



# THE SOUTH SUDAN WESTERN TRADE CORRIDOR IN TIMES OF HYPERINFLATION

*Rapid Market Assessment in  
Northern Bahr el Ghazal and Warrap*



**World Food  
Programme**



# THE SOUTH SUDAN WESTERN TRADE CORRIDOR IN TIMES OF HYPERINFLATION

*Rapid Market Assessment in Northern Bahr El Ghazal and Warrap*

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**vam**  
food security analysis

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## Acronyms

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|        |   |
|--------|---|
| AAA    | Abyei Administrative Area                                 |
| BSFP   | Blanket supplementary feeding programmes                  |
| CBT    | Cash-based transfer                                       |
| CFA    | Cash for asset programmes                                 |
| CFSAM  | Crop and food security assessment mission                 |
| FAO    | Food and Agriculture Organization                         |
| FFA    | Food for assets programmes                                |
| FFE    | Food for education programmes                             |
| FSMS   | Food security monitoring system                           |
| GDP    | Gross domestic product                                    |
| GFD    | General food distribution                                 |
| IDP    | Internally displaced person                               |
| IMF    | International Monetary Fund                               |
| IPC    | Integrated food security phase classification             |
| NBEG   | Northern Bahr el Ghazal                                   |
| NBS    | The Republic of South Sudan National Bureau of Statistics |
| NEER   | Nominal effective exchange rate                           |
| OCHA   | Office for the Coordination of Humanitarian Affairs       |
| POC    | Protection of civilians                                   |
| REER   | Real effective exchange rate                              |
| SDP    | Sudanese pound  |
| SKU    | Stock keeping units                                       |
| SSP    | South Sudanese pound                                      |
| TSFP   | Targeted supplementary feeding programmes                 |
| UNFSIA | United Nations Interim Security Force for Abyei           |
| US\$   | US dollar   |
| VAR    | Vector auto-regressive [model]                            |
| VEC    | Vector error correction [model]                           |
| WFP    | World Food Programme                                      |

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The views in this report and any errors or omissions are those of the authors.



Agok market

## Executive summary

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The civil conflict in South Sudan is now entering in its fourth year. Exacerbated by a severe economic crisis, it has resulted in the worst humanitarian situation since independence. The South Sudan Integrated Food Security Phase Classification (IPC) technical working group<sup>1</sup> has estimated that at the height of the 2017 lean season almost 5.5 million people will be severely food insecure: this is one of the worst humanitarian crises that the international community has had to deal with.

In 2016, the World Food Programme (WFP) provided assistance to 4 million people in South Sudan. However, the increasing insecurity along the country's backbone trade route – the so-called western corridor – has caused WFP to rely on expensive air drops on a scale that is not financially sustainable over the medium period.

Against this backdrop, the purpose of this report is to evaluate the feasibility of alternative ways of providing food security support through cash or vouchers – if markets are functional enough – in some areas of the country where the security situation is still acceptable, namely in Northern Bahr el Ghazal (NBEG) and Warrap, both bordering Sudan.

A rapid market assessment in some NBEG and Warrap markets<sup>2</sup> was conducted in November 2016, using a semi-structured market questionnaire for key informants. Further price analyses using econometric techniques corroborated the evidence gathered from the field.

The main findings of the assessment are as follows:

**The economic context is dramatic: the crashing currency and out-of-control inflation are not ideal circumstances for relying on markets.**

In October 2016, inflation stood at more than 800 percent compared to the previous year; this was the ninth most severe hyperinflation episode ever recorded anywhere in the world. In practical terms, this pace of inflation means that prices double every nine days.

The soaring prices are by and large the result of the crashing currency. Since the South Sudanese pound was unpegged from the US dollar in November 2015, the exchange rate has plummeted by more than 2,000 percent.

South Sudan exports low quality oil, which was not very profitable in 2016 when international oil prices took a nosedive. Moreover, the currency devaluation has not improved the country's competitiveness at all. South Sudan is highly dependent on imported goods but has limited hard currency available because of the collapse of oil revenues and the recent unsuccessful attempt by the Central Bank to infuse dollars in the economy, which has curtailed foreign reserves.

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<sup>1</sup> IPC, 2017. May-July 2017 table, IPC *Crisis, Emergency or Catastrophe* phases.

<sup>2</sup> Markets were assessed in Aweil town, Gok Machar, Malek Alel, Nyamlel and Warawar in NBEG, and in Agok, Turalei and Wunrok in Warrap.

**Traders face difficulties on both sides – importing from Uganda is risky and uncertain, while demand is sluggish.**

Traders face chronic challenges to importing food from Uganda – which remains the most important flow of goods for the whole country – as the parallel market is the only source of US dollars. Consequently, food prices are skyrocketing in all monitored markets. However, when the effect of inflation is removed, real prices show a downward trend as the economy is stagnant and household purchasing power is extremely low.

Traders not only have to deal with depressed demand and structural inefficiencies: insecurity in Greater Equatoria has recently affected the western corridor, interrupting this vital commercial route and pushing prices up further.

Still, markets will have to fulfil the vast majority of household consumption needs as the rainy season kicks in – up to 70 percent in NBEG and 60 percent in Warrap. A slight temporary release for markets will be provided by local supply: the harvest outlook for 2016/17 shows a timid surplus in Warrap, and a moderate deficit in NBEG, mostly confined to Aweil East.

**Supplies from Sudan may partially offset these challenges, but they are highly constrained by the official border closure and seasonal factors.**

An alternative influx of goods arrives from the Sudan end of the western corridor, in particular to Warrap through the Amiet market in the Abyei Administrative Area (AAA). NBEG is served by two other smuggling trade routes from the north, but the most promising one from Darfur is largely only passable between January to May.

In many markets, overall trader capacity is stretched by the limited capital available, in the face of rising business costs as insecurity worsens and customers' lack of purchasing power. Except in Agok and Wunrok markets in Warrap, the number of main traders (either wholesalers or importers) has fallen by more than 50 percent in a year. It takes traders an average 30 to 60 days to restock in the dry season, and between 60 and 180 days in the rainy season. At the time of the assessment, the variety of goods available in the markets was very low, especially in NBEG markets (except in Aweil town).

**Cautious implementation of CBT may be feasible although it will be extremely challenging given the circumstances.**

Market-based interventions remain very challenging in South Sudan, since the volatile situation may deteriorate at any time. However, to reduce the insurmountable costs of the operation in the country, and given that the number of WFP beneficiaries in the selected locations is less than 10 percent of the population, there is room for a cautious implementation of cash-based transfers (CBT) instead of providing general food distributions (GFD), also considering the growing consensus in the humanitarian community that beneficiaries prefer such transfer modalities.

Although we found no statistical evidence that removing GFD in NBEG and, to some extent, in Warrap would affect local prices, in a context of hyperinflation we need to be wary that exogenously stimulating demand by introducing CBT could increase prices if supply does not



increase accordingly. As such, assessing and monitoring traders' capacity to increase their supply is paramount.

**Considering forecast local supply and the temporary partial functioning of the trade corridors from Sudan, between 95,000 and 145,000 beneficiaries may be assisted with value-based vouchers.**

Given all the contextual limitations, we recommend value-based vouchers, since this seems to be the only transfer modality that would allow traders to plan a decent restocking strategy for the rainy season.

The markets of Aweil town, Agok and Wunrok seem to have a relatively higher capacity to absorb additional demand. The markets of Gok Machar and Nyamlel have a lower capacity, and those of Warawar and Malek Alel have the lowest capacity of the assessed markets.

In terms of numbers, CBT could be used with 45,000 beneficiaries in Warrap, and with 50,000 to 95,000 in NBEG. This is admittedly a small part of the people in need, who number 885,000 in NBEG and 330,000 in Warrap (IPC, 2017).<sup>3</sup> The recommended figures are not prescriptive in any sense, as the volatile situation in South Sudan could change drastically, even in a positive direction whereby traders demonstrate a greater capacity to increase supply than our current expectations. Therefore, we have designed a tool that can relax some of the constraints, meaning that CBT beneficiary numbers can be reviewed and the intervention cautiously scaled up if programme monitoring suggests that would be desirable.

To improve overall food security and ease humanitarian access, the border between Sudan and South Sudan should be formally opened, at minimum for humanitarian supplies, and ideally for commercial trade.

**A flexible approach is needed when implementing value-based vouchers to avoid potential problems. In particular, we recommend the following measures:**

- ✓ Incorporate an assessment of traders' stock levels in monitoring exercises, and improve their chances of increasing supply by allowing them to stock in advance as much as possible.
- ✓ Adjust the voucher value to inflation considering that prices may double every two weeks or so.
- ✓ Provide extremely timely payments to traders to avoid dumping the costs of inflation on them, which would risk pushing them out of the business.
- ✓ Combine nutrition-specific interventions with CBT, as the supply in the markets is limited to a few goods and is not able to meet the nutritional requirements of the most vulnerable people.
- ✓ Revive local trade networks where possible, leveraging on the additional business that WFP brings to traders to improve supply chains in rural markets.

---

<sup>3</sup> May-July 2017 table, IPC *Crisis, Emergency or Catastrophe* phases.

- ✓ Strengthen food price monitoring in all the markets where CBT operations are implemented. The market in Juba could be used as a benchmark to assess price anomalies in NBEG and Warrap, since price shocks are expected to transmit with a delay of one month.
- ✓ Define a contingency plan to switch back to GFD from May onwards, if monitoring reveals that traders have inadequate stocks, or if it is operationally unfeasible to keep up with inflation when adjusting the transfer value and paying back traders.



Grains in Turalei market



## I. Introduction

---

Many of the hopes and aspirations of South Sudan at the time of independence have been wiped out as crisis tears the country apart. In less than five years, the youngest nation in the world faced a sequence of challenges including plummeting international oil prices that undermined its economic development plans; political rivalry escalating into indiscriminate ethnic violence against civilians in the Greater Upper Nile; shaky peace talks; insecurity associated with uncontrolled armed groups and increasing banditry in Greater Equatoria; and an economic crisis with the crash of the exchange rate and spiralling hyperinflation.

The toll of these events is dramatic: 1.9 million internally displaced people (IDPs) and 1.6 million refugees.<sup>4</sup> In proportional terms, that means 16 percent of the population are IDPs and 14 percent are refugees. In 2016, the humanitarian funding required was US\$1.3 billion,<sup>5</sup> with 4.8 million people deemed food insecure at the height of the lean season.<sup>6</sup> In January 2017, the Integrated Food Security Phase Classification (IPC) found that 55 percent of those classified in IPC *Crisis*, *Emergency* or *Catastrophe* phases (IPC, 2017)<sup>7</sup> were living in Northern Bahr el Ghazal (NBEG), Unity and Jonglei.<sup>8</sup> By July 2017, around 5.5 million are expected to be severely food insecure (*ibid.*).<sup>9</sup>

The World Food Programme (WFP) and its partners are on the front line to assist the vulnerable population. In 2016, a monthly average of 1.3 million people were reached and 129,000 mt of food was distributed from January to October – equivalent to 10 kg per beneficiary every month. General food distributions (GFD) make up the lion's share of the total, representing 71 percent of food assistance transfers.<sup>10</sup>

The very challenging context in which this massive humanitarian effort is being sustained became even more complex with an outbreak of violence in July and August 2016. Alongside civilians, humanitarian operators were also affected and their premises were looted. The recent spread of violence in Greater Equatoria (Map 1, panes 2015 and 2016) is concerning; it signals a new phase in the conflict that involves ethnic groups beyond the Dinka and Nuer. There are already forecasts of lower crop production in the 'bread basket' of South Sudan as

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<sup>4</sup> OCHA, *Humanitarian Bulletin South Sudan*, Issue no. 4, 10 March 2017.

<sup>5</sup> OCHA, *South Sudan Humanitarian Response Plan January–December 2016*, December 2015.

<sup>6</sup> Source: National Bureau of Statistics, retrieved from IPC, [April 2016 Update – Communication Summary](#).

<sup>7</sup> January 2017 table, IPC *Crisis*, *Emergency* or *Catastrophe* phases.

<sup>8</sup> In 2015, the government created 28 states out of the former ten regional states. To ease comparison with historical data, we will continue to refer to the old administrative boundaries if not otherwise clarified, calling them 'areas'.

<sup>9</sup> May–July 2017 table, IPC *Crisis*, *Emergency* or *Catastrophe* phases.

<sup>10</sup> The remainder of WFP's food assistance in South Sudan has been transferred with food for assets (FFA) programmes that include cash for asset programmes, food for education (FFE) programmes, targeted supplementary feeding programmes (TSFP), and blanket supplementary feeding programmes (BSFP).

fighting disrupted the first harvest and the preparatory activities for the second harvest. Insecurity is also affecting the western trade corridor, which was left unscathed during the first years of the conflict (WFP, 2015). In particular, the road connecting Kampala and Juba via Nimule is no longer safe; supplies of goods have been intermittent since summer 2016. This has further complicated the logistics of moving goods within the country, increasing cost and time – which were already high because of the very poor road conditions.

WFP is not immune to these circumstances, often having to mitigate the risks along the road with air drops that are far more expensive than trucking. One way to reduce the logistical burden of moving food could be to scale up cash-based transfer (CBT) programmes in some locations, particularly after the harvest. The WFP country office is currently implementing some conditional cash transfers in NBEG, and it is also providing cash to IDPs living in the protection of civilians (POC) sites in Juba and in the Mingkaman camp on the Bor side of the White Nile River. However, these are being carried out on a small scale.

Normally, the expansion of CBTs is feasible and appropriate if markets have enough capacity to meet increased demand without compromising the local economy. If this condition is satisfied, the markets are defined as functioning properly and these interventions can be the best operational solution for providing food assistance. However, this is hardly the case in South Sudan. At the same time, transporting such an enormous amount of in-kind food assistance cannot be considered cost-efficient. Assisting thousands of vulnerable people remains WFP's paramount concern; the operational conundrum lies in identifying the best blend of transfer modalities to use, given the context.

All these caveats considered, NBEG and Greater Warrap seem the best candidates for assessing the feasibility of market-based interventions, given their lowest rates of insecurity so far, as shown in Map 1. This rapid market assessment conducted in November 2016 aims to provide recommendations to fine-tune WFP interventions in these two areas. The assessment team visited markets in Turalei, Agok and Wunrok in Twic (Warrap), and in Warawar, Gok Machar, Nyamlel, Aweil and Malek Alel in NBEG.<sup>11</sup>

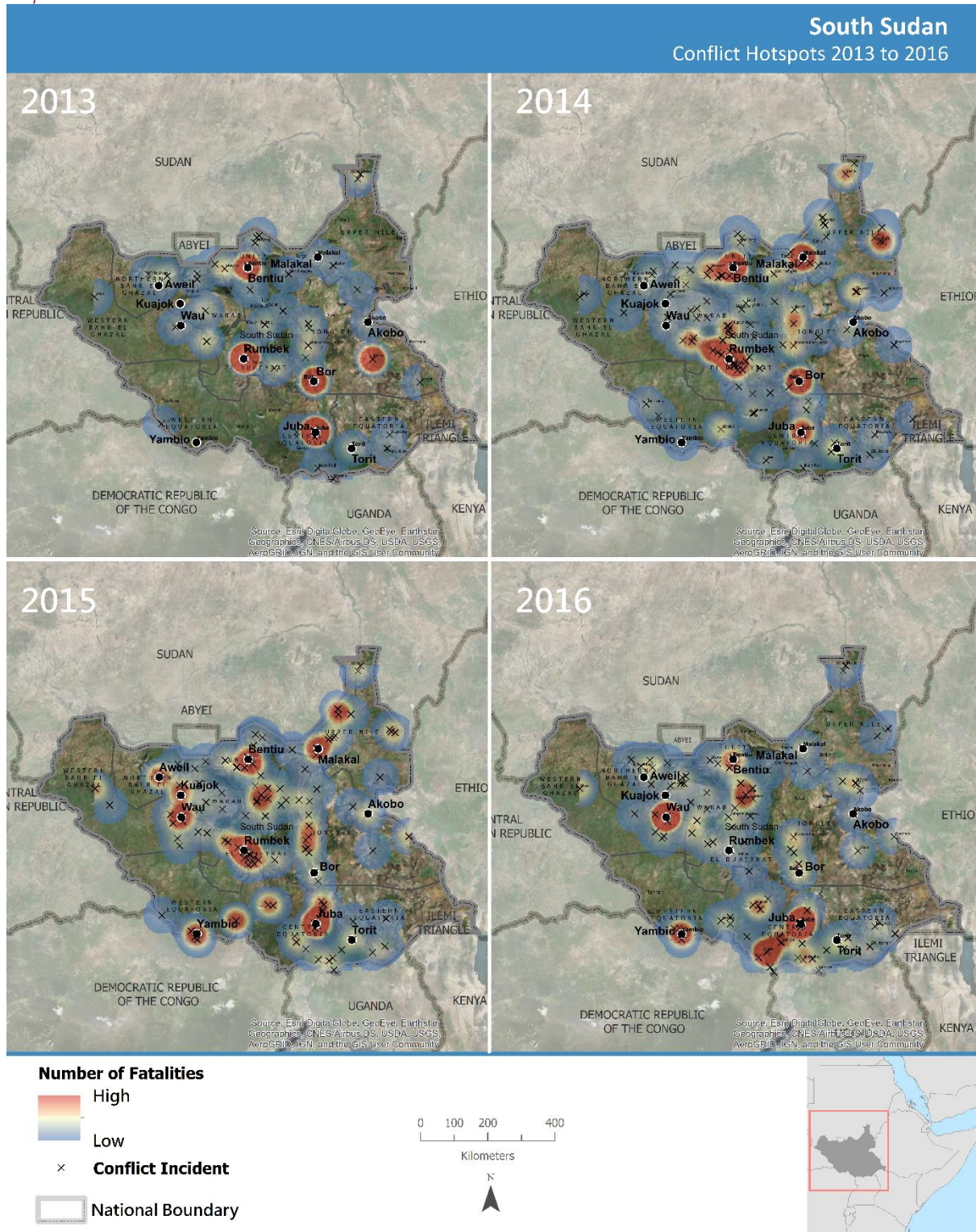
The remainder of the paper is organized as follows. Section II provides insight into the economic context for WFP's interventions. Section III describes the markets visited during the assessment and maps the trade flows in and out of those locations. Section IV provides an in-depth price analysis, and Section V describes the capacity of markets to sustain CBT. The conclusions of the study are presented in Section VI, and Section VII sets out the programme recommendations for CBT.

---

<sup>11</sup> Warawar is in Aweil East, Gok Machar is in Aweil North, Nyamlel is in Aweil West, Aweil town is in Aweil Centre and Malek Alel is in Aweil South (formerly in NBEG state). Wunrok, Turalei and Agok are in Twic (formerly Warrap state). The latter is now informally referred to as Greater Warrap. The use of these designations in this paper reflects the administrative boundaries before the proposed 28 states and does not imply official endorsement or acceptance by WFP.



Map 1 - Violence in South Sudan



Date Created: **29 Dec 2016**  
 Contact: [sarah.muir@wfp.org](mailto:sarah.muir@wfp.org)  
 Website: [www.wfp.org](http://www.wfp.org)  
 Prepared by: **HQ VAM**

**Sources**  
 Global Administrative Units (GAUL) - FAO 2013  
 Conflict Data: ACLED Armed Conflict Location and Event Data

The boundaries and names shown and the designations used on this map do not imply official endorsement or acceptance by the United Nations.

## II. Context

---

### II.1 Hyperinflation

The inflation rate in South Sudan has reached staggering levels and can be defined as one of the most severe hyperinflation episodes ever.<sup>12</sup> According to consumer price index data released by the National Bureau of Statistics, headline inflation was at 836 percent in October 2016, while food inflation was at 1002 percent (Figure 1).<sup>13</sup> It is difficult to understand what these rates mean for the population in practical terms, so a benchmark following Hanke & Krus (2012) is useful. The monthly inflation rate is equivalent to 7.7 percent daily, which means that it takes just nine days for prices to double. As it currently stands, this level of hyperinflation ranks ninth in the list of all hyperinflation episodes recorded since the French Revolution (see Table 8 in Annex I).<sup>14</sup>

South Sudan is now entering in its fourth year of civil conflict. Political instability, tribal conflicts over land resources, over-reliance on oil production, under-performance of the agricultural sector, poor infrastructures and road network, a large informal sector, high import dependency and very low levels of education (WFP, 2015) remain the structural constraints on economic development. However, allowing the national currency to float freely was at the root of the spiralling inflation pattern from November 2015 onwards. After that, the SSP devalued against the US dollar by more than 2000 percent in just 12 months. During this time, the official exchange rate dropped from SSP2.96 to SSP70.39, while the parallel exchange rate drifted from SSP16.95 to SSP77.08 (Figure 2). Although pegging the exchange rate to the US dollar was unsustainable, the limited hard currency available in the country was and still is the main reason behind the proliferation of the parallel exchange rate market. The attempt made by the Central Bank of South Sudan to inject dollars into the economy with auctions to commercial banks was not only unsuccessful, it actually contributed to the depletion of foreign currency reserves. Indeed, despite public denials (The Enough Project, 2016), printing money seems to have been the only short-term solution implemented by the government to maintain its payroll thus far.

An out-of-control inflation pattern could have been predicted just by reading the unlikely-to-be-implemented recommendations from a WFP and FAO study early in 2016: “The

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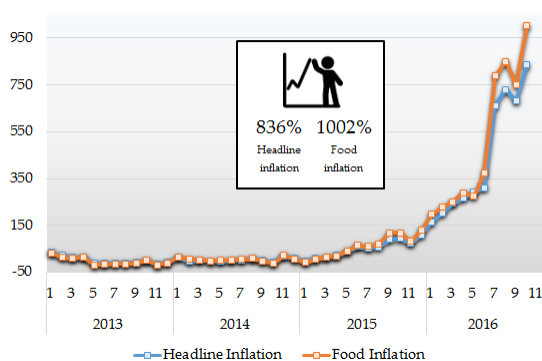
<sup>12</sup> “Hyperinflation is an economic malady that arises under extreme conditions: war, political mismanagement, and the transition from a command to market-based economy – to name a few” (Hanke & Krus, 2012). An episode of hyperinflation starts when there is a month in which price levels increase by at least 50 percent year-on-year. When the monthly inflation rate drops below this threshold and stays there for at least one year, the episode is said to end (Cagan, 1956).

<sup>13</sup> Year-on-year.

<sup>14</sup> The inflation figures reported in this paragraph are those officially available at the time of the assessment: all the interviews were conducted against that benchmark. However, in mid-December 2016, official figures were revised retroactively from June to October 2016 as per Table 7 in Annex I. While the revision is substantial, it does not change the overall picture described here, as the current hyperinflation episode remains the ninth most extreme in history, while the time needed for prices to double would still be impressive (i.e. slightly less than twelve days).

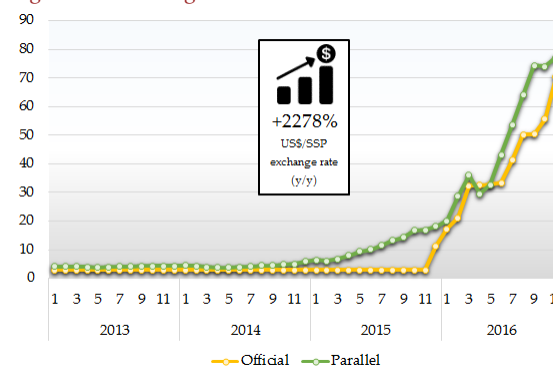
Government should fast-track the necessary fiscal and monetary policies that reduce inflation by cutting aggregate demand and lowering domestic re-current expenditures. There is therefore need to accelerate public sector and structural reforms aimed at achieving among other things: removing bottle necks to private investments, ensuring macro-economic stability, reducing the government wage bill, ensuring sustainable public debt management, strengthening non-oil revenue collection systems, rehabilitation and immediate re-opening of oil fields, diversification of the economy and achieving sustainable peace” (WFP and FAO, 2016).

Figure 1 - Headline and Food Inflation (%)



Source: National Bureau of Statistics, South Sudan. Retrieved from Trading Economics

Figure 2 - Exchange rate (US\$/SSP)



Source: OTC Interbank. Retrieved from Trading Economics

With very volatile GDP growth (Figure 16 and Figure 17 in Annex I), the slight increase in non-oil revenues in the past few years (Figure 18 in Annex I) is mostly a reflection of plummeting oil revenues rather than a real lift of the non-oil sector. On top of the cut in production caused by conflict (Figure 19 in Annex I), the price of oil is too low to make it profitable for South Sudan. In 2016, the price of Brent oil fluctuated between US\$36 and US\$57 per barrel, with an increasing trend over the year. At these prices, the profitability of oil was almost zero at the beginning of 2016 considering that the Dar Blend oil produced in South Sudan is a low quality oil normally worth US\$10 per barrel less than Brent oil, and also taking into account that South Sudan has to pay to Sudan a fixed rate of US\$25 per barrel.<sup>15</sup>

Government expenditure makes up almost one fourth of GDP (Figure 20 in Annex I), but it is a tricky component to reduce, as it also includes civil servant salaries. According to the IMF, the deficit in 2016/17 could top US\$1.1 billion, or 25 percent of GDP.<sup>16</sup> However, the recently adopted 2016/17 fiscal year budget reflects most of the revenue and expenditure measures proposed by the IMF and presents a substantial reduction in the deficit from around 30 percent of GDP in 2015/16 to around 9 percent.<sup>17</sup>

<sup>15</sup> The ‘Agreement on Oil Related Economic Matters’ signed in Addis Ababa on 27 September 2012 between South Sudan and Sudan foresees a transitional financial arrangement of US\$15 per barrel, transit fees of US\$1 per barrel, and transportation fees of US\$8.4 per barrel. A new agreement under negotiation at the time of writing is expected to introduce some margin of variability in the fees payable by South Sudan, to reflect the level of international oil prices.

<sup>16</sup> IMF Press Release no. 16/259, 1 June 2016.

<sup>17</sup> IMF Press Release no. 16/556, 23 December 2016.



## II.2 Effective exchange rate

In South Sudan there is no expected positive effect from currency devaluation, as the export sector is so weak and is unable to offset the rising imports bill. All in all, given the very high dependency of the country on imported goods and services (WFP, 2015, pp. 6-7), more expensive imports will increase the current account deficit, which was SSP935.4 million in 2014.<sup>18</sup>

Foreign direct investments are tailing off because of the complex political situation and the unattractiveness of investing in the country. In fact, South Sudan ranks 186<sup>th</sup> for business in a comparison across 190 economies that measures “how easy or difficult it is for a local entrepreneur to open and run a small to medium-size business when complying with relevant regulations”. The country is among the worst performers in almost all indicators (World Bank, 2016).<sup>19</sup>

The international competitiveness of a country can be measured by the exchange rates and price movements in the country itself and in its trading partners. The Nominal Effective Exchange Rate (NEER) is an index that measures the value of a given currency against a number of foreign currencies with which the country undertakes commercial relations. It is the weighted average (geometric mean) of the exchange rates of the relevant currencies converted into an index by means of a base period. Similarly, the Real Effective Exchange Rate (REER) takes into account domestic and foreign price changes as measured by the consumer price index. Annex II provides the formulas used for both indices.

The weights used to build these indices take into account the importance of South Sudan’s trading partners in the three-year period 2012–2014.<sup>20</sup> For the sake of simplicity, only import and export countries in the top ten are considered, plus Sudan. Considering that few countries play a key role for South Sudan for both import and export flows, REER and NEER have been calculated for 16 countries only, representing 94 percent of total imports and almost 100 percent of exports. The lion’s share of South Sudanese exports – almost exclusively crude oil - belongs to China (97 percent), while the bulk of imports comes from just four countries (Uganda, 38 percent; China, 16 percent; Pakistan, 14 percent; and USA, 8 percent). Since the

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<sup>18</sup> World Bank, World Development Indicators.

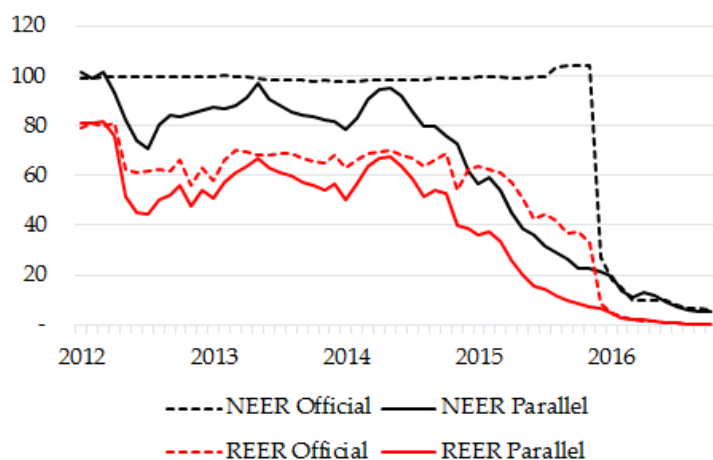
<sup>19</sup> The topics considered in the index and South Sudan’s ranking are as follows: dealing with construction permits (178<sup>th</sup>), getting electricity (188<sup>th</sup>), registering property (181<sup>st</sup>), getting credit (175<sup>th</sup>), protecting minority investors (179<sup>th</sup>), paying taxes (68<sup>th</sup>), trading across borders (177<sup>th</sup>), enforcing contracts (73<sup>rd</sup>), resolving insolvency (169<sup>th</sup>) and starting a business (181<sup>st</sup>).

<sup>20</sup> Source: The Observatory for Economic Complexity by MIT. “South Sudan has not yet reported any trade data to the UN’s COMTRADE database. Mirror statistics (i.e. data reported by South Sudan’s trade partners) can only be indicative, and must be treated with caution, not least because several other countries (particularly in sub-Saharan Africa) do not report their data, and many of those that do report have not necessarily yet done so for the most recent years” (Basnett & Garang, 2015).



data captures official records only, it is very likely that the trading flow from Sudan is underestimated.<sup>21</sup>

Figure 3 - NEER and REER



Source: National Bureau of Statistics, South Sudan; Observatory for Economic Complexity, Trading Economics; and Oanda. Authors' calculation.

Imports become cheaper and exports more expensive whenever REER increases, while the opposite is true when REER falls. In the case of South Sudan, imports are of course very expensive given the current value of the pound against the other currencies, while the potential gain for exports cannot offset the weakness of the national currency. Figure 3 shows the extent of the overvaluation of the South

Sudanese pound at the end of 2015 and confirms that by no means has the devaluation improved the country's competitiveness; actually, the REER fell dramatically.



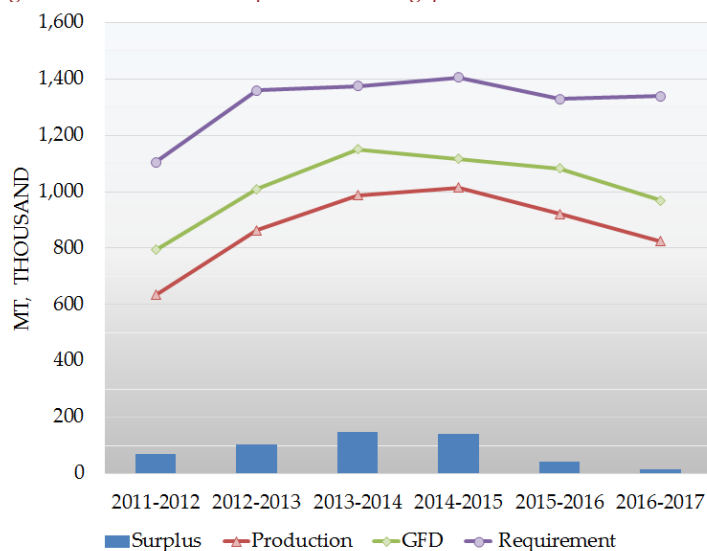
Onions and other goods on a stall made of groundnut shells in Agok market

<sup>21</sup> Before the reduction of trade between the two states in 2012 following the tension over pipeline transit fees, available data from January to December 2011 at Kosti border post in Sudan reported the following incoming goods to South Sudan: 27,082 mt of wheat flour, 25,809 mt of maize flour, 52,891 mt of maize grain, 27,929 mt of sugar and 37,310 mt of groundnuts (ADBG, 2013).

### II.3 Market dependency

Most of the food requirements for 2017 will need to be satisfied by markets, even though hyperinflation and disruption to livelihoods are dramatically eroding household purchasing power.

Figure 4 - Estimated cereal production and gap



Source: CFSAM 2015, CFSAM 2016, CFSAM 2017 (forthcoming). GFD data from WFP.

According to preliminary data from the Crop and Food Security Assessment Mission (CFSAM) 2017, national cereal production for the 2016/17 season is expected to be 825,000 mt, around 10 percent less than the previous agricultural year. Figure 4 shows the gap between human consumption needs and the food available (i.e. production and GFD). It also shows the overall surpluses that South Sudan states were able to produce. The cereal gap is estimated at 499,000 mt,

resulting from cereal requirements of 1,324,000 mt. Taking a ballpark figure of 144,000 mt of GFD, the overall import requirements will be 355,000 mt.<sup>22</sup> Warrap may have a little surplus (15,900 mt for the first year in the past six), while NBEG will have to import 21,600 mt (Figure 24 in Annex I).

Household data from WFP's food security monitoring system (FSMS)<sup>23</sup> confirms that the most important difference between NBEG and Warrap is the relative importance of agricultural income, which is greater in the latter (Table 1). As expected, households who depend more on agricultural income have lower monthly expenditures, as they can allocate a lower percentage of their income to food<sup>24</sup> and consume less sorghum bought in the market.

<sup>22</sup> GFD data estimated using monthly weighted averages from the last five years of food assistance, broken down by state.

<sup>23</sup> The FSMS exercise is normally conducted three times a year to capture household food security at different times of the year. Although some delays may have occasionally occurred because of insecurity, the rounds of data collection we are referring to span October 2010 to July 2016, with data collected between October and December for the harvest season, between February and April for the dry season, and between June and August for the rainy season.

<sup>24</sup> With a recall period of 30 days, excluding own production and food aid.

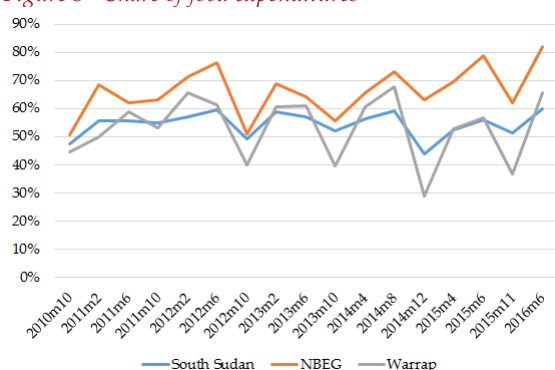
Table 1 - Income sources

|        |              | Agriculture | Waged labour | Salaried work | Trade | Other | Monthly Expenditures (SSP) | Share of expenditures on food | Market sourced sorghum |
|--------|--------------|-------------|--------------|---------------|-------|-------|----------------------------|-------------------------------|------------------------|
| NBEG   | Aweil Center | 26%         | 20%          | 27%           | 21%   | 6%    | 641                        | 68%                           | 61%                    |
|        | Aweil North  | 30%         | 24%          | 18%           | 26%   | 2%    | 835                        | 72%                           | 66%                    |
|        | Aweil West   | 29%         | 28%          | 20%           | 19%   | 4%    | 782                        | 67%                           | 66%                    |
|        | Aweil South  | 37%         | 23%          | 21%           | 17%   | 2%    | 625                        | 68%                           | 55%                    |
|        | Aweil East   | 34%         | 26%          | 19%           | 19%   | 3%    | 615                        | 74%                           | 68%                    |
| Warrap | Twic         | 61%         | 9%           | 9%            | 13%   | 8%    | 559                        | 56%                           | 48%                    |
|        | Tonj South   | 50%         | 18%          | 5%            | 17%   | 10%   | 560                        | 56%                           | 43%                    |
|        | Tonj North   | 71%         | 10%          | 3%            | 10%   | 6%    | 576                        | 50%                           | 38%                    |
|        | Tonj East    | 76%         | 4%           | 2%            | 10%   | 9%    | 390                        | 57%                           | 32%                    |
|        | Gogrial East | 63%         | 12%          | 5%            | 11%   | 10%   | 467                        | 51%                           | 43%                    |
|        | Gogrial West | 61%         | 12%          | 8%            | 14%   | 6%    | 529                        | 52%                           | 44%                    |

Source: WFP FSMS, 2010–2016

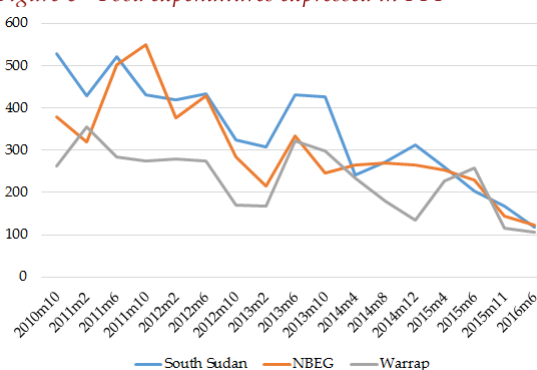
Most of the budget spent by families in South Sudan goes on food, in line with Engel’s law.<sup>25</sup> The average share of expenditure on food has remained stable since 2010. Depending on the season, it varies between 50 and 60 percent at the national level. In NBEG it fluctuates between 50 and 80 percent, while in Warrap it remains between 30 and 65 percent showing significant but temporary dips in post-harvest seasons (Figure 5). In NBEG, the share of food expenditure is growing over time, possibly indicating a progressive depletion of household wealth.

Figure 5 - Share of food expenditures



Source: WFP FSMS, 2010–2016

Figure 6 - Food expenditures expressed in PPP



Net from seasonal variability, given the sharp increase in food prices (Figure 21 in Annex I), the effort that households make to allocate a stable share of their income to food comes at the expense of allocating less money to non-staple food items. When food expenditures are deflated and expressed in purchasing power parity as at June 2011,<sup>26</sup> households in South Sudan can now allocate just 23 percent of what they used to spend immediately after independence: in NBEG, the proportion is 25 percent and in Warrap, 38 percent (Figure 6).

<sup>25</sup> “The poorer is a family, the greater is the proportion of the total outgo which must be used for food”, Engel quoted in Zimmerman (1932).

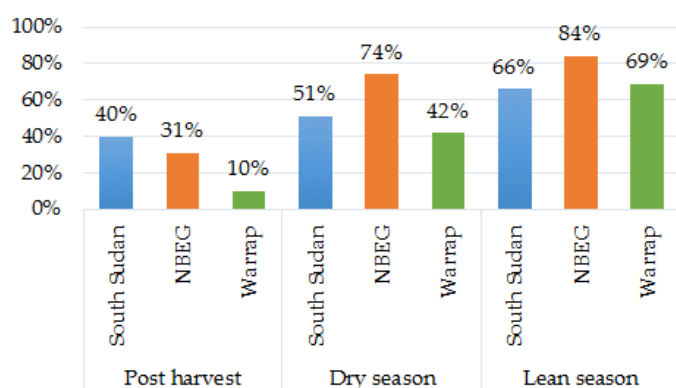
<sup>26</sup> We used the non-food CPI as a deflator.

Food insecurity is broadly on the rise and households are currently poorer than ever, with little difference between regions.

The post-harvest season is the time of the year when households are least dependent on cereal markets (Figure 7). In the locations selected for the assessment, the proportion of cereals bought from markets is below the national average of 40 percent, standing at 31 percent in NBEG and just 10 percent in Warrap. This is a relevant consideration for programme design, as post-harvest is the only time window when market dependency is low and piloting CBT would be relatively less difficult. Despite some business opportunities, very few households produce a surplus and have adequate storage capacity, so they obtain the lowest selling price as produce reaches the market right after the harvest, when local supply is at its peak.

In the dry season between February and May, market dependency – measured as share of cereal consumption bought in the market – jumps to 42 percent in Warrap and 74 percent in NBEG. Dependency rises still further in the lean season, to 69 percent in Warrap and 84 percent in NBEG.

Figure 7 - Market dependency (share of cereal consumption bought in the market)



Source: WFP FSMS 2010-2016

This occurs at a time when those who depend on subsistence farming for a few months of the year have depleted their stocks. The higher demand on markets coincides with a drop in supply caused by rains and floods that cut off most of the trade network, leaving traders with only the stocks they managed to accumulate beforehand. In this scenario, an increase of cash in the hands of customers would not ease the limited physical

availability of food in the market.

Beyond cereals,<sup>27</sup> almost all the sampled households in NBEG and Warrap consumed minimal quantities of vegetable oil and pulses in 2016, as both were too expensive (see Section III.2 Products and markets overview). The weak demand for these goods means traders have little appetite to deal in them.

<sup>27</sup> Here we refer to cereals, pulses and cooking oil only, in line with WFP's GFD.



### III. Market structure and conduct

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#### III.1 Trade flows

South Sudan used to have two main trade routes known as the ‘western corridor’ and the ‘White Nile corridor’, mostly supplying goods from Uganda via Nimule and Torit. Both corridors depart from Juba. The former heads north-west to Rumbek, Wau and Aweil and is the backbone of trade in the country. The latter heads north-east to Bor, Bentiu and Malakal; it has been severely affected by the civil conflict and is largely dysfunctional (WFP, 2015).

Food supply chains are stretched. Along the western corridor, markets perform at decreasing levels the further traders have to venture into the country from the borders in the north and south; inefficiencies induced by poor infrastructure and corruption multiply the further markets are away from Juba, and in general from cross-border points (*ibid.*). Moreover, recent insecurity in Greater Equatoria has disrupted the predictability of supplies from Uganda, compromising the availability of goods in the markets at the peak of the violence in July and August 2016 (see Section IV. Price analysis). Northbound trucks leaving Juba to Rumbek, Wau and Aweil currently have to bypass the shortest road via Mundri and take an alternative route via Terakera, Minkaman and Yirol, adding extra time and costs that are ultimately passed on to customers (Map 2). Normally, traders transfer their South Sudanese pounds to Juba via banks or money transfers and then physically go there to exchange them in the parallel market for US dollars; this process can take up to a couple of weeks.<sup>28</sup> It then takes a further four to seven days in Kampala to buy the required food stuff and organize the truck. Reportedly, the journey back to Aweil can take up to four weeks. Given the recent insecurity, traders have no other risk mitigation strategy than to move in convoy and wait for government forces to clear the road and provide patrol trucks at night. No insurance scheme appears to be available for traders at present.

The markets in NBEG and Warrap find themselves at the very end of the western corridor. Depending on the food item, they are either the end of the corridor for trucks coming from Juba, or the entry-point for those coming from Sudan. If insecurity along the road does not escalate, the political relations between South Sudan and Uganda normally allow sustained trade. By contrast, informal trade is the norm when it comes to the movement of goods from Sudan.

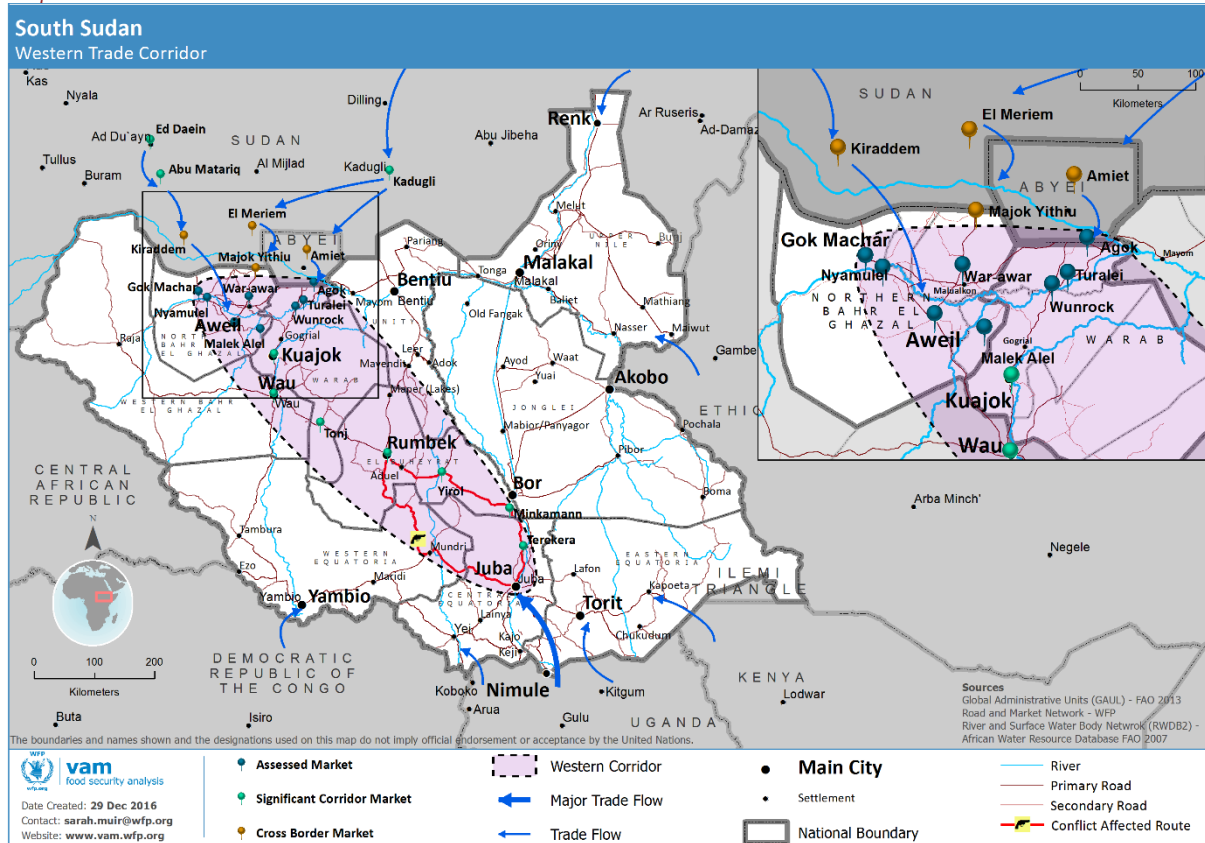
From west to east, the key border markets that serve NBEG and Warrap are Kiraddem, Majok Yientiu and Amiet. For security reasons, we were not able to visit them, but we managed to assess their proximity markets, respectively Gok Machar, Warawar and Agok. The supply chains from Sudan are very different: Warrap leans completely towards the Abyei

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<sup>28</sup> In the past, licensed traders could have access to the official exchange rate, with a significant advantage for them as the rate was artificially too low. This “[a]ccess is reported to be closely linked to corruption, nepotism and the war economy” (Mosel & Henderson, 2015).

Administrative Area (AAA) through Amiet–Agok markets, while NBEG has two main routes, one through Kiraddem–Gok Machar markets, which is the natural entry point for goods from Darfur during the dry season, and the other through Majok Yientu–Warawar markets, providing an access route in the rainy season.

Map 2 - Western corridor



Most of the goods from Khartoum, El Obeid and Kadugli transit through Amiet in the AAA<sup>29</sup> before reaching Warrap. Amiet is the main market of the region and serves as an informal commercial hub between Sudan and South Sudan. Reportedly, it is a temporary market at the crossroads, where no established infrastructure exists as there are often security issues. For this reason, traders do not offload their goods on arrival but wait until they have a buyer. Due to the large presence of Dinka Ngok, there is ethnic continuity between Warrap and Abyei town area, so traders accept SSP but they either exchange it for other currencies or buy other goods to avoid the erosion of the nominal value of the money driven by the inflation. Alongside the food market, there is a large auction market where it is possible to buy livestock and second-hand items such as generators, vehicles, motorbikes and fridges. Allegedly, these can also be the items being looted in various locations in South Sudan. The functioning of

<sup>29</sup> The Abyei box is a disputed territory between South Sudan and Sudan, currently administrated by the United Nations Interim Security Force for Abyei (UNFSIA). This operation was established in 2011 with the United Nations Security Council’s [Resolution 1990](#), with the task of monitoring the flashpoint border between north and south and facilitating the delivery of humanitarian aid, also using the force to protect civilians and humanitarian workers in Abyei.

Amiet market is very volatile, and it can stop at any time. Differently from the south, the north of the AAA is inhabited by the pastoral Arab tribe of the Missiriya,<sup>30</sup> who have to migrate south on a seasonal basis and historically have had complex relations with South Sudanese people. Reportedly, a Joint Peace Committee between the Ngok and Missiriya has recently reduced the tension between the two ethnic groups, granting investigations and giving compensation in the event of violence,<sup>31</sup> and securing access to water for the pastoral tribes. As labile as the situation is, the agreement allows a decent flow of goods to nearby markets in South Sudan as long as it holds, and it represents a feasible business opportunity for local traders. The visit to Agok market on the border with the AAA confirms the current importance of this trade route.

Similarly to Warrap, most of the goods reaching NBEG markets from Sudan are also sourced from Khartoum, El Obeid and Kadugli, where they are diverted through the alternative corridor via Merriem, Majok Yientiu, Warawar and Aweil town. This smuggling route is mostly used from August to October where informal trade is the norm and traders essentially transport goods through the bush using small pickup trucks, loading 2.5 mt of food per trip from Merriem to Majok Yientiu. At the time of the assessment, the pace of arrivals in Majok Yientiu and the overall quantities were not enough to allow a sustained commercial trade flow to the markets in NBEG. Traders in NBEG markets have three possible alternatives to purchase from Sudan:

- ✓ By cash in Majok Yientiu, where big traders have to exchange SSP into SDG before purchasing the goods from Sudan. Reportedly, Sudanese traders may immediately buy livestock in the same market if they accept SSP.
- ✓ Via money transfer using a token payment system<sup>32</sup> between Majok Yientiu and Merriem, that permits traders to send SSP1000 for SDG170. However, this means of payment is accessible only to traders who happen to have connections with Arab traders.
- ✓ Via bank transfer from the Ivory Bank, Western Union c/o KCB bank branches in Aweil town to Sudan. An alternative is a private company called Euro Transfer. The best option is the Ivory Bank, as it is possible to send SSP1000 for SDG200 and the money transfer is tracked.<sup>33</sup>

During the dry season (between January and May), the situation normally improves thanks to the alternative route from Darfur to Gok Machar and Aweil town. In fact, as the Kiraddem River dries up, trucks carrying up to 25 mt can reach NBEG markets from Abu Matariq and Eddain markets. The scarcity of permanent settlements in the swampy area in the southern part

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<sup>30</sup> The complexity of the relationship between the two ethnic groups dates back to the beginning of the 19<sup>th</sup> century. The two populations remain economically interdependent and a stabilization of their relationship can only help in settling local disputes (Sansculotte-Greenidge, 2011).

<sup>31</sup> Allegedly, in the event of violence, the main market Amiet can remain closed for a couple of days until the Committee settles the dispute.

<sup>32</sup> In this case, a trader brings SSP to the money transfer in Majok Yientiu and receives a cheque (or token) that can be exchanged back in Merriem for SDG.

<sup>33</sup> While it is possible to send SSP1000 for SDG170 using the token payment system.

of East Darfur and the poor road conditions make it difficult to control the safety of the trade route. Reportedly, the lack of agreement upon the 'zero line' in the sector of the border between NBEG and East Darfur also prevents UNIFSA forces from monitoring the situation on the ground.

### III.2 Products and markets overview

By and large, processed foods originate from Kampala. The two main exceptions to this are sugar and groundnut oil, which come from Sudan. The cheaper sunflower oil normally comes from Uganda. Rice can be sourced from both sides of the corridor as well.

At the time of the assessment, traders were able to sell locally produced sorghum – which can be harvested twice in the space of a few months – particularly close to the AAA. The first harvest comes in October and usually goes in the market. To have the second harvest, farmers reported that they cut off the main stem and the remaining part then branches out at nodes of the first leaf and grows independently for the second harvest in December. Depending on the rains, this second harvest can be similar to the first in terms of quantity, and its quality is usually better because it grows during the dry season. As such, it is mostly intended for own consumption. Later in the season, sorghum is also imported and stored before the rainy season.

Although the clay soil affords good availability of locally produced groundnuts in NBEG (ROSS, 2012), and moderate availability of sesame, most of the cooking oil is imported from Sudan and can be too expensive for the poorest households. A variety of cooking oil from local trees produced with a time-consuming traditional process is often the preferred substitute for poorer households.

Reportedly, the very limited local production of pulses is consumed at subsistence level and does not reach markets. Therefore, pulses need to come from elsewhere through the western corridor, making the cost prohibitive for households.

Besides local food, the availability of processed and fresh food is low in most rural markets. The two markets where traders have a relatively higher number of stock keeping units (SKU) are Wunrok and Agok. Aweil town market is the best-stocked market overall.

Table 2 provides a snapshot of the main differences between the visited markets in terms of the number of traders, overall volumes and restocking strategies. This information comes from key informant interviews, mostly at the level of chambers of commerce, and should be considered as the possible best guess.<sup>34</sup>

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<sup>34</sup> A trader survey would need to be conducted for more in-depth information. However, given time constraints and security concerns, we opted for a lighter assessment. In a trader survey conducted in July–September 2015, about 20 percent of foreign traders had already closed their shops in Aweil town (Nanga, 2015).



Table 2 - Market descriptions

|                                | NBEG    |            |         |        |            | Warrap  |        |        |
|--------------------------------|---------|------------|---------|--------|------------|---------|--------|--------|
|                                | Warawar | Gok Machar | Nyamlel | Aweil  | Malek Alel | Turalei | Agok   | Wunrok |
| Number of big traders          |         |            |         |        |            |         |        |        |
| <i>Currently</i>               | 15      | 33         | 5       | 95     | 5          | 10      | 75     | 60     |
| <i>Before</i>                  | NA      | NA         | NA      | 300    | 30         | 20      | NA     | NA     |
| <i>Change</i>                  | -       | -          | -       | -68%   | -83%       | -50%    | +      | +      |
| Overall capacity in MT         | 100     | 300        | 200     | 4200   | 4          | 100     | 2000   | 1800   |
| Capacity per big trader in MT  | 7       | 9          | 40      | 44     | 1          | 10      | 27     | 30     |
| Restocking frequency (in days) |         |            |         |        |            |         |        |        |
| <i>Dry season</i>              | 30-60   | 60         | 30-60   | 15-30  | 30-60      | 30-60   | 15     | 15     |
| <i>Rainy season</i>            |         | 180        | 90-180  | 60-120 |            | 60-180  | 60-180 | 60-180 |

Source: WFP, Market Assessment 2016. Note that in the 'Before' row, the timeframe is not consistent – in many cases it is between 2012 and 2014

We tried to gauge the number of 'big' traders active in each market. These are either wholesalers or importers and are the ones that determine the overall supply in a market. Naturally, the capacity of these traders varies greatly from market to market. In Aweil town, the 95 big traders allegedly have an average monthly capacity of 44 mt each. In Agok and Wunrok, the average capacity is around 27–30 mt, while in the other markets it falls below 10 mt. The capacity of the whole market reflects the number of big traders operating there, except in Nyamlel, where the few traders seem to have an overcapacity compared to the size of the market, which is probably not fully operational given sluggish demand. The number of these traders has fallen substantially almost everywhere in the last year or so. Reportedly, for the markets where we have information, more than 50 percent of traders have gone out of business.<sup>35</sup> The only markets with an increase in operating traders are Wunrok and Agok. In the former, this is because a huge number of IDPs from the AAA and bordering states in South Sudan have created additional business opportunities for local traders. For the latter, it is the result of the flow of goods coming from Amiet market.<sup>36</sup> Traders confirm that they manage to restock relatively more frequently in the dry season: the majority can restock every 30 to 60 days, although in Aweil, Agok and Wunrok markets restocking time is more frequent at twice a month. Conversely, in the rainy season restocking frequency jumps to 60–180 days almost everywhere. It seems very difficult to believe that traders involved in CBT would be able to increase their restocking policy much during this time of year, given all the structural constraints to trade.

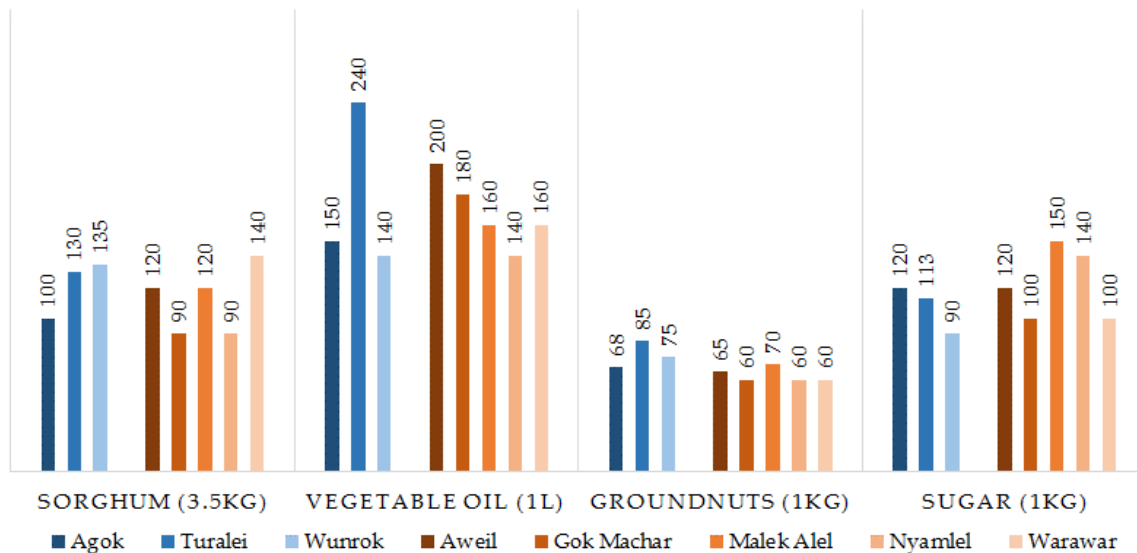
Variations in supply sources and overall capacity are reflected in the array of different retail prices in these markets (Figure 8). Vegetable oil has the highest price variability between markets. Since the reported price is for sunflower oil from Uganda, the high variability reflects

<sup>35</sup> "Foreign traders often had very different support networks than those available to South Sudanese. Those operating in South Sudan often act as a subsidiary of a family business or as an informal 'branch'. These traders' losses were made good with loans from relatives in Juba to enable them to restart their businesses. In this sense, for some of these foreign traders losses were operational not capital losses, as they are part of a wider network. South Sudanese traders often lacked such support networks" (Mosel & Henderson, 2015).

<sup>36</sup> "Although market infrastructure in Twic [...] has not been affected by the crisis, the influx of IDPs has created additional demand for key commodities. This demand is not an "income effect" but rather a crisis effect, resulting in an increase in prices" (Simbwa & Patiño, 2014).

the inefficiencies of the western corridor. Conversely, groundnuts are supplied locally and the price difference is minimal; the lowest prices are in NBEG markets where the bulk of the production is. The price difference for sorghum can be explained by the abundance of local produce and own consumption at the time of the assessment. Finally, sugar comes from Sudan and is slightly cheaper in Warrap markets.

Figure 8 - Retail prices in SSP as at November 2016



Source: WFP, Market Assessment 2016

### III.3 Cost structure and trader profit margins

The three main supply chains – one from Juba, one from Sudan and one from local production – entail very different cost structures, and hence different profit margins for traders.

The sorghum mark-up<sup>37</sup> for retailers who are supplied by local wholesalers is normally below 20 percent in Aweil and Kuajok markets. In Wau, it can be as high as 40 percent but has been very volatile in the recent past<sup>38</sup> (Figure 9). Higher margins are still available in Juba, but their trend is negative. Overall, it seems that business opportunities for local traders are either shrinking or too risky for retailers who rely on local supply chains only, as it is quite likely that they will operate at a loss if their stocking strategy does not allow them to skip purchases when prices are not profitable for them.

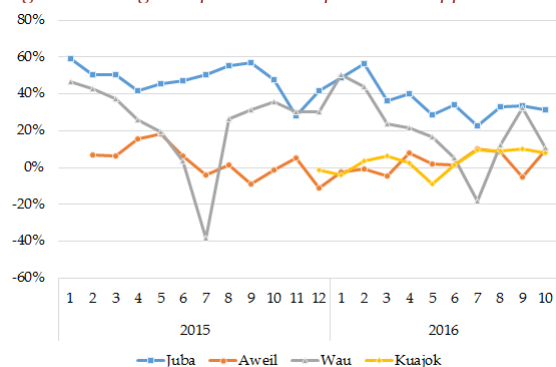
Traders who can afford to get their supplies in Juba have a price mark-up that is well above 20 percent, normally in the range of 40 to 60 percent (Figure 10). The mark-up in Aweil

<sup>37</sup> The retail mark-up is the difference between retail and wholesale prices. It can be considered a loose proxy for traders’ profits. It is calculated as follows:  $(P_{sell} - P_{buy})/P_{sell} * 100$ .

<sup>38</sup> Figure 9 also shows counter-intuitive negative mark-ups. We computed this indicator using the wholesale and retail prices that were recorded in the market in a specific month. The negative mark-up implies that buying in bulk is occasionally less convenient than buying at the retail level, as wholesale prices are normally faster to adjust to a new price than retail prices. In this case, since small retailers have to purchase their supplies daily in the market but are normally price-takers, they might temporarily operate at a loss.

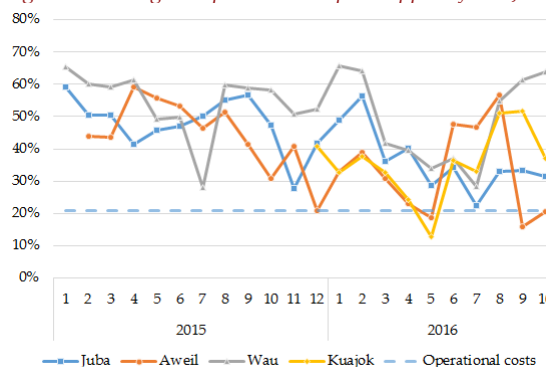
increased between June and August 2016, in contrast to the other reference markets. This is probably a reflection of availability issues caused by problems along the supply route in the Equatoria states.

Figure 9 - Sorghum price mark-up – Local supplies



Source: NBS and World Bank data visualization tool

Figure 10 - Sorghum price mark-up – Supplies from Juba



Source: NBS and World Bank data visualization tool

Operational costs – including the increasing price of fuel and different types of taxation along the way – induce traders to keep high margins on wholesale despite decreasing demand. Considering the forecasts of further price increases, they also have to chase inflation to be able to restock the next time.

Based on our estimates,<sup>39</sup> at the time of the assessment traders required an average 21 percent mark-up to cover their operational costs.<sup>40</sup> These costs can be broken down into three categories: transportation (57 percent of the total),<sup>41</sup> formal and informal taxation including checkpoints along the road (34 percent), and other services including night surveillance and the loading and unloading of goods.<sup>42</sup> Figure 11 and Figure 12 show the cost breakdown for different markets, taking into account the supply chain from Juba and from Sudan.

Larger traders in Aweil seem to be much more efficient in supplying their market than other traders in NBEG and Warrap, since their operational costs are lowest both from Juba and from Sudan. Since they operate in the largest market in the area, they can benefit from economies of scale, as reportedly this is the only market in NBEG where large traders normally move

<sup>39</sup> Data from key informants met in the chambers of commerce of the visited markets.

<sup>40</sup> This is based on rescaling the nominal cost that traders have to spend to bring a 100 kg bag to the assessed markets from both supply routes. The cost is then compared with the retail cost of a sack of sorghum in the same market and averaged for all the markets.

<sup>41</sup> According to a World Bank study, “transportation costs explain up to 33 percent of the variation of food price differences across South Sudan” (Varela, Cali, Pape, & Rojas, 2016).

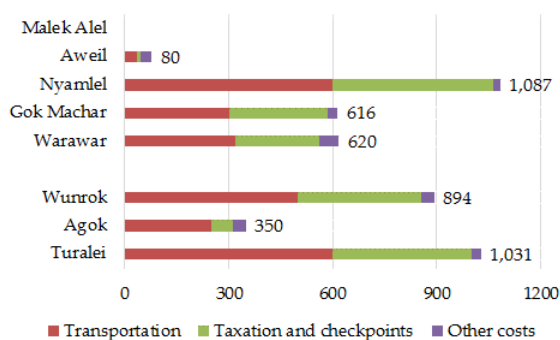
<sup>42</sup> “For example, a trader who imports goods from Uganda all the way through Northern Bahr el Ghazal State to Gok Machar in Aweil North County incurs high and extra costs of car repairs (the poor roads lead to excessive tyre wear and other damage), fuel (multiple checkpoints mean vehicles have to stop and start) and delays *en route*. And, of course, an already bad situation gets still worse during the rainy season, when roads are frequently impassable for days” (Basnett & Garang, 2015).

goods using trailers with a loading capacity of 70 mt.<sup>43</sup> The supply is secured by the proximity to Sudan which allows for short trips, and by a demand sustained by the large presence of international organizations in the territory, which gives a certain stability to the flow of supplies from Juba, even though insecurity and road conditions affect the time required for restocking. The presence of banks smooths business opportunities in both Juba and Khartoum.<sup>44</sup>

Traders in Warawar, Gok Machar and Nyamlel either operate with small pick-ups with a capacity of 2.5 mt or hire collective trucks with a capacity of 25 mt. The costs faced by traders in Malek Alel are not so high, as they get their supplies entirely from Aweil, which is close<sup>45</sup> and the road between them is passable all year round. However, Malek Alel market is marginal and demand is weak, since the inhabitants are among the poorest in NBEG.

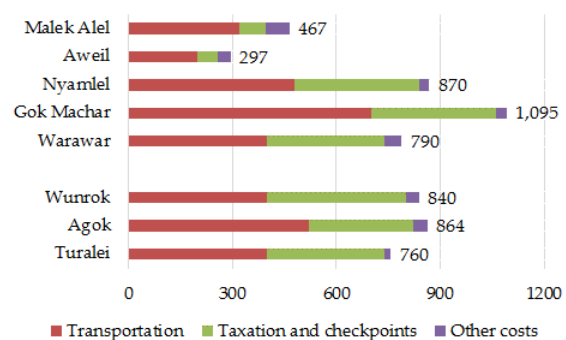
Traders operating in Warrap face similar costs, but taxation represents an average 43 percent of the costs from Juba, and 19 percent of the costs from Aweil. Traders in Agok naturally have lower import costs from Sudan, which gives them greater margin to expand their businesses, though the lack of consistent price information prevents them from estimating the entirety of their profit margins and the stability of the market. Reportedly, the chamber of commerce in Agok releases stocks at lower prices to relax price pressure at the peak of the lean season; this practice comes from a government policy that was in place until 2008/09.

Figure 11 - Cost breakdown for 100 kg sack from Juba



Source: WFP, Market Assessment 2016

Figure 12 - Cost breakdown for 100 kg sack from Sudan



Source: WFP, Market Assessment 2016

With increasing nominal costs and declining margins, traders will have less capital to invest in restocking, thus reducing the availability of some commodities or the variety of others, irrespective of the strength of their connection with commercial partners along the two main supply chains. In the near future, fuel availability in Juba might also affect traders' capacity to bring in goods from the south.

<sup>43</sup> This lowers transportation costs and informal taxation – to a certain extent negotiable – is often applied as a flat tax, which is proportionally lower for a truckload.

<sup>44</sup> Reportedly two banks and a private company have arrangements to run a money transfer service to Khartoum and other places in Sudan.

<sup>45</sup> Less than an hour's journey using pick-ups, trucks or motorbikes. It is also reachable by bicycle or on foot.



## IV. Price analysis

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With such an impressive inflation rate, the nominal prices of food and fuel are skyrocketing (Figure 21 in Annex I). By contrast, a declining trend similar to the one described for the REER (Figure 3) can be plotted when nominal prices (Figure 22 in Annex I) and wages (Figure 23 in Annex I) are deflated.<sup>46</sup> This shows how low purchasing power and plummeting demand have been closely intertwined in the past few months. In Aweil town, Wau and Wunrok, the terms of trade of agricultural and non-agricultural work to sorghum fell to record-low levels; the former is more volatile according to the season. In the third quarter of 2016, it took one day of casual work to buy 250 g of sorghum. A civil servant or a primary school teacher may earn SSP350 per month,<sup>47</sup> which is roughly worth just three *malwa*<sup>48</sup> of sorghum, meaning even those with salaried jobs need additional casual work or own crop production.

Since July 2016, real prices of sorghum, vegetable oil and sugar have been falling. For sorghum, this trend is expected to continue until April 2017, when household stocks decline and real prices normally increase. However, the extent of the current slowdown of real prices is incomparable with the past, so it is difficult to give robust insights into future price developments. Normally, sorghum prices in Kuajok and Aweil closely follow those in Juba, while prices in Wau remain slightly higher.

Apart from a minor increase during the rainy season 2016, real prices of vegetables have been declining since the SSP was unpegged from the dollar. The real price of sugar in Juba has followed a similar trend, whereas in Aweil, Wau and Kuajok the downward push only started in July 2016. All in all, when the effect of inflation is removed, all prices show a downward trend, as the economy is stagnant and purchasing power is extremely low.

The rest of this section explores price dynamics in depth and provides empirical evidence to support the field visit findings. It describes the likely effect on prices of moving away from GFD in specific markets. Besides anecdotal evidence, we want to understand whether there is a statistical causality relationship and long-run equilibria between NBEG and Warrap markets and the source markets on both sides of the trade corridor. In addition, we aim to find out how far a price shock is transmitted along the supply chain, in order to fine-tune price monitoring in source markets and adjust transfer values before a price shock reaches the markets where WFP may be implementing CBT. Finally, before shifting to other transfer mechanisms, we need to know whether removing GFD in certain locations could have a detrimental price effect on top of the ongoing hyperinflation. Data for this section is from WFP's price monitoring and from the operational summary of metric tons being delivered each month in the country.

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<sup>46</sup> By the non-food CPI and by the CPI, respectively.

<sup>47</sup> Grade 14, which is reportedly the minimum rate. The salary for grade 7 civil servants could be up to SSP1,200.

<sup>48</sup> A *malwa* of sorghum weighs 3.5 kg.

#### IV.1 Market causality and price transmission

In order to test the market relationships in terms of causality and long-run equilibrium, we ran the Granger causality test (Granger, 1969)<sup>49</sup> and Johansen test (Johansen, 1991) for co-integration<sup>50</sup> with sorghum prices in the markets for which we have enough data available – namely, Aweil, Rumbek and Wau, covering the western corridor. Details of the procedure are in Annex III.<sup>51</sup>

We investigated the relationships that these markets have with Juba, which in turn depends on Kampala and Gulu markets in Uganda as described in a previous market assessment (WFP, 2015). We also considered the casual relationships with a number of markets in Sudan, namely El Fashir, Damazin, Ed Daein, Geneina, El Obeid, Kadugli, Kassala, Kosti, Nyala and Port Sudan.<sup>52</sup> Finally, we tested the fit of the model by searching for a relationship between the markets in the western corridor and those in the White Nile corridor (i.e. Bentiu, Bor and Malakal), expecting to find no significant result as the two corridors are supposed to be connected in Juba only. The results are presented in Table 3.<sup>53</sup>

All the markets within the western corridor (i.e. Rumbek, Wau and Aweil) show strong causality relationships and co-integration with Juba. Interestingly, following the direction of trade away from the capital city, Rumbek is not co-integrated with the downstream markets of Wau and Aweil, but a long-run equilibrium exists between the latter two.<sup>54</sup> Aweil is well connected with the Darfurian markets of Fashir and Nyala, but also with Damazin and El Obeid, thus confirming the two supply sources that were described in the trade flows section.

<sup>49</sup> Suppose there are two time series:  $x_t$  and  $y_t$ . When the past and present values of  $y$  provide some useful information to forecast  $x_{t+1}$  at time  $t$ , it is said that  $y_t$  Granger causes  $x_t$  (Maddala & Kim, 1998, p. 188).

<sup>50</sup> Two variables  $y_t$  and  $x_t$  integrated of order  $d$  - or  $I(d)$  - are said to be co-integrated if there exists a linear combination  $\beta$  such that  $y_t - \beta x_t$  is  $I(d-b)$ , with  $b > 0$  (Maddala & Kim, 1998, p. 26). For a non-technical intuition of what co-integration is, see Murray (1994) where he explains that two co-integrated series remain tied together in the long run even though both can occasionally depart from their pattern, like a puppy “wander[ing] aimless when unleashed” follows its drunken master walking unsteadily away from the pub.

<sup>51</sup> A combination of Vector Auto-Regressive models, Auto Regressive Integrated Moving Average models and Vector Error Correction models is used to analyse the price information. We used the Toda-Yamamoto (1995) procedure for the Granger causality test.

<sup>52</sup> In the Granger test we tested the null hypothesis that prices in the location  $i$  (Aweil, Bentiu, Bor, Malakal, Rumbek and Wau) do not Granger-cause prices in location  $j$  (Juba and the markets in Sudan) and vice versa. The rationale behind this is to detect key markets for every single market  $i$ , including the direction of the causality.

<sup>53</sup> Preliminary tests on stability detected unit roots in the time series. We tested the presence of structural breaks (Clemente, Montañés, & Reyes, 1998) and found two innovative structural breaks in January 2015 and January 2016, following the sharp devaluation of the SSP. To compare between different currencies and achieve stationarity, we converted all the prices in South Sudanese and Sudanese pounds into US dollars. Residuals of this transformation do not show correlation with the exchange rates.

<sup>54</sup> “From a geographical perspective, results indicate that Aweil and Wau tend to form a market with Juba (with different degrees of intensity) for all products considered” (Varela, Cali, Pape, & Rojas, 2016).

The procedure for testing Granger causality leads to the inclusion of a three-month lag and confirms that Aweil market depends on the aforementioned Sudanese markets and on Juba, but the speed of price transmission is faster within the western corridor than from Sudan (one month vs. three months), as the goods from the north are mostly brought through smuggling routes.

Table 3 - Granger Causality and Johansen Tests western corridor<sup>55</sup>

| Country     | State/Corridor      | Market           | Commodity        | Aweil        |               | Rumbek       |               | Wau          |               |
|-------------|---------------------|------------------|------------------|--------------|---------------|--------------|---------------|--------------|---------------|
|             |                     |                  |                  | Granger test | Johansen test | Granger test | Johansen test | Granger test | Johansen test |
| Sudan       | Darfur              | Al Fashir        | Sorghum Food Aid | 0.082 *      | 22.23 *       | 0.346        | 16.20 *       | 0.665        | 19.86 *       |
|             |                     |                  | Sorghum          | 0.881        | 18.90         | 0.768        | 9.13          | 0.334        | 16.85 *       |
|             |                     | Ed Daein         | Sorghum Food Aid | 0.361        | 23.74 *       | 0.861        | 12.52         | 0.518        | 19.29 *       |
|             |                     |                  | Sorghum          | 0.438        | 19.78         | 0.530        | 9.86          | 0.811        | 20.01 *       |
|             |                     | El Geneina       | Sorghum Food Aid | 0.677        | 25.16 *       | 0.589        | 17.00 *       | 0.153        | 22.19 *       |
|             |                     |                  | Sorghum          | 0.839        | 20.76 *       | 0.500        | 15.07         | 0.319        | 18.66 *       |
|             | Nyala               | Sorghum Food Aid | 0.018 *          | 17.71        | 0.432         | 11.95        | 0.727         | 15.31        |               |
|             |                     | Sorghum          | 0.069 *          | 23.29        | 0.919         | 11.89        | 0.759         | 25.90 *      |               |
|             | Kordofan            | El Obeid         | Sorghum          | 0.055 *      | 19.62         | 0.797        | 6.30          | 0.238        | 19.09 *       |
|             |                     |                  | Sorghum          | 0.807        | 21.28 *       | 0.166        | 12.04         | 0.219        | 17.24 *       |
|             | Kassala             | Kassala          | Sorghum          | 0.924        | 15.27         | 0.413        | 15.08         | 0.379        | 16.17 *       |
|             | Blue Nile           | Ad Damazin       | Sorghum          | 0.078 *      | 21.38 *       | 0.075 *      | 6.71          | 0.032 *      | 18.12 *       |
| White Nile  | Kosti               | Sorghum          | 0.522            | 16.42        | 0.845         | 7.13         | 0.233         | 16.66 *      |               |
| Red Sea     | Port Sudan          | Sorghum          | 0.802            | 16.90        | 0.456         | 10.43        | 0.497         | 15.67        |               |
| South Sudan | Western corridor    | Juba             | Sorghum (white)  | 0.043 *      | 14.39 *       | 0.008 *      | 9.15          | 0.032 *      | 16.17 *       |
|             |                     |                  | Aweil            | -            | -             | 0.925        | 12.02         | 0.011 *      | 23.06 *       |
|             |                     |                  | Rumbek           | 0.220        | 12.02         | -            | -             | 0.215        | 18.17 *       |
|             |                     |                  | Wau              | 0.463        | 23.06 *       | 0.339        | 18.17 *       | -            | -             |
|             | White Nile corridor | Bentiu           | Sorghum (white)  | 0.507        | 14.53         | 0.595        | 15.19         | 0.464        | 12.56         |
|             |                     |                  | Bor              | 0.879        | 11.40         | 0.115        | 15.39         | 0.227        | 12.63         |
|             |                     |                  | Malakal          | 0.414        | 25.16 *       | 0.007 *      | 14.60         | 0.442        | 20.45 *       |

Source: Authors' calculations. The notation (\*) implies a level of significance of the test at 5 percent. Johansen trace test with full trace is provided in the table

To analyse the impact that price variations have on Aweil market, we generated an impulse response of a doubling of the price of sorghum from the co-integrated markets. The resulting function is plotted in Figure 13, where the extent of the impact of a price shock in Aweil is shown on the vertical axis, and the duration of the shock on the horizontal axis.

A price increase in Juba affects prices in Aweil after one month, and its effect not only remains over time but intensifies as well, from 15 percent in the first month to 24 percent after one year. This indicates that the price level in Aweil necessarily adjusts to reflect changes in Juba market, and even if the price transition is delayed by one month, the two series tend to converge in the long run on a common steady-state. In operational terms, this implies that monitoring the evolution of prices in Juba can indicate the likely sorghum price changes in Aweil one month ahead. Price variations in other markets do not have similar effects. For example, price changes in Wau anticipate those in Aweil and affect the latter over a shorter period: on average 45 percent of the variation is passed almost immediately; however, in the following three months the effect falls by around 19 percent, gradually becoming negligible after eight months. Markets in Sudan show an impulse effect after three months and in some cases the effect quickly reverts, showing some instability in the long-run relationship, in

<sup>55</sup> When a coefficient is followed by the notation (\*), it means that the null hypothesis of the test was rejected, or in more technical terms, that there is a causality and/or a long-term relationship between either Aweil, Rumbek or Wau and the markets listed in the table.

particular with Obeid and Damazin. According to our model, the price variations in Sudan that affect Aweil market the most are those from Nyala and Fashir, where sorghum price increases affect Aweil prices by almost 40 percent. The effects from Nyala expire after nine months and those from Fashir after three months.

The little persistence and high volatility of the price pass-through from Sudan markets to Aweil may be explained by seasonal disruptions in the trade routes towards the north. Prices in Aweil are positively influenced by the evolution of the SDG/SSP exchange rate,<sup>56</sup> so that in principle, a depreciating Sudanese pound could lead to lower prices in Aweil. However, given the galloping pace of SSP depreciation, this effect is now very marginal.

We also conducted an impulse response exercise for Wau market in relation to sorghum price variations in Aweil and Juba (Figure 14). We considered this market in the analysis because it is the last stop for goods before Warrap markets, given that we do not have decent time series to test the market integration of the latter. Of course, the main price effect is from Juba, where a price change passes to Wau by an initial 20 percent, which becomes 35 percent in the following two months. After that, the price shock stabilizes, leaving a permanent effect of 25 percent. From the other side of the western corridor, although the flow is smaller, some goods from Sudan still reach Wau via Aweil, which explains the direction of the relationship between the two markets. The pass-through is quick and reaches its peak in the first month, then disappears after three months.

Figure 13 - Impulse response function in Aweil

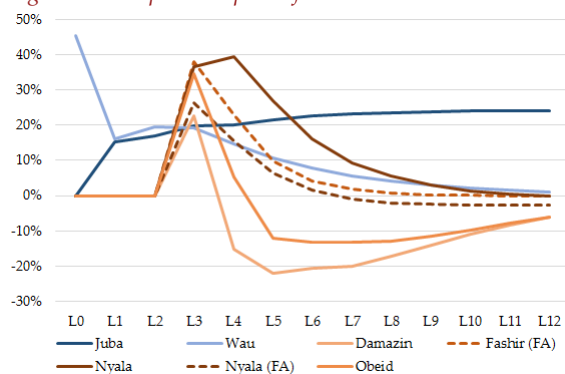
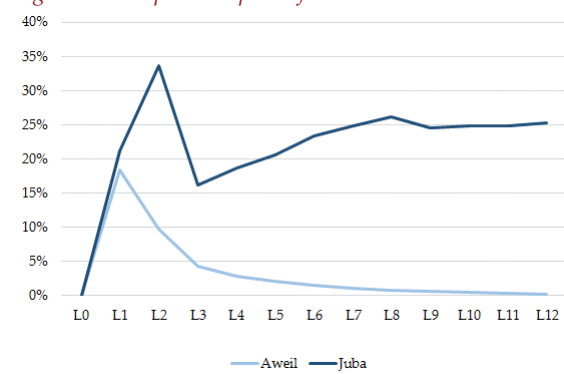


Figure 14 - Impulse response function in Wau



Source: WFP. Authors' calculations. L0 refers to the time of the shock, while L1-L12 are the monthly lags in the year following the shock

## IV.2 GFD impact on prices

Besides the price transmission between markets, there is another price feature that WFP needs to analyze before moving to CBT in locations that are used to receiving massive amounts of

<sup>56</sup> Even though all the prices are expressed in US dollars, the VAR model still returns a positive and statistically significant coefficient for the SDG/US\$ exchange rate.



GFD every month. In fact, in-kind food assistance is substantial in many states of South Sudan and it makes a large contribution to overall food availability (Figure 24 in Annex I).

We ran an impulse response analysis to test the impact of WFP programmes on sorghum prices,<sup>57</sup> this time considering all the metric tons distributed in seven out of ten states in the last five years (Figure 25 in Annex III). We are aware that other factors may amplify this relationship, including the functioning of the market, the integration with other markets, the availability of local production, and the proportion of the population being assisted.

While this study focuses on NBEG and Warrap, we also show the results for the other states to cross-check the goodness of the model in places with larger volumes of GFD. We tested whether there is a GFD effect on prices, either in terms of causality or long-term equilibrium, according to the results of the Granger and Johansen tests. We also tested this relationship in the other direction, meaning that we wanted to understand whether prices influence the amount of GFD being provided, such that whenever prices are too high, WFP intervenes with more food assistance. Table 4 summarizes the findings; more analytical output is presented in Table 9 and Table 10 in Annex III.

*Table 4 - GFD effect on prices*

| GFD               | Market  | GFD effect on Prices          |                          |                | Price effect on GFD |
|-------------------|---------|-------------------------------|--------------------------|----------------|---------------------|
|                   |         | Dampening (Granger causality) | Long-run (Johansen test) | Overall effect |                     |
| NBEG              | Aweil   | No                            | No                       | No             | Yes                 |
| Unity             | Bentiu  | No                            | No                       | No             | No                  |
| Jonglei           | Bor     | Yes                           | No                       | Yes            | Yes                 |
| Central Equatoria | Juba    | Yes                           | Yes                      | Yes            | No                  |
| Upper Nile        | Malakal | No                            | Yes                      | Yes            | No                  |
| Lakes             | Rumbek  | Yes                           | No (*)                   | Yes            | No                  |
| WBEG              | Wau     | No                            | Yes                      | Yes            | No                  |

Source: WFP. Authors' calculation. When 'Yes' is specified in the Granger causality and Johansen test columns, a level of significance of the tests below 5 percent was found. The notation (\*) refers to a 10 percent significance at lag 11

There is no statistically significant evidence that WFP food aid in NBEG has an effect on prices in Aweil market and to some extent in Wau.<sup>58</sup> In other words, we are not expecting to see an increase in sorghum prices if there is a shift from GFD to CBT. Interestingly, there is evidence of the opposite causal relationship in NBEG, meaning that the humanitarian response adjusts rapidly to increases in food prices.

<sup>57</sup> Again prices are expressed in US dollars according to the parallel exchange rate and transformed in logarithms.

<sup>58</sup> There is evidence of co-integration but not of Granger causality.

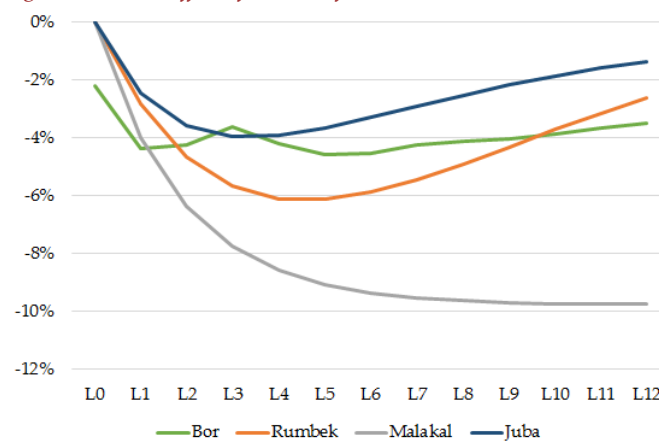
By contrast, a dampening effect on prices was found in Bor,<sup>59</sup> Juba<sup>60</sup> and Rumbek,<sup>61</sup> and only a long-run relationship was detected in Malakal. The average effect of additional food aid deliveries is shown in Table 5 and Figure 15. The magnitude and speed of the price response differs by market; a 100 mt distribution in Bor leads sorghum prices to fall by a steady 4 percent, while in Juba and Rumbek the effect is high in the first three to five months,<sup>62</sup> but then it tends to fade within the year, particularly in Juba. In Malakal the effect cumulates rapidly and remains stable over the following twelve months, confirming the area’s high dependency on food aid.

Table 5 - Price effect of 100 mt of GFD

| Lag | Bor   | Rumbek | Malakal | Juba  |
|-----|-------|--------|---------|-------|
| L0  | -2.2% | 0.0%   | 0.0%    | 0.0%  |
| L1  | -4.3% | -2.8%  | -4.0%   | -2.4% |
| L2  | -4.2% | -4.6%  | -6.3%   | -3.6% |
| L3  | -3.6% | -5.7%  | -7.7%   | -3.9% |
| L4  | -4.2% | -6.1%  | -8.6%   | -3.9% |
| L5  | -4.6% | -6.1%  | -9.1%   | -3.6% |
| L6  | -4.5% | -5.9%  | -9.4%   | -3.3% |
| L7  | -4.2% | -5.4%  | -9.5%   | -2.9% |
| L8  | -4.1% | -4.9%  | -9.6%   | -2.5% |
| L9  | -4.0% | -4.3%  | -9.7%   | -2.2% |
| L10 | -3.9% | -3.7%  | -9.7%   | -1.9% |
| L11 | -3.7% | -3.1%  | -9.7%   | -1.6% |
| L12 | -3.5% | -2.6%  | -9.8%   | -1.3% |

Source: WFP. Authors’ calculation

Figure 15 - Price effect of 100 mt of GFD



Source: WFP. Authors’ calculation

## V. CBT capacity

When it comes to planning the switch of beneficiaries from in-kind food aid<sup>63</sup> to restricted or unrestricted cash modalities, there are additional considerations beyond absolute market capacity and the political and economic context. Firstly, it is critical to consider the projected CBT caseload and the share of the targeted population. In most of NBEG and in Twic the caseload is largely below 10 percent – except in Aweil centre, where WFP beneficiaries represent one fourth of the population. Secondly, we need to take into account the substitution effect between modalities in terms of the metric tons available in

<sup>59</sup> Food aid deliveries in Jonglei significantly relax prices in Bor in the short term. There is an anti-seasonal effect represented by the persistence of the GFD impulse after four months. The converse causality relationship was also found to be true.

<sup>60</sup> A loose Granger causality was found in Juba, strengthened by a long-term relationship that exists between sorghum prices and GFD. However, prices do not react to regular food aid distributions, but only to extraordinary ones (see Figure 25 in Annex III).

<sup>61</sup> In Rumbek, a long-lasting dampening effect is found if we model the increase of food aid compared to the previous month (see Lag 2, Diff in Table 10 in Annex III).

<sup>62</sup> Prices falling by 4 percent in Juba, and by 6 percent in Rumbek.

<sup>63</sup> Irrespective of the conditionality of the food assistance transfer. See footnote 5.

the market; in fact, while in-kind food aid relaxes the volume of demand to be met by traders, the opposite is true with CBT. Beneficiaries who are moved to market-based interventions exert additional demand pressure on the market, net to the reduced amount of food available as less in-kind food will be delivered. Thirdly, given the hyperinflation, we need to ascertain whether the additional demand can be satisfied by local production or by food from other locations, mostly imports.<sup>64</sup> Sourcing produce from local farmers will make traders more likely to be able to increase their supply in line with their new customers. By contrast, relying on imports to satisfy the additional demand could be challenging, especially in rural markets. We have set conservative thresholds between 10 and 30 percent for traders' additional response capacity. In fact, in other contexts where WFP plans to use market-based interventions, an extra capacity of 25 percent is considered a safe rule of thumb when gauging whether traders can cope with additional demand.

Based on the production estimates and food requirements presented on page 8 and considering the market dependency information from WFP FSMS, we have also estimated the share of consumption that will come from home production, local supply, imported supply and GFD, and the time of the year when these will be most important, assuming that households will first consume their own produce, then local supplies and finally imported supplies.

Annex IV contains a detailed description of the methodology. We present six dashboards summarizing the information and setting out the maximum recommended number of additional beneficiaries that markets may be able to supply relatively safely (Figure 26 to Figure 31). These numbers are not intended to be prescriptive, but should be considered part of a tool designed to support programme design. As such, in Table 6 we provide several scenarios based on two variables. The first variable is traders' capacity to increase supply: if traders cannot increase supply, then the additional demand issuing from CBT will trigger further inflation. The second variable is what we have defined in Annex V as the 'CBT comfort zone' and the 'CBT risk zone'. These are designed such that the demand triggered by CBT as a share of total market demand must not exceed traders' potential capacity to increase supply. The 'CBT comfort zone' only considers local supply, as we assume that it will be easier for traders to rely on local sources if available. The 'CBT risk zone' also takes into account imported supply. Beyond these thresholds, it seems very unlikely that traders will be able to expand their supply without pushing up prices. Naturally, all the constraints to trade described in the previous sections still hold, so careful programme design and monitoring should be implemented to be able to switch back to GFD if the markets do not respond as expected.

Markets in Twic seem better equipped because local food will likely be available from the slight surplus produced in Warrap this year. For other goods, these markets also count on a decent import flow as long as Amiet market in the AAA continues to function. At the other

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<sup>64</sup> Figure 24 in Annex I shows that only Western Equatoria and Warrap have very marginal agricultural surpluses available in the 2016/17 season. It seems fair to assume that most of the local production will remain in nearby markets within each state.

end, markets in NBEG might be able to sustain a CBT caseload with mostly local production (supply sources from Sudan are weaker than in Warrap), so the post-harvest period could be a good time to pilot CBT programmes. Of course, Aweil town is an exception, as it is the market hub for supplies coming from Juba and trader capacity is much higher than elsewhere in NBEG.

Table 6 - CBT caseload

| Area   | County       | Assessed Markets | Overall capacity in MT | Additional traders' capacity required |                           |                              |                           |                              |                           |
|--------|--------------|------------------|------------------------|---------------------------------------|---------------------------|------------------------------|---------------------------|------------------------------|---------------------------|
|        |              |                  |                        | 10%                                   |                           | 20%                          |                           | 30%                          |                           |
|        |              |                  |                        | Comfort zone caseload ('000)          | Risk zone caseload ('000) | Comfort zone caseload ('000) | Risk zone caseload ('000) | Comfort zone caseload ('000) | Risk zone caseload ('000) |
| Warrap | Twic         | Agok,            | 2,000                  |                                       |                           |                              |                           |                              |                           |
|        |              | Turalei,         | 100                    | 20                                    | 35                        | <b>45</b>                    | 70                        | 70                           | 100                       |
|        |              | Wunrok           | 1,800                  |                                       |                           |                              |                           |                              |                           |
| NBEG   | Aweil Centre | Aweil town       | 4,200                  | 5                                     | 10                        | 15                           | 20                        | <b>25</b>                    | 30                        |
| NBEG   | Aweil East   | Warawar          | 100                    | <b>20</b>                             | 55                        | 45                           | 100                       | 70                           | 100                       |
| NBEG   | Aweil North  | Gok Machar       | 300                    | <b>20</b>                             | 25                        | 45                           | 50                        | 70                           | 75                        |
| NBEG   | Aweil South  | Malek Alel       | 4                      | <b>5</b>                              | 10                        | 15                           | 25                        | 25                           | 40                        |
| NBEG   | Aweil West   | Nyamlel          | 200                    | <b>25</b>                             | 30                        | 55                           | 60                        | 85                           | 95                        |

Source: Authors' calculation. Figures in bold indicate the scenarios considered most feasible by the assessment team

Table 6 contains different scenarios based on the potential capacity of traders to increase supply, and the likelihood that they do so (the comfort zone or the risk zone). Overall, traders may be able to support the additional demand ensuing from CBT implementation for a caseload of 45,000 beneficiaries in Twic (Warrap) and 95,000 in NBEG. These figures are conservative as they remain in the 'comfort zone' of the market in terms of the additional trader capacity required. Over the course of the year, if the market situation improves and traders increase supply to match the additional CBT demand, WFP could consider moving to the 'risk zone' caseload or upgrading revising trader capacity to upwards to the next level.

However, in places such as Aweil East, own production will run out in April and local supplies in May, so implementing CBT beyond that period seems risky. Similarly, the overall trading capacity in Aweil South appears very limited, so only a very timid CBT programme could be considered. Elsewhere, we believe that limited CBT may be considered, particularly in Twic and Aweil Centre. In Twic, the consumption satisfied by the markets will be much lower than that covered by own production until April 2017, giving a relatively comfortable margin for CBT. Given traders' self-reported capacity (Table 2) and the seasonal opening of the Darfurian trade route between January and May, it is more likely that Aweil Centre, Aweil North and Aweil West markets will be able to sustain the numbers reported in Table 6.

Table 6 is based on staple foods produced in South Sudan. When it comes to other foods, especially processed foods, the quantities available in rural markets are very small. In NBEG at the time of the assessment, the number of SKU traders were selling was extremely low, in many cases limited to red sorghum, groundnuts, sugar, vegetable oil and a few other items. Compared to WFP GFD rations, pulses were poorly available. To sustain a more diversified



diet, vegetables, meat and eggs are unlikely to be found in reasonable amounts in such markets.



Red sorghum in Gok Machar market

## VI. Concluding remarks

**A**t the height of the lean season in 2016, an estimated 4.8 million people in South Sudan were severely food insecure (IPC, 2016). In 2017, the food security outlook is even worse, with 5.5 million people affected (IPC, 2017). The challenge of providing lifesaving food assistance to so many people is compounded by insecurity, which has recently spread to the Equatoria states that were relatively untouched by the first two years of the civil conflict. In the face of these challenges and considering the extremely poor road network, air drops have become one of the most effective ways of providing food assistance. However, the operational costs associated are overwhelming, and alternative options to assist vulnerable people need to be considered.

This market assessment was designed to explore the feasibility of market-based interventions in a very limited number of locations that have so far remained relatively stable, namely NBEG and Warrap,<sup>65</sup> located in the northern part of the country on the border with Sudan.

The concluding remarks are as follows:

**The prices of all goods, including food, are skyrocketing, leading to one of the worst hyperinflation episodes ever recorded.** In October 2016, headline inflation stood at 836 percent, meaning that prices were doubling every nine days.

**There are two main reasons behind the price increases: 1) insecurity** is reducing the predictability of goods available in the market and is adding to the final costs that customers have to pay; and **2) a crashing exchange rate** is amplifying the import bill, affecting all goods, directly or indirectly.

**The western corridor, the main trade route within South Sudan, is not as stable as it used to be.** A reliable flow of goods from Uganda is vital for the country, since the vast majority of imported items are sourced from there. Following the sudden outburst of violence in July 2017, the availability of food in the country fell drastically as traders could not take the risk of being looted along the road. At the time of the assessment, this situation had improved slightly, and traders had restarted their businesses, often using convoys and military surveillance from the government.

**Although formal trade with Sudan is officially prohibited, a significant supply manages to enter the country from the north of the western corridor.** Goods arriving in Warrap are sourced through the AAA, while those arriving in NBEG follow two additional routes: one from Darfur to Gok Machar, and the other through Majok Yientiu and Warawar. None of these routes is extremely stable, as they are highly prone to insecurity and seasonal obstacles. However, at the time of the assessment, a decent trade flow was arriving in Warrap, and local traders were expecting to be able to increase supply in NBEG between January and May, when the road to Darfur becomes passable.

**Many traders have gone out of business because their margins have been squeezed between increasingly high running costs and sluggish demand.** Traders' restocking capacity is undermined by falling real prices and shrinking investment capital as the national currency continues to crash. The smaller the market, the less chance traders can be operationally efficient. Traders can restock every 30 to 60 days in the dry season and every 60 to 180 days in the rainy season. Only in Aweil town, Agok and Wunrok can traders restock twice a month in the dry season.

**An overall drop in the number of traders was reported almost everywhere, except in Agok and Wunrok markets.** Overall, the capacity of rural markets in NBEG was minimal.

**Except in Aweil town, the supply in Warrap markets was generally higher; however, in most of the rural markets there was little to buy but locally produced food.** Markets in

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<sup>65</sup> Limited to Twic.



NBEG were particularly badly supplied; the number of SKU was slightly higher in Warrap. Given the constraints that traders face along the western corridor, local supply in the market may partially offset supply shortfalls for the first few months in 2017.

**There is a high dependency on own production, except for households whose main income source is salaried employment. This will reduce the pressure on markets until February/March 2017,** when market dependency will rise again by up to 70 percent during the lean season. The lowest paid civil servants are likely to be extremely vulnerable to high prices, as their monthly salary is only worth around 10 kg of sorghum.

**Preliminary findings show that Warrap may have a nominal cereal surplus this year, while NBEG remains in deficit, mostly in Aweil East.** Almost half the cereal consumption requirements in Twic (Warrap area) will be met by own production; this share is between 25 and 30 percent in NBEG. As such, the consumption requirement that markets are called to satisfy is much lower in Warrap than in NBEG.

## VII. Recommendations

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Normally, a complex crisis such as the one in South Sudan precludes the use of market-based interventions. In particular, hyperinflation and insecurity along the western corridor are two worrying factors for CBT programming.

However, given the unsustainable costs that this massive humanitarian effort brings to WFP and the international community, we recommend a very cautious introduction of CBT in Warrap, and with a lower level of confidence in NBEG, for a short period of time before the 2017 rainy season begins.

Considering the current numbers being assisted by WFP, and if the market situation remains as it was during the assessment, 45,000 beneficiaries in Warrap (i.e. Twic) and between 50,000 and 95,000 in NBEG could possibly be assisted with CBT instead of GFD with a certain acceptable level of confidence that takes into account the capacity of traders to increase supply so as to avoid placing additional local pressure on prices. We propose a programme-design tool that can be tweaked to increase these numbers as long as monitoring confirms that conditions are amenable to removing some of the constraints we have described in this paper. The odds for successful programming are higher in Warrap markets, as the trade flow seems to be more stable. However, we also expect some opportunities for traders in NBEG (i.e. Aweil North and West) once the seasonal trade flow from Darfur recommences, and in the proximity of Aweil town. Furthermore, we found no empirical evidence that reducing the amount of GFD in Warrap and NBEG would have a detrimental effect on prices.

However, nutrition-specific interventions should be considered in combination with CBT, as many markets will not be able to satisfy all the nutritional requirements of the vulnerable population.

As described in this report, at the current pace prices are doubling every nine days, and the situation is likely to worsen in the coming months. Programme design should consider this

constraint very seriously and plan in advance the necessary adjustments to the transfer value. In this instance, it seems that value-based restricted cash could be better than unrestricted cash, as the burden of adjusting the entitlement value will be shared between WFP and the contracted traders, without involving the households. This transfer modality would also have the operational advantage for traders to allow them to plan in advance the supply they need, particularly before the rainy season when food availability can be an issue. Since CBT could slightly sustain demand in the following months, traders may have some room to increase their stocks and improve the number of SKU in the shops, thus limiting the current dismantling of their trade network. However, few traders may meet the operational standards required by WFP, so we suggest that one potential strategy could be to engage with the few 'big' traders and try to build on their networks.<sup>66</sup> An additional option would be using commodity vouchers.<sup>67</sup> These are similar to value vouchers<sup>68</sup> in that the challenges associated with inflation remain within WFP only,<sup>69</sup> and part of the operational risks are transferred to traders, but for beneficiaries they would be only marginally better than the current GFD system in terms of offering improved choice and purchasing power.

The sharp price increases in NBEG and Warrap have been triggered not only by the currency depreciation, but also by the unpredictability of the supply from the western corridor and to some extent, from Uganda. In July and August, when the main supply route from Uganda to Juba was not functioning, prices increased much more at the very end of the trade corridor. Traders remain supply-dependent on Uganda, even though Sudanese traders can provide some relief to markets by supplying certain foods. For humanitarian reasons, all possible advocacy efforts with the Government of Sudan and the Government of South Sudan should be exerted to increase the supply inflows from Sudan and possibly to tackle the seasonal difficulties associated with the route to Darfur.

Otherwise, the dependency on Juba could be a factor that triggers a return to GFD. In fact, a price shock in Juba is transmitted and remains persistent in NBEG and Warrap markets. In any case, we recommend establishing a price monitoring system in all markets where CBT is implemented for WFP and its partners. Such system could anticipate food scarcity linked to low supplies and depleting stocks during the rainy season and a return to GFD could buffer against such risks.

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<sup>66</sup> Admittedly, this report does not provide answers to the very relevant questions raised by Mosel & Henderson (2015, p. 27) with regards to supporting local markets and the private sector. Those are: "are we supporting people who already have links to power and money, and if so what does this mean and what kind of analysis do we need as humanitarians to understand these issues better? Are we supporting private sector actors as 'partners', or as instrumental conduits for a particular purpose, and what consequences does this have for what we want to achieve?"

<sup>67</sup> According to the 2017–2019 [WFP management plan](#), a commodity voucher is "a paper or electronic entitlement expressed in fixed quantities of specified goods; they are a distinct transfer modality, and are not cash-based or in-kind".

<sup>68</sup> Above called 'value-based restricted cash'.

<sup>69</sup> Only if WFP manages to pay traders on time.



## References

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- ADBG. (2013). *South Sudan: A study on Competitiveness and Cross Border Trade with Neighbouring Countries*. African Development Bank Group.
- Basnett, Y., & Garang, J. (2015). *Exiting the cycle of conflict in South Sudan. Diversifying trade for sustained and inclusive prosperity*. ODI.
- Cagan, P. (1956). The monetary dynamics of hyperinflation. In M. Friedman, *Studies in the Quantity Theory of Money*. Chicago: University of Chicago Press.
- Clemente, J., Montañés, A., & Reyes, M. (1998). Testing for Unit Root in Variables with a Double Change in the Mean. *Economic Letters*, 175-182.
- Granger, C. (1969). Investigating Casual Relationships by Econometric Models and Cross Spectral Methods. *Econometrica*(37), 424-438.
- Hanke, S. H., & Krus, N. (2012). *World Hyperinflations*. Institute for Applied Economics, Global Health, and the Study of Business Enterprise. Baltimore, MD 21218: The John Hopkins University.
- Hanke, S., & Krus, N. (2012). *World Hyperinflations*. The John Hopkins University. Baltimore: Institute for Applied Economics, Global Health, and the Study of Business Enterprise.
- IPC. (2016). South Sudan - Rising Food Insecurity and Critical Malnutrition. *IPC Alert, Issue 5, June 29*. Integrated Food Security Phase Classification.
- IPC. (2017). *Key IPC findings: January-July 2017*.
- Johansen, S. (1991). Estimation and Hypothesis Testing of Cointegration Vectors in Gaussian Vector Autoregressive Models. *Econometrica*, 1551-1580.
- Maddala, G., & Kim, I.-M. (1998). *Unit Roots, Cointegration, and Structural Change*. Cambridge University Press.
- Mosel, I., & Henderson, E. (2015). *Market in crises: South Sudan case study*. Overseas Development Institute. London: Humanitarian Policy Group.
- Murray, M. (1994). A drunk and her dog: an illustration of coitegration and error correction. *The American Statistician*, 48(1), 37-39.
- Nanga, K. (2015). *South Sudan Traders Survey*. Crop and Livestock Market Information System South Sudan.
- ROSS. (2012). *Northern Bahr EL Ghazal State - Aweil Centre - Country Profile and Strategic Plan FY 2012 FY 2015*. The Republic of South Sudan.
- Sansculotte-Greenidge, K. (2011, May). Abyei: From a Shared Past to a Contested Future. *Policy & Practice Brief*(7).

Simbwa, A., & Patiño, M. (2014). *Rapid Assessment of Markets. Warrap State: Twic County and the Abyei Administrative Area (AAA)*. Mercy Corps.

The Enough Project. (2016). *Addressing South Sudan's Economic and Fiscal Crisis*. Policy brief.

Toda, H., & Yamamoto, T. (1995). Statistical inferences in vector autoregressions with possibly integrated processes. *Journal of Econometrics*(66), 225-250.

UNMISS. (2013, May 28). *UNMISS meets UNIFSA in Aweil North County*.

Varela, G., Cali, M., Pape, U., & Rojas, E. (2016). *Market Integration and Poverty. Evidence from South Sudan*. World Bank.

WFP. (2015). *Market Assessment in South Sudan*.

WFP and FAO. (2016). Special Working Paper on Devaluation of South Sudan Pound: Short-term Food Security Implications.

World Bank. (2016). *Doing Business 2017, South Sudan Economy Profile, 14th edition*. Washington D.C.: International Bank for Reconstruction and Development / The World Bank.

Zimmerman, C. (1932). Ernest Engel's Law of Expenditures for Food. *The Quarterly Journal of Economics*, 47(1), 78-101.

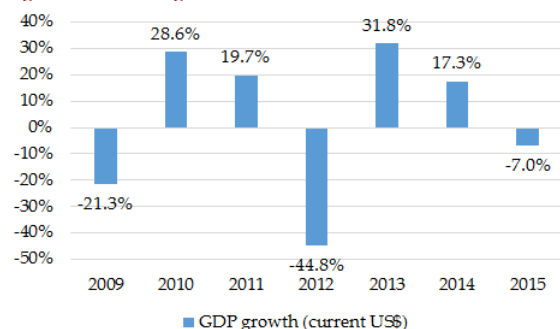


Market in Gok Machar

© WFP/Caccavale Oscar

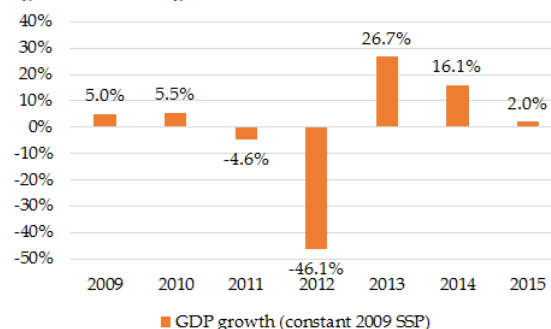
## Annex I - Additional figures and tables

Figure 16 - GDP growth in US\$



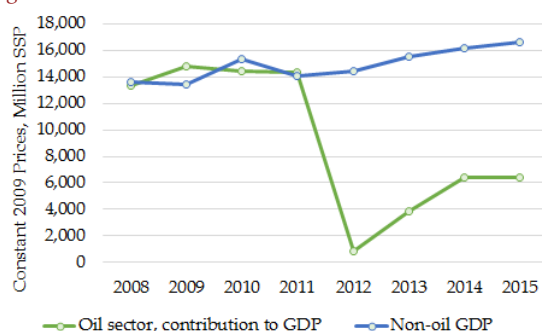
Source: NBS

Figure 17 - GDP growth in constant SSP



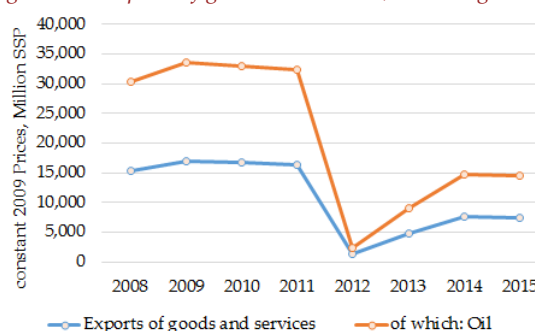
Source: NBS

Figure 18 - Contribution to GDP



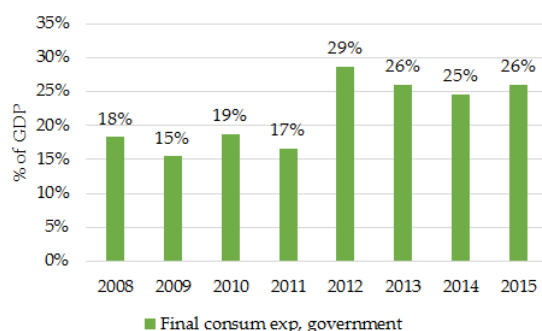
Source: NBS

Figure 19 - Exports of goods and services, including oil



Source: NBS

Figure 20 - Government expenditure



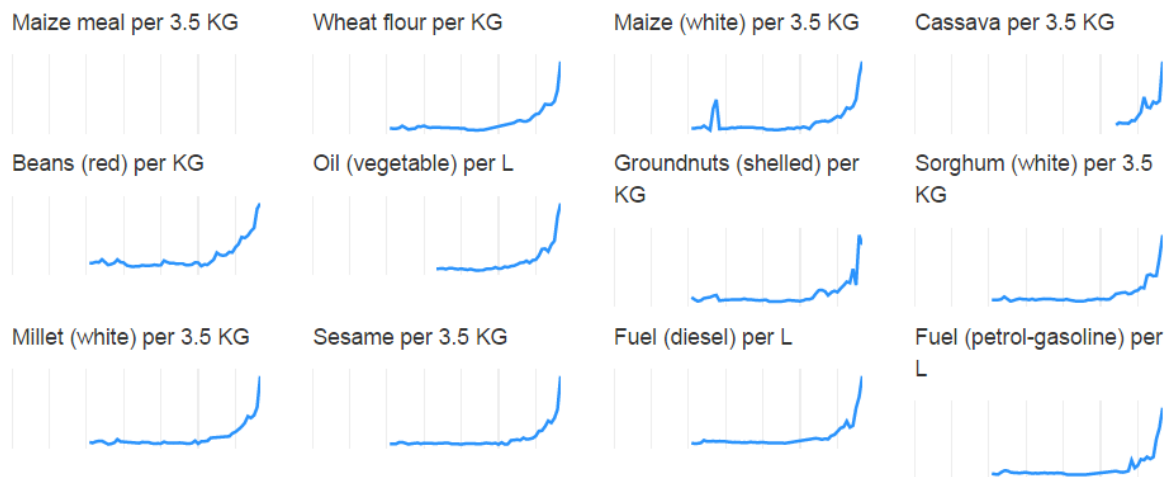
Source: NBS

Table 7 - CPI and Inflation comparison

| Date      | October 2016 release | November 2017 release | Difference | Inflation with October data | Inflation with November data |
|-----------|----------------------|-----------------------|------------|-----------------------------|------------------------------|
| Jan 2016  | 436.23               | 436.23                | 0%         | 163%                        | 163%                         |
| Feb 2016  | 517.19               | 517.19                | 0%         | 203%                        | 203%                         |
| Mar 2016  | 600.83               | 600.83                | 0%         | 245%                        | 245%                         |
| Apr 2016  | 683.32               | 683.32                | 0%         | 266%                        | 266%                         |
| May 2016  | 824.07               | 824.07                | 0%         | 295%                        | 295%                         |
| Jun 2016  | 1027.73              | 720.08                | -30%       | 310%                        | 187%                         |
| July 2016 | 1826.38              | 1318.20               | -28%       | 661%                        | 449%                         |
| Aug 2016  | 2197.06              | 1391.93               | -37%       | 730%                        | 426%                         |
| Sep 2016  | 2378.74              | 1975.12               | -17%       | 682%                        | 549%                         |
| Oct 2016  | 2798.72              | 1779.76               | -36%       | 836%                        | 495%                         |
| Nov 2016  |                      | 1895.30               |            |                             | 457%                         |

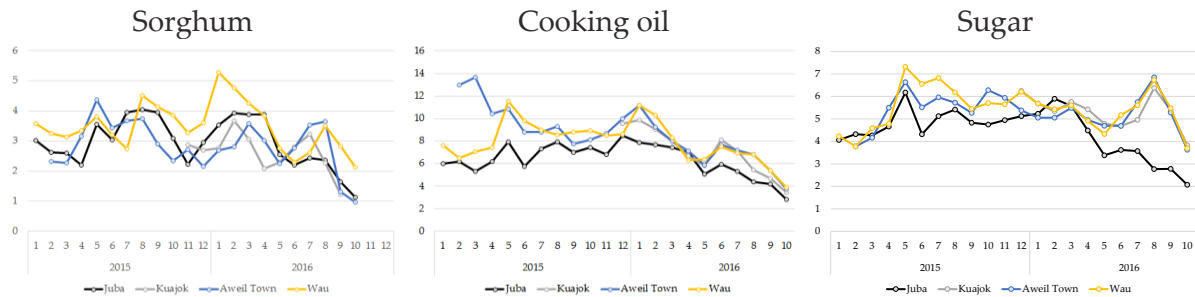
Source: NBS

Figure 21 - Nominal prices, 2010-2016 (national average)



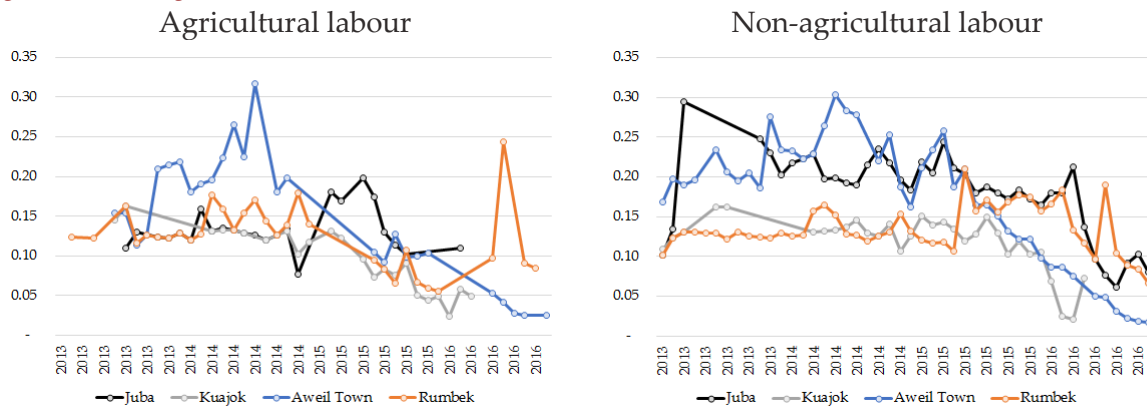
Source: WFP

Figure 22 - Real prices of sorghum, vegetable oil and sugar



Source: NBS and World Bank Price Reporting System, WFP. Authors' calculation

Figure 23 - Real wages



Source: NBS, WFP. Authors' calculation

Source: NBS, WFP. Authors' calculation



Table 8 - Worst documented hyperinflation episodes in history

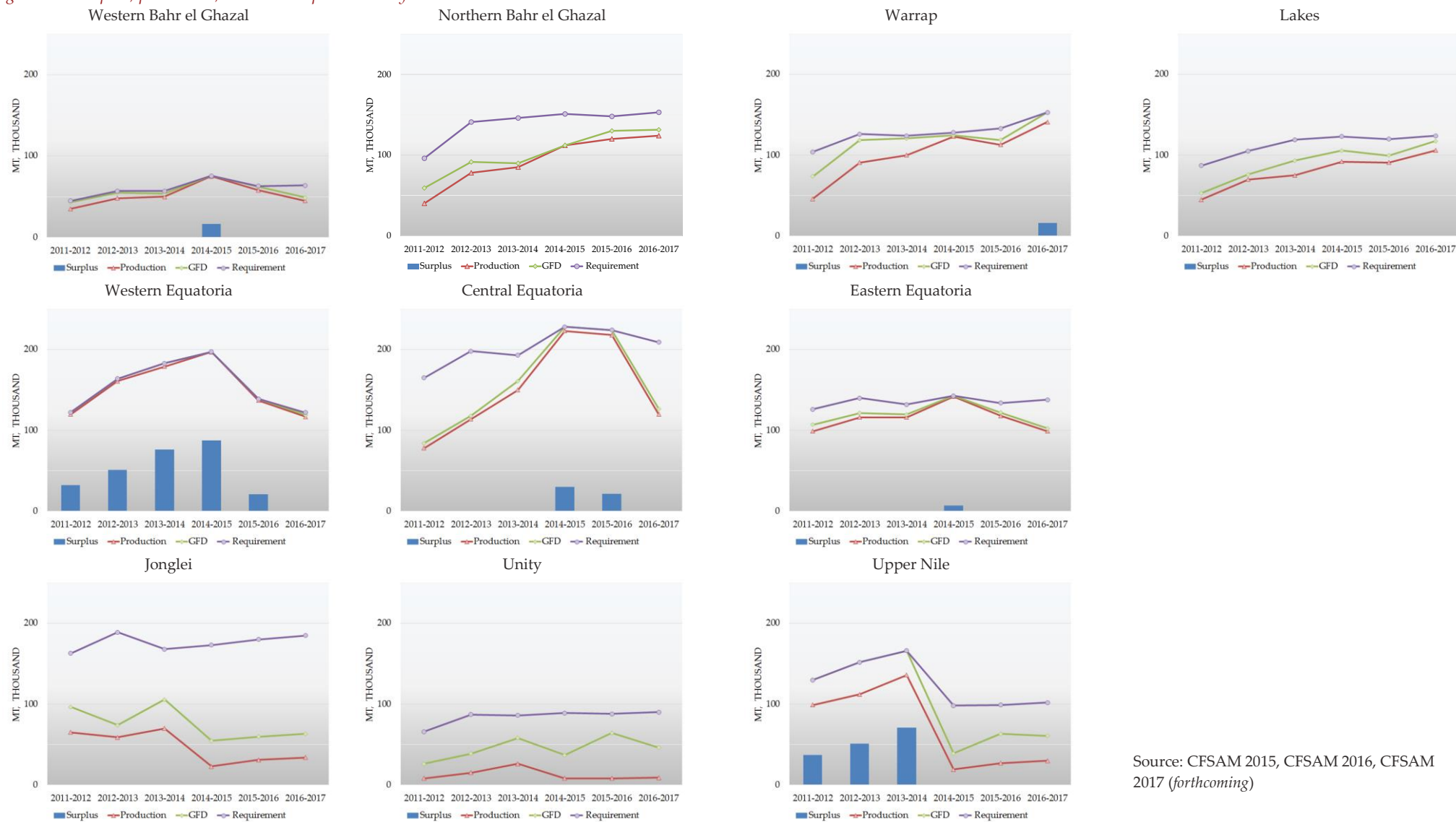
| #  | COUNTRY                           | START DATE      | END DATE | HIGHEST INFLATION RATE | MONTHS OF HYPER-INFLATION <sup>(ϕ)</sup> | START TO PEAK MONTHS <sup>(ϕ)</sup> | PEAK TO END MONTHS <sup>(ϕ)</sup> | HIGHEST MONTHLY INFLATION RATE | EQUIVALENT DAILY INFLATION RATE <sup>(τ)</sup> | DAYS REQUIRED FOR PRICES TO DOUBLE <sup>(ϕ)</sup> | CURRENCY             | TYPE OF PRICE INDEX    |
|----|-----------------------------------|-----------------|----------|------------------------|--|-------------------------------------|-----------------------------------|--------------------------------|--|---|----------------------|------------------------|
| 1  | Hungary                           | Aug-1945        | Jul-1946 | Jul-1946               | 12                                       | 12                                  | 0                                 | 4.19 x 10 <sup>16</sup> %      | 207.2%   | 0.62  | Pengő                | Consumer               |
| 2  | Zimbabwe                          | Mar-2007        | Nov-2008 | Nov-2008               | 21                                       | 21                                  | 0                                 | 7.96 x 10 <sup>10</sup> %      | 98.0%  | 1.01  | Dollar               | Implied Exchange Rate  |
| 3  | Yugoslavia                        | Apr-1992        | Jan-1994 | Jan-1994               | 22                                       | 22                                  | 0                                 | 313000000%                     | 64.6%  | 1.39  | Dinar                | Consumer               |
| 4  | Republika Srpska                  | Apr-1992        | Jan-1994 | Jan-1994               | 22                                       | 22                                  | 0                                 | 297000000%                     | 64.3%  | 1.40  | Dinar                | Consumer               |
| 5  | Germany                           | Aug-1922        | Dec-1923 | Oct-1923               | 17                                       | 15                                  | 2                                 | 29500%                         | 20.9%  | 3.65  | Papiermark           | Wholesale              |
| 6  | Greece                            | May-1941        | Dec-1945 | Oct-1944               | 57                                       | 43                                  | 14                                | 13800%                         | 17.9%  | 4.21  | Drachma              | Exchange Rate          |
| 7  | China                             | Oct-1947        | May-1949 | Apr-1949               | 20                                       | 19                                  | 1                                 | 5070%                          | 14.1%  | 5.27  | Yuan                 | Wholesale for Shanghai |
| 8  | Free City of Danzig               | Aug-1922        | Oct-1923 | Sep-1923               | 15                                       | 14                                  | 1                                 | 2440%                          | 11.4%  | 6.43  | German Papiermark    | Exchange Rate          |
| 9  | <b>South Sudan <sup>(ϕ)</sup></b> | <b>Jun-2015</b> | <b>?</b> | <b>Oct-2016</b>        | <b>17</b>                                | <b>17</b>                           | <b>?</b>                          | <b>836%</b>                    | <b>7.7%</b>                                    | <b>9.30</b>                                       | <b>Pound</b>         | <b>Consumer</b>        |
| 10 | Armenia                           | Oct-1993        | Dec-1994 | Nov-1993               | 15                                       | 2                                   | 13                                | 438%                           | 5.8%   | 12.36   | Dram & Russian Ruble | Consumer               |
| 11 | Turkmenistan                      | Jan-1992        | Nov-1993 | Nov-1993               | 23                                       | 23                                  | 0                                 | 429%                           | 5.7%   | 12.48   | Manat                | Consumer               |
| 12 | Taiwan                            | Aug-1945        | Sep-1945 | Aug-1945               | 2  | 1                                   | 1                                 | 399%                           | 5.5%   | 12.94   | Yen                  | Wholesale for Taipei   |
| 13 | Peru                              | Jul-1990        | Aug-1990 | Aug-1990               | 2  | 2                                   | 0                                 | 397%                           | 5.5%   | 12.97   | Inti                 | Consumer               |
| 14 | Bosnia and Herzegovina            | Apr-1992        | Jun-1993 | Jun-1992               | 15                                       | 3                                   | 12                                | 322%                           | 4.9%   | 14.44   | Dinar                | Consumer               |
| 15 | France                            | May-1795        | Nov-1796 | Aug-1796               | 19                                       | 16                                  | 3                                 | 304%                           | 4.8%   | 14.89   | Mandat               | Exchange Rate          |
| 16 | China                             | Jul-1943        | Aug-1945 | Jun-1945               | 26                                       | 24                                  | 2                                 | 302%                           | 4.7%   | 14.95   | Yuan                 | Wholesale for Shanghai |
| 17 | Ukraine                           | Jan-1992        | Nov-1994 | Jan-1992               | 35                                       | 1                                   | 34                                | 285%                           | 4.6%   | 15.43   | Russian Ruble        | Consumer               |
| 18 | Poland                            | Jan-1923        | Jan-1924 | Oct-1923               | 13                                       | 10                                  | 3                                 | 275%                           | 4.5%   | 15.73   | Marka                | Wholesale              |
| 19 | Nicaragua                         | Jun-1986        | Mar-1991 | Mar-1991               | 59                                       | 59                                  | 0                                 | 261%                           | 4.4%   | 16.20   | Córdoba              | Consumer               |
| 20 | Congo (Zaire)                     | Nov-1993        | Sep-1994 | Nov-1993               | 11                                       | 1                                   | 10                                | 250%                           | 4.3%   | 16.60   | Zaire                | Consumer               |
| 21 | Russia                            | Jan-1992        | Jan-1992 | Jan-1992               | 1  | 1                                   | 0                                 | 245%                           | 4.2%   | 16.79   | Ruble                | Consumer               |
| 22 | Bulgaria                          | Feb-1997        | Feb-1997 | Feb-1997               | 1  | 1                                   | 0                                 | 242%                           | 4.2%   | 16.91   | Lev                  | Consumer               |
| 23 | Moldova                           | Jan-1992        | Dec-1993 | Jan-1992               | 24                                       | 1                                   | 23                                | 240%                           | 4.2%   | 16.99   | Russian Ruble        | Consumer               |
| 24 | Russia / USSR                     | Jan-1922        | Feb-1924 | Feb-1924               | 24                                       | 24                                  | 0                                 | 212%                           | 3.9%   | 18.28   | Ruble                | Consumer               |
| 25 | Georgia                           | Sep-1993        | Sep-1994 | Sep-1994               | 13                                       | 13                                  | 0                                 | 211%                           | 3.9%   | 18.33   | Coupon               | Consumer               |
| 26 | Tajikistan                        | Jan-1992        | Oct-1993 | Jan-1992               | 22                                       | 1                                   | 21                                | 201%                           | 3.7%   | 18.87   | Russian Ruble        | Consumer               |

Source: All data from Hanke & Krus (2012), except (ϕ) from the authors

(τ) Hanke & Krus (2012) compute the equivalent daily inflation rate  $r_d$  as follows:  $r_d = (1 + r_m)^{\frac{1}{360}} - 1$ , where  $r_m$  is the highest monthly inflation rate

(ϕ) We calculate the days  $d$  required for prices to double as follows:  $d = \frac{\log(2)}{\log(1+r_d)}$

Figure 24 - Surplus, production, GFD and requirements by area



Source: CFSAM 2015, CFSAM 2016, CFSAM 2017 (forthcoming)

## Annex II - Nominal and real effective exchange rates

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There are different ways to compute the nominal and real effective exchange rates. We used the following formulas for Section II.2 Effective exchange rate:

$$NEER_t = \prod_{i=1}^k \left( \frac{e_{it}}{e_{it_0}} \right)^{w_i}$$

$$REER_t = \prod_{i=1}^k \left( \frac{e_{it}}{e_{it_0}} \times \frac{p_i}{p_{SSD}} \right)^{w_i}$$

$$w_i = \frac{X_i + M_i}{\sum_{i=1}^k (X_i + M_i)}$$

Where:

- $e_{it}$  is the monthly average nominal exchange rate between national and foreign currency of country  $i$  at time  $t$
- $e_{it_0}$  is the monthly average nominal exchange rate between national and foreign currency of country  $i$  as at the baseline time  $t_0$  (i.e. December 2011)
- $p_i$  is the monthly consumer price index of country  $i$
- $p_{SSD}$  is the monthly consumer price index of South Sudan
- $X_i$  is the value in US\$ of total exports of South Sudan to country  $i$  between 2012 and 2014
- $M_i$  is the value in US\$ of total imports of South Sudan from country  $i$  between 2012 and 2014

## Annex III - Model procedure specification for price/GFD analysis

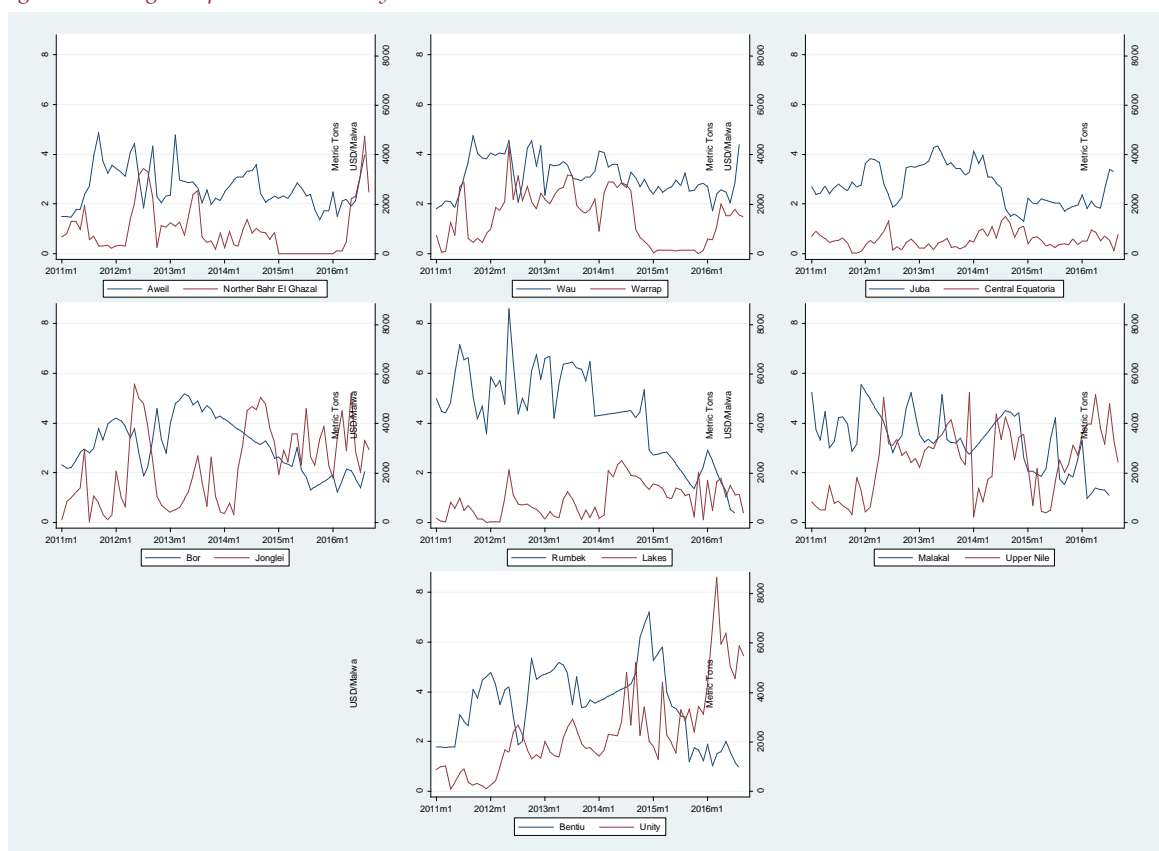
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The findings in Section IV. Price analysis require a statistical procedure to select the most appropriate model to test the causality and the long-run relationship of each pair of price time series. The procedure is as follows:

1. We first exclude the time series that do not satisfy the following minimum criteria:
  - 36 observations
  - 1 observation per month
  - Less than 5 percent of missing values
2. We then run a number of statistical tests to detect unit roots and stationarity:
  - Augmented Dickey-Fuller Unit roots test
  - Phillips-Perron unit roots test
  - Kwiatkowski-Phillips-Schmidt-Shin stationarity test
  - Clemente-Montanés-Reyes unit roots test in presence of structural breaks

3. A vector auto-regressive (VAR) model is specified and then checked for autocorrelation in residuals due to potential exclusion and inclusion errors by using:
  - VAR maximum likelihood autocorrelation test
  - Wald lag-exclusion statistics
 where the following criteria were considered to determine the number of lags to include in the model:
  - Parsimony on degrees of freedom
  - Maximum log likelihood value and ratio
  - Final Prediction Error
  - Akaike Information Criterion
  - Bayesian Information Criterion
  - Hannan-Quinn Information Criterion
4. A companion Vector Error Correction (VEC) model is used to determine the number of co-integrating vectors conditional on trend specification and lag order by running:
  - Johansen trace statistic method
5. In order to support the hypothesis of a direct effect of one series on the other we use:
  - Granger Non-Causality test on model 3
  - Presence of co-integration on model 4
6. If at least one of the two conditions in step 5 is satisfied, then either the VAR or the VEC model is used to build the Impulse Response Function.

Figure 25 - Sorghum prices and GFD by state



Source: WFP. Blue lines refer to prices in the specified markets, while red lines refer to GFD in the specified states



*Table 9 - Granger and Johansen tests for prices and GFD*

| Market  | Granger test |                | Johansen test  |      |
|---------|--------------|----------------|----------------|------|
|         | Food aid on  | Prices on food | Max eigenvalue | Rank |
| Aweil   | 0.833        | 0.079 *        | 18.82 **       | 0    |
| Bentiu  | 0.291        | 0.121          | 10.61          | -    |
| Bor     | 0.037 **     | 0.013 **       | 18.35 **       | 0    |
| Juba    | 0.097 *      | 0.616          | 23.55 ***      | 1    |
| Malakal | 0.220        | 0.716          | 22.39 ***      | 1    |
| Rumbek  | 0.042 **     | 0.613          | 18.73 **       | 0    |
| Wau     | 0.747        | 0.151          | 33.08 ***      | 1    |

Source: WFP. Authors' calculation. The notations (\*\*\*) , (\*\*) and (\*) imply a level of significance of the tests at 1, 5 and 10 percent, respectively



Dried fish sold along the road in Ajak

Table 10 - GFD to sorghum price models

| Aweil - Northern Bahr El Ghazal |       |             |                | Bentiu - Unity |       |             |                | Bor - Jonglei  |       |             |                |
|---------------------------------|-------|-------------|----------------|----------------|-------|-------------|----------------|----------------|-------|-------------|----------------|
|                                 |       | Log (Price) | Log (Food Aid) |                |       | Log (Price) | Log (Food Aid) |                |       | Log (Price) | Log (Food Aid) |
|                                 |       | VAR         |                |                |       | VAR         |                |                |       | VAR         |                |
| Log (Price)                     | Lag 1 | 0.601 *     | 0.006          | Log (Price)    | Lag 1 | 0.838 *     | -0.408 *       | Log (Price)    | Lag 1 | 0.725 *     | -1.929 *       |
| Log (Food Aid)                  | Lag 1 | 0.013 *     | 0.916 *        | Log (Price)    | Lag 4 | 0.043       | 0.331 *        | Log (Price)    | Lag 4 | 0.167 *     | 1.152 *        |
|                                 |       |             |                | Log (Food Aid) | Lag 1 | -0.042      | 0.669 *        | Log (Food Aid) | Lag 1 | -0.043 *    | 0.412 *        |
|                                 |       |             |                |                | Lag 4 | 0.007       | 0.193 *        | Log (Food Aid) | Lag 4 | 0.005       | -0.190 *       |
| Constant                        |       | 0.448 *     | 0.474          | Constant       |       | 0.435 *     | 1.223 *        | Constant       |       | 0.430 *     | 6.830 *        |

| Rumbek - Lakes |             |             |                | Malakal - Upper Nile        |       |                      |          | Wau - Warrap   |        |                |          |
|----------------|-------------|-------------|----------------|-----------------------------|-------|----------------------|----------|----------------|--------|----------------|----------|
|                |             | Log (Price) | Log (Food Aid) | Diff(Log (Price))           |       | Diff(Log (Food Aid)) |          | Log (Price)    |        | Log (Food Aid) |          |
|                |             | VAR         |                | VEC (Moving Average Impact) |       |                      |          |                |        | VAR            |          |
| Log (Price)    | Lag 1       | 0.872 *     | 0.383          | Log (Price)                 | Lag 1 | 0.888 *              | -0.817 * | Log (Price)    | Lag 1  | 0.470 *        | 1.148 *  |
| Log (Food Aid) | Lag 2       | -0.038 *    | 0.764 *        | Log (Food Aid)              | Lag 2 | -0.122 *             | 0.112 *  | Log (Food Aid) | Lag 1  | -0.005         | 0.618 *  |
|                | Lag 11      | -0.047 *    | 0.228 *        | Cointegrating               | Beta  | 1.000 *              | 1.087 *  |                | Lag 3  | 0.039 *        | 0.174 *  |
|                | Lag 2, Diff | 0.013       | -0.311 *       | Eq.                         | C     | -9.684 *             | -9.684 * |                | Lag 11 | -0.022         | -0.591 * |
| Constant       |             | 0.719 *     | -0.505         | Constant                    |       | -0.020               | 0.003    | Constant       |        | 0.596 *        | 0.691    |

| Juba - Central Equatoria |       |             |                |
|--------------------------|-------|-------------|----------------|
|                          |       | Log (Price) | Log (Food Aid) |
|                          |       | VAR         |                |
| Log (Price)              | Lag 1 | 0.780 *     | -0.198         |
| Log (Food Aid)           | Lag 1 | -0.028 *    | 0.655 *        |
|                          | Lag 3 | -0.050 *    | -0.166 *       |
| Constant                 |       | 0.761 *     | 3.340 *        |

Source: WFP. Authors' calculation. The notation (\*) implies a level of significance of the test at 5 percent



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Malwa of sugar



## Annex IV - CBT dashboards

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The findings described in Section V. CBT capacity are the outcome of the following procedure:

1. We estimate the yearly cereal requirements in a specific area, based on CFSAM 2017 data, as the result of the projected population growth and the per capita requirements.
2. The cereal requirement is the amount of food that needs to be supplied by own production, market supply from local producers or importers, and in-kind food distributions.
3. For each month we compute the '**cereal requirement**', the '**requirements net of GFD**', and the '**cumulative consumption**' (current month requirement plus previous month requirements).
4. We break down the '**cumulative consumption**' based on the different sources of supply (GFD, own production, local supply in the market, and imported supply) by month:
  - a) For the sake of simplicity, we consider '**consumption from GFD**' in 2017 as the weighted average of the metric tons distributed in 2014, 2015 and 2016 (respectively with the increasing weights of 17, 33 and 50 percent). The GFD metric tons computed for 2017 are then distributed equally into twelve months even though GFD normally increase in the lean season.
  - b) '**Consumption from local supply**' in the market by month is derived as a share of '**requirements net from GFD**' times the market dependency derived from FSMS data (see also Section II.3 Market dependency). The market dependencies in NBEG are 31 percent in the harvest season (between October and December), 74 percent in the dry season (between January and April), and 84 percent in the rainy season (between May and September). The equivalent figures for Warrap are respectively 10, 42 and 69 percent.
  - c) '**Consumption from own production**' by month is the remaining part of the '**requirements net of GFD**' if we also remove '**consumption from local supply**' in the market.
  - d) Given the current challenging market context described in the paper, we assume that traders will be supplying cereals from local production first, to then deal with imported goods once local supply is exhausted. As such, '**consumption from imported supply**' is the difference between '**requirements net of GFD**' on the one side, and '**consumption from own production**' plus '**consumption from local supply**' on the other side.
  - e) The bottom panes of Figure 26 to Figure 29 show the sources of '**cumulative consumption**' on a yearly basis and with a monthly breakdown.
  - f) For each month, we also compute the '**market demand**' as the sum of local and imported supply.
5. We then provide different scenarios, based on the number of beneficiaries who will be assisted with CBT. Each scenario takes into account an increase in the CBT caseload of 5,000 people, ranging from 0 (no CBT at all) to 100,000. Figures in the upper left pane

of the dashboards show the number of GFD and CBT beneficiaries as a proportion of the total population. The rationale behind building such scenarios is twofold: i) the metric tons provided via GFD need to be substituted by another supply source (either local or imported) the higher the caseload. Depending on the scenario, this substitution effect will end once no more beneficiaries are assisted with GFD; ii) for each scenario we can thus estimate the **'demand to be satisfied by CBT'**, based on the caseload times the per capita requirements as per CFSAM 2017 data. The latter is a loose proxy of the additional demand triggered by the CBT caseload.

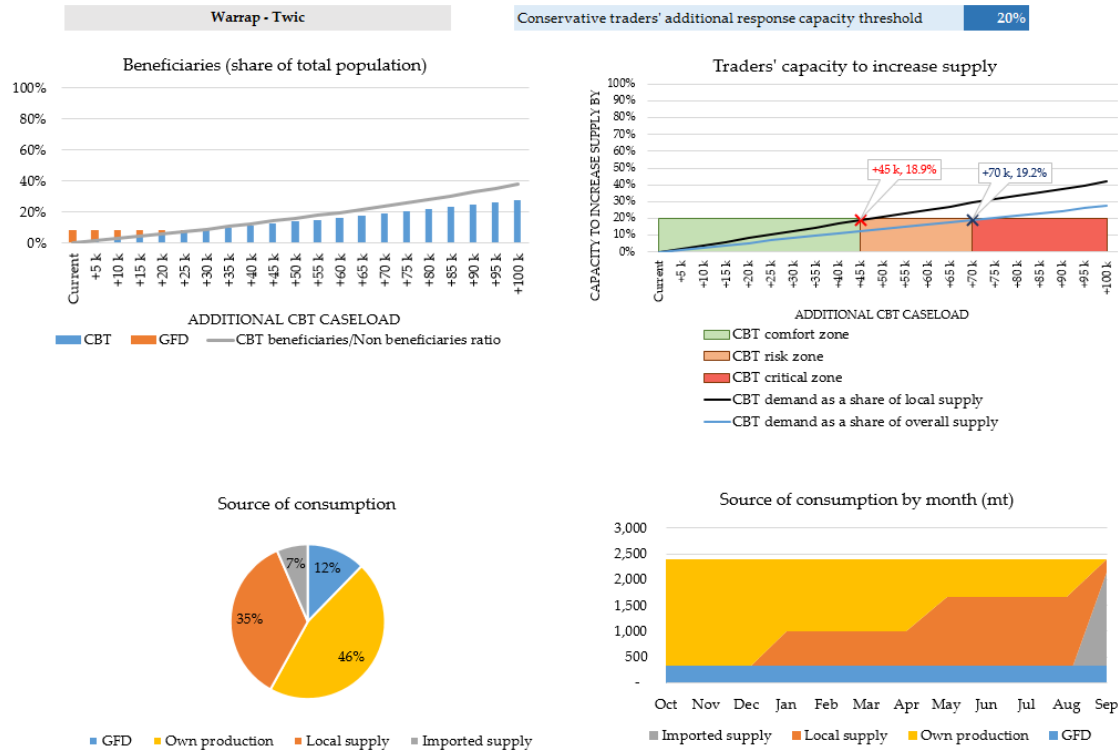
6. We estimate the **'market demand as a share of local supply'** and the **'market demand as a share of overall supply'**. Both shares have at the numerator the **'demand to be satisfied by CBT'**, while at the denominator respectively **'consumption from local supply'** and the sum of **'consumption from local supply'** and **'consumption from imported supply'**.
7. For each dashboard, we give an arbitrarily defined threshold for **'traders' capacity to increase supply'**: 30 percent in Aweil Centre, 20 percent in Twic – as we believe that markets are more structured there (see also Table 2 and Table 6 in the main body of the paper) – and 10 percent for the remaining counties in NBEG.
8. Finally, in the upper right pane in Figure 26 to Figure 31 we define three areas whenever the **'traders' capacity to increase the supply'** is:
  - ✓ Lower than the **'market demand as a share of local supply'** (green area). In this case, we define a **'CBT comfort zone'** as being when the demand associated with CBT can be met by local supply alone.
  - ✓ Lower than the **'market demand as a share of overall supply'** (orange area). In this case, we define a **'CBT risk zone'**, where traders will have to rely on imported food. Compared to the **'CBT comfort zone'**, the higher the caseload, the less likely markets will be able to supply the required metric tons.
  - ✓ Higher than the **'market demand as a share of overall supply'** (red area). In this case, we define a **'CBT critical zone'** where, according to the scenario simulated, CBT is not recommended as the extra demand will exceed traders' capacity to increase local and imported supply.



Edge of the marketplace in Turalei

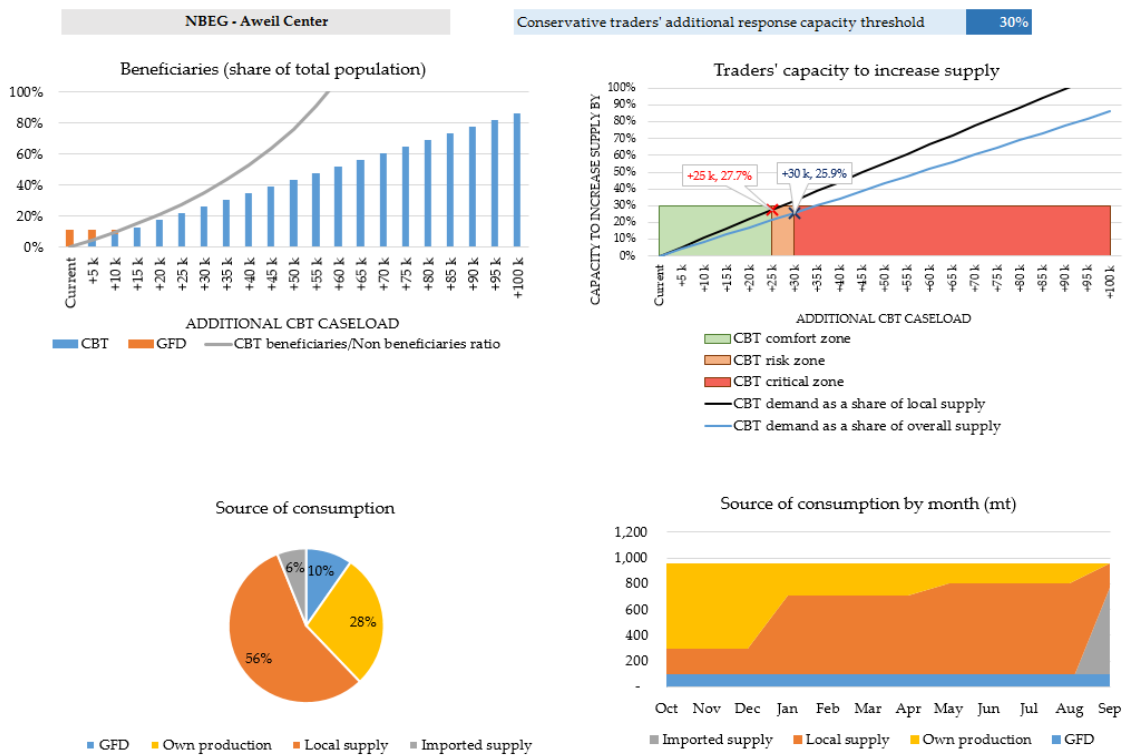


Figure 26 - CBT beneficiaries in Twic (dashboard)



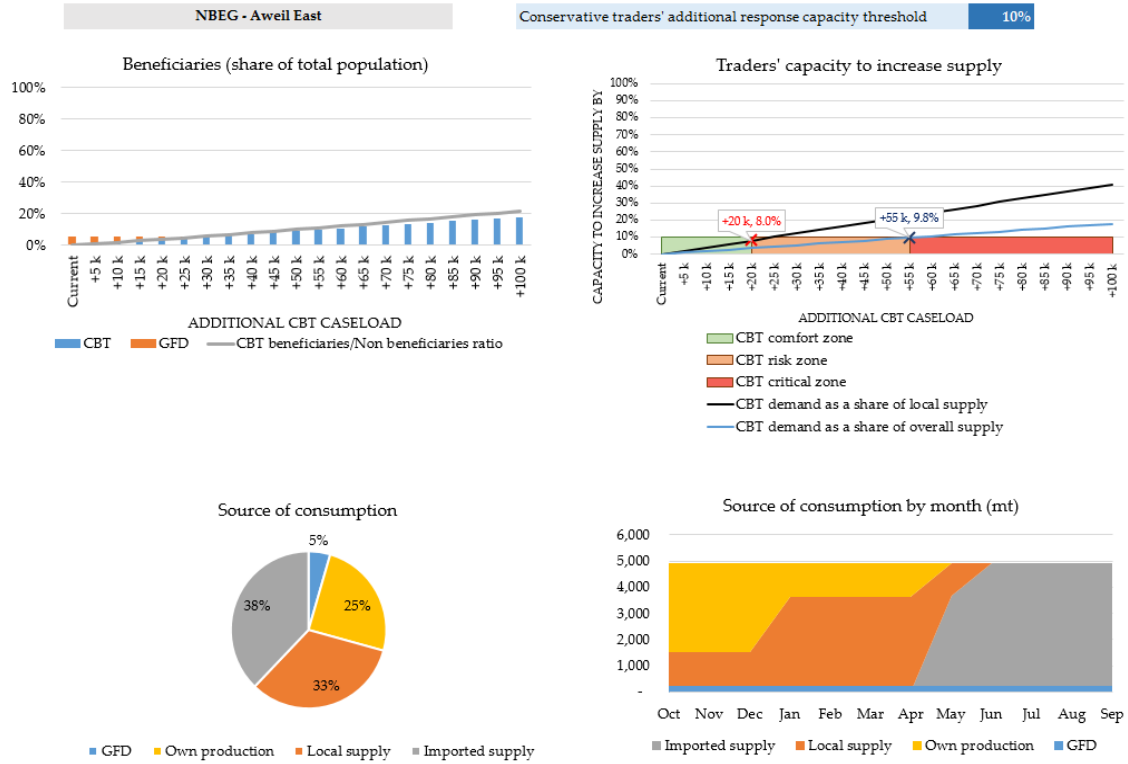
Source: NBS, WFP, CFSAM 2017 (forthcoming). Authors' calculation

Figure 27 - CBT beneficiaries in Aweil Centre (dashboard)



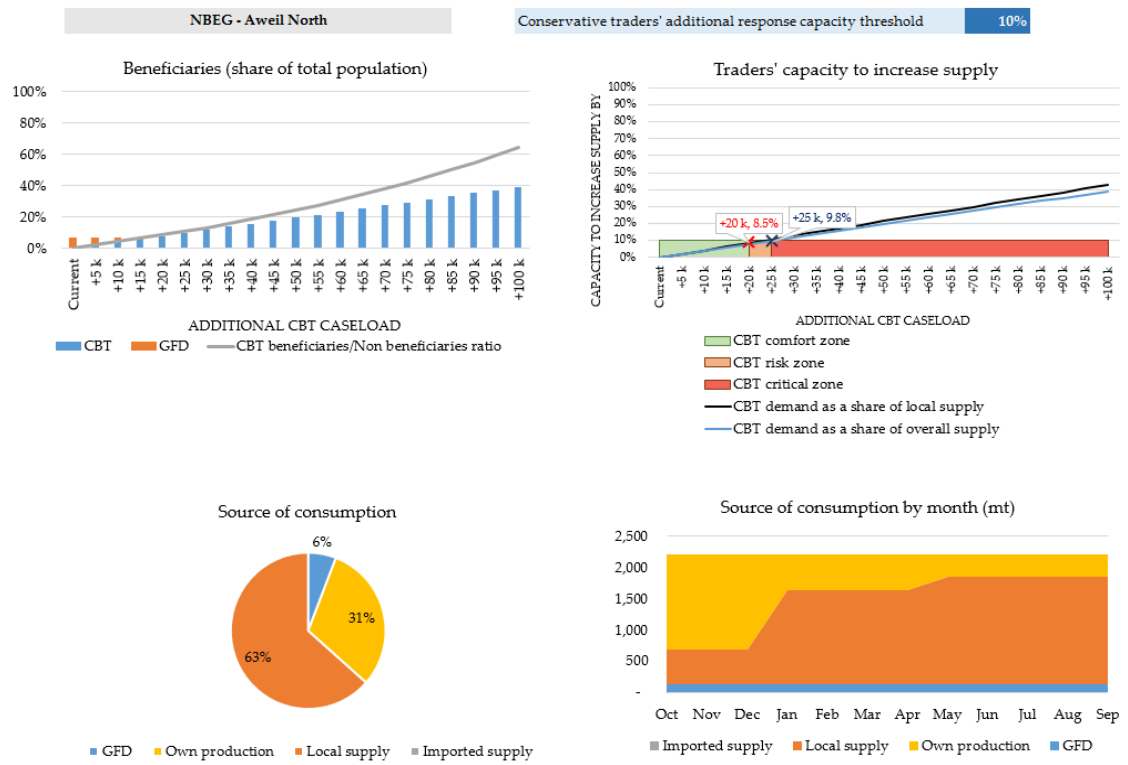
Source: NBS, WFP, CFSAM 2017 (forthcoming). Authors' calculation

Figure 28 - CBT beneficiaries in Aweil East (dashboard)



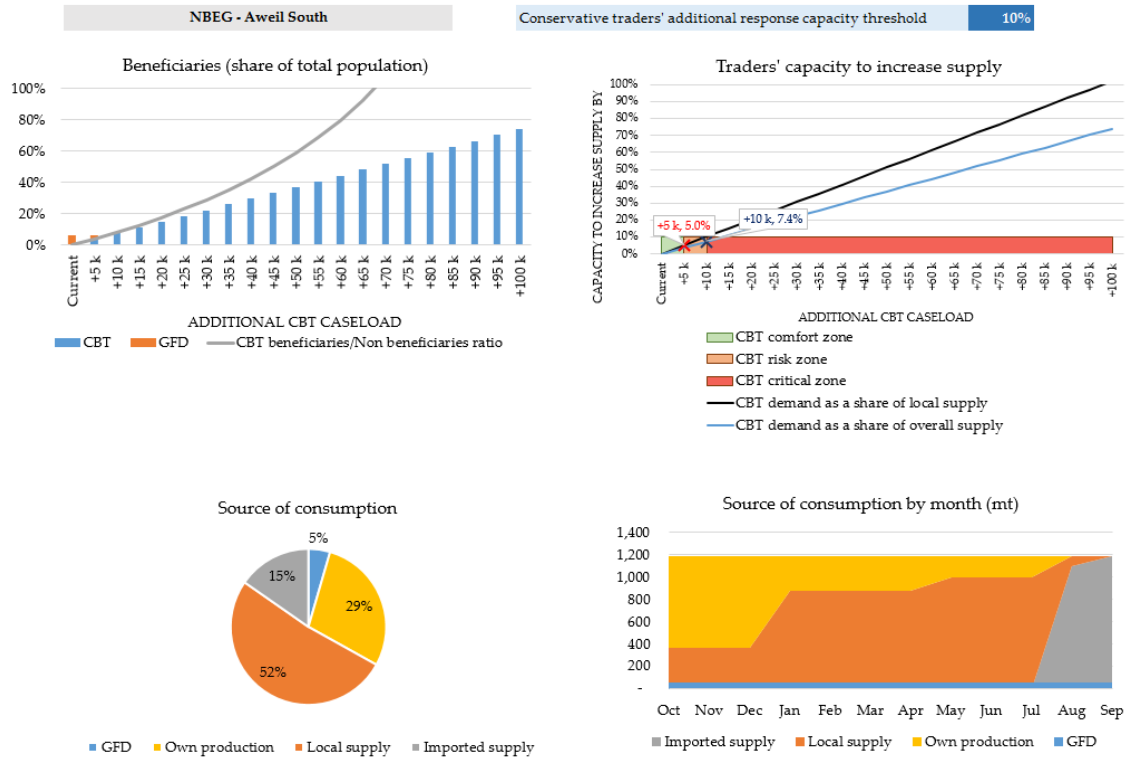
Source: NBS, WFP, CFSAM 2017 (forthcoming). Authors' calculation

Figure 29 - CBT beneficiaries in Aweil North (dashboard)



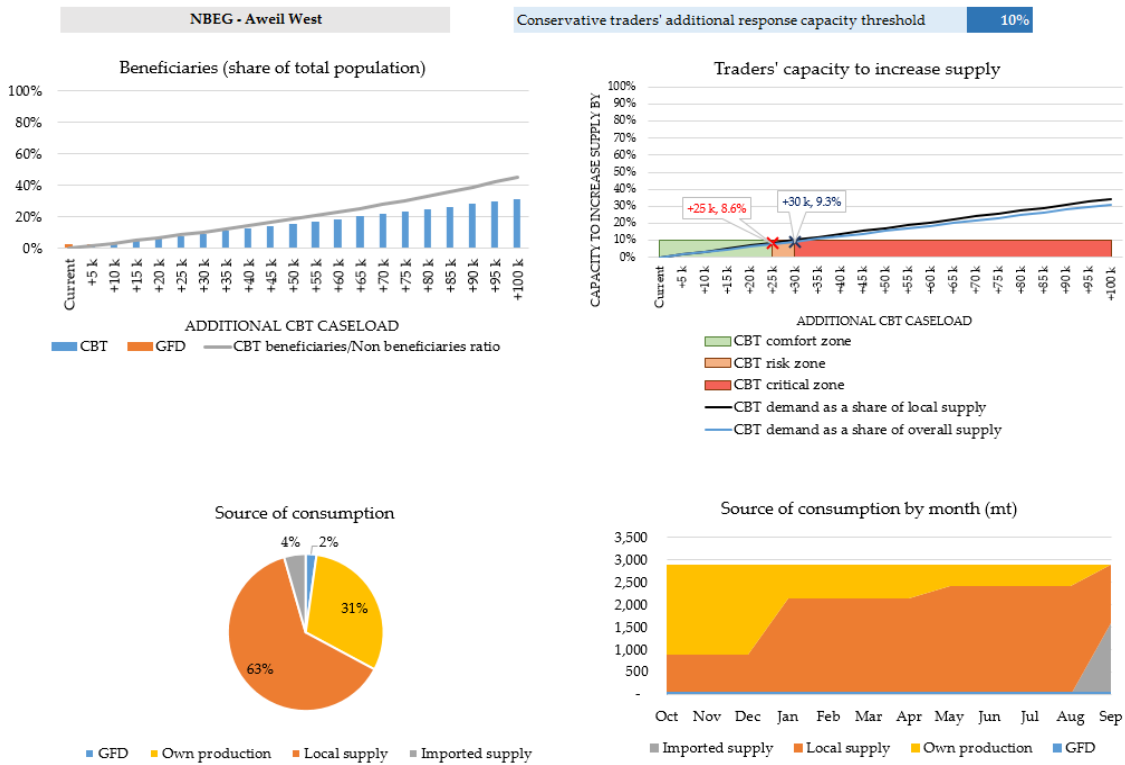
Source: NBS, WFP, CFSAM 2017 (forthcoming). Authors' calculation

Figure 30 - CBT beneficiaries in Aweil South (dashboard)



Source: NBS, WFP, CFSAM 2017 (forthcoming). Authors' calculation

Figure 31 - CBT beneficiaries in Aweil West (dashboard)



Source: NBS, WFP, CFSAM 2017 (forthcoming). Authors' calculation

## Annex V - Market questionnaire



**vam**  
food security analysis

# Rapid Market Assessment

## *Warrap and North Bahr el Ghazal*

**Market:**

**Field visit:**

**Key informants:**

**Background information:**

| <b>PRICES</b> | 1. What basic food commodities are traded in this market? What is the actual wholesale price? Can you please specify the source of the commodities? |        |                |           |       |        |
|---------------|---|--------|----------------|-----------|-------|--------|
|               | <i>Retail prices can be collected in the market visit. It is also good practice to double-check the wholesale prices in the market.</i>             |        |                |           |       |        |
|               | COMMODITY   | RETAIL |                | WHOLESALE |       | SOURCE |
|               |   | Unit   | Price          | Unit      | Price |        |
|               | Sorghum (white)   | 3.5 KG |                | 100 KG    |       |        |
|               | Beans (red)   | 1 KG   |                | 50 KG     |       |        |
|               | Cassava   | 3.5 KG |                |           |       |        |
|               | Groundnuts (shelled)  | 1 KG   |                | 100 KG    |       |        |
|               | Maize (white)   | 3.5 KG |                | 100 KG    |       |        |
|               | Millet (white)  | 3.5 KG |                |           |       |        |
|               | Oil (sunflower)   | 1 L    |                | 20 L      |       |        |
|               | Oil (groundnuts)  | 1 L    |                | 18 L      |       |        |
|               | Sesame  | 3.5 KG |                |           |       |        |
|               | Wheat flour   | 3.5 KG |                | 50 KG     |       |        |
|               | Sugar (white)   | 1 KG   |                | 50 KG     |       |        |
| Sugar (brown) | 1 KG  |        |                |           |       |        |
| Rice          | 1 KG  |        | 25 KG<br>20 KG |           |       |        |



| <b>AVAILABILITY</b>  | 2. Are there food commodities that are currently not available?<br><table border="1" style="width: 100%; border-collapse: collapse; margin-top: 5px;"> <tr> <td style="width: 25%; text-align: center;">Yes</td> <td style="width: 25%;"></td> <td style="width: 25%; text-align: center;">No</td> <td style="width: 25%;"></td> </tr> </table>   | Yes          |                | No                   |                      |                      |           |        |           |           |  |  |  |              |  |  |  |                      |  |     |  |    |  |  |  |  |  |
|--|---|--------------|----------------|----------------------|----------------------|----------------------|-----------|--------|-----------|-----------|--|--|--|--------------|--|--|--|----------------------|--|-----|--|----|--|--|--|--|--|
|  | Yes   |              | No             |                      |                      |                      |           |        |           |           |  |  |  |              |  |  |  |                      |  |     |  |    |  |  |  |  |  |
|  | 3. Do traders usually run out of stocks? Why?<br><br><table border="1" style="width: 100%; border-collapse: collapse; margin-top: 5px;"> <tr> <td colspan="4" style="text-align: center;">Dry season</td> <td colspan="2" style="text-align: center;">Commodity and reason</td> </tr> <tr> <td style="text-align: center;">Yes</td> <td></td> <td style="text-align: center;">No</td> <td></td> <td colspan="2"></td> </tr> </table><br><br><table border="1" style="width: 100%; border-collapse: collapse; margin-top: 5px;"> <tr> <td colspan="4" style="text-align: center;">Rainy season</td> <td colspan="2" style="text-align: center;">Commodity and reason</td> </tr> <tr> <td style="text-align: center;">Yes</td> <td></td> <td style="text-align: center;">No</td> <td></td> <td colspan="2"></td> </tr> </table> | Dry season   |                |                      |                      | Commodity and reason |           | Yes    |           | No        |  |  |  | Rainy season |  |  |  | Commodity and reason |  | Yes |  | No |  |  |  |  |  |
|  | Dry season  |              |                |                      | Commodity and reason |                      |           |        |           |           |  |  |  |              |  |  |  |                      |  |     |  |    |  |  |  |  |  |
| Yes  |   | No           |                |                      |                      |                      |           |        |           |           |  |  |  |              |  |  |  |                      |  |     |  |    |  |  |  |  |  |
| Rainy season   |   |              |                | Commodity and reason |                      |                      |           |        |           |           |  |  |  |              |  |  |  |                      |  |     |  |    |  |  |  |  |  |
| Yes  |   | No           |                |                      |                      |                      |           |        |           |           |  |  |  |              |  |  |  |                      |  |     |  |    |  |  |  |  |  |
| 4. Are these prices normally higher, same or lower compared to the following markets?  | <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 5px;"> <thead> <tr> <th style="width: 30%;">Market</th> <th style="width: 30%;">Harvest season</th> <th style="width: 30%;">Rainy season</th> </tr> </thead> <tbody> <tr> <td>Aweil town</td> <td>H - S - L</td> <td>H - S - L</td> </tr> <tr> <td>Kuajok</td> <td>H - S - L</td> <td>H - S - L</td> </tr> </tbody> </table>   | Market       | Harvest season | Rainy season         | Aweil town           | H - S - L            | H - S - L | Kuajok | H - S - L | H - S - L |  |  |  |              |  |  |  |                      |  |     |  |    |  |  |  |  |  |
| Market   | Harvest season  | Rainy season |                |                      |                      |                      |           |        |           |           |  |  |  |              |  |  |  |                      |  |     |  |    |  |  |  |  |  |
| Aweil town   | H - S - L   | H - S - L    |                |                      |                      |                      |           |        |           |           |  |  |  |              |  |  |  |                      |  |     |  |    |  |  |  |  |  |
| Kuajok   | H - S - L   | H - S - L    |                |                      |                      |                      |           |        |           |           |  |  |  |              |  |  |  |                      |  |     |  |    |  |  |  |  |  |
| <b>'BIG' TRADERS</b>   | 5. How many 'big traders' (e.g. wholesalers) that sell food operate in this market? Where are they from?  |              |                |                      |                      |                      |           |        |           |           |  |  |  |              |  |  |  |                      |  |     |  |    |  |  |  |  |  |
| 6. Have you noticed a significant change of the number of these 'big traders' since July/August and since 2014? Why?   | <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 5px;"> <tr> <td style="width: 25%; text-align: center;">Yes</td> <td style="width: 25%;"></td> <td style="width: 25%; text-align: center;">No</td> <td style="width: 25%;"></td> </tr> </table>  | Yes          |                | No                   |                      |                      |           |        |           |           |  |  |  |              |  |  |  |                      |  |     |  |    |  |  |  |  |  |
| Yes  |   | No           |                |                      |                      |                      |           |        |           |           |  |  |  |              |  |  |  |                      |  |     |  |    |  |  |  |  |  |
| 7. Can you please give your definition of a 'big trader' in terms of average metric tons traded per month during the dry season?   |   |              |                |                      |                      |                      |           |        |           |           |  |  |  |              |  |  |  |                      |  |     |  |    |  |  |  |  |  |
| 8. You have mentioned that there are X ( <i>see question 5</i> ) 'big traders', each one bringing Y ( <i>see question 7</i> ) mt per month. Is it correct to assume that in this market there are X*Y mt of food supplies per month?<br><br><i>This is a check for questions 5 to 7. Use this question to double-check in particular the answer for question 7. Try to have a more detailed breakdown of the supply capacity of the 'big' traders.</i> |   |              |                |                      |                      |                      |           |        |           |           |  |  |  |              |  |  |  |                      |  |     |  |    |  |  |  |  |  |

|                            | 9. Who are the most important customers for the 'big' traders?   | <table border="1"> <thead> <tr> <th>Customers</th> <th>Importance (1-4)</th> <th>From</th> </tr> </thead> <tbody> <tr> <td>Local traders</td> <td></td> <td></td> </tr> <tr> <td>Traders from other markets</td> <td></td> <td></td> </tr> <tr> <td>Households</td> <td></td> <td></td> </tr> <tr> <td>Other, specify</td> <td></td> <td></td> </tr> </tbody> </table>   | Customers        | Importance (1-4)                          | From                  | Local traders   |  |  | Traders from other markets |  |  | Households           |  |  | Other, specify |  |  |                |  |  |                     |  |  |                |  |  |
|----------------------------|--|--|------------------|---|-----------------------|-----------------|--|--|----------------------------|--|--|----------------------|--|--|----------------|--|--|----------------|--|--|---------------------|--|--|----------------|--|--|
|                            |  | Customers  | Importance (1-4) | From                                      |                       |                 |  |  |                            |  |  |                      |  |  |                |  |  |                |  |  |                     |  |  |                |  |  |
| Local traders              |  |  |                  |   |                       |                 |  |  |                            |  |  |                      |  |  |                |  |  |                |  |  |                     |  |  |                |  |  |
| Traders from other markets |  |  |                  |   |                       |                 |  |  |                            |  |  |                      |  |  |                |  |  |                |  |  |                     |  |  |                |  |  |
| Households                 |  |  |                  |   |                       |                 |  |  |                            |  |  |                      |  |  |                |  |  |                |  |  |                     |  |  |                |  |  |
| Other, specify             |  |  |                  |   |                       |                 |  |  |                            |  |  |                      |  |  |                |  |  |                |  |  |                     |  |  |                |  |  |
| RE-STOCKING                | 10. How often do you restock by season? (e.g. daily/weekly/bi-weekly/monthly)  | <table border="1"> <thead> <tr> <th>Dry season</th> <th>Rainy season</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> </tr> </tbody> </table>  | Dry season       | Rainy season                              |                       |                 |  |  |                            |  |  |                      |  |  |                |  |  |                |  |  |                     |  |  |                |  |  |
|                            | Dry season   | Rainy season   |                  |   |                       |                 |  |  |                            |  |  |                      |  |  |                |  |  |                |  |  |                     |  |  |                |  |  |
|                            |  |  |                  |   |                       |                 |  |  |                            |  |  |                      |  |  |                |  |  |                |  |  |                     |  |  |                |  |  |
|                            | 11. How long does the round-trip to get these stocks take, including the road trip, and the time spent in the market to buy the commodities?   | <table border="1"> <thead> <tr> <th></th> <th>Dry season</th> <th>Rainy season</th> </tr> </thead> <tbody> <tr> <td>Juba</td> <td></td> <td></td> </tr> <tr> <td>Sudan</td> <td></td> <td></td> </tr> </tbody> </table>  |                  | Dry season                                | Rainy season          | Juba            |  |  | Sudan                      |  |  |                      |  |  |                |  |  |                |  |  |                     |  |  |                |  |  |
|                            | Dry season   | Rainy season   |                  |   |                       |                 |  |  |                            |  |  |                      |  |  |                |  |  |                |  |  |                     |  |  |                |  |  |
| Juba                       |  |  |                  |   |                       |                 |  |  |                            |  |  |                      |  |  |                |  |  |                |  |  |                     |  |  |                |  |  |
| Sudan                      |  |  |                  |   |                       |                 |  |  |                            |  |  |                      |  |  |                |  |  |                |  |  |                     |  |  |                |  |  |
| SUPPLY CHAIN               | 12. We have already quickly touched on the sources of food commodities. Please could you elaborate further, indicating which the main trade routes for this market are now and how the business works in detail?<br><br><i>Show a map if necessary and refer to Juba, Wau, Aweil, Abyei, Sudan, Bentiu, Warrap</i> |  |                  |   |                       |                 |  |  |                            |  |  |                      |  |  |                |  |  |                |  |  |                     |  |  |                |  |  |
|                            | 13. What price do you buy sorghum at? In which market?   | <table border="1"> <thead> <tr> <th>Source</th> <th>Price</th> <th>Unit</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td></td> </tr> </tbody> </table>   | Source           | Price                                     | Unit                  |                 |  |  |                            |  |  |                      |  |  |                |  |  |                |  |  |                     |  |  |                |  |  |
| Source                     | Price  | Unit   |                  |   |                       |                 |  |  |                            |  |  |                      |  |  |                |  |  |                |  |  |                     |  |  |                |  |  |
|                            |  |  |                  |   |                       |                 |  |  |                            |  |  |                      |  |  |                |  |  |                |  |  |                     |  |  |                |  |  |
|                            | 14. Can you provide a breakdown of the cost incurred per bag, including rental of truck, taxes, checkpoints, and other costs?  | <table border="1"> <thead> <tr> <th>COSTS</th> <th>SUDAN<br/>Cost per bag (100 KG) of sorghum</th> <th>JUBA<br/>(25 MT truck)</th> </tr> </thead> <tbody> <tr> <td>Rental of truck</td> <td></td> <td></td> </tr> <tr> <td>Taxation source</td> <td></td> <td></td> </tr> <tr> <td>Taxation destination</td> <td></td> <td></td> </tr> <tr> <td>Checkpoints</td> <td></td> <td></td> </tr> <tr> <td>Porters source</td> <td></td> <td></td> </tr> <tr> <td>Porters destination</td> <td></td> <td></td> </tr> <tr> <td>Other, specify</td> <td></td> <td></td> </tr> </tbody> </table> | COSTS            | SUDAN<br>Cost per bag (100 KG) of sorghum | JUBA<br>(25 MT truck) | Rental of truck |  |  | Taxation source            |  |  | Taxation destination |  |  | Checkpoints    |  |  | Porters source |  |  | Porters destination |  |  | Other, specify |  |  |
| COSTS                      | SUDAN<br>Cost per bag (100 KG) of sorghum  | JUBA<br>(25 MT truck)  |                  |   |                       |                 |  |  |                            |  |  |                      |  |  |                |  |  |                |  |  |                     |  |  |                |  |  |
| Rental of truck            |  |  |                  |   |                       |                 |  |  |                            |  |  |                      |  |  |                |  |  |                |  |  |                     |  |  |                |  |  |
| Taxation source            |  |  |                  |   |                       |                 |  |  |                            |  |  |                      |  |  |                |  |  |                |  |  |                     |  |  |                |  |  |
| Taxation destination       |  |  |                  |   |                       |                 |  |  |                            |  |  |                      |  |  |                |  |  |                |  |  |                     |  |  |                |  |  |
| Checkpoints                |  |  |                  |   |                       |                 |  |  |                            |  |  |                      |  |  |                |  |  |                |  |  |                     |  |  |                |  |  |
| Porters source             |  |  |                  |   |                       |                 |  |  |                            |  |  |                      |  |  |                |  |  |                |  |  |                     |  |  |                |  |  |
| Porters destination        |  |  |                  |   |                       |                 |  |  |                            |  |  |                      |  |  |                |  |  |                |  |  |                     |  |  |                |  |  |
| Other, specify             |  |  |                  |   |                       |                 |  |  |                            |  |  |                      |  |  |                |  |  |                |  |  |                     |  |  |                |  |  |

|   |  |  |           |          |                       |         |            |  |                 |  |                |  |                |  |                |  |
|---|--|--|-----------|----------|-----------------------|---------|------------|--|-----------------|--|----------------|--|----------------|--|----------------|--|
| CONSTRAINTS   | 15. Which are the current top three constraints to business, in order of importance?   | <table border="1"> <tr><td>Inflation</td><td></td></tr> <tr><td>Lack of hard currency</td><td></td></tr> <tr><td>Insecurity</td><td></td></tr> <tr><td>Road conditions</td><td></td></tr> <tr><td>Border closure</td><td></td></tr> <tr><td>Lack of demand</td><td></td></tr> <tr><td>Other, specify</td><td></td></tr> </table> | Inflation |          | Lack of hard currency |         | Insecurity |  | Road conditions |  | Border closure |  | Lack of demand |  | Other, specify |  |
|   | Inflation  |  |           |          |                       |         |            |  |                 |  |                |  |                |  |                |  |
| Lack of hard currency   |  |  |           |          |                       |         |            |  |                 |  |                |  |                |  |                |  |
| Insecurity  |  |  |           |          |                       |         |            |  |                 |  |                |  |                |  |                |  |
| Road conditions   |  |  |           |          |                       |         |            |  |                 |  |                |  |                |  |                |  |
| Border closure  |  |  |           |          |                       |         |            |  |                 |  |                |  |                |  |                |  |
| Lack of demand  |  |  |           |          |                       |         |            |  |                 |  |                |  |                |  |                |  |
| Other, specify  |  |  |           |          |                       |         |            |  |                 |  |                |  |                |  |                |  |
| 16. What mitigation measures can you put in place to secure your business?<br><br><i>For instance, armed escorts, insurance, driving at daylight, patrolling of the government soldiers in the night, etc.</i>              |  |  |           |          |                       |         |            |  |                 |  |                |  |                |  |                |  |
| CURRENCY  | 17. What is the currency normally used for payments?<br><br><i>Try to find out in the market itself, in Sudan, in Abyei and in Juba.</i> | <table border="1"> <tr><td>SSP</td><td></td></tr> <tr><td>SDG</td><td></td></tr> <tr><td>USD</td><td></td></tr> <tr><td>Other, specify</td><td></td></tr> </table>   | SSP       |          | SDG                   |         | USD        |  | Other, specify  |  |                |  |                |  |                |  |
|   | SSP  |  |           |          |                       |         |            |  |                 |  |                |  |                |  |                |  |
|   | SDG  |  |           |          |                       |         |            |  |                 |  |                |  |                |  |                |  |
|   | USD  |  |           |          |                       |         |            |  |                 |  |                |  |                |  |                |  |
| Other, specify  |  |  |           |          |                       |         |            |  |                 |  |                |  |                |  |                |  |
| 18. Is it easy to get foreign currency in this market?<br><br><i>Try to find out how many days it takes, if they get US\$ in Juba, and if traders use the official or black market rate</i>                                 | <table border="1"> <tr> <td>Yes</td> <td></td> <td>No</td> <td></td> </tr> </table>  | Yes  |           | No       |                       |         |            |  |                 |  |                |  |                |  |                |  |
| Yes   |  | No   |           |          |                       |         |            |  |                 |  |                |  |                |  |                |  |
| 19. What is the exchange rate here today?   | <table border="1"> <tr><td>US\$/SSP</td><td></td></tr> <tr><td>US\$/SDG</td><td></td></tr> <tr><td>SDG/SSP</td><td></td></tr> </table>   | US\$/SSP   |           | US\$/SDG |                       | SDG/SSP |            |  |                 |  |                |  |                |  |                |  |
| US\$/SSP  |  |  |           |          |                       |         |            |  |                 |  |                |  |                |  |                |  |
| US\$/SDG  |  |  |           |          |                       |         |            |  |                 |  |                |  |                |  |                |  |
| SDG/SSP   |  |  |           |          |                       |         |            |  |                 |  |                |  |                |  |                |  |
| 20. Are there financial institutions and money transfer agencies? What rate is charged to transfer money?<br><br><i>If there are no banks, ask where the closest banks are, and ask whether traders have a bank account</i> | <table border="1"> <tr> <td>Yes</td> <td></td> <td>No</td> <td></td> </tr> </table>  | Yes  |           | No       |                       |         |            |  |                 |  |                |  |                |  |                |  |
| Yes   |  | No   |           |          |                       |         |            |  |                 |  |                |  |                |  |                |  |

|  |   |                           |    |    |  |  |
|--|---|---------------------------|----|----|--|--|
| DEMAND   | 21. Is local demand sustained for your business (e.g. any purchasing power issues)?   | Yes                       |    | No |  |  |
|  | 22. Are people now buying smaller amounts of food and/or different items (e.g. less preferred food) because of the current inflation? | Yes                       |    | No |  |  |
|  | 23. Which are the prevalent wage rates here?  | Skilled (mason)           |    |    |  |  |
|  |   | Skilled (mason assistant) |    |    |  |  |
|  |   | Primary school teacher    |    |    |  |  |
| Office messenger/helper  |   |                           |    |    |  |  |
| Agricultural labour  |   |                           |    |    |  |  |
|  | Porter  |                           |    |    |  |  |
| 24. Would you be able to expand your business if WFP were to introduce cash/vouchers to stimulate demand?<br><br>To what extent? | Yes   |                           | No |    |  |  |



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Kids in Turalei market



