more likely to be food insecure (see Chart 14 above). One factor driving this was the poorer food consumption scores obtained by these households, with 41% classified as having Borderline or Poor scores, compared to non-Dinka tribes who had the lowest proportion of Borderline or Poor scores (17%).

Chart 20: Households by Food Consumption Score and tribal affiliation

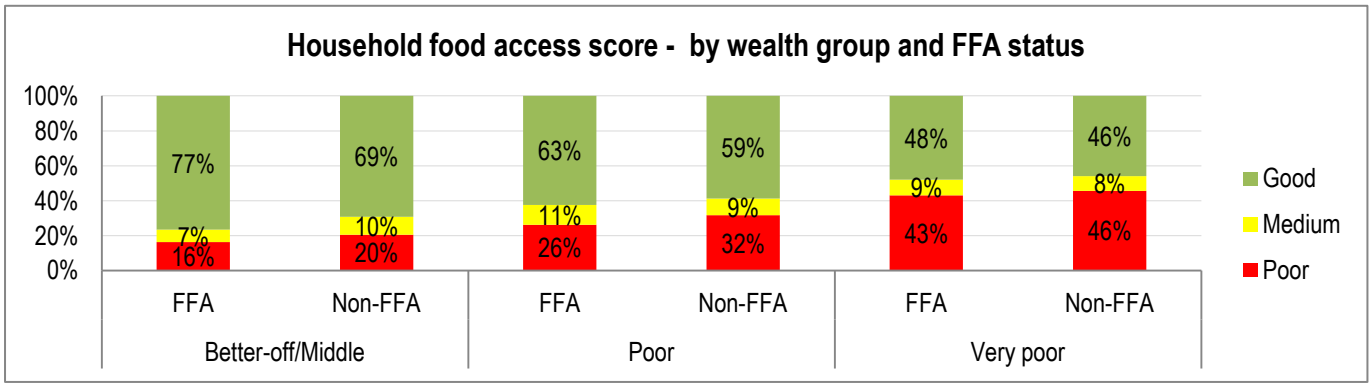


[46] World Food Programme (2013) The South Sudan - Annual Needs and Livelihoods Analysis 2012/2013, March 2013

2.2.2. Food Access

The Food Access Score is the second of the three components that constitute the food insecurity index. Food Access Scores were found to be correlated with both wealth group and FFA participation – with FFA households receiving higher food access scores across all wealth groups. Future rounds of surveying will assess whether FFA participation leads to higher food access scores – or alternatively, whether households with higher food access scores are selected for FFA participation.

Chart 21: Households by Food Access Score, wealth group and FFA participation



2.2.2.1. Income source reliability and sustainability

Main finding: Wealthier households and those participating in GFD were more likely to report reliable and sustainable primary sources of incomes. Two thirds of household members contributing to an income source were women. Future surveys will assess whether GFD participation contributes to more reliable and sustainable income sources – or whether households with more reliable and sustainable incomes are more likely to be selected for GFD participation.

The Food Access Score is in turn composed by income source reliability and sustainability scores – along with percentage spent on food – which contribute to the overall food access score. Scores were low in the BRACE data, with significant variation when comparing Northern Bahr el Ghazal and Warrap States. While 56% of households received a poor score in Northern Bahr el Ghazal, this figure dropped to 50% in Warrap. Scores were low compared to the FSMS national average, where only 30% of households across South Sudan received a poor score.[47]

Using the scale employed by FSMS, BRACE data was more likely than FSMS to score households as having a lower income reliability and sustainability score. The score ranges from 1- 9 with three categories 1-3 (poor); 4-5 (medium) and 6+ (good). BRACE data scored households lower than FSMS data, given that BRACE data included two sources of income the maximum obtainable score was 6, while FSMS data is gathered on 3 income sources, hence yielding a maximum score of 9. While difference in variation within the data sets can be compared, direct comparison between the data sets can only be made bearing this in mind.

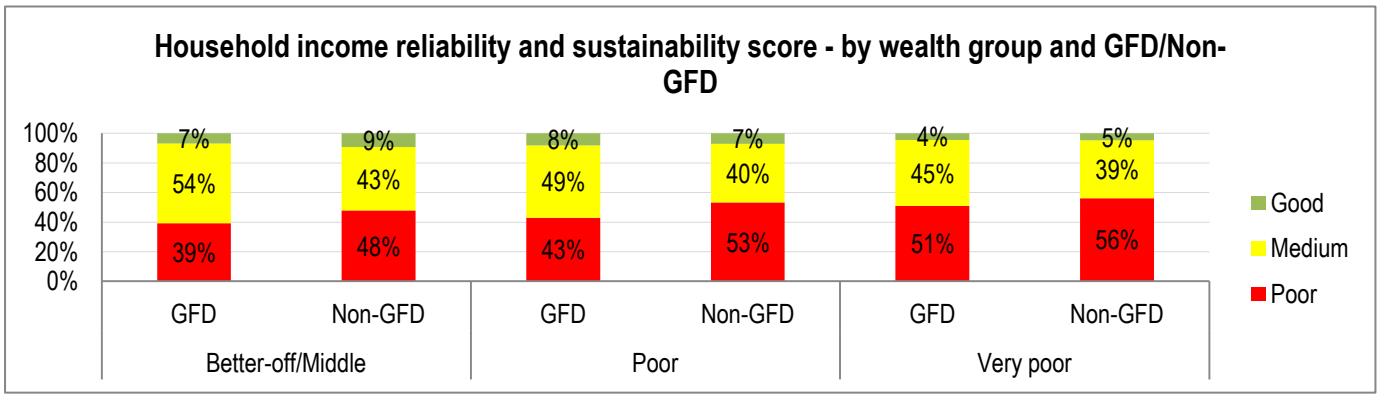
[47] FSMS, Round 9, February 2013

Table 12: Income reliability and sustainability score by type of income

Income reliability and sustainability rating		
Poor (Score=1)	**Medium (Score=2)**	**Good (Score=3)**
Aid	Alcohol sale	Crop sales
Begging	Casual agricultural labour	Livestock products sale
Borrowing	Wild food sale	Livestock sales
Casual non-agricultural labour		Salaried work
Gifts		Trade/business
Natural resources sale		

There was no significant difference in income reliability and sustainability score between FFA and non-FFA households; but wealthier households and those that received GFD where significantly more likely to have a higher income source scores. Only 39% of Middle/Better-off households participating in GFD had a Poor income score compared to 48% of non-GFD households in the same wealth group and 56% of non-GFD households amongst the Very Poor. Future rounds of surveying will assess whether FFA and/or GFD participation improves income reliability scores to reach the level of those not participating in FFA.

Chart 22: Households by income reliability and sustainability score, wealth group and GFD participation



FSMS found high reliance on natural resources as a primary (main) source of income in Northern Bahr el Ghazal in particular (39% of households compared to 22% in Warrap).[48] This trend was also visible in BRACE data, where 31% of households in Northern Bahr el Ghazal reported reliance on sale of firewood, charcoal or grass as their main income during the most recent dry season, compared to 22% in Warrap. Sale of natural resources is scored as having poor reliability and sustainability by the FSMS, a characteristic shared with reliance on non-agricultural casual labour and reliance on gifts, begging, borrowing or sale of food aid. Casual labour in construction was reported as the main source of income by 7% of households in both states respectively.[49]

Significant variation was also seen between households depending on participation in FFA and whether a household was Very Poor or not. Reliance on sale of natural resources was higher amongst Very Poor non-FFA households (29%) compared to FFA households in the same wealth group (25%). FFA households were also more likely to rely on more reliable sources such as salaried work (7% compared to 5% of non-FFA households). But non-FFA households also reported reliance on more reliable income sources such as sale of crops (7% compared to 5% of FFA households). Amongst wealthier households, non-FFA households were more likely to be engaging in sale of natural resources (28%) than FFA households (22%). A higher proportion of wealthier households engaged in an income source with better reliance rating – including trade (13% of FFA and 12% of non-FFA

[48] FSMS, Round 9, February 2013
[49] See full calculation in Annex B.

households), salaried work (8% and 6% respectively) and sale of livestock which was reported by 6% of wealthier households compared to 4% of the Very Poor.

Reliance on crop farming, which had been reported by 82% of households in Warrap and 79% of households in Northern Bahr el Ghazal during the 2008 census, was only recorded as a main income source for 3-7% of households across the wealth groups and seasons.[50]

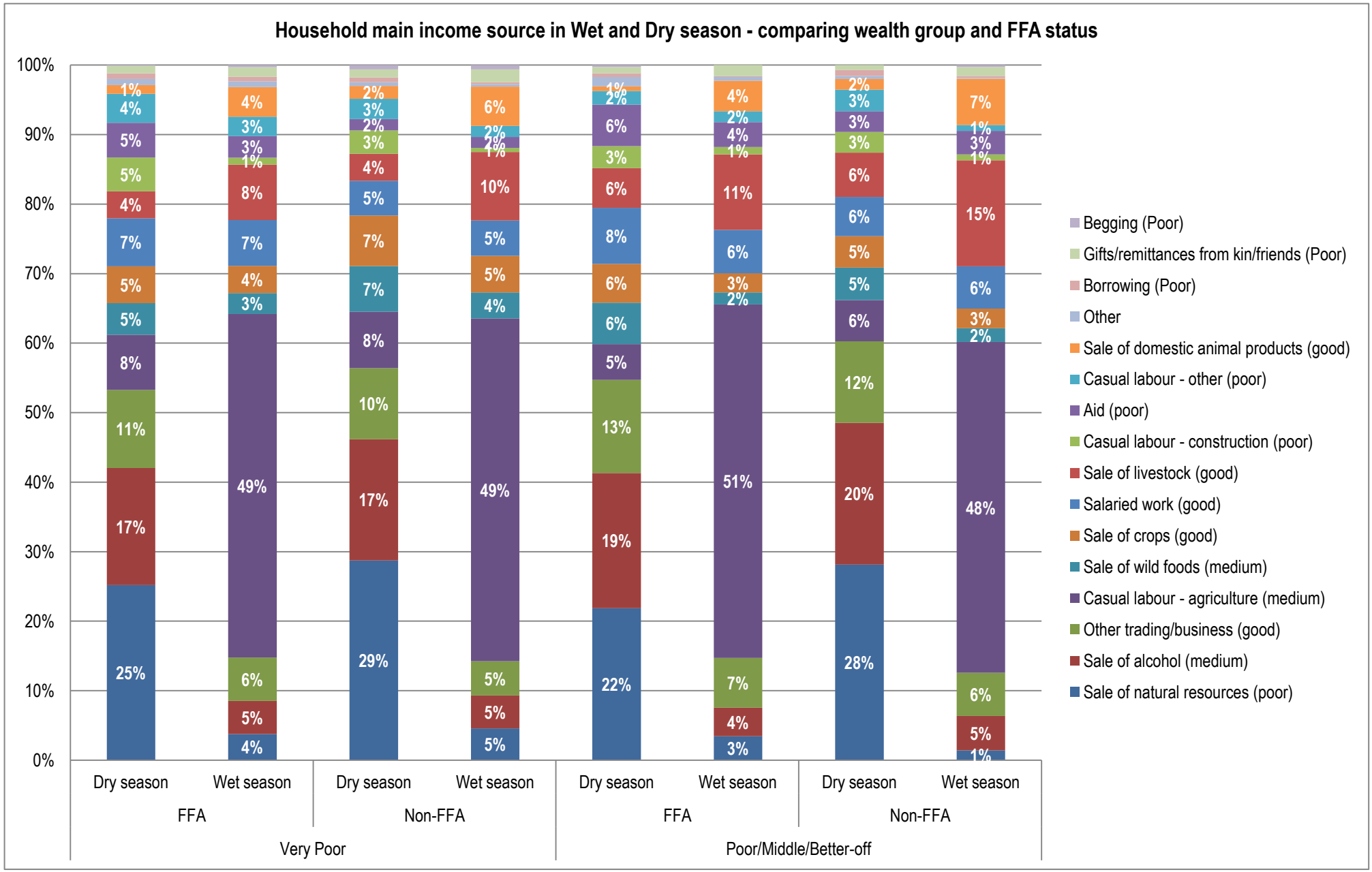
Casual agricultural labour replaced sale of natural resources and alcohol as the most common main source of income during the most recent wet season across all wealth groups – providing a main income for 48-51% of households in all wealth groups. Conversely, sale of natural resources dropped dramatically across all wealth groups while sale of livestock increased. While 29% of Very Poor non-FFA households relied on sale of natural resources during the dry season, the corresponding proportion was 5% during the wet season. Sale of livestock increased the most amongst wealthier non-FFA households – from 6% in the dry season to 15% in the wet season.

Further surveys will assess whether FFA participation leads to households gravitating towards certain sources of income, or whether households relying on a certain source of income are more likely to be selected for FFA participation.

The table below outlines types of main income sources during dry and wet seasons, comparing groups where significant variation was detected, hence distinguishing between FFA and non-FFA households in addition to Very Poor as opposed to other households. Income source reliability and sustainability rating applied by the FSMS is stated in brackets for each source.

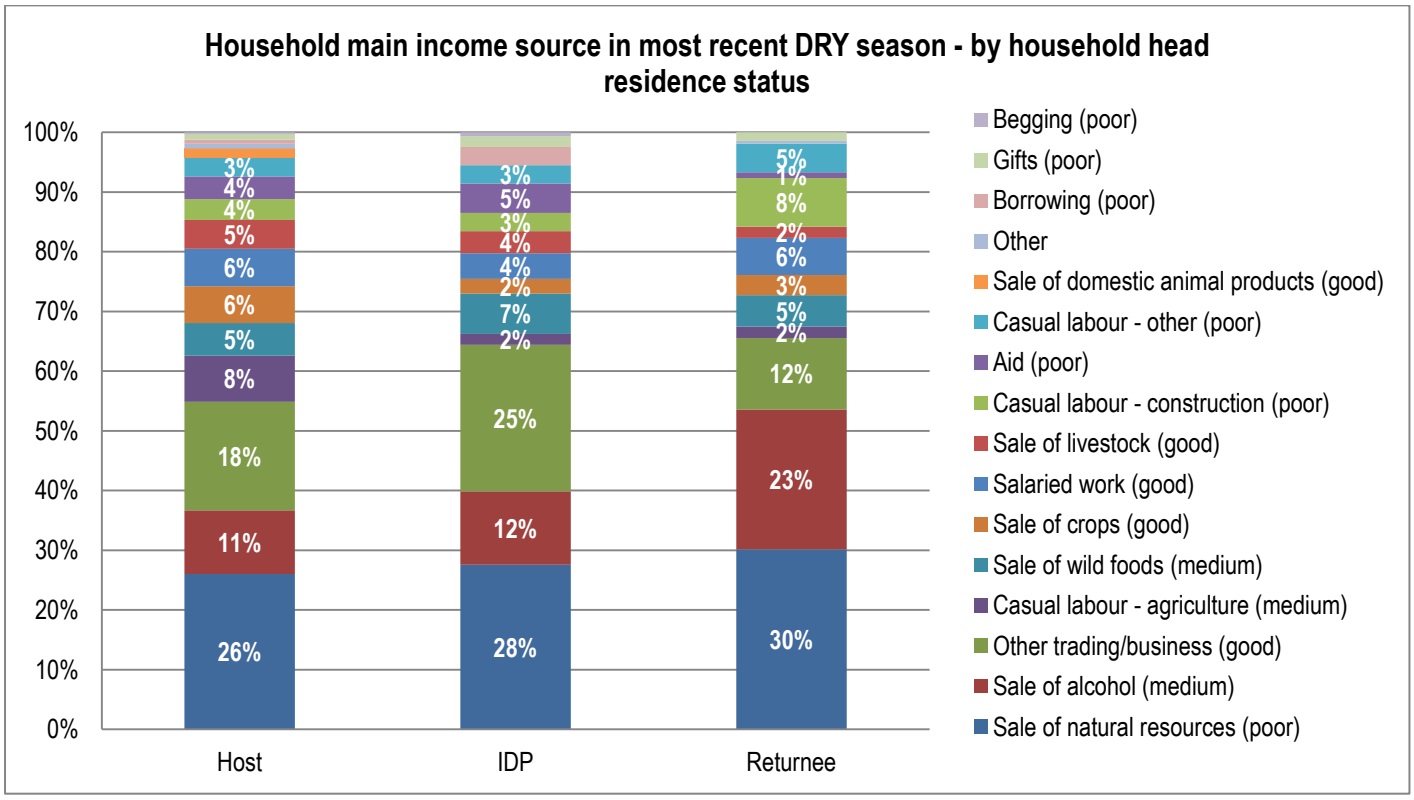
[50] See Southern Sudan Centre for Census, Statistics and Evaluation (2010) 'Statistical Yearbook for Southern Sudan'

Chart 23: Households by main income source in the most recent wet and dry season; wealth group; and FFA participation



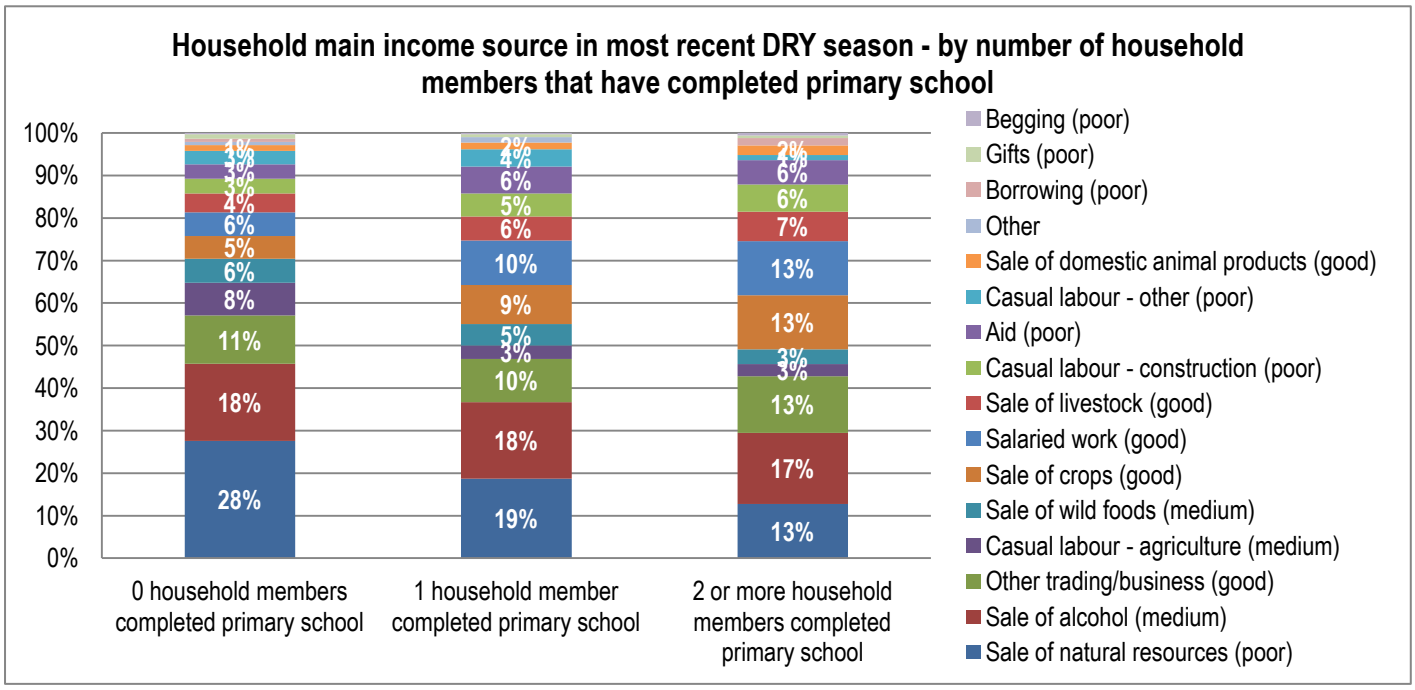
There was significant variation in type of main income source when comparing host with returnee and IDP households. Returnee households were more likely to be relying on sale of natural resources as their main source of income (30%) than IDP (28%) and Host (26%) households. They were also more likely to be relying on sale of alcohol (23%) compared to IDP (12%) and Host (11%) households. Returnee and IDP households were less likely to rely on Aid as a primary source of income (2% respectively) compared to host households (8%). When taking the two main income sources into account, returnee households were more likely to receive a Medium or Good (53%) income reliability and sustainability score, compared to IDP (48%) and host (47%) households.

Chart 24: Households by main income source in the most recent dry season and residence status of the household head



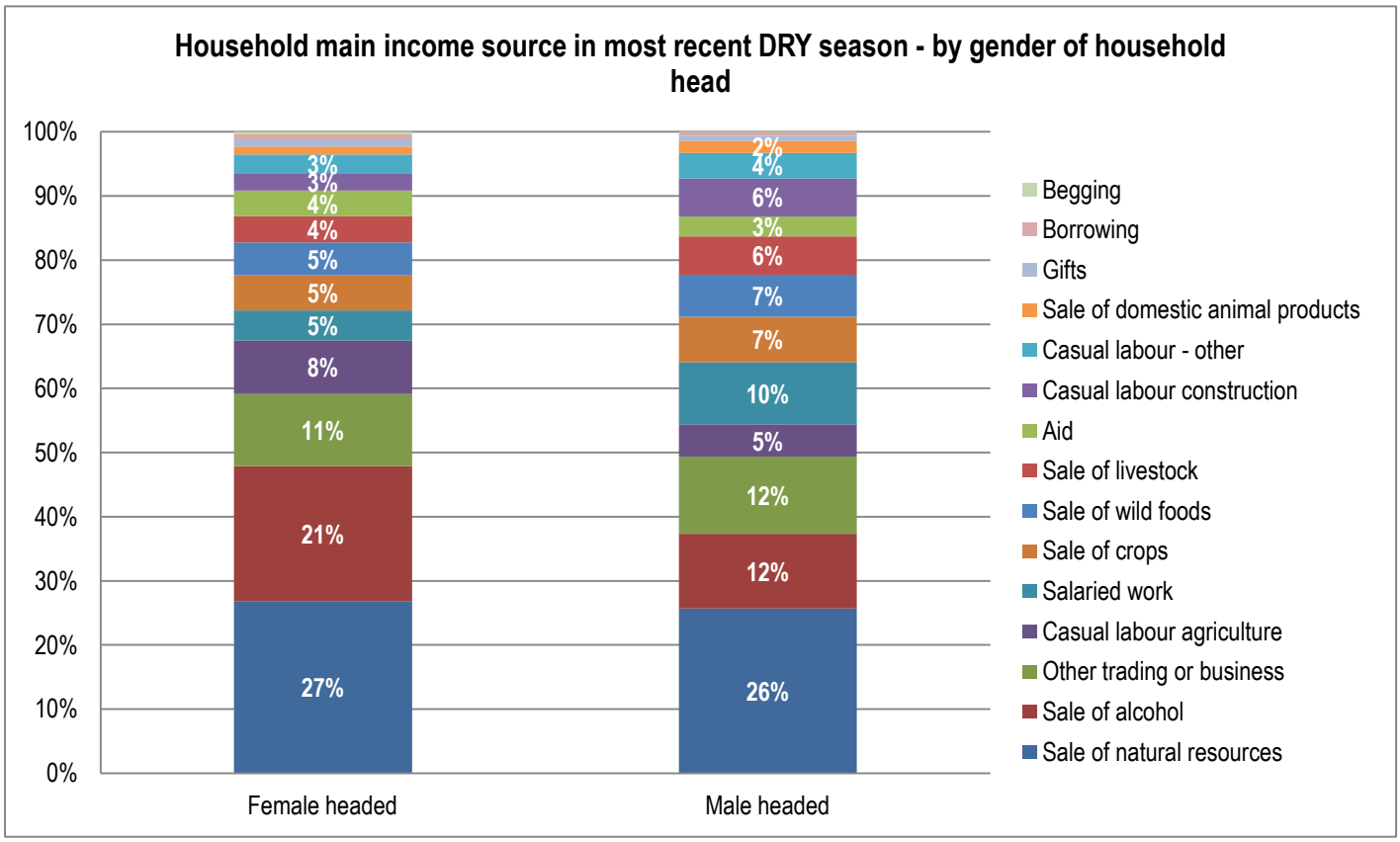
There was also significant variation in type of income source depending on how many members of the household that had completed primary school. Reliance on sale of natural resources was found to be associated with lower primary school completion, relied on by 28% of households where no member had completed primary school, compared to just 13% of households where at least two members had completed primary school. Considerable variation was also seen in reliance on sale of crops – just 5% of households where no member had completed primary school were selling crops, compared to 13% of those where two or more had completed primary school. Salaried work was also more frequently cited as a main income source by households where two or more members had completed primary school (13%) compared to those where no member had completed primary school (6%).

Chart 25: Households by main income source in the most recent dry season and number of household members that completed primary school



Type of income sources were also correlated with the gender of household head. Female headed households were more likely to rely on sale of alcohol (21%) compared to male headed households (12%).

Chart 26: Households by main income source in the most recent dry season and gender of the household head



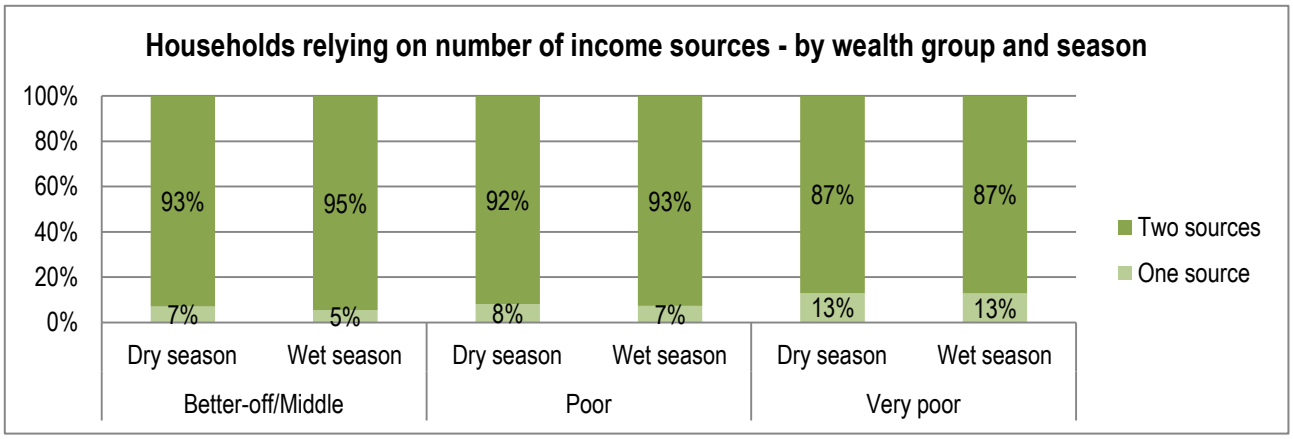
Overall, the majority of households had at least two sources of income. Female headed households, who were overall found more likely to be food insecure, were also more likely to report two or more income sources (92%) than male headed households (83%).

Reliance on a single source of income was correlated with those income sources that are considered more reliable. Hence 21.1% of households relying on salaried work and 16.3% of those relying on agricultural casual labour during the most recent dry season reported having no other source of income. Although gifts from kin were considered an unreliable source of income, 16.3% of households relying on gifts reported no secondary source of income. It may be the case that gifts or remittances from wealthier kin, for example from absent husbands, could be a relatively reliable income source. This would then leave less incentive in some cases to seek alternative sources of income. Households selling livestock products were also amongst the least likely to have a second income source (15%), followed by households relying on construction based casual labour (14.4%) and those relying on trade or other businesses (14.2%).

This trend of reliable sources of income also becoming sole sources of income may thus indicate that diversification of income sources can be a coping strategy for households that are struggling to survive on one source.[51]

However, when exploring the proportion of households within each wealth group that relied on a single income, there was no positive association between wealth and single income but the opposite. The Middle/Better-off group was slightly *more* likely to have at least two income sources (93%), while the proportion dropped to 92% of Poor and 87% of Very Poor. There was no significant difference in the proportion of households relying on a single income source depending on participation in FFA.

Chart 27: Households by number of income sources, wealth group and season



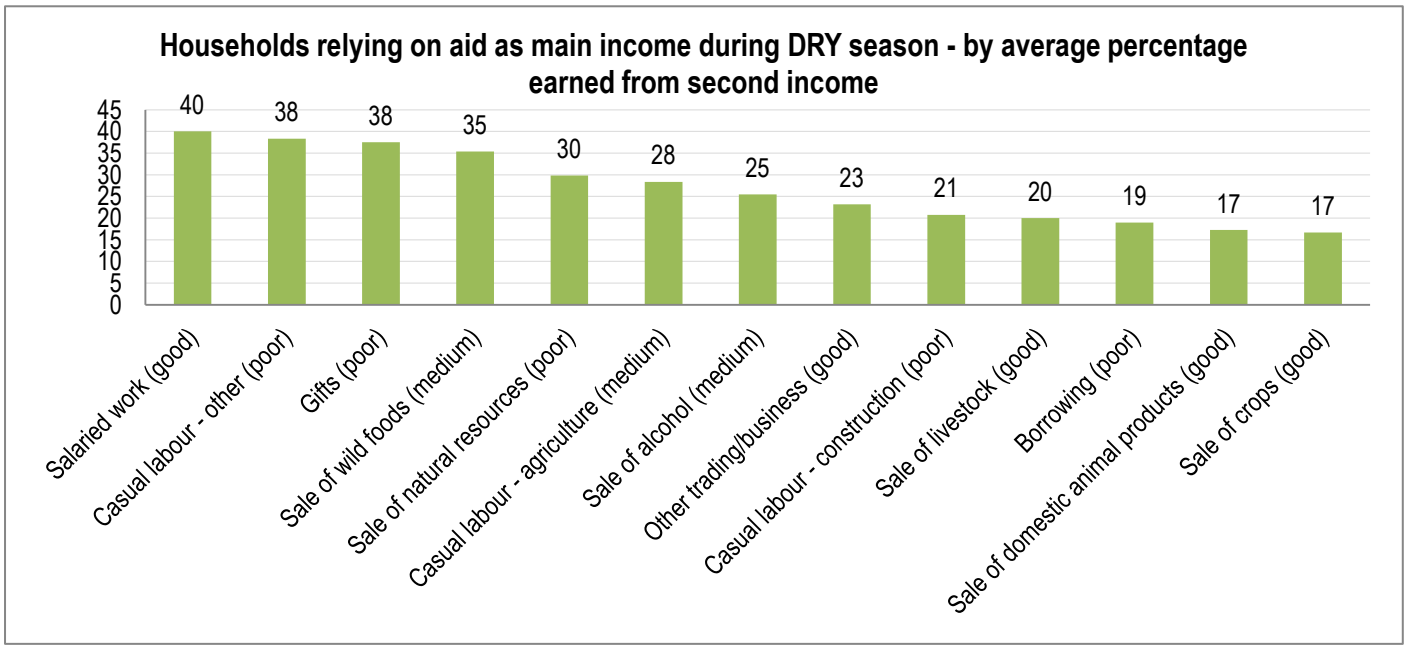
Households reporting reliance on main sources of income considered more unreliable main income sources were often seen to rely on equally unreliable secondary sources. Households relying on borrowing during the most recent dry season reported in 42.2% of cases that begging was their secondary income, while households relying on begging reported in 33.3% of cases sale of natural resources and in 41.7% of cases that borrowing was a secondary income. Those who relied on casual non-agricultural labour reported in 33.6% of cases also selling natural resources.[52] Out of those relying on food aid; 30.1% reported selling alcohol as a second income; followed by 19.6% that reported reliance on other trading or business; 19.0% that sold natural resources; and 8.5% that sold wild foods.

Exploring proportions contributed to the overall household income by respective sources revealed some variation amongst households stating aid as their main source of income. Where salaried work was reported as the second income following aid, salaries contributed on average 40% of the overall income, with aid thus representing on average 60% across the two main sources. Sale of alcohol, natural resources, wild foods or other trade and businesses provided on average 25%, 30%, 35% and 23% respectively when providing a secondary income to aid. The impact of FFA on income sources will be assessed through future surveying to examine whether the proportion of households relying on certain income sources or the proportion earned from these, change as FFA provides an alternative source of income.

[51] See 'Household Economic Analysis (HEA) Livelihoods Profiles Report – South Sudan: Western Flood Plains & Ironstone Plateau (Final Report, April 2013) Food Economy Group

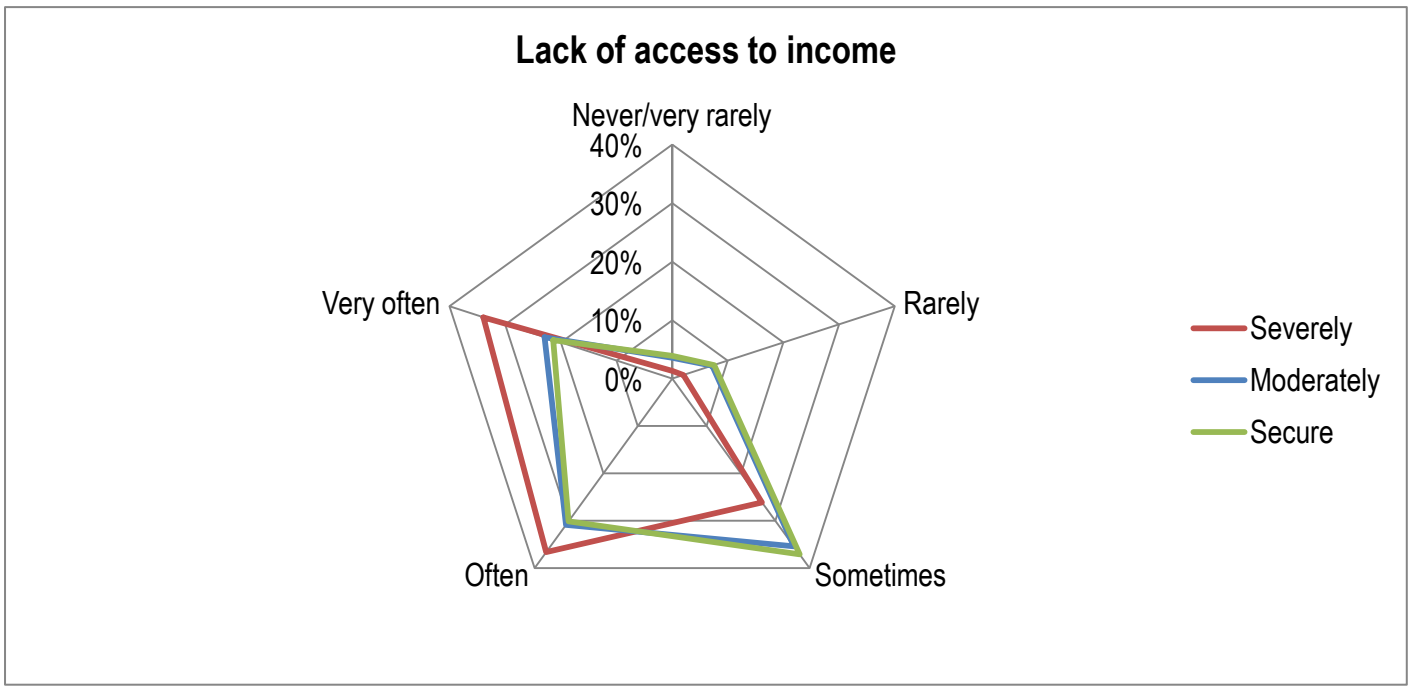
[52] For more detail on main and secondary income source combinations during the most recent dry season see Annex C: Income notes

Chart 28: Average proportion contributed by a second income during 30 days preceding the survey – amongst households relying on aid as the main income



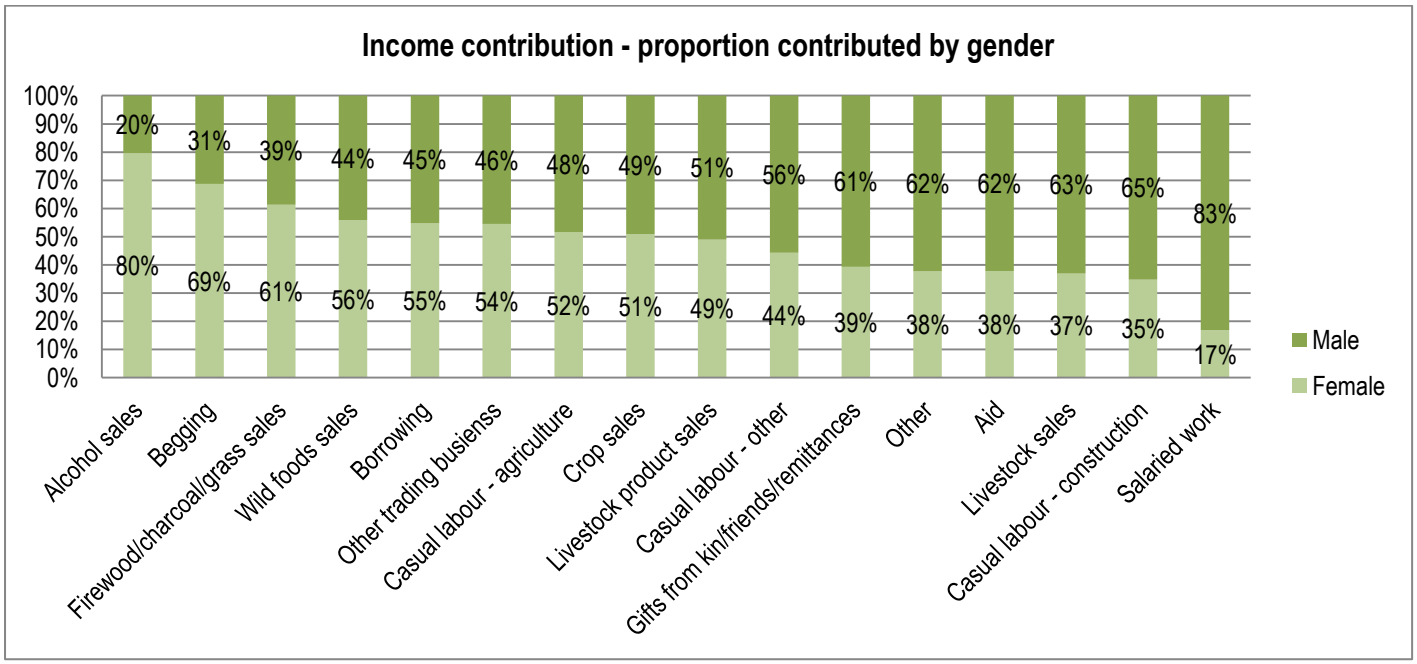
Severely food insecure households were more likely to cite lack of income as a problem they had faced "Often" or "Very often" during the 30 days preceding the survey, while less food insecure households were more likely to report lack of income as a problem occurring "Sometimes".

Chart 29: Frequency with which households experienced lack of access to income - by household level food insecurity rating



Women conducted most of the labour contributing to the two most common income sources during the dry season at the time of the survey – sale of alcohol (80%) and sale of natural resources (61%). Men dominated in proportion of salaried work (83%); casual construction labour (65%); and livestock sales (63%). The overall ratio of female to male contribution to up to two income sources was 1.45:1 – hence for every two men, three women were contributing an income. Significant variation in ratio was seen when comparing wealth groups – the most even ratio was found in Poor households (1.33:1), followed by Middle/Better-off households (1.43:1) and Very Poor households (1.54:1).

Chart 30: Proportion of individuals contributing to income source during the dry season at the time of the survey - by gender



2.2.2.2. Expenditure

Main finding: Sale of crops as primary source of income was negatively correlated with expenditure. Interestingly, households relying on begging, borrowing and aid spent the most. As expected, although wealthier households spent a smaller proportion on food, their expenditure in real terms was higher than that of other wealth groups, especially on non-staple foods.

Income sources in the table below all had a significant effect on level of household expenditure. Households selling crops, rated as having good reliability and sustainability by the FSMS, had the lowest average level of per capita expenditure over the 30 days preceding the survey, by 41 SSP less compared to income sources omitted from the model (amongst which there was no significant variation in average expenditure). Types of income that had a good or medium reliability and sustainability score and contributed to higher average levels of expenditure included sale of wild foods (28 SSP higher); salaried work (44 SSP); trade and business (53 SSP); sale of alcohol (56 SSP); and sale of domestic animal products (60 SSP). However, the highest average expenditures were associated with income sources with a poor score, including aid (105 SSP higher expenditure); begging (119 SSP); and borrowing (204).

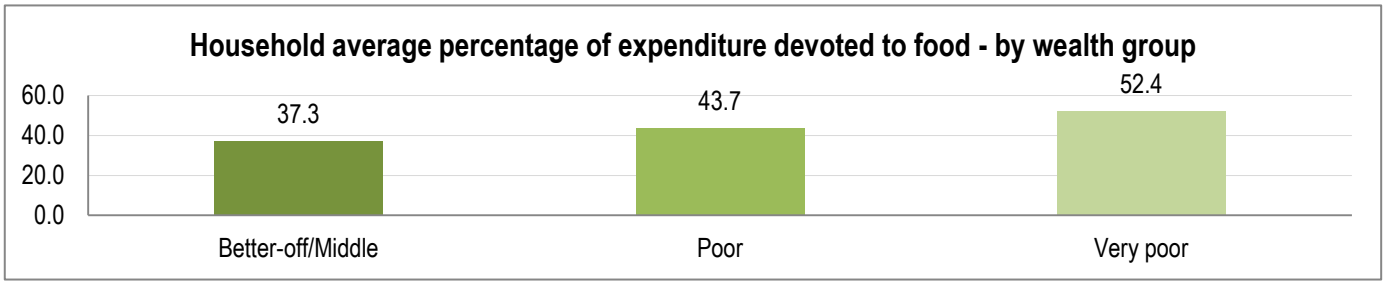
Table 13: Linear regression model estimating effect of types of main income on average household per capita expenditure during the 30 days preceding the survey

Coefficients[a]								
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	140.619	4.449		31.605	.000	131.897	149.342
	Sale of crops (good)	-41.145	13.301	-.048	-3.093	.002	-67.221	-15.068
	Sale of domestic animal products (good)	59.627	26.121	.035	2.283	.022	8.417	110.837
	Sale of wild foods (medium)	28.052	13.720	.032	2.045	.041	1.155	54.949
	Sale of alcohol (medium)	56.255	8.427	.107	6.675	.000	39.733	72.777
	Other trading/business (good)	52.913	10.071	.083	5.254	.000	33.170	72.657

	Salaried work (good)	44.067	12.966	.053	3.399	.001	18.647	69.487
	Aid (poor)	105.328	16.473	.098	6.394	.000	73.031	137.624
	Borrowing (poor)	204.230	36.084	.085	5.660	.000	133.487	274.973
	Begging (poor)	119.293	57.726	.031	2.067	.039	6.121	232.465
a. Dependent Variable: Total household expenditure (per capita)								

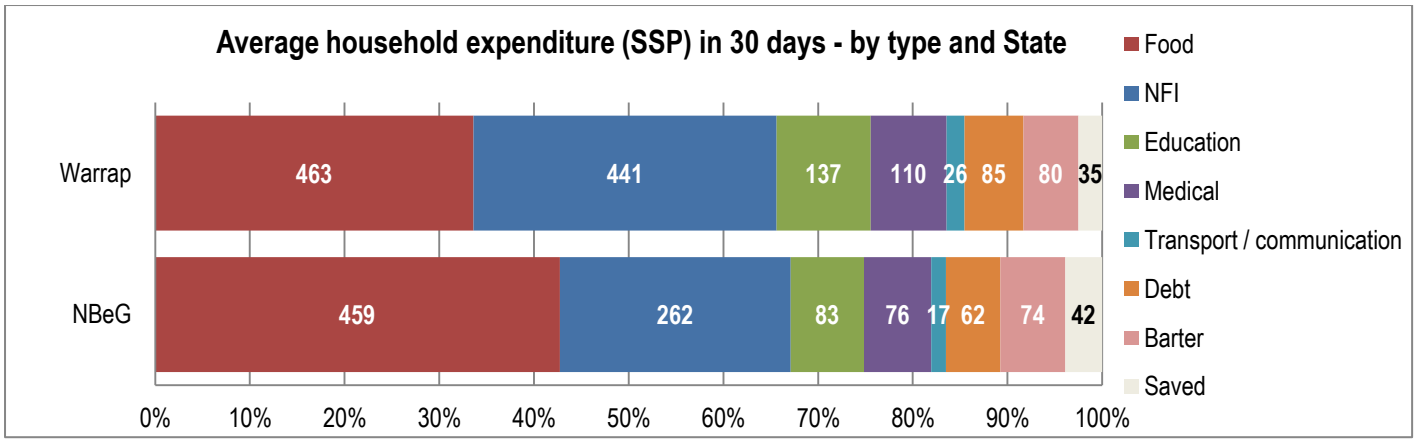
Food access is partly based on income source reliability and sustainability and partly on the proportion of expenditure a household devotes to food. Receipt of FFA or GFD did not to have a significant effect on percentage spent on food, when comparing households within the same wealth groups. Proportion spent on food varied significantly between wealth groups however, with Very Poor households devoting 52.4% of their expenditure to food, compared to 43.7% of Poor households and 37.3% of Middle/Better-off households. Future surveys will assess whether the lack effect observed depending on FFA and GFD participation is due to FFA and/or GFD aligning the proportion spent on food of those that participate with those that do not.

Chart 31: Average proportion of expenditure devoted to food during the 30 days preceding the survey - by wealth group



Proportional expenditure on food was higher in Northern Bahr el Ghazal (43%) than Warrap (34%) State. The proportion spent on food was significantly lower than the monthly average recorded by the 2008 census, where on average 83% of total expenditure was devoted to food in Warrap and 85% in Northern Bahr el Ghazal.[53] The FSMS had also found a higher proportion of expenditure on food in Northern Bahr el Ghazal (69%) than Warrap (60%).[54] The higher proportion of food expenses recorded by the FSMS is interesting given that BRACE total expenditure did not include livelihood inputs, such as seeds, tools, labour, livestock and drugs for livestock – these items were assessed on a yearly expenditure basis to allow for disaggregation into wealth groups according the HEA framework.[55] Hence the proportion of food expenditure would be expected to be higher, not lower, in BRACE data compared to FSMS.

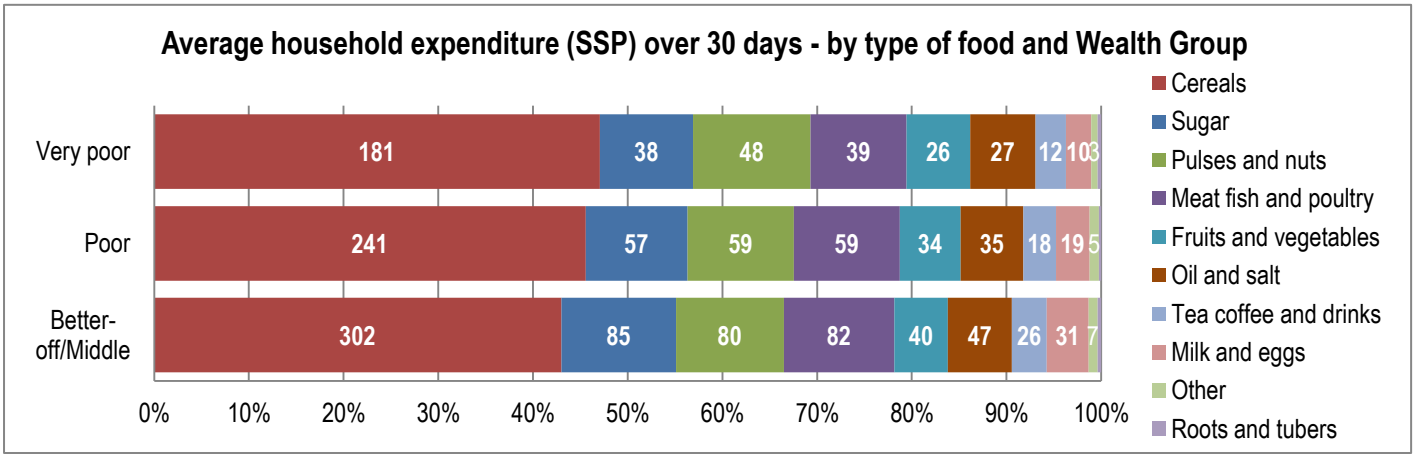
Chart 32: Average household expenditure in SSP during 30 days preceding the survey - by type and State



[53] See Southern Sudan Centre for Census, Statistics and Evaluation (2010) 'Statistical Yearbook for Southern Sudan' p.124
[54] FSMS, Round 9, February 2013
[55] The HEA establishes parameters for livelihood expenditure based on a 12 month recall period; hence the same time-frame was used to gather the corresponding data for the present baseline.

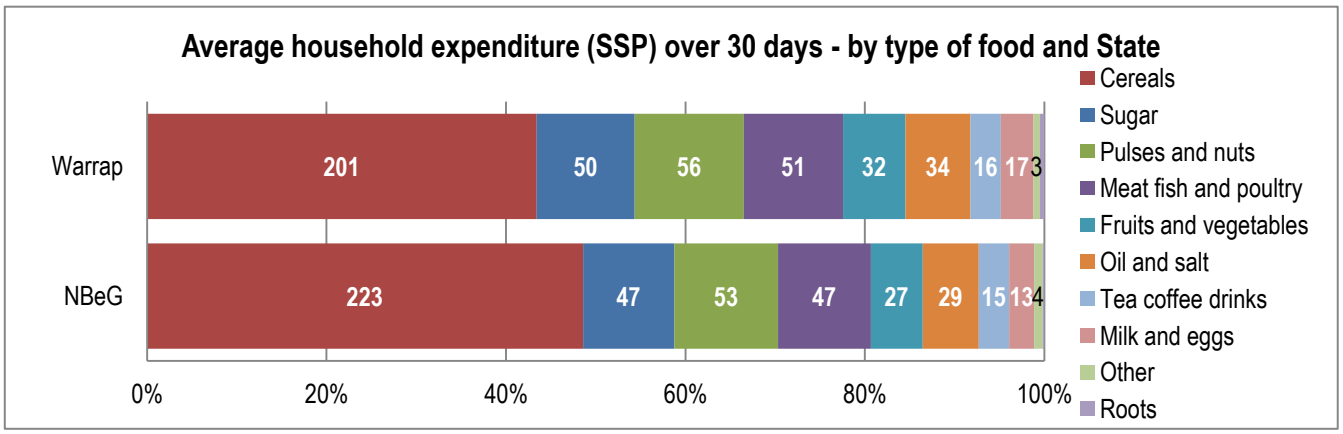
Although proportion spent on each type of food did not vary much between wealth groups the actual amounts did, with the Middle/Better-off wealth group spending on average more than twice as much during the 30 days preceding the survey (113SSP) as the Very Poor (49SSP) on protein rich foods such as meat, fish, poultry, eggs and milk.

Chart 33: Average household expenditure in SSP during the 30 days preceding the survey - by type of food and wealth group



Households in Northern Bahr el Ghazal spent a slightly higher proportion of food expenditure on staples (cereals). This could be related to the fact that a much higher proportion of households in Northern Bahr el Ghazal stated market purchases as opposed to own production as their main source of staples such as maize and sorghum (see Chart 36). The average share of household expenditure spent on cereal was 21% in Northern Bahr el Ghazal, compared to 15% in Warrap – the overall average share was 17%. The FSMS found a similar pattern, with 41% spent in Northern Bahr el Ghazal compared to 32% in Warrap.[56]

Chart 34: Average household expenditure in SSP during 30 days preceding the survey - by type of food and state



Some types of main income sources had a significant effect on the average level of per capita food expenditure. Compared to households relying on sale of livestock, animal products, wild foods, natural resources, casual non-agricultural labour, gifts, borrowing or begging, those selling crops or casual agricultural labour spent on average 28.5 SSP and 11 SSP less respectively per capita on food. Those selling alcohol on the other hand, spent on average 14 SSP more and those engaging in trade or business spent 13 SSP more. But the households that spent the most on food on average were those relying on aid as their main income. It may be the case that households were able to sell aid received to purchase other, preferred types of food.

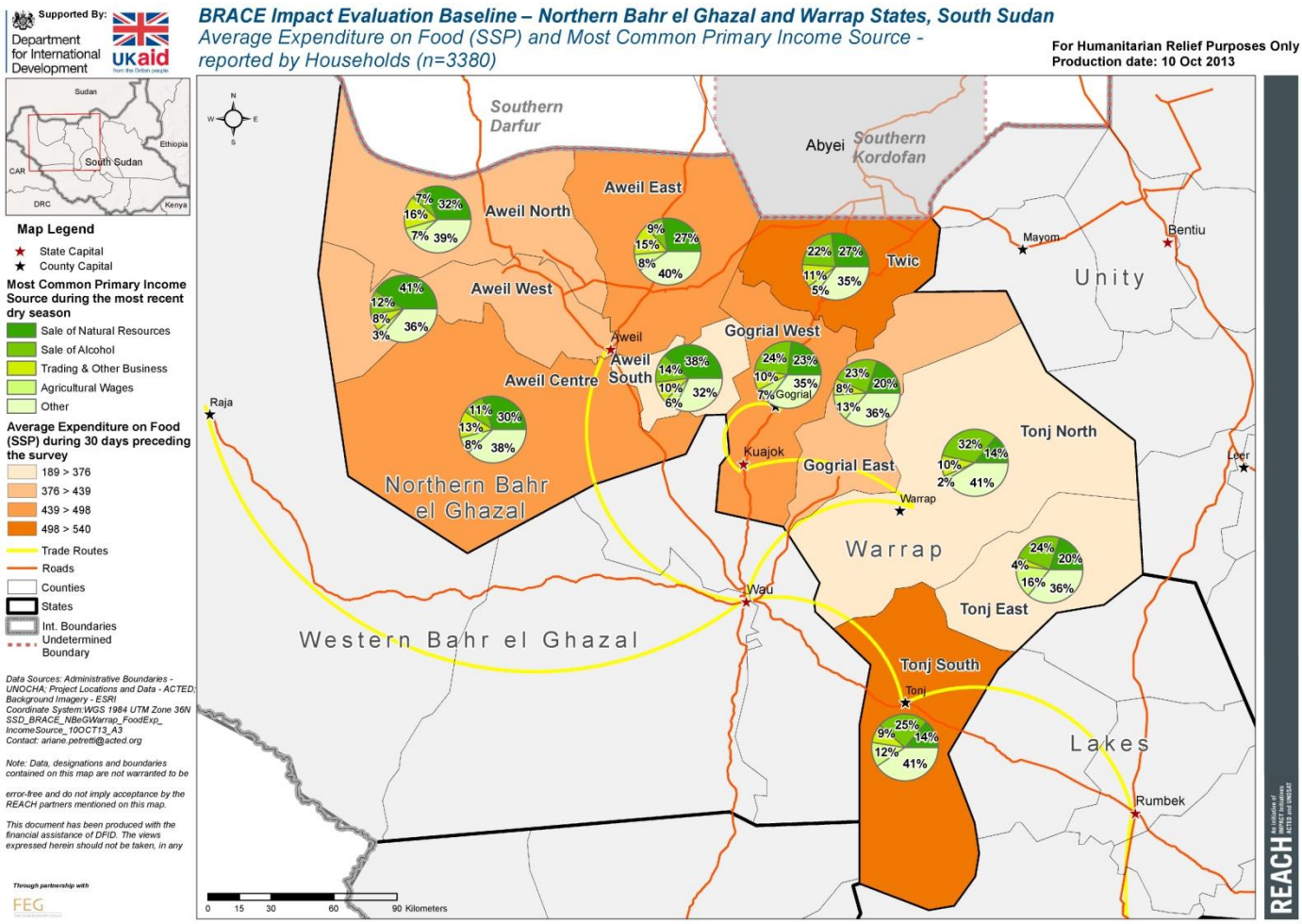
[56] FSMS, Round 9, February 2013

Table 14: Linear regression model estimating effect of types of main income on average household per capita expenditure on food during 30 days preceding the survey

Coefficients[a]								
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	59.097	1.272		46.474	.000	56.604	61.590
	Sale of crops	-28.483	3.827	-.116	-7.443	.000	-35.986	-20.981
	Sale of alcohol	14.349	2.421	.096	5.927	.000	9.603	19.096
	Other trading/business	12.809	2.892	.070	4.429	.000	7.139	18.479
	Casual labour - agriculture	-11.458	3.487	-.052	-3.286	.001	-18.294	-4.621
	Salaried work	9.685	3.697	.041	2.620	.009	2.438	16.933
	Aid	23.215	4.722	.076	4.917	.000	13.958	32.472
a. Dependent Variable: Household expenditure on food (per capita)								

The map below shows average expenditure amongst households on food in SSP during the 30 days preceding the survey, in addition to the proportion of households in each county that reported reliance on the four most common dry season primary sources of income – sale of natural resources; sale of alcohol; trading and other business; and casual labour – agriculture.

Map 3: Average household expenditure on food in SSP and proportion of households reporting reliance on the four most common primary sources of income – by county



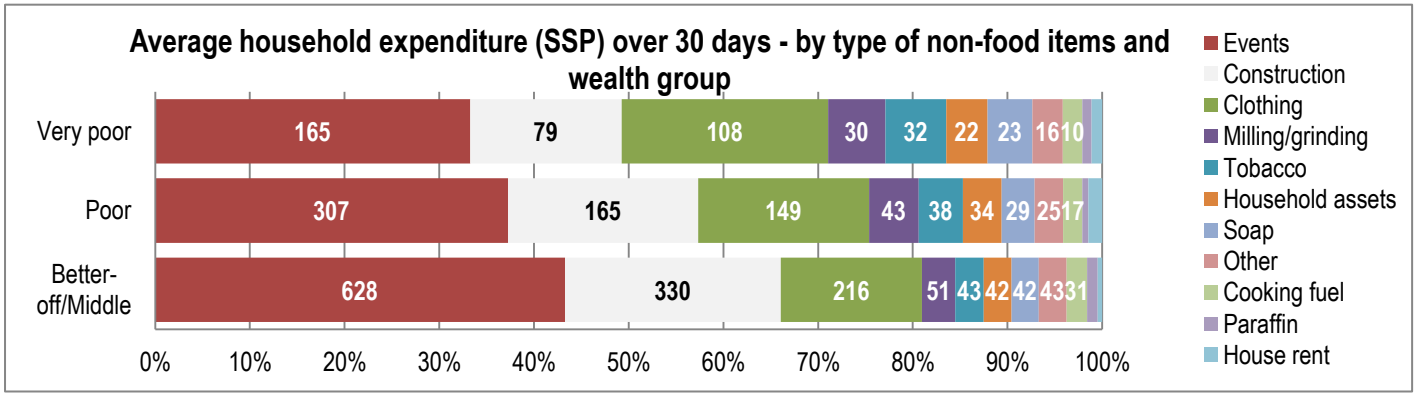
Households spending more on food were found to have an on average higher food consumption score. Every additional 10 SSP spent on food increased the food consumption score by on average 0.72.

Table 15: Linear regression model estimating the effect of average household per capita expenditure on food during 30 days preceding the survey on food consumption score

Coefficients[a]								
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	46.592	.462		100.865	.000	45.686	47.498
	EXP_Food_PC	.072	.005	.202	13.541	.000	.062	.083
a. Dependent Variable: Food Consumption Score								

A large share of non-food expenditure was devoted to events by all wealth groups, with Middle/Better-off households spending the most, both in proportion and in real terms (628 SSP on average during the most recent 30 days, compared to 165 SSP spent by the Very Poor).

Chart 35: Average household expenditure by non-food item during 30 days preceding the survey and wealth group



Compared to other types of income sources, households selling wild foods spent on average 16SSP more per capita during the 30 days preceding the survey, while the corresponding figure was 24 SSP for those selling alcohol, 20 SSP for trade and business, 53 SSP for aid, 74 SSP for begging and 83 SSP for borrowing.[57]

Table 16: Linear regression model estimating effect of primary income type on household per capita expenditure on non-food items

Coefficients[a]								
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	36.533	1.872		19.516	.000	32.863	40.203
	Sale of wild foods	15.797	6.529	.038	2.420	.016	2.997	28.596
	Sale of alcohol	24.288	3.907	.098	6.216	.000	16.628	31.948
	Other trading/business	19.539	4.711	.065	4.147	.000	10.302	28.776
	Aid	52.131	7.797	.103	6.686	.000	36.845	67.417
	Borrowing	83.497	18.939	.068	4.409	.000	46.366	120.627
	Begging	74.443	27.267	.042	2.730	.006	20.985	127.900
a. Dependent Variable: Household expenditure on non-food items (per capita)								

[57] Closer examination of types of NFI expenditure showed that households relying on begging and borrowing spent a large proportion on events and clothes.

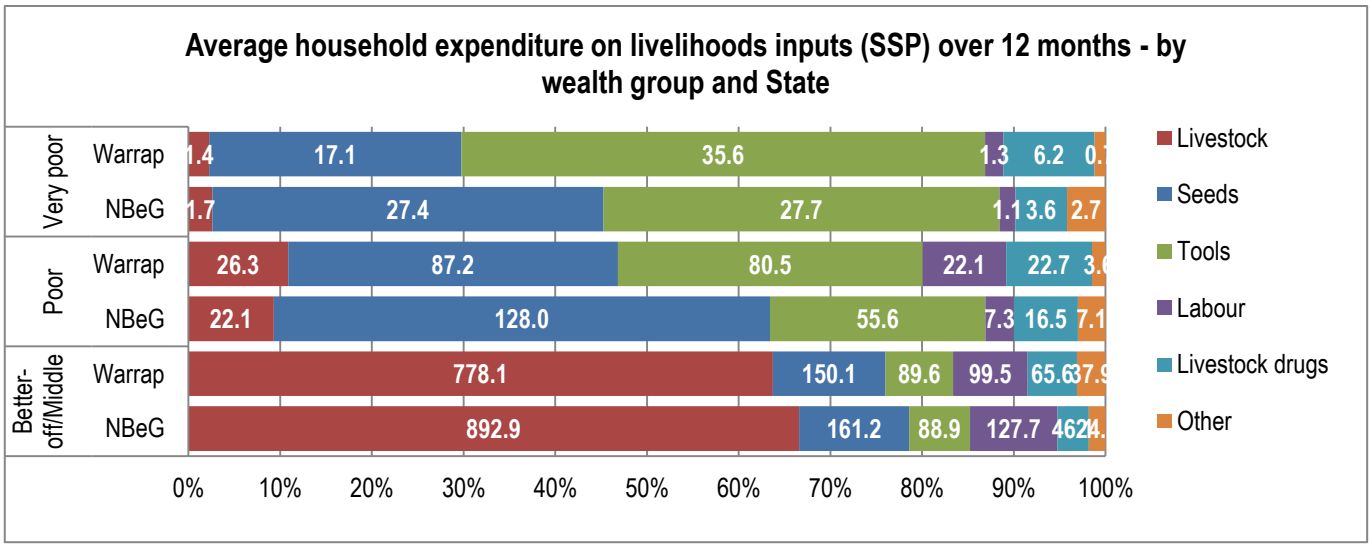
Other expenditures that were significantly affected by type of main income included transport and communication, with households engaging in trading or other business spending on average 1.5SSP per capita more and those relying on salaried work spending on average 3.9SSP more per capita than households relying on other types of main incomes. Households spending the least were those relying on casual agricultural labour, with on average 2.0 SSP per capita devoted to transport and communication.

Table 17: Linear regression model estimating effect of type of main income on average household per capita expenditure on transport and communication during 30 days preceding the survey

Coefficients[a]								
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	2.500	.139		17.941	.000	2.227	2.773
	Other trading/business	1.467	.384	.059	3.818	.000	.714	2.220
	Casual labour - agriculture	-1.978	.469	-.065	-4.218	.000	-2.897	-1.058
	Salaried work	3.894	.498	.120	7.813	.000	2.917	4.872
a. Dependent Variable: Household expenditure on transport and communication (per capita)								

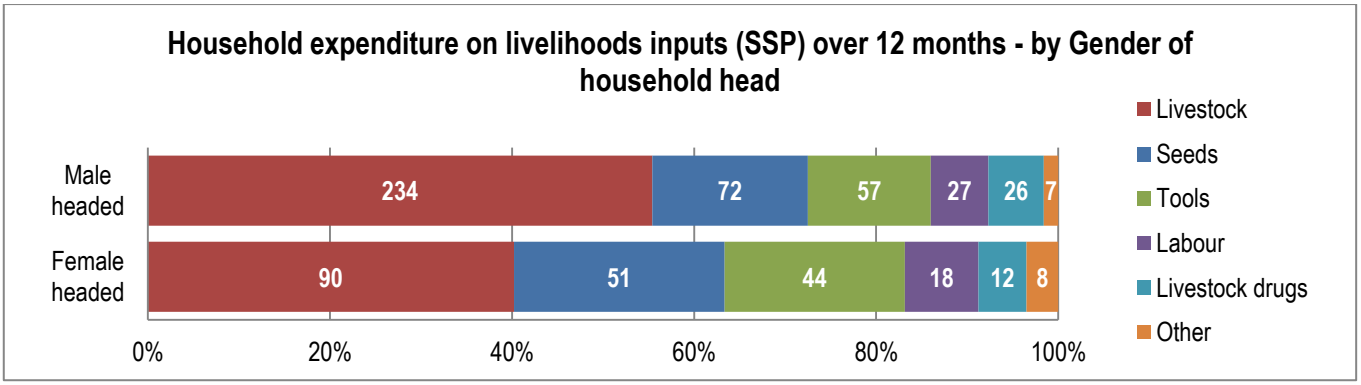
Livelihood input expenditure was used to categorise households into wealth groups following the HEA methodology (see Table 3 above). Significant variation was seen in type of livelihood expenditure depending on wealth group. Middle/Better-off households spent a vast majority of their input on livestock purchases, with the average being higher in Northern Bahr el Ghazal (892.9SSP) than Warrap State (778.1 SSP) for the wealthiest group. The Poor wealth group spent the largest share on seeds, again with a higher average in Northern Bahr el Ghazal (128.0SSP) than Warrap State (87.2SSP). The Very Poor were most likely to have spent the largest share on tools, here with a higher average in Warrap (35.6 SSP) compared to Northern Bahr el Ghazal (27.7 SSP).

Chart 36: Average household expenditure over 12 months preceding the survey – by type of livelihood input, wealth group and State



Average proportion and amounts in SSP spent on livelihoods also varied depending on gender of the household head. Male headed households spent almost three times as much on livestock purchases over the 12 months preceding the survey (234 SSP) as female headed households (90 SSP).

Chart 37: Average household expenditure during 30 days preceding the survey - by type of livelihood input and gender of household head



2.2.2.3. Food sources and market access

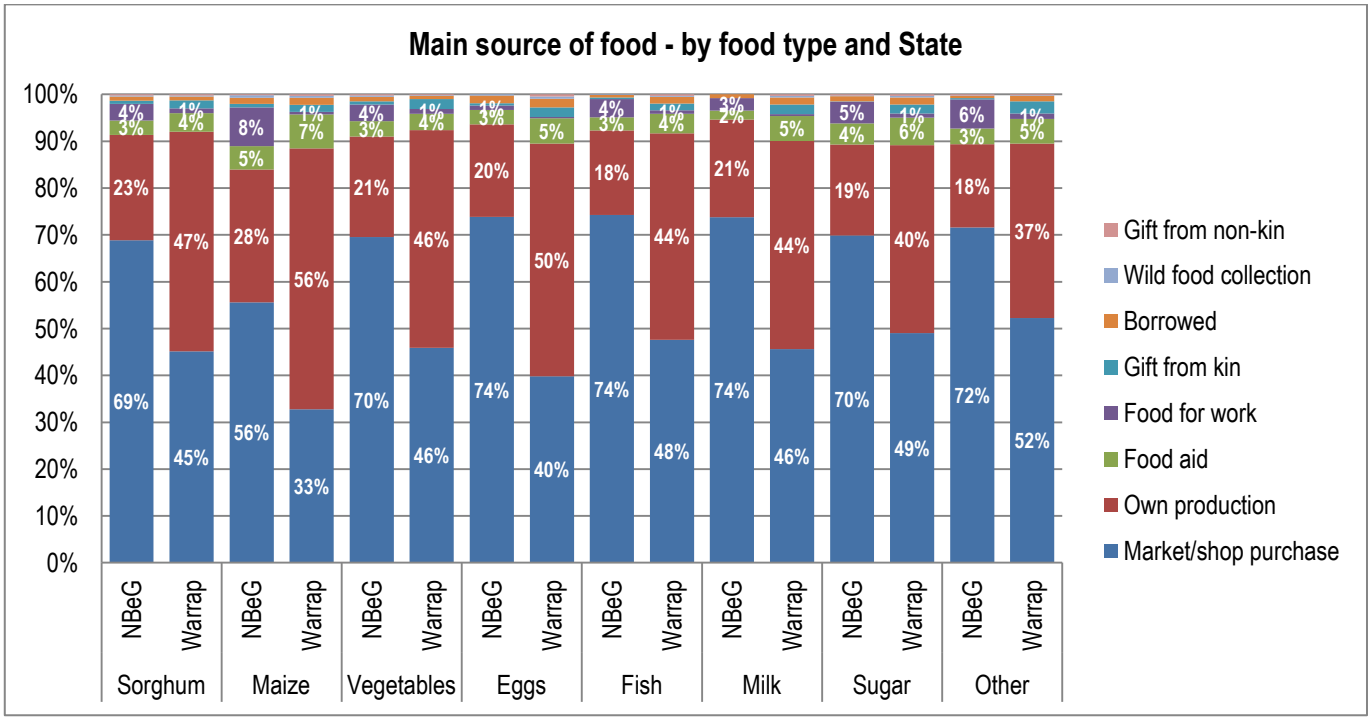
Households relied in the majority of cases on markets for their food purchases at the time of the survey - on average 55% of all foods were bought at the market during the 7 days preceding the survey. Of the food types surveyed, only Maize was more often sourced from own production (46%) than markets (41%).Own production still accounted for a significant proportion of food sourcing in February and March, providing on average 34% of foods. Food aid was the third most commonly reported food source, accounting for 5% of all foods. FSMS reported a higher national reliance on markets for purchases of cereals (56%) than the average reliance found by BRACE across Northern Bahr el Ghazal and Warrap States (50%).[58]

There was significant variation between States for some foods, including sorghum, which was to a greater extent purchased at the market in Northern Bahr el Ghazal (by 69% of households) compared to Warrap (45%). Market reliance was also higher in Northern Bahr el Ghazal for purchases of maize (56% compared to 33%); vegetables (70% compared to 46%); eggs (74% compared to 40%); fish (74% compared to 48%); milk (74% compared to 46%); sugar (70% compared to 49%) and other items including condiments (72% compared to 52%). Based on CFSAM (2013) estimates of cereal production amongst traditional small-holders in the two states, Northern Bahr el Ghazal is facing a 27,954 tonne cereal deficit during 2013, significantly larger than the

[58] FSMS, Round 9, February 2013

17,694 tonne deficit estimated in Warrap.[59] One reason for the greater reliance on markets in Northern Bahr el Ghazal may thus be lower levels of own production. Another reason may be that market prices are significantly lower in Northern Bahr el Ghazal, leading households to purchase from the market for their own consumption while retaining own production for use when prices rise. The CFSAM attributes low prices in northern market towns such as Aweil in Northern Bahr el Ghazal, to informal imports from Sudan.[60] Food for work was more often cited as the main source of foods in Northern Bahr el Ghazal compared to Warrap state, while Food Aid was more often said to be the source in Warrap. This mirrors the higher level of FFA participation in Northern Bahr el Ghazal and the higher level of GFD participation in Warrap (see above Chart 6).[61]

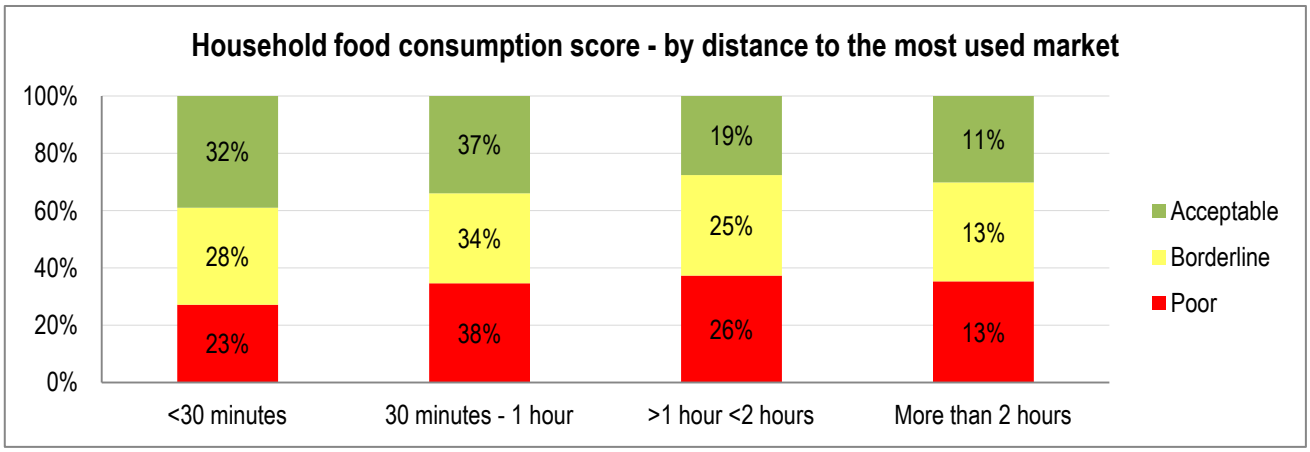
Chart 38: Household main source of food during 7 days preceding the survey – by type of food and State



The vast majority (98%) of households reported reaching the most used market by foot. There was no significant difference in time taken to reach markets depending on food insecurity rating of households – 31% reported less than 30 minutes travel time, followed by 37% with 30 minutes to 1 hour, 21% with 1 -2 hours and 12% of households who spent more than 2 hours to reach their nearest market. There was no significant variation in food expenditure depending on distance to the market. However, there was significant negative correlation between household food consumption score and distance to the most used market. While 68% of households reporting a distance of less than 30 minutes had a borderline or poor food consumption score, this proportion rose to 89% of those who reported taking more than two hours to reach their most used market.

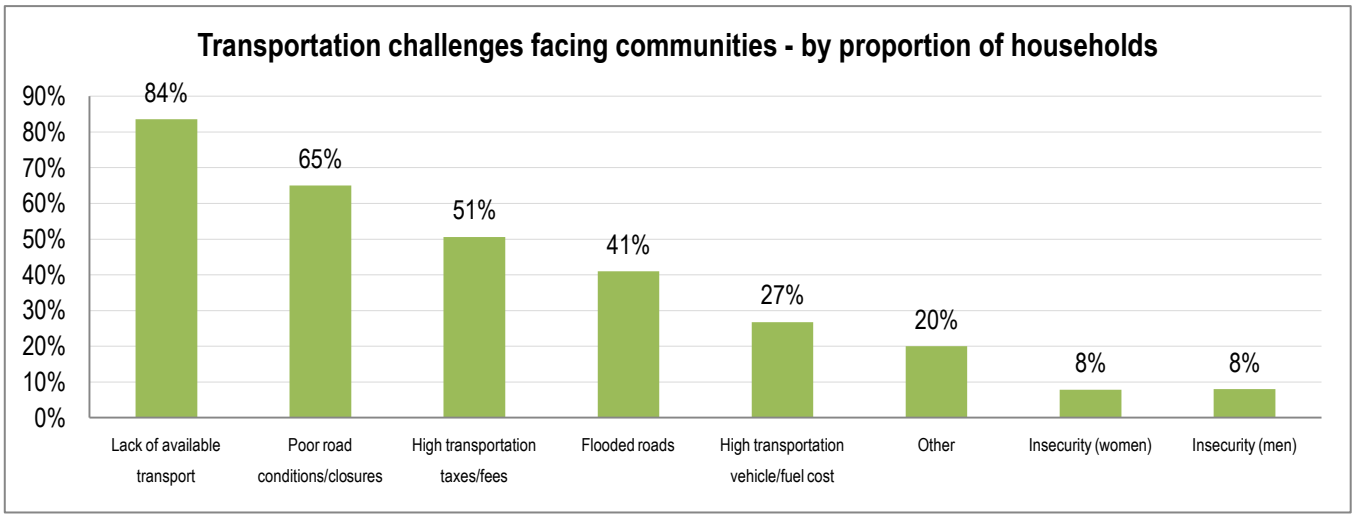
[59] Note this deficit does not take into account household production of ground nuts which is estimated to contribute 6,154 tonnes (gross) of cereal equivalent in Warrap and 9,800 tonnes (gross) in Northern Bahr el Ghazal.
[60] Food and Agriculture Organisation/World Food Programme (2013) Crop and Food Security Assessment Mission, p.31
[61] Few households had participated in GFD only across both states but a larger proportion of Warrap households reported switching from GFD to FFA.

Chart 39: Households by Food Consumption Score and distance to the most used market



Transportation issues most frequently highlighted by surveyed communities were related to lack of available transport – 84% of households were located in communities where modes of transport were lacking. Poor conditions and closures (not related to flooding) was a complaint raised by communities where 65% of households were located.

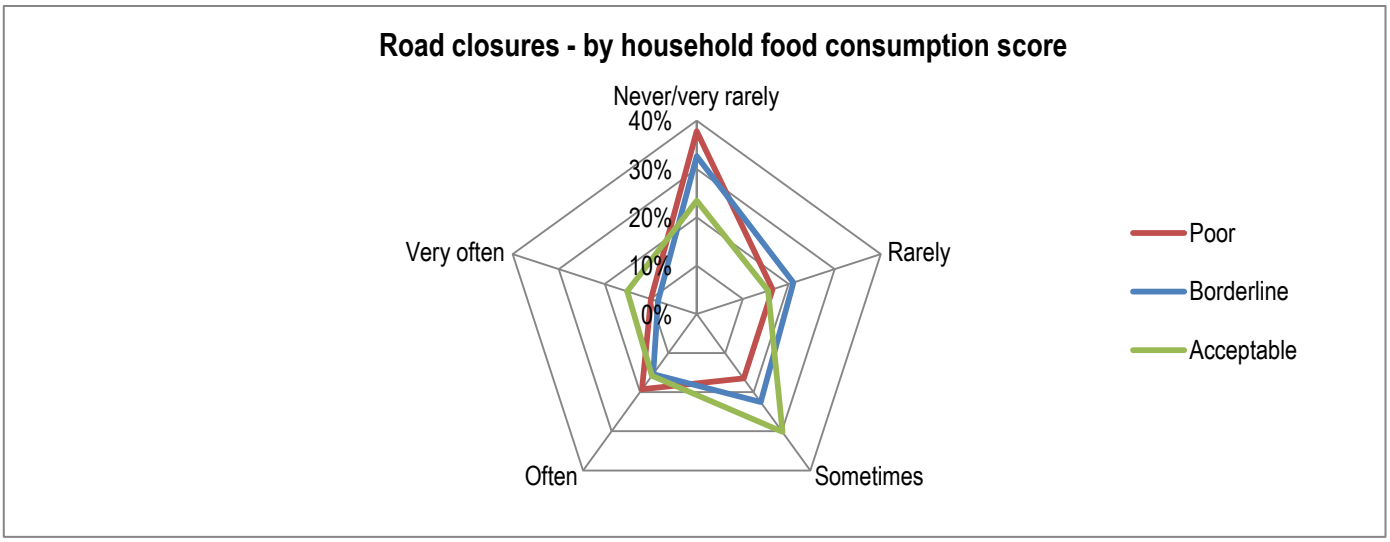
Chart 40: Households by transportation challenges reported by communities



The ANLA 2012/2013 report identified poor road connections as a key structural factor that has a detrimental impact on nutrition rates.[62] There was significant variation, albeit counter-intuitive, between households depending on food consumption score and frequency with which they experienced poor road conditions or closures. Households with poor food consumption scores were actually *less* likely than those with acceptable scores to report poor road or road closures as a frequent occurrence. This finding is counter-intuitive and the relationship between the two factors will be monitored during future round of surveying with the aim of identifying underlying reasons for this correlation.

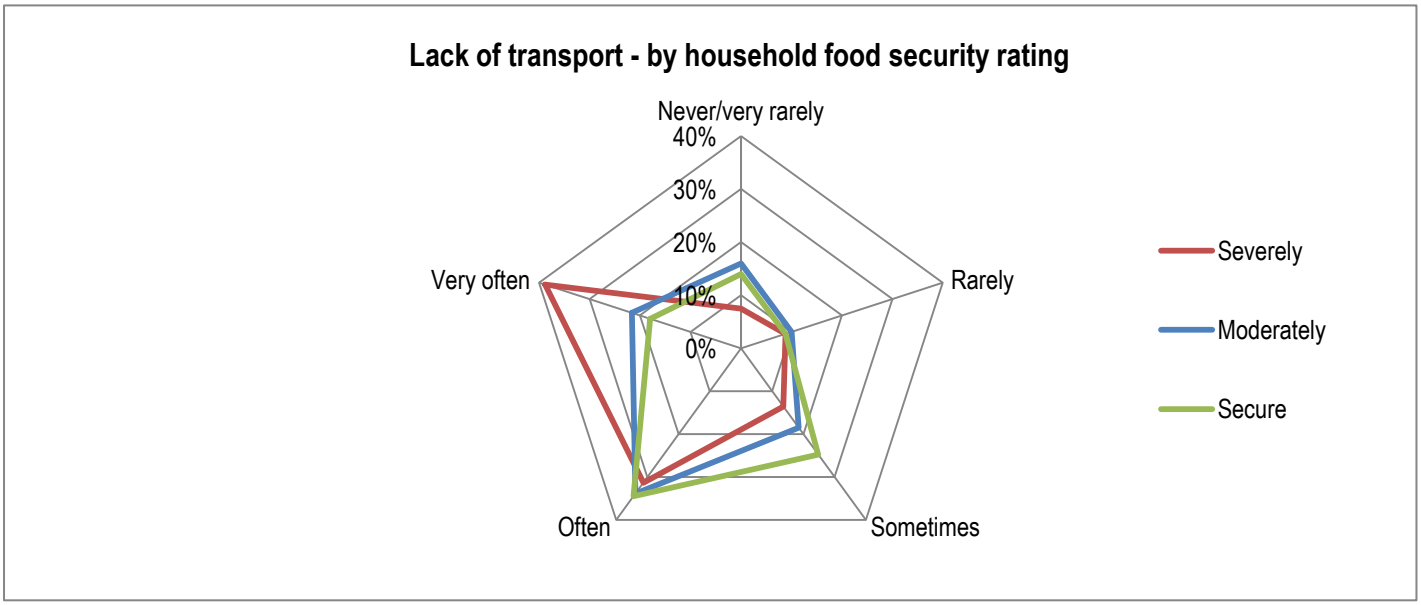
[62] World Food Programme (2013) The South Sudan - Annual Needs and Livelihoods Analysis 2012/2013, March 2013

Chart 41: Frequency with which households experienced road closures - by Food Consumption Score



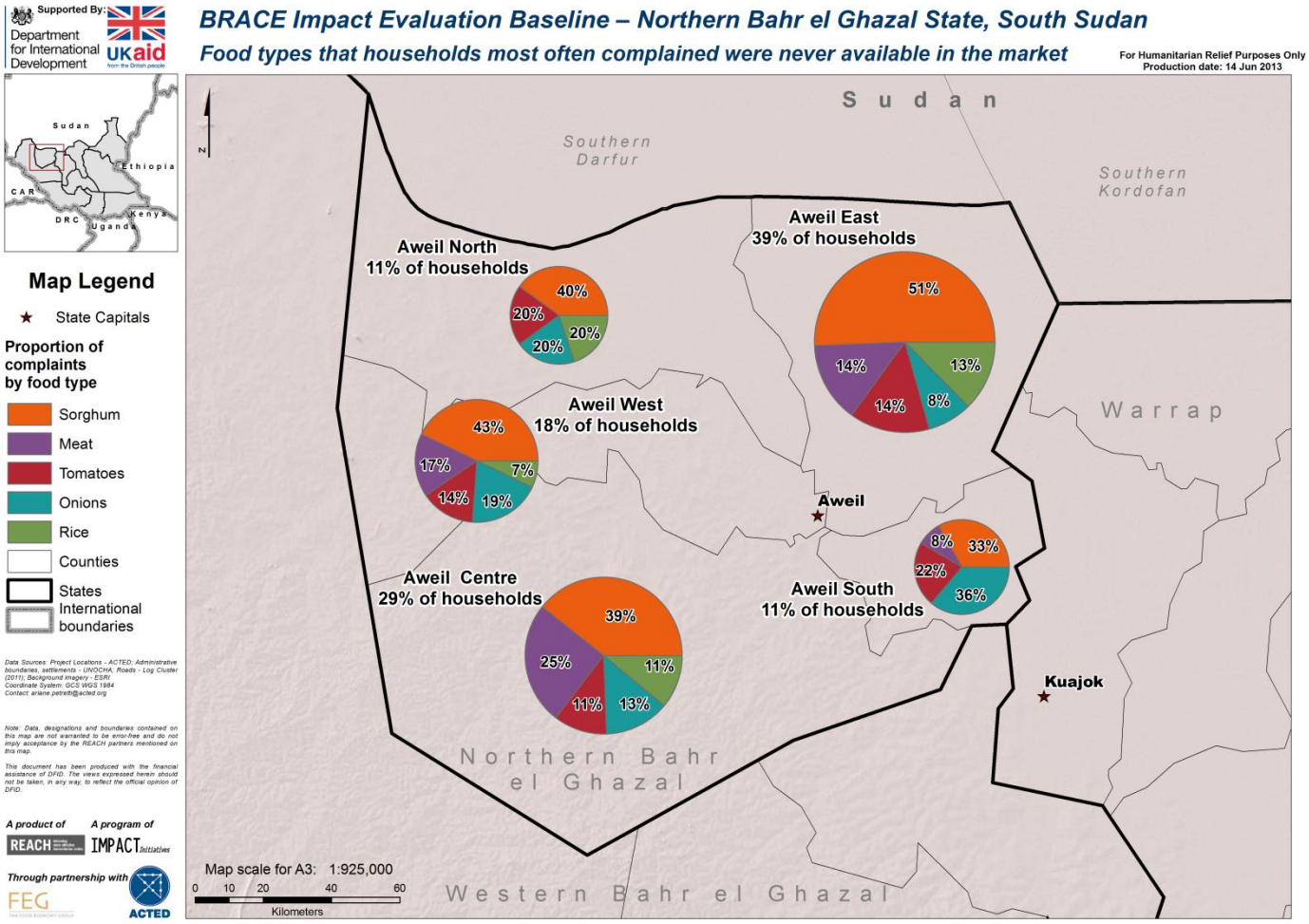
Less surprising was the positive correlation found between household food insecurity rating and the frequency with which they complained about lack of available transport. Severely food insecure households were most likely to complain that transport was 'Very often' not available.

Chart 42: Frequency with which households experienced lack of transport - by food insecurity index rating



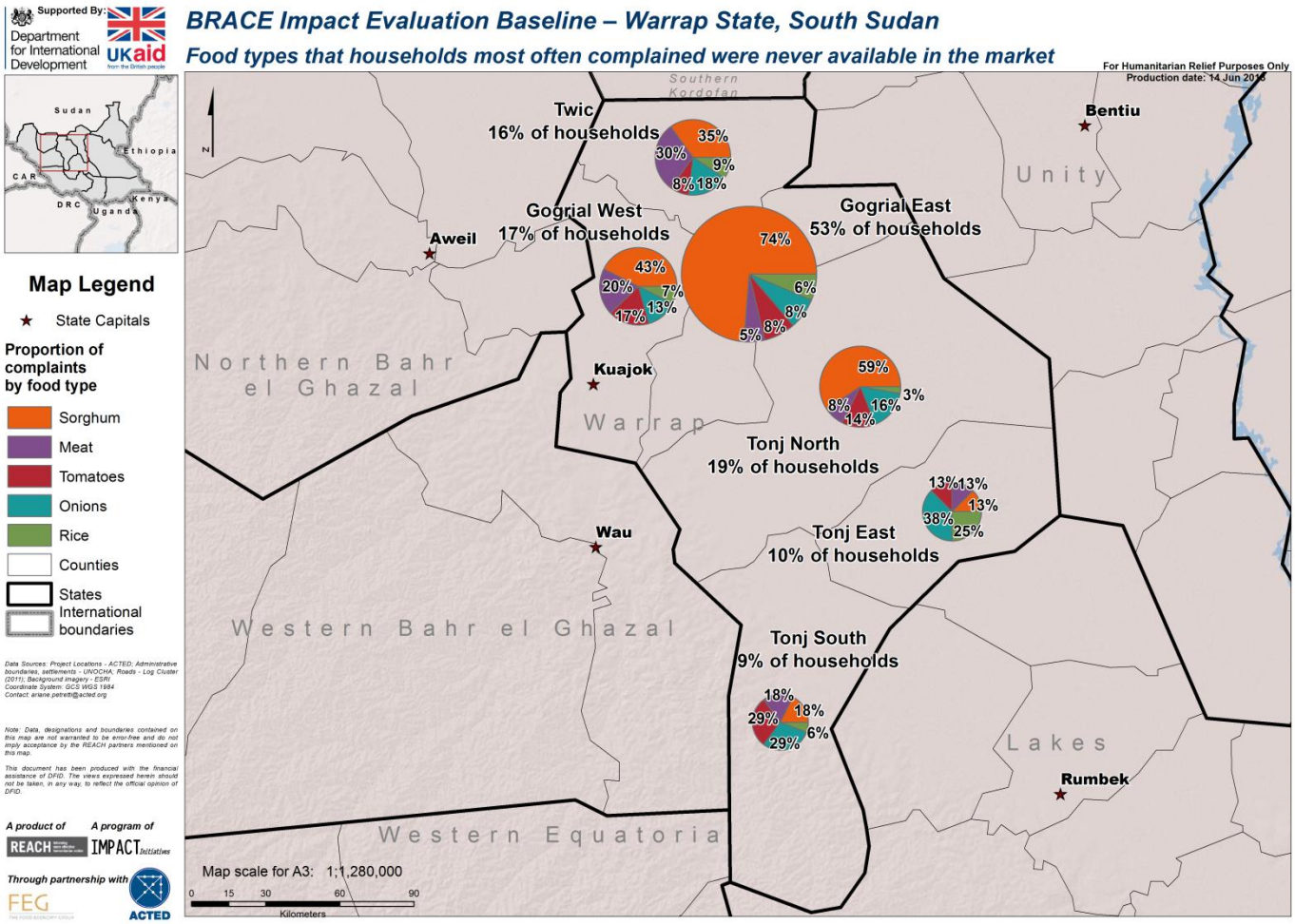
Access to markets did not necessarily mean that foods were available for purchase – 40% of households reported that some food items that they wanted to buy were not available in the market. The maps below display the food types that were most frequently reported not to be available. Aweil East was the county in Northern Bahr el Ghazal where the largest proportion of households complained (39%). Sorghum was the food type most frequently complained about – 51% of households in Aweil East said that sorghum was never available to buy in their local market. Meat, tomatoes onions and rice were the four other types of food that households most often complained were not available.

Map 4: Households complaining of foods not being available in the market - by most frequently mentioned food and proportion of households in Northern Bahr el Ghazal state



In Warrap State, Gogrial East was the county where the largest proportion of households (53%) complained that foods they wanted to buy were not available in their local market. As in Northern Bahr el Ghazal, sorghum was the type of food most frequently complained about, with 74% of households in Gogrial East reporting that sorghum was never available in their local market.

Map 5 : Households complaining of foods not being available in the market - by most frequently mentioned food and proportion of households in Warrap State



2.3. Coping Strategy Index

Coping strategy use was found to be positively correlated with income sources with low reliability and sustainability scores but was also, surprisingly, more frequently reported amongst wealthier households.

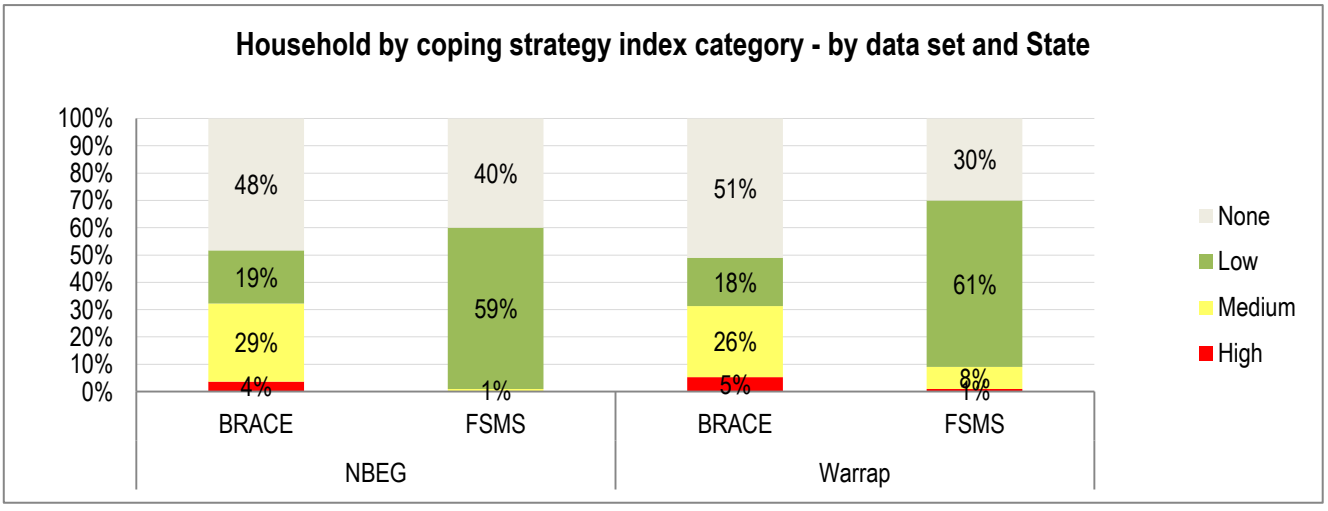
The coping strategy index is the third and final component used to estimate the food insecurity index categories developed by the FSMS. A range of coping strategies are weighted according to severity before being multiplied by the number of days they are used. The index ranges from 0 to 177 – the highest obtainable score should each strategy be applied for the full 7 days. Scores of 50 and below are considered low (good), while scores from 51 to 100 are medium and scores higher than 100 are high.

Chart 43: Coping Strategy Index groups determined by Coping Strategy Index score

Coping Strategy Index groups	CSI Score	Colours
Low	<=50	
Medium	>50 to <=100	
High	>100	

BRACE found that 50% of households had used a coping strategy in the 7 days preceding the survey, lower than the proportion reported by FSMS (57%).[63] There was little variation between the States, with 52% of households in Northern Bahr el Ghazal reporting use of at least one strategy, followed by 49% in Warrap State. In Northern Bahr el Ghazal, 33% of households scored medium or high on the index based on BRACE data, while the corresponding figure for FSMS in the State was 1%. In Warrap, 31% of households surveyed by BRACE scored medium or high on the index, compared to 9% of those surveyed by FSMS.

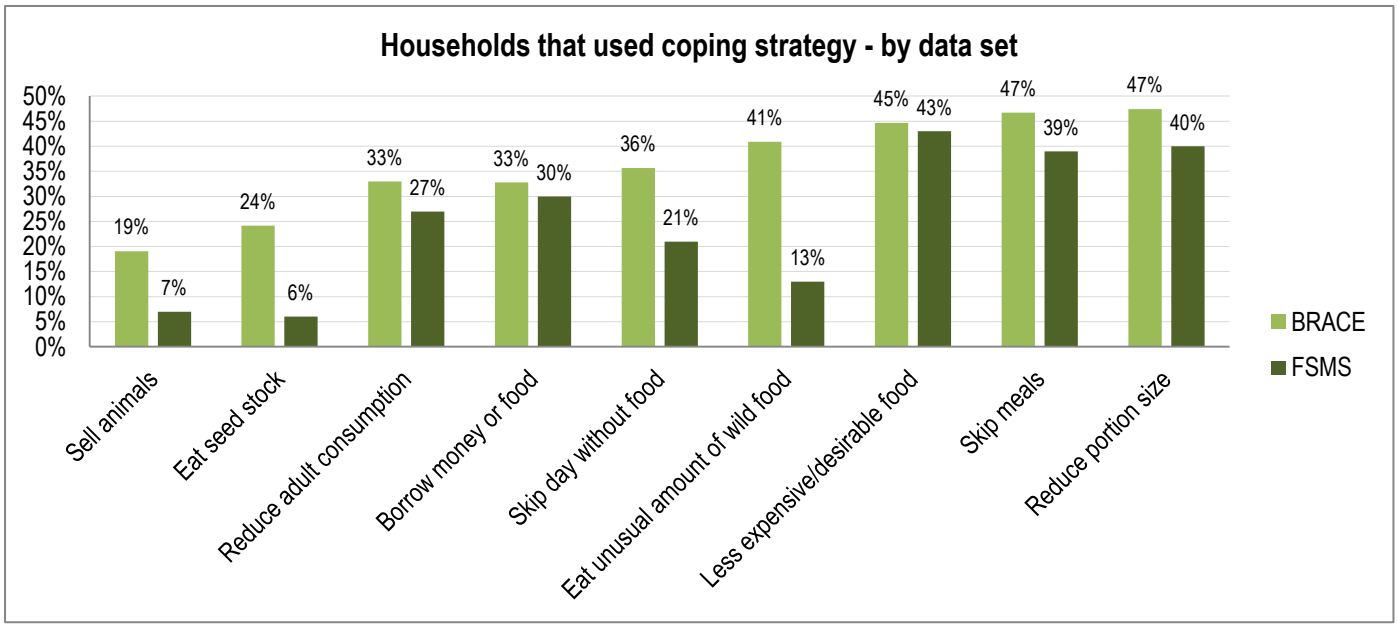
Chart 44: Households by Coping Strategy Index group, State and data set



Particular variation between the two data sets was found regarding the proportion of households that reported collecting and eating unusual amounts of wild foods for the season, during the 7 days preceding the survey. The strategy was reported by 41% of households surveyed by BRACE, compared to 13% of FSMS households.[64] Consumption of seed stocks and sale of animals were also reported by BRACE households to a greater extent – by 24% and 19% of households compared to 6% and 7% of FSMS households respectively.

[63] FSMS, Round 9, February 2013
[64] FSMS, Round 9, February 2013

Chart 45: Households by data set and coping strategy used in the 7 days preceding the survey

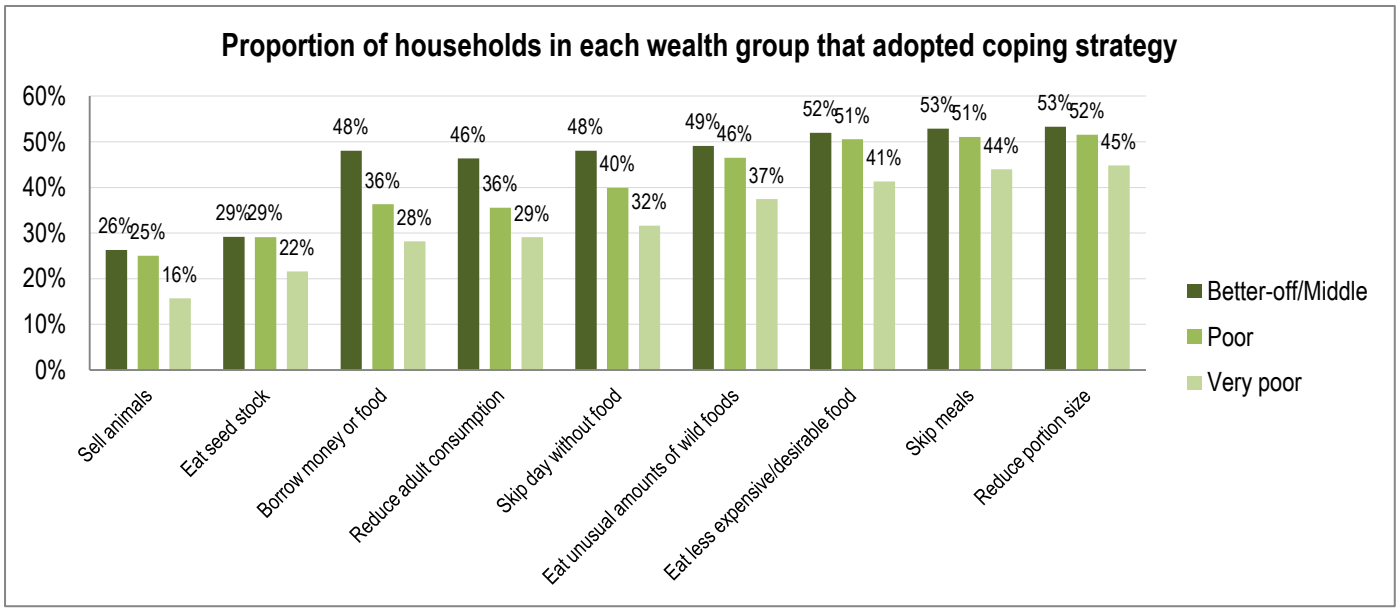


The difference in coping strategy index scores between FSMS and BRACE data sets cannot be explained by difference in methodology as both interview questions and the subsequent calculation were the same for both sets. It could be due to sampling while the FSMS sample consists of 10 – 15 locations in each state with a total of 2,836 households across the entire country, BRACE sampled from 230 locations across Northern Bahr el Ghazal and Warrap states alone with a total number of 4,308 households.[65] One conclusion that may be drawn from the result is that a representative sample is particularly important if the objective is to generalise the use of coping strategies to a wider population, given that coping strategy use clearly varies widely and may not be possible to estimate with confidence based on a non-representative sample.

But the coping strategy index also generated surprising results within the BRACE sample. Wealth was found to be correlated with coping strategy use in a counter-intuitive manner – while 48% of Very Poor households had used coping strategies during the 7 days preceding the survey, the figure rose to 53.9% for Poor households and 55.6% for Middle/Better-off. The most common coping strategy amongst all wealth groups were reducing portion sizes and skipping meals – which were both used by 53% of Middle/Better-off households; by 52 and 51% of Poor households; and by 45 and 44% of Very Poor households.

[65] For details on FSMS methodology see FSMS, Round 9, February 2013

Chart 46: Households by wealth group and type of coping strategy used in the 7 days preceding the survey

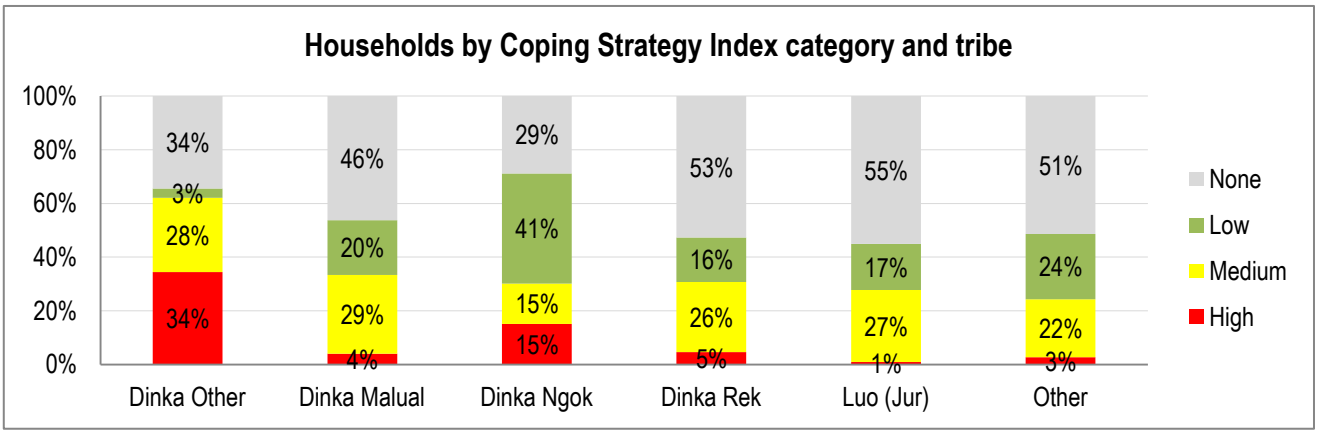


FFA households were slightly less likely than non-FFA households to have used coping strategies in the 7 days prior to the survey – 49.3% had used coping strategies compared to 51.3% of non-FFA households. Future surveys will assess whether this is due to FFA contributing to lower coping strategy use – or to households with lower coping strategy use being more likely to be selected for FFA participation. There was no significant difference in coping strategy use when comparing female and male headed household but returnee households were less likely to have a Low coping strategy score (71%) compared to host (69%) and IDP (54%) households.

One possible explanation for the surprising correlation between wealth and coping strategy use could be that households interpreted the questions used to measure coping strategies differently, depending on how wealthy they were. Households were asked whether they had 'enough' to eat in the 7 days preceding the survey. The interpretation of 'enough' is key here – there may be times when all households, regardless of wealth, *choose* to devote disposable income on items other than food, hence altering their usual consumption pattern temporarily. Every household will have a different perception of what their consumption should be, hence a wealthier household may consider a reduction in consumption of non-essential food items, an indicator of not having 'enough' to eat. Almost all households surveyed (96%) complained that the food they wanted had been too expensive or not available during the 30 days preceding the survey. A second factor to bear in mind is that some strategies are only accessible by some households – sale of animals or consumption of seed stock is only possible if the household owns livestock and seeds. Similarly accessing cash or food on loan may only be possible if the household is relatively wealthy and considered able to repay the debt.

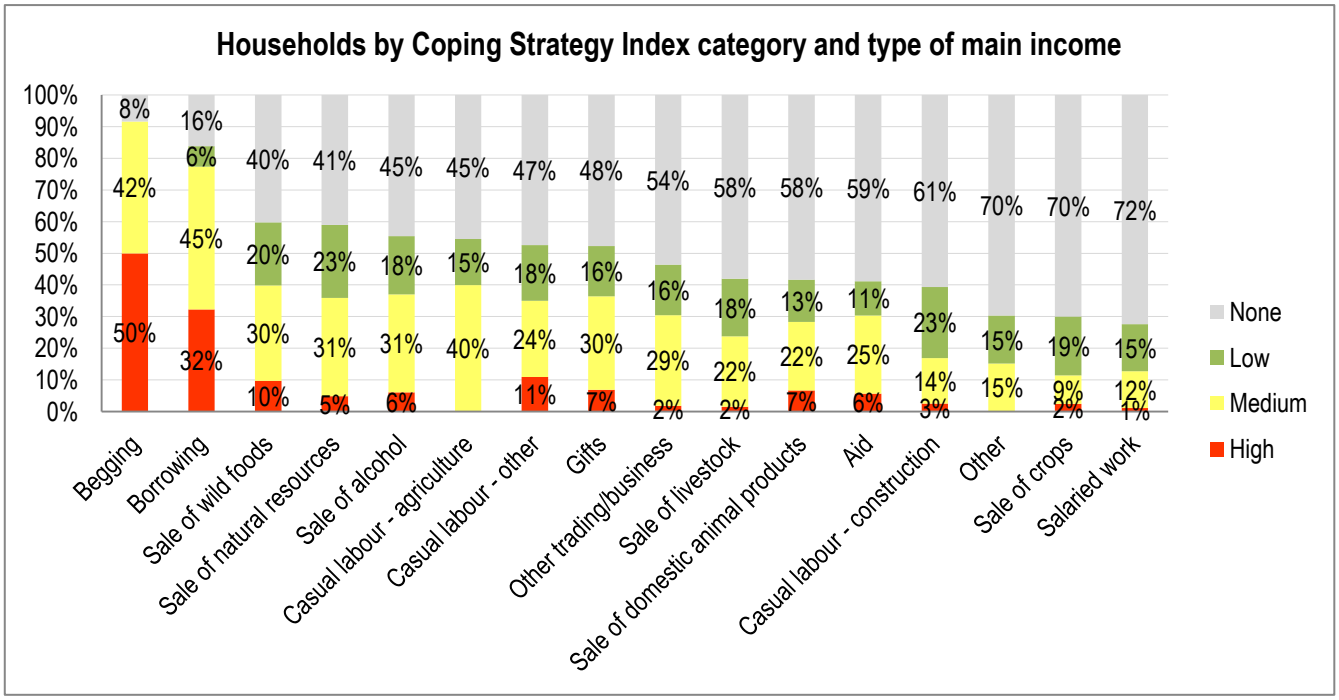
There was significant variation in coping strategy index scores depending on tribal affiliation. The highest level of coping strategy use was seen amongst minority Dinka sub-tribes – 62% of these households scored medium or high on the index. The lowest level of use was amongst non-Dinka tribes, where only 25% of households scored medium or high.

Chart 47: Households by Coping Strategy Index group and tribe



Main source of income also had a significant effect on the coping strategy score of households. Those who relied on begging and borrowing used a high or medium level of coping strategies in 92% and 77% of cases respectively. Households with lowest level of coping strategy use included those relying on salaried work or sale of crops, where only 13% and 11% recorded medium or high use of coping strategies.

Chart 48: Households by coping strategy index category and type of main income



2.4. Food Consumption Score, Coping Strategy Index & Food Access correlation

Main finding: While two of the indicators that constitute the food insecurity index – Food Consumption Scores and Food Access Scores (including income reliability and sustainability scores and percentage spent on food) were correlated, the Coping Strategy Index showed no correlation with food consumption or percentage spent on food.

Variation in food security rating depending on Food Consumption Score, Coping Strategy Index or Food Access Score of the households is of little interest to report, simply because the food security rating is based on these three indicators. Hence incomes sources with low reliability; poor food consumption scores; poor food access scores; and high coping strategy index scores all contribute to a low food security score.

What can be tested is the correlation between food consumption score, coping strategy index and food access. Given that the three measures are all used to indicate level of food insecurity the assumption would be that they should be correlated.

Food consumption score was correlated with income reliability score – a one point increase in income reliability score yielded a 2.9 points increase in food consumption score. Hence income sources that are considered more reliable and sustainable appear to lead to an increase and diversification in food consumption.

Table 18: Linear regression model estimating effect of Income Reliability & Sustainability score on Food Consumption Score

Coefficients[a]								
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	40.944	.998		41.020	.000	38.987	42.901
	Inc_Rel_Sus_Score_Tot	2.895	.266	.165	10.879	.000	2.373	3.417
a. Dependent Variable: Food Consumption Score								

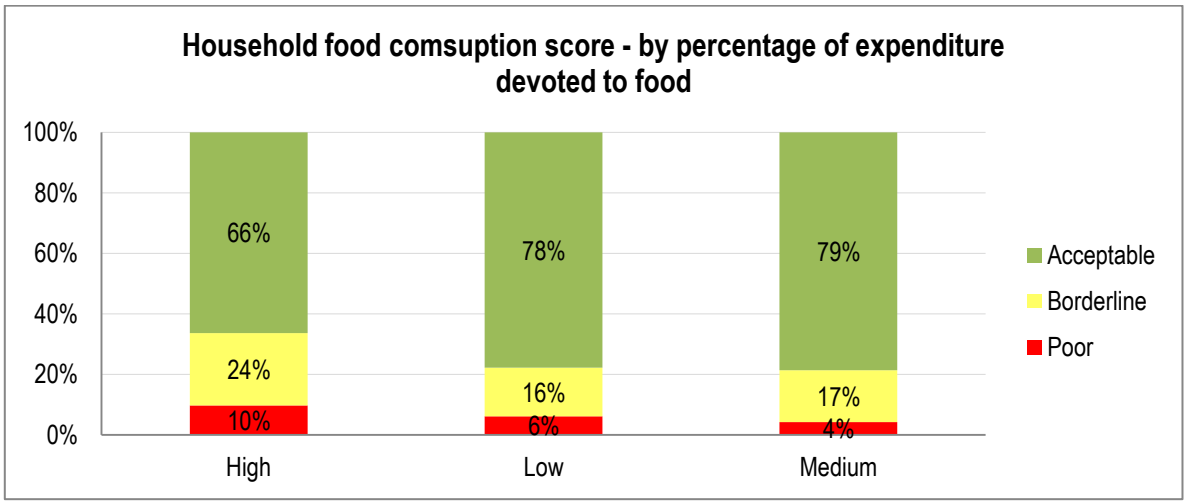
Food consumption was also correlated with percentage expenditure on food, with a 10% increase in expenditure on food leading to a 0.83 point decrease in food consumption score. This perhaps indicates that households with a higher level of disposable income and thus lower proportional expenditure on food were able to access higher quantities and a more diverse selection of foods. The finding is in line with the ANLA which partly attributed poor nutrition to high food prices.[66]

Table 19: Linear regression model estimating effect of average household proportion spent on food on Food Consumption Score

Coefficients[a]								
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	55.202	.689		80.117	.000	53.851	56.552
	Perc_EXP_Food	-.083	.013	-.100	-6.582	.000	-.107	-.058
a. Dependent Variable: Food Consumption Score								

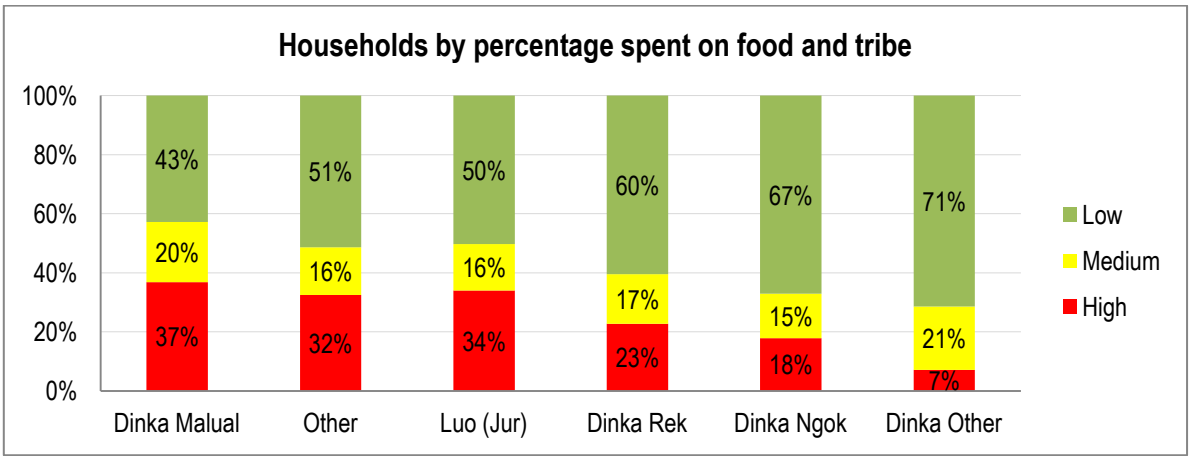
[66] World Food Programme (2013) 'The South Sudan - Annual Needs and Livelihoods Analysis 2012/2013', March 2013

Chart 49: Households by Food Consumption Score and percentage spent on food category



The correlation between food consumption score and percentage spent on food could be seen clearly when comparing households according to tribal affiliation. Amongst non-Dinka households, who were most likely to have an acceptable food consumption score (84%), 71% spent a Low proportion of their expenditure on foods. Amongst Dinka Malual on the other hand, who were less likely to have an acceptable food consumption score (75%), only 43% spent a Low proportion on foods.[67] As noted above, Dinka Malual households mostly resided in Northern Bahr el Ghazal where households overall reported an on average higher proportional expenditure on food compared to those in Warrap State.

Chart 50: Households by percentage spent on food category and tribe



Income reliability and sustainability score was associated with percentage spent on food, with a one point increase in score leading to a decrease by 2.1% in percentage of expenditure devoted to food. Hence incomes considered more reliable and sustainable were associated with a lower proportion of expenditure on food, perhaps a reflection of reliable income sources earning a higher income which in turn enabled households to increase their non-food expenditure.

[67] High share of expenditure on food is >65%; Medium share of expenditure on food is 50% to 65%; Low share of expend. On food <50%

Table 20: Linear regression model estimating effect of Income Reliability and Sustainability score on average proportion spent on food

Coefficients[a]								
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	55.909	1.200		46.592	.000	53.556	58.262
	WFP_Income_RelSusTot	-2.102	.321	-.100	-6.551	.000	-2.731	-1.473
a. Dependent Variable: Household percentage of total expenditure on food								

The income reliability and sustainability score was in turn correlated with the Coping Strategies Index. A one point increase in income reliability score yielded a 3.196 points decrease in coping strategies index score. Thus as income becomes more reliable, households seemed to adopt fewer or less severe coping strategies.

Table 21: Linear regression model estimating effect of Income Reliability and Sustainability Score on Coping Strategy Index score

Coefficients[a]								
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	41.369	1.670		24.767	.000	38.094	44.643
	Inc_Rel_Sus_Score_Tot	-3.194	.445	-.110	-7.173	.000	-4.068	-2.321
a. Dependent Variable: Coping Strategies Index								

The coping strategy index and food consumption score were however *not* correlated; hence variation in coping strategy index did not explain variation in food consumption score. The coping strategy index was also not associated with any change in percentage of expenditure devoted to food. This finding further highlights the potential unreliability of the coping strategy index in assessing food security and resilience. The significant variation depending on BRACE and FSMS data sets and the finding that wealthier households were more likely to use coping strategies (see above Charts 43 and 44), coupled with lack of correlation between coping strategy scores and food consumption scores or proportion of household expenditure devoted to food, casts doubt on the internal validity of the index – i.e. it may not actually be measuring what we think it is measuring. In order to explore the validity of the coping strategy index, future rounds of surveying will measure use of an expanded set of 'strategies' identified by the HEA and will in addition measure use amongst all households as opposed to only those that said they did not have enough to eat over the 7 days preceding the survey. The objective will be to a) assess the importance of current coping strategy categories against additional strategies and b) test correlation between variables other than the perceived sufficiency of food and coping strategies.

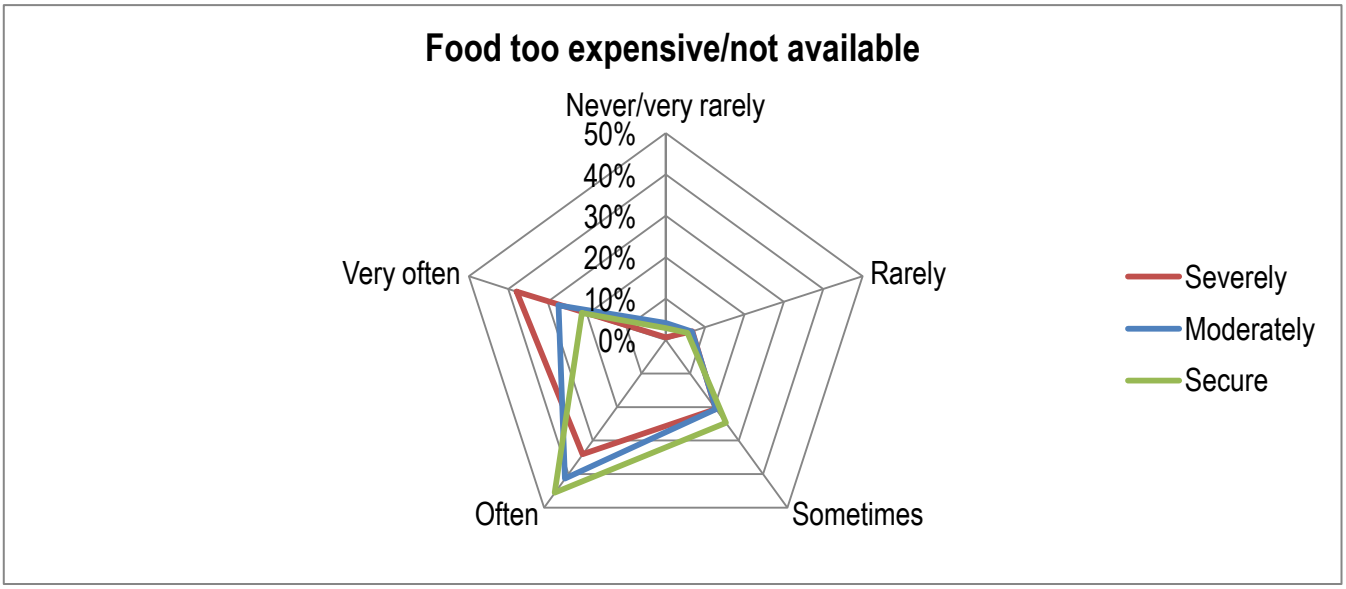
As discussed above (see page 57) the problem of defining behaviours as 'coping' strategies may rest partly on the way households themselves perceive their food consumption – whether they have 'enough' to eat – and partly on access to strategies measured here – sale of animals is only possible for households that own livestock.

External factors that may influence coping strategy use include the price of food. Almost all households (96%) complained that food had been too expensive or not available at all during the 30 days preceding the survey. High food prices were also recorded as a common complaint amongst FSMS households (66%) although this had dropped from 80% in June 2012.[68] The ANLA 2012/2013 report also reported that increasing food prices was the most prominent shock identified by households in 2012.[69] Amongst households surveyed by BRACE, a higher proportion (29%) complained that food was Very often not available or too expensive in Northern Bahr el Ghazal than in Warrap (21%) state. It was noted above (see Chart 36) that households in Northern Bahr el Ghazal relied on markets to a greater extent for some food types, including sorghum. Complaints of food being too expensive or

[68] FSMS, Round 9, February 2013
[69] World Food Programme (2013) The South Sudan - Annual Needs and Livelihoods Analysis 2012/2013, March 2013

not available were found to be correlated with the food insecurity rating of the household. A larger proportion (38%) of severely food insecure households complained compared to moderately food insecure (27%) and food secure (21%) households.

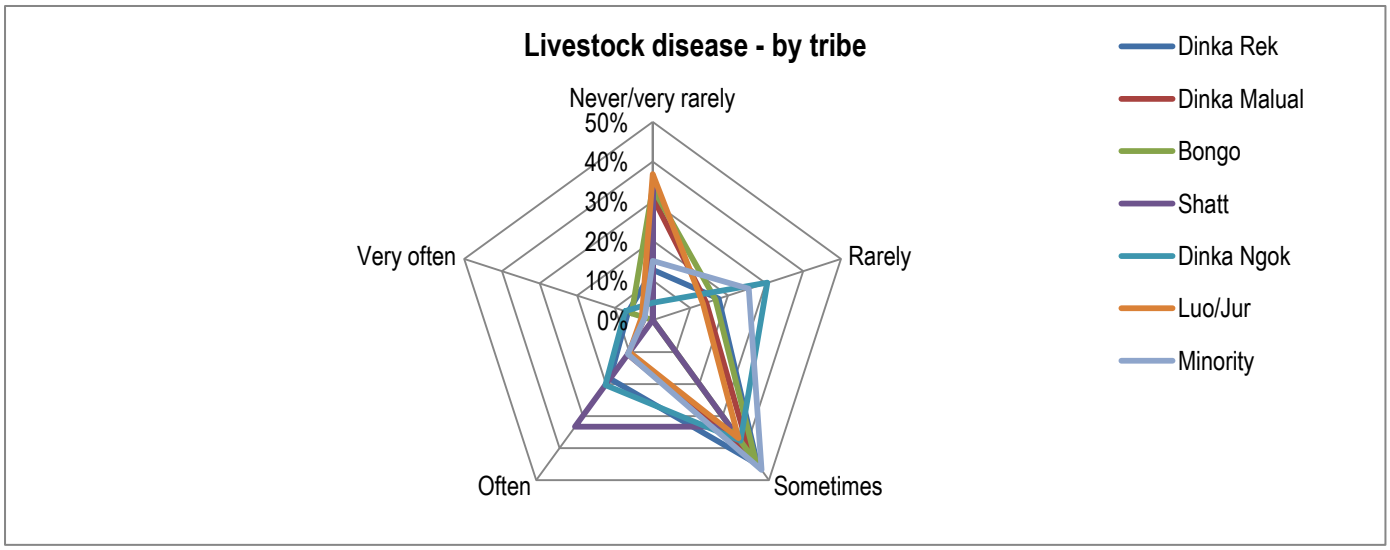
Chart 51: Frequency with which households were affected by lack of available or expensive food – by food insecurity rating



Poor road networks and long distances for food transports were identified by the FSMS as a possible underlying reason for high food prices across all border states. The BRACE survey found that 69% of households in Warrap and 72% in Northern Bahr el Ghazal had experienced poor road conditions or closures in the 30 days preceding the survey – at the height of the dry season.

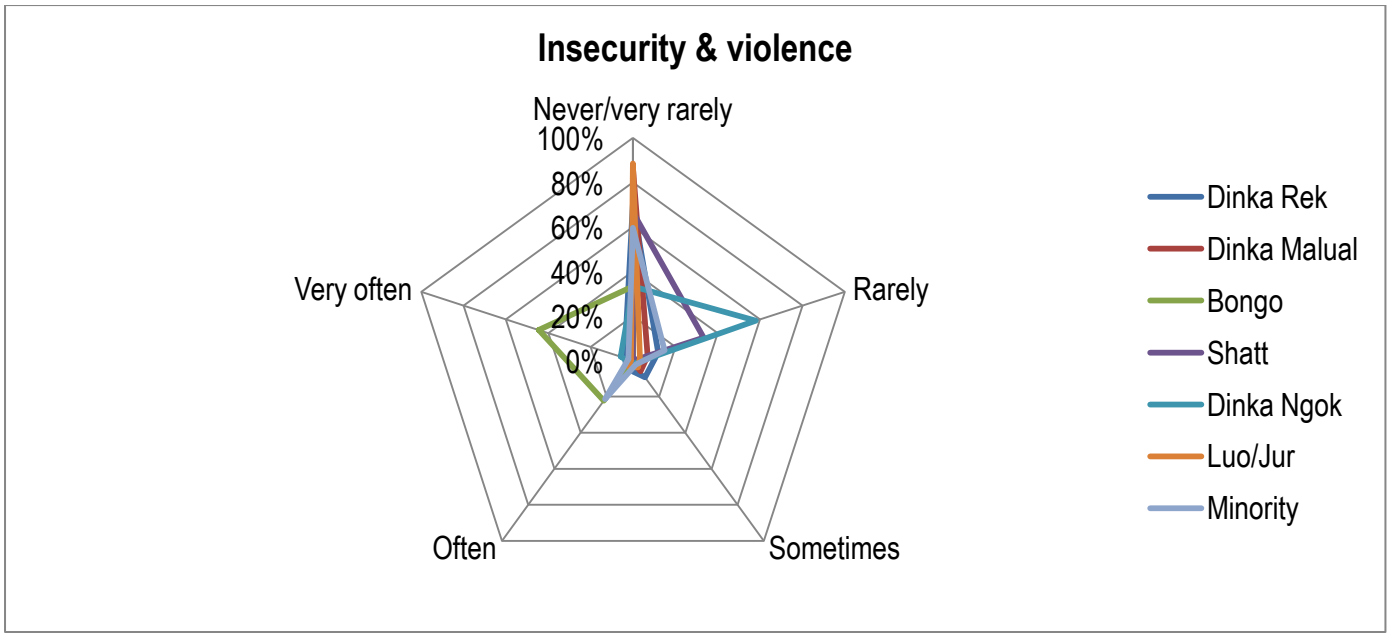
Another external factor that differed between the states was livestock disease. The FSMS found livestock disease to be a particularly common complaint in Warrap State (49% of households); this was confirmed by BRACE data where 82% of Warrap households complained of livestock disease, compared to 66% in Northern Bahr el Ghazal. Complaints of livestock disease also differed depending on the tribal affiliation of the household. Livestock disease was more frequently reported by Dinka Ngok (96%) than Dinka Rek (86%), Dinka Malual (69%), Bongo (67%) and Luo (63%).

Chart 52: Frequency with which households were affected by livestock disease - by tribal affiliation



Insecurity and violence was another external factor where the frequency with which it was experienced differed depending on tribal affiliation of the household. It was reported most frequently by Bongo and Dinka Ngok (67% of households), followed by Dinka Rek (30%), Dinka Malual (13%) and Luo (11%).

Chart 53: Frequency with which households experienced insecurity and violence – by tribal affiliation



3. OTHER KEY RESILIENCE INDICATORS

3.1. EDUCATION

Main finding: FFA participation was positively correlated with a higher proportion of members attending primary school, even when comparing households in the same wealth group. Future rounds of surveying will assess whether FFA participation contributes to increased primary school attendance or whether households with a higher proportion of members attending primary school are more likely to be selected for FFA participation. Higher education levels were positively correlated with more reliable and sustainable incomes. Consequently, wealthier households reported a higher proportion of educated household members, especially women, in addition to on average higher levels of expenditure on education over the 30 days preceding the survey.

The level of education was low across the sample. Only 0.5% of the 34.040 individuals surveyed reported having completed primary school, 0.3% had completed secondary school and 0.1% had completed university education. There was no significant difference between FFA and non-FFA households in the average proportion of household members that reported completing any level of education (2.4%) or primary level education (2.0%). Receipt of GFD was also not significant.[70]

However, wealth group status had a significant effect on percentage of household members completing education, increasing the average proportion educated by 1.5% in Poor households and by 2.1% in Middle/Better-off households compared to Very Poor households. Table

22: Linear regression model estimating effect of wealth group on proportion of household members that have completed any education

Coefficients[a]								
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	1.795	.162		11.075	.000	1.478	2.113
	Poor	1.453	.344	.065	4.219	.000	.778	2.129
	Middle_Better_off	2.119	.373	.088	5.684	.000	1.388	2.849
a. Dependent Variable: Household percentage of members that have completed any level of education								

A slightly higher proportion of FFA household members were attending primary school (20.1%) compared to non-FFA group members (18.7%). Attendance rates for secondary school were just 1.2% of FFA household members and 1.1% of non-FFA group household members. University attendance applied to 0.2% of FFA and non-FFA members respectively. The effect remained after controlling for wealth – household members in FFA households were more likely to attend primary school compared to others in the same wealth group who did not participate in FFA. Future surveying will assess whether FFA participation contributes to increased primary school attendance – or whether households with a higher proportion of primary school attendees are more likely to be selected for FFA participation.

Overall, women and girls were much less likely to have completed or be attending any level of education, as shown by the gender parity index below.[71] This is in line with previous studies, which have estimated that South Sudan has the highest level of female illiteracy in the world. Only 8% of the female population is believed to be literate.[72] Women and girls in Northern Bahr el Ghazal and Warrap were less likely than their male counterparts to have started; be attending; or have completed any type of schooling. Only 6 females for every 100 males were attending university amongst Poor and Middle/Better-off household members. Completion ratio for primary schooling was 18 and 19 females for every 100 males in Poor and Very Poor households. Primary school attendance

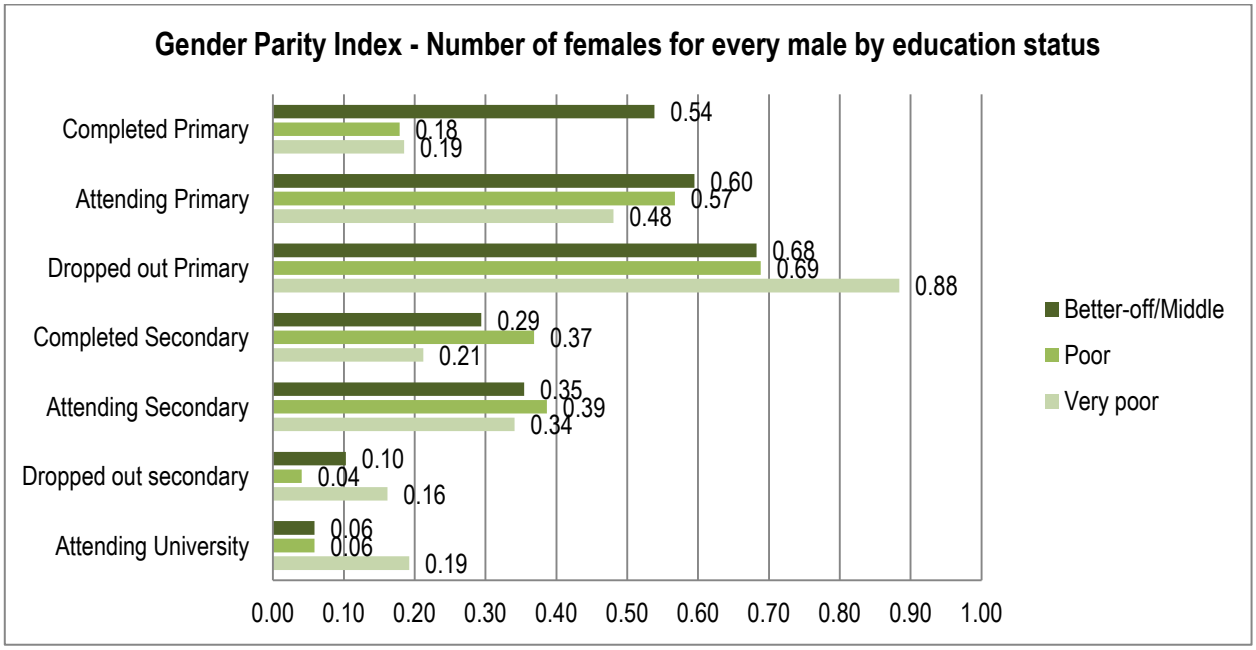
[70] Note that we are here first reporting the proportions in the sample overall followed by proportions calculated on the household level – hence the first calculation gives each individual in the sample the same weight while in the second does not – i.e. in the second calculation 1 person in primary school would be 50% in a HH of 2 and 25% in a HH of 4

[71] Gender parity is reached when the gender parity index is between 0.97 and 1.03 – See UNESCO (2011) 'Education For All: Global Monitoring Report'

72 See UNESCO (2011) 'Building a better future: Education for an independent South Sudan' p.7

was 48 girls for every 100 boys amongst Very Poor households, a proportion which rose to 60 girls for every 100 boys amongst the Middle/Better-off. This was slightly more even than the ratio recorded for the two states during the 2008 census (43 girls for every 100 boys), perhaps indicating that the gap in access to education for females and males is slowly closing.[73]

Chart 54: Gender Parity Index by wealth group and education status



Attendance and drop-out ratio and rate will be monitored during subsequent surveys to detect whether removal of children from school is a coping strategy when households face a drop in resources; whether this affects male and female students to a different degree; and whether FFA participation leads to a decrease in student drop-out rates.

Expenditure on education was as expected low, with 1,636 (36.6%) of households reporting 0 expenditure on education. This finding remains valid when only considering households with children of school age (5-14), with 1,505 (37.7%) of these households reporting 0 expenditure. It should be noted here that expenditure on education was measured over the 30 days prior to the survey, which could misrepresent spending over the school year, which is likely to be limited to key points in time (such as payment of school fees at the beginning of term).

Comparing households containing children and young adults (aged 5-24 years), wealth group status did not have a significant effect on proportional expenditure on education, but in real terms it did. Compared to Very Poor households, Poor households containing children of school age, spent on average 6.5 SSP per capita more on education over the 30 days preceding the survey and Middle/Better-off households spent on average 9.1 SSP more per capita.

Table 23: Linear regression model estimating effect of wealth group on average household per capita expenditure on education during the 30 days preceding the survey

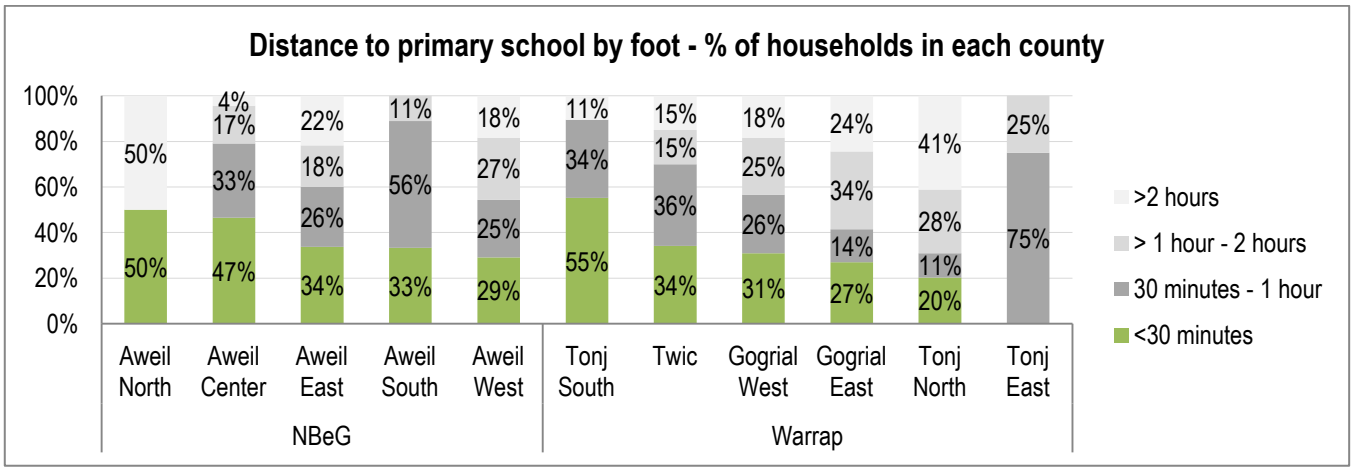
Coefficients[a]								
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	11.098	1.163		9.545	.000	8.819	13.378
	Poor	6.490	2.465	.041	2.633	.008	1.658	11.322
	Middle_Better_off	9.099	2.663	.054	3.417	.001	3.879	14.320
a. Dependent Variable: Household expenditure on education (per capita)								

[73] See Southern Sudan Centre for Census, Statistics and Evaluation (2010) 'Statistical Yearbook for Southern Sudan' p.54-55

Distance to primary school did not have a significant effect on primary school attendance of either males or females. Around a third (33.6%) of households reported distances of less than 30 minutes by foot to the nearest school, while 29.6% reported 30 minutes – 1 hour and 36.7% were located more than 2 hours from the nearest primary school. Most households (62.4%) had to travel more than 2 hours by foot to reach the nearest secondary school.

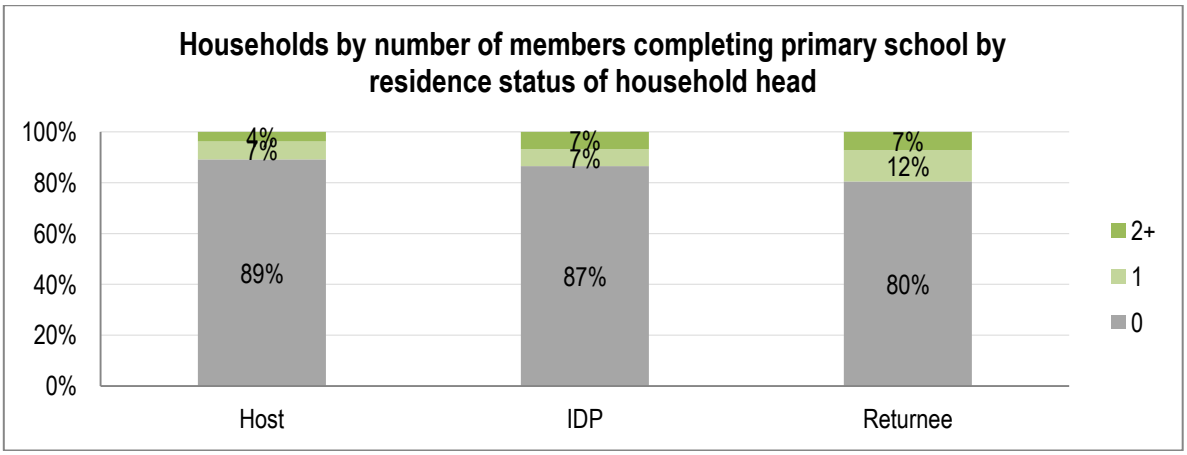
Tonj East, North and Aweil North have been identified for a forthcoming UNICEF school building programme. Aweil North was the surveyed county with had the highest proportion of households (50%) that reported distances of more than 2 hours to the nearest school. Sampled communities in Tonj East reported distances of 30 minutes to 1 hour (75%) and up to 2 hours (25%). School access varied in Tonj North, with 20% of sampled households located in communities with less than 30 minutes to the nearest school and 41% with more than 2 hours to the nearest school.[74]

Chart 55: Households by distance to primary school reported by community and county



Returnee households had a slightly higher proportion of household members that had completed primary school – 19% of returnee households contained at least one member that had completed primary school, compared to 14% of IDP households and 11% of host households.

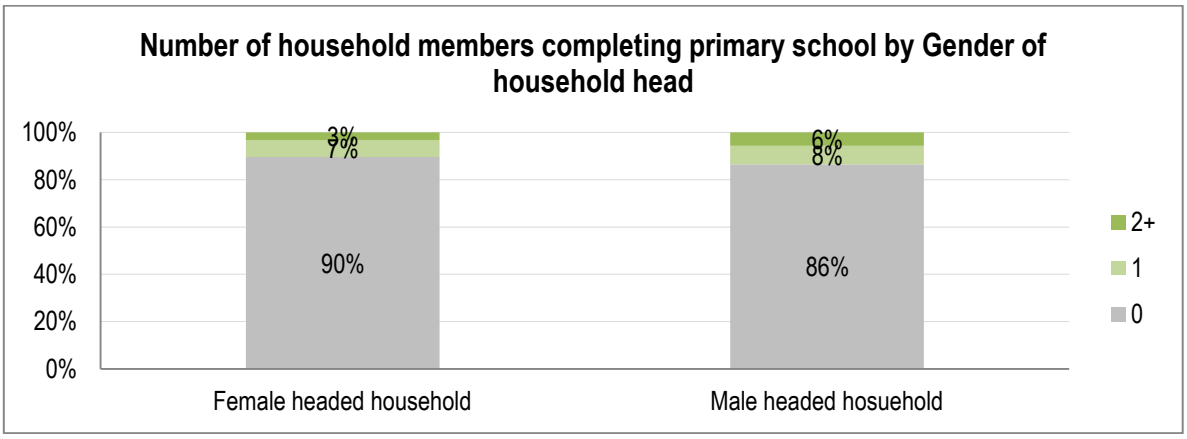
Chart 56: Households by number of members completing primary school and residence status of household head



Female headed households were less likely to contain members that had completed primary school than male headed households. Only 10% of female headed households included members that had completed primary school, while the corresponding proportion of male headed households was 14%.

[74] The comparison on the county level can only be seen as an indication of distances and cannot be generalised to the site population overall due to the small size of the sample when split between counties.

Chart 57: Households by number of members completing primary school and gender of household head

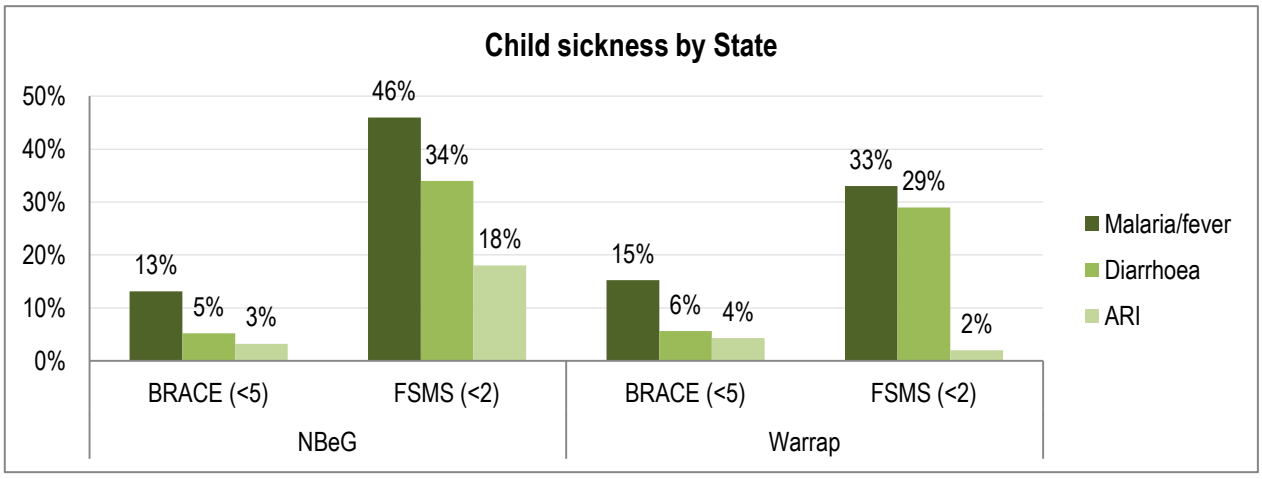


3.2. HEALTH, WATER AND SANITATION

Main finding: Poorer, food insecure households spent less on medical costs even though members in poorer households were more likely to fall ill.

Very Poor households were most likely to report that members that had fallen ill over the two weeks preceding the survey (36% of households), compared to Poor (24%) and Middle/Better-off (19%). According to the FSMS, 46% of children under the age of two surveyed in Northern Bahr el Ghazal were reported to have experienced symptoms of malaria during the 2 weeks preceding the survey. BRACE data asked for child sickness for children aged less than 5, also over a two-week period preceding the survey, finding that 13% of children aged less than 5 surveyed in the state were reported to have had symptoms of malaria. Incidence of diarrhoea also varied depending on age bracket. While 5% of children under 5 in Northern Bahr el Ghazal and 6% in Warrap state reporting symptoms, the corresponding figure when considering only those aged less than 2 was 34% and 29%. The same trend was seen for symptoms of acute respiratory infections (ARI) in Northern Bahr el Ghazal – from which 3% of children under 5 and 18% amongst those aged less than 2 had been affected. In Warrap on the other hand, the incidence amongst those aged less than 2 dropped to 2% - compared to 4% of children under 5.

Chart 58: Proportion of children reported to have suffered from symptoms of disease, by age group and state

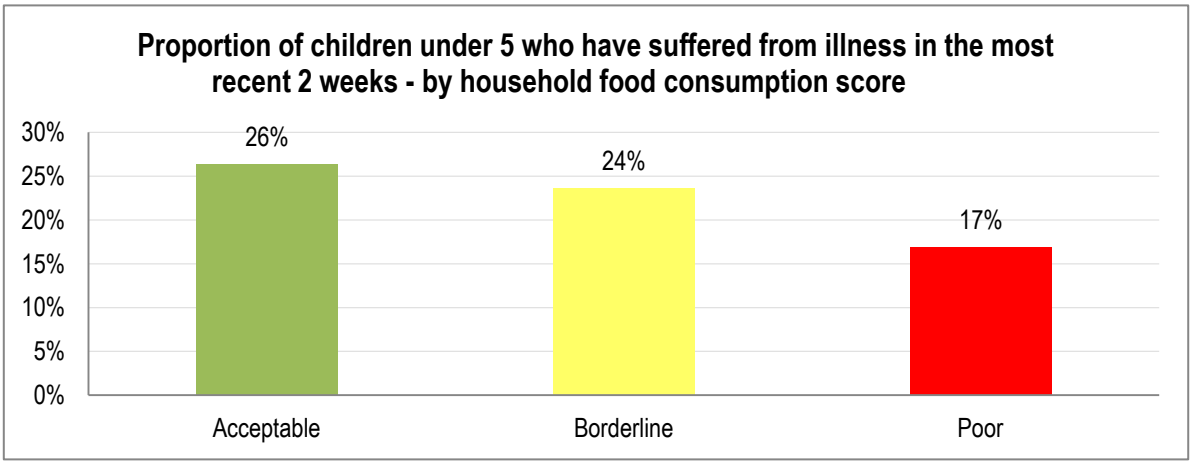


Food consumption scores of households did not seem to be associated with a reduction in child sickness, a surprising finding given that studies including the ANLA 2012/2013 have attributed malnutrition to child sickness.[75] There was also no significant variation in child sickness comparing female and male headed households. Correlation between women's work burden and childhood

[75] World Food Programme (2013) The South Sudan - Annual Needs and Livelihoods Analysis 2012/2013, March 2013

sickness was explored but no significant variation was seen in incidence of child sickness and the proportion of women in the household that contributed to main income generation.

Chart 59: Proportion of children aged less than 5 who have suffered from illness during the most recent two weeks = by household food consumption score



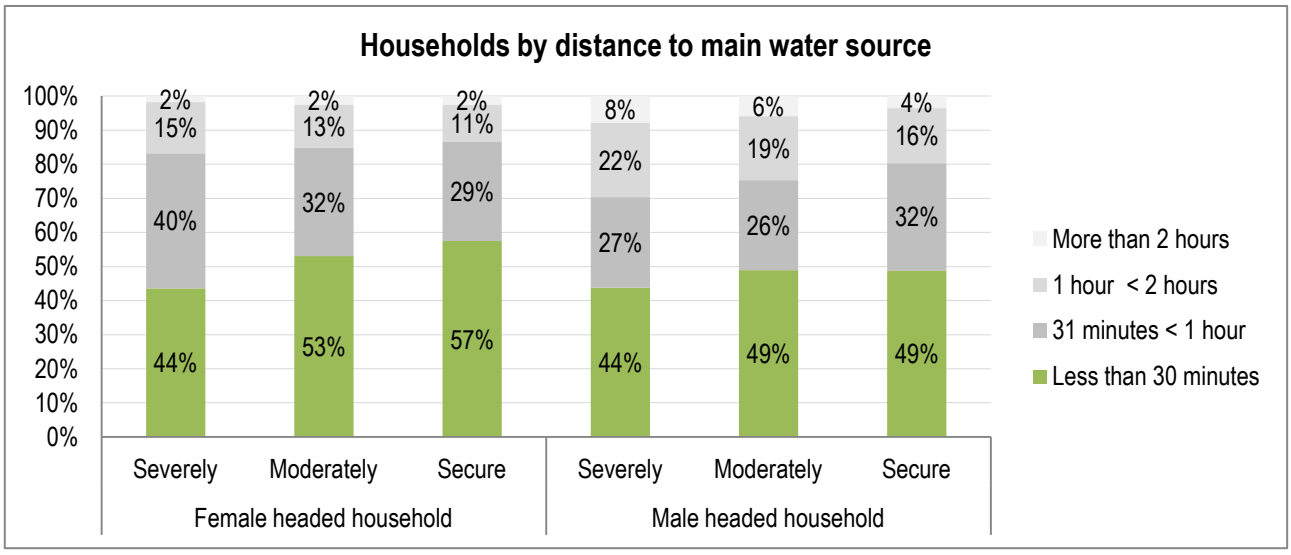
Diarrhoea incidence was only marginally higher amongst the Very Poor and Poor households (5% of children under 5) compared to Middle/Better-off (4%) households. There was no significant difference between wealth groups for other diseases. There was no significant variation in child sickness overall depending on type of main income, between wealth groups or food security categories.

Similarly, there was also no significant variation in child sickness depending on which drinking water source the household used.[76] The majority of households used borehole with pump (76%) – a higher proportion than that recorded during the census for Warrap (37.6%) and Northern Bahr el Ghazal (63.3%) populations.[77] Unprotected dug wells were the second most commonly used source (11%), which in 2008 had been used by 30.9% and 23.6% of the population in Warrap and Northern Bahr el Ghazal respectively. The third most frequently cited source was open running water such as ponds, rivers or streams (9%); protected dug well (2%); and purchases (1%). There was no significant variation between wealth groups or food security categories.

There was no significant correlation between distance to water source and child sickness but distance to the main water source varied between food security categories and according to gender of the household head. Food secure female headed households were significantly more likely to live less than 30 minutes from a water source (57%) than moderately (53%) and severely (44%) food insecure. The effect of distance was not as marked amongst male headed households, with 49% of food secure or moderately food insecure households and 44% of severely food insecure households reporting a distance of less than 30 minutes.

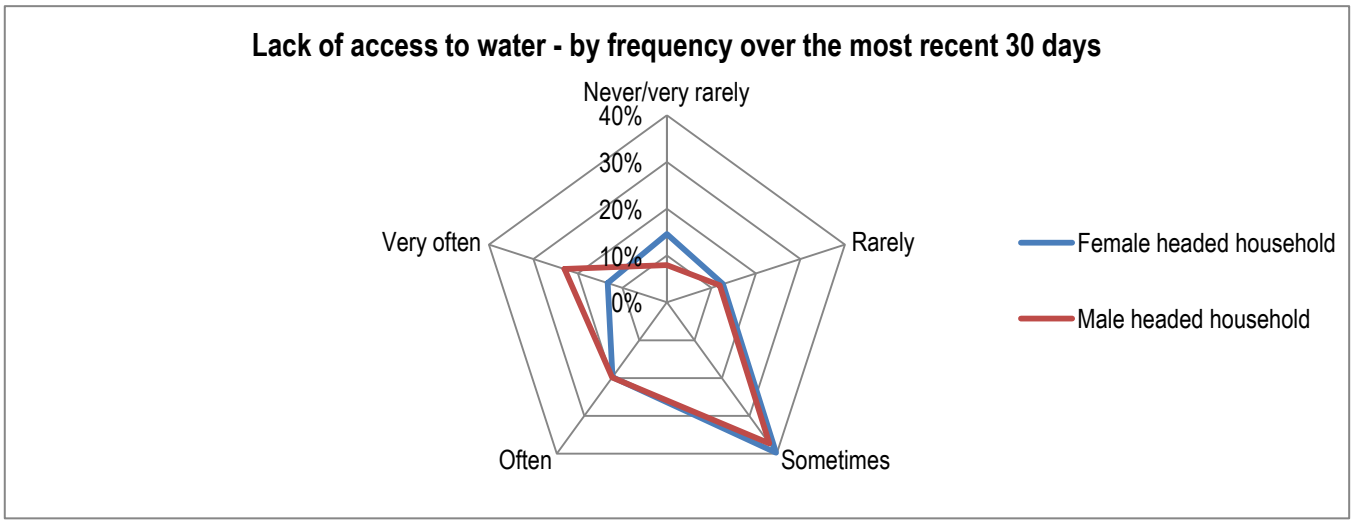
[77] See Southern Sudan Centre for Census, Statistics and Evaluation (2010) 'Statistical Yearbook for Southern Sudan,' p.34

Chart 60: Households by distance to water source; food insecurity; and gender of household head



Male headed households were also more likely to complain about lack of access to water. While 83% of the overall sample complained of lack of access to water over the most recent 30 days preceding the survey, the frequency with which this was experienced varied. While 43% of male headed households complained that lack of access had occurred often or very often, the corresponding proportion of female headed households was 33%.

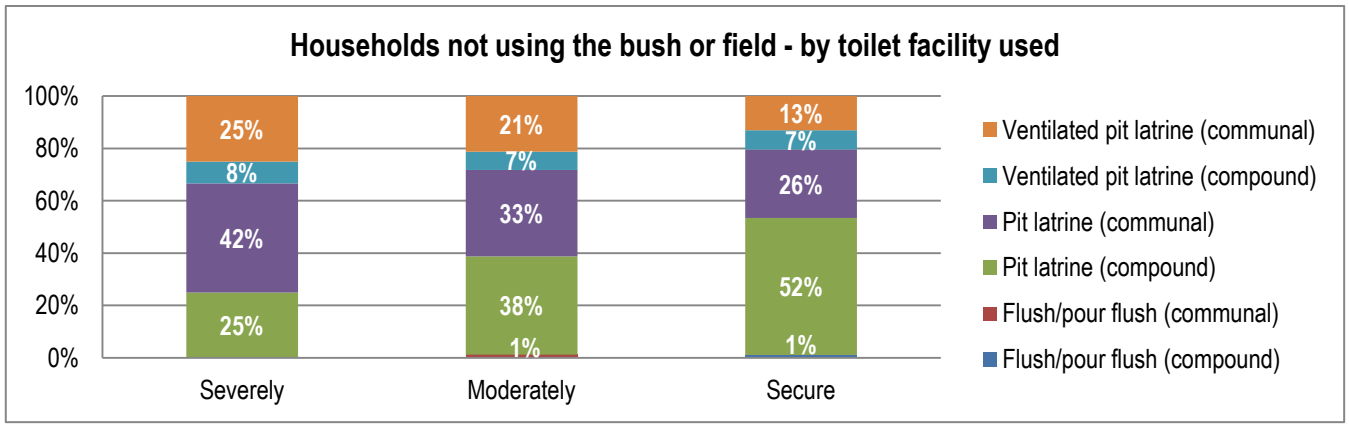
Chart 61: Frequency with which households were affected by lack of water was experienced - by gender of household head



No significant variation in child sickness was found depending on which toilet facility was used by children, although food secure households were less likely to use the bush (92%) compared to moderately (95%) and severely (96%) food insecure households. The vast majority of households (93%) reported that children used the bush or field, while the remaining proportion used communal or private pit latrines. There was no significant difference in use by household members aged more or less than 5 years of age.

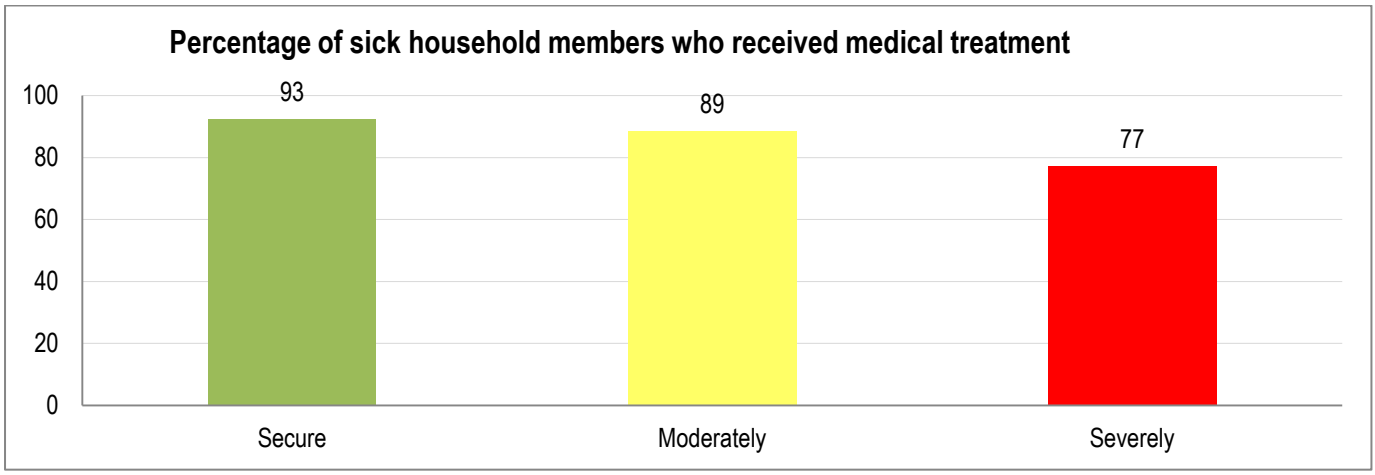
Severely food insecure households that did not use the bush were most likely to use communal pit latrines (42%), while moderately food insecure were more likely to use pit latrines in their compound (38%), which was even more the case for food secure households (52%).

Chart 62: Households using toilet facility - by type of facility and food insecurity rating



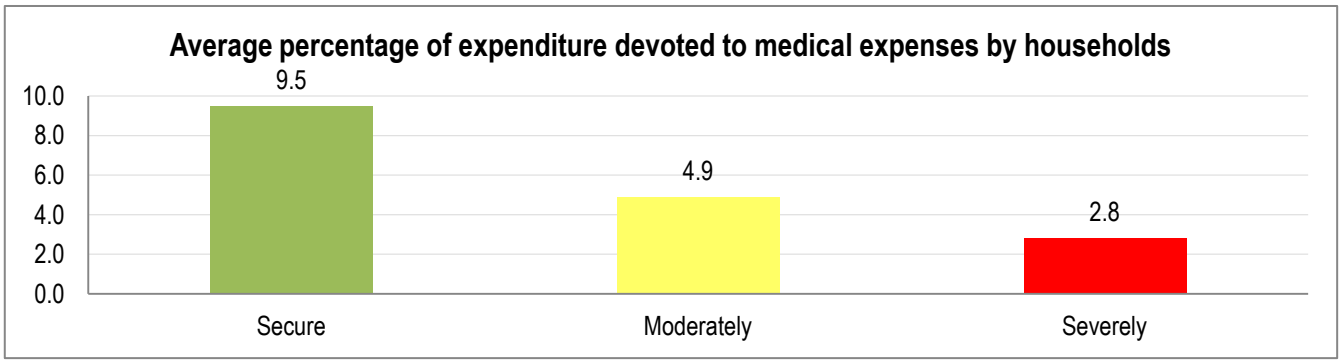
Almost all households (94%) complained of lack of access to medical care but the majority of household members who fell ill obtained some type of treatment. No significant correlation was found between the proportion of sick household members that were treated when comparing non-FFA and FFA household and States. Members in households that were classified as severely food insecure were however less likely to obtain treatment when sick – 77% were treated compared to 89% in moderately food insecure households and 93% in food secure households.

Chart 63: Average proportion of sick members that receive treatment by household level food insecurity rating



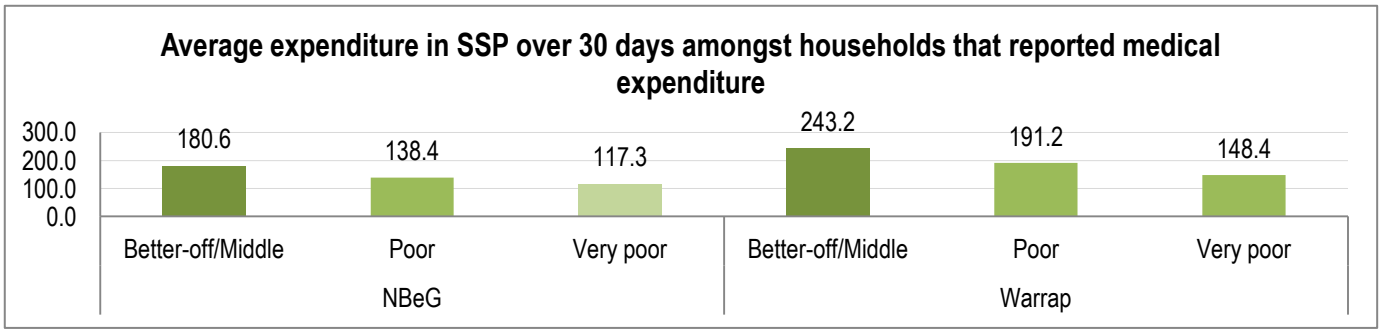
There was no significant difference in the proportion of household expenditure devoted to medical expenses, when comparing non-FFA and FFA households but Middle/Better-off and Poor households spent on average a slightly larger proportion (8.1 and 8.3% respectively) on medical expenses than Very Poor households (6.9%). The proportion also varied significantly between households depending on food insecurity rating. Severely food insecure households devoted just 2.8% of their overall expenditure to medical costs, compared to the 4.9% dedicated by moderately food insecure and 9.5% by food secure households. The difference in proportion depending food insecurity was also reflected in actual amount spent – adding up to on average 20 SSP amongst severely food insecure, 47 SSP amongst moderately food insecure, and 137 SSP amongst food secure households.

Chart 64: Average proportion of expenditure devoted to medical costs by household level food insecurity rating



40.7% of households reported 0 medical expenditure during the 30 days preceding the survey – Very Poor households were most likely to report 0 expenditure (47.0%) followed by Poor (32.6%) and Middle/Better-off (21.5%). Amongst households that spent on medical, considerable variation in level of expenditure was seen depending on wealth group and State. Middle/Better-off households in Warrap spent on average 243 SSP over the 30 days preceding the survey, compared to 117 SSP amongst Very Poor households in Northern Bahr el Ghazal.

Chart 65: Average amount in SSP devoted to medical expenditure by State and wealth group



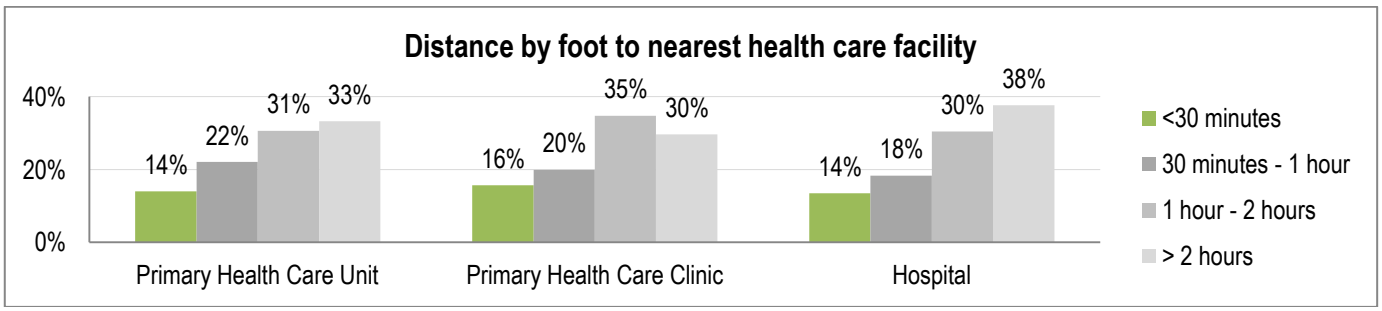
The pattern remained when looking at per capita expenditure – i.e. level of medical expenditure per household member. Per capita expenditure on medical was on average 3 SSP less in Northern Bahr el Ghazal than in Warrap, controlling for household wealth group and food insecurity rating. Poor and Middle/Better-off households spent on average 4.5 SSP and 8.9 SSP more per capita than Very Poor households, all else equal. The average increase in expenditure was 8.3 SSP per capita for each food insecurity category. FFA and GFD participation did not have a significant effect on medical expenditure when wealth group, state and food insecurity was controlled for. Future rounds of surveying will assess whether this lack of effect is due to FFA/GFD participation aligning expenditures with those who participate with those that do not.

Table 24: Linear regression model estimating effect of wealth group, State and food insecurity index rating on average household per capita medical expenditure during 30 days preceding the survey

Coefficients[a]								
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	95.0% Confidence Interval for B	
		B	Std. Error	Beta			Lower Bound	Upper Bound
1	(Constant)	-.537	1.330		-.404	.686	-3.143	2.070
	Poor	4.518	1.235	.059	3.657	.000	2.096	6.940
	Middle_Better_off	8.865	1.335	.109	6.640	.000	6.247	11.482
	State	-3.015	.960	-.050	-3.141	.002	-4.897	-1.133
	NEW_Food_insecurity	8.294	.763	.176	10.875	.000	6.799	9.789
a. Dependent Variable: Household expenditure on medical costs (per capita)								

The average cost of reaching a Primary Health Care Unit by motorbike was 21 SSP, followed by Primary Health Care Clinic at 35 SSP and Hospitals at 73 SSP.

Chart 66: Households by distance to nearest health facility reported by community and type of facility



Change in disease rates, health seeking behaviour and medical expenditure will be assessed in future rounds of surveying to monitor seasonal change.

ANNEX A: TABLE OF CHARTS, MAPS, TABLES AND FIGURES

ANNEX B: FSMS FOOD INSECURITY CALCULATION

FOOD CONSUMPTION SCORE CALCULATION

Analysis of Food Consumption Score			
	Weight (A)	Days eaten in past 7 days (B)	Score =A*B
		Examples	
Cereals, tubers & root crops	2	7	14
Pulses	3	2	6
Vegetables	1	5	5
Fruits	1	4	4
Meats, poultry, Fish& eggs	4	3	12
Milk	4	0	0
Sugar	0.5	6	3
Oil	0.5	6	3
Composite score			**47**

Food Consumption groups	FCS Score	
Poor	<= 21	
Borderline	>21 to 35	
Acceptable	>35	

COPING STRATEGIES INDEX CALCULATION

ONLY If yes to 5.1 Has your household done any of the listed things, and how frequent were they done in the past 7 days:	**FREQUENCY** Over the last **7 days**, how many days did you use any of the following strategies? If not used, mark 0	**Severity weight**	**Weighted score** =Frequency * weight
Rely on less preferred and less expensive food	|___1__|	2.43	2.43
Borrow food, or rely on help from friends or relatives	|_____|	2.33	
Limit portion size at meals	|__0__|	2.51	0
Restrict consumption by adults in order for small children to eat	|_____|	2.76	
Reduce number of meals eaten in a day	|_____|	2.72	

Skip entire days without eating	|____|	4	
Collect any unusual amounts of types of wild foods for this season	|____|	2.90	
Sell more animals than usual	|____|	2.79	
Consume seed stocks held for the next season	|____|	2.89	

CSI Category	CSI Score	
Low	<=50	
Medium	>50 to <=100	
High	>100	

INCOME SOURCE RELIABILITY & SUSTAINABILITY CALCULATION

Incomes sources of poor reliability and sustainability: 1= sale of firewood, 2=sale of charcoal, 3=sale of grass; 4=Begging; 5=Borrowing; 6=Sale of Food aid; 7=Gifts 8=Non-agric. Casual labour 9=Casual labour in construction --**we assign them a score of 1**

Income sources of medium reliability/sustainability: 1=Sale of fish 2=Sale of vegetables, groundnuts and other food products 3=Sale of alcoholic beverages 4=Agriculture related casual work –**we assign them a score of 2**

Income sources of good reliability/sustainability: 1=Sale of cereals 2=Sale of livestock 3=sale of animal products 4=Skilled labour 5=Salaried work 6=Petty trade/small business ---**we assign them a score of 3**

The above categorisation was generated through focus group discussions in 2010. For example, it was felt that fishing in more seasonal and therefore less reliable compared to cropping. At that time, sale of other crops—vegetables, ground nuts was seen less reliable probably due to the perception. I believe this sale of vegetables can now graduate to be of same level as sale of cereals.

Since we ask for 3 income sources, thus a score of 1-3 is poor, 4-5 is medium and >=6 is good

Income groups
1=Sale of cereals and other crops (sale of cereals + sale of other crops)
2=Sale of livestock and products (sale of livestock + sale of animal products
3=Brewing/sale of alcohol
4=Casual labour
5-Salaried work (skilled labour and salaried work)
6= Sale of natural resources (firewood, charcoal, grass
7= Others (the rest)

This provides us with additional understanding of income sources

FOOD ACCESS INDICATOR CALCULATION

IF (share of expend on food is high AND Income Source is poor) Food Access = poor.
IF (share of expend on food is high AND Income Source is medium) Food Access = poor.
IF (share of expend on food is high AND Income Source is good) Food Access = medium.
IF (share of expend on food is medium AND Income Source is poor) Food Access = poor.

IF (share of expend on food is medium AND Income Source is medium) Food Access = medium.
IF (share of expend on food is medium AND Income Source is good) Food Access = good.
IF (share of expend on food is low AND Income Source is poor) Food Access = good.
IF (share of expend on food is low AND Income Source is medium) Food Access = good.
IF (share of expend on food is low AND Income Source is good) Food Access = good.

High share of expenditure on food is >65%
Medium share of expenditure on food is 50% to 65%
Low share of expend. On food <50%

FOOD SECURITY CLASSIFICATION CALCULATION

				Food Consumption: Poor	Food Consumption: Borderline	Food Consumption: Acceptable
Ability to access food	Poor	Coping Strategies Index	High			
			Medium			
			Low			
	Medium	Coping Strategies Index	High			
			Medium			
			Low			
	Good	Coping Strategies Index	High			
			Medium			
			Low			

Food Secure
Moderately Food Insecure
Severely Food Insecure

ANNEX C: INCOME NOTES – MOST RECENT DRY SEASON

Proportion of households relying on a single income

21.1% of those relying on salaried work
16.3% of those relying on casual labour – agriculture
16.3% of those relying on remittances or gifts
15.0% of those selling livestock products
14.4% of those relying on casual labour – construction
14.2% of those relying on other trading or businesses

Of those relying on

- crop sales as a main income, 33.7% relied on sale of firewood/charcoal/grass as a secondary source, while 24.2% relied on alcohol sales
- Livestock sales as a main income, 24.2% sold firewood/charcoal/grass as a secondary income, while 19.7% relied on alcohol sales, 12.6% conducted other trading or businesses
- Livestock product sales as main income, 25% relied on firewood/charcoal/grass as a secondary income and 26.7% sold alcohol
- Firewood/charcoal/grass as a main income 18.4% also sold wild foods and 27.8% sold alcohol, 11.7% conducted other trading or business
- Wild foods as main income, 36.1% also sold firewood/charcoal/grass and 18.9% sold alcohol
- Alcohol sales as main income, 33.6% also sold firewood charcoal/grass and 10.8% sold wild foods, and 18.3% did other trading or business
- Trading/business as a main income – 28.5% also sold firewood/charcoal/grass and 25.6% sold alcohol
- Casual labour – agriculture as a main income, 22.9% also sold firewood/charcoal/grass, while 19.6% sold alcohol and 1.5% did other trading or business
- Casual labour construction as main income – 31.3% also sold firewood/charcoal/grass and 21.3% sold alcohol
- Casual labour other as main income – 33.6% also sold firewood/charcoal/grass and 17.5% sold alcohol and 11.7% did other trading or business
- Salaried work as main income, 17.7% also sold firewood/charcoal/grass, 14.7% sold alcohol, and 21.5% undertook other trading or businesses
- Aid as main income, 18.4% also sold firewood and charcoal, while 29.7% sold alcohol and 19% did other trading or business
- Remittances/gifts – 14% sold alcohol, 32.6% did other trading or business and 11.6% did begging
- Borrowing money as main income – 29.0% also sold alcohol and 45.2% did begging
- Begging as main income – 33.3% also sold firewood/charcoal/grass, 16.7% relied on gifts and 41.7% borrowed