# Emergency Market Mapping and Analysis (EMMA) Report:

## Livestock off-take and Sorghum Market Systems in Abiemnhom County, Unity State, South Sudan

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## EXECUTIVE SUMMARY

This report is an Emergency Market Mapping and Analysis of the sorghum and livestock (cattle, sheep, and goats) off take in Abiemnhom County, Unity State, South Sudan, approximately a year after the start of the conflict that resulted from the political fall-out between the president of South Sudan (Salva Kiir) and his former vice president (Dr. Riek Machar) in December 2013. The gradual escalation of violence resulted in the displacement of populations and their livestock, disruption of agricultural production, obstruction of trade routes and markets, and further compounded the severe impacts of a South Sudan – Sudan cross border trade ban, and the seasonal flooding that occurred in August and September 2014.

**Target population**

Within this context, an EMMA was launched in Abiemnhom County specifically to analyze the sorghum and livestock offtake market systems in the county, which the vulnerable and host communities rely on to earn an income and access essential food. In general, the population in Abiemnhom is engaged in livestock keeping and rain-fed agriculture, and consumes sorghum as a staple food. Households in Abiemnhom utilize sorghum produced locally, turning to market supply when their own produce runs out. The sale of livestock, especially small ruminants, offers significant income generation opportunities for livestock keepers and largely determines their capacity to purchase food items. During the assessment, three critical market systems were selected for analysis – sorghum, cattle, and sheep and goats (shoats) off take. These market systems were selected due to their importance in the target area, both as sources of staple food and to generate income through market exchange.

**Prevailing context**

The market system in the county has been hit by two severe shocks in relatively close succession; the initial ban imposed in 2012 by Sudan partially cut sorghum supply and livestock trade, which was then followed by the current conflict.

The assessment found that the sorghum, cattle and shoats market system is functional, although there were significant disruptions, inefficiencies and bottlenecks. For instance, local production and market access are disrupted, and households do not have the capacity to address structural seasonal food deficits that typically occur in the lean season. The crisis also resulted in a reduction in volume of essential commodities in the market, increased costs of doing business in the area, reduced purchasing power of households (due to limitations in income earning opportunities), severed social capita; and resulted in unfavourable terms of trade for livestock keepers.

Furthermore, the county has a sorghum deficit due to a number of successive shocks and stresses. Firstly, the closure of the Sudanese border reduced the amount of commodities, including sorghum, imported from Sudan, which were available in the market hubs. Flooding in 2014 also destroyed much of the seasonal crop, and resulted in the closure of roads linking the market hubs to secondary markets. Thirdly, the current conflict resulted in the closure of trade routes, and reluctance among the main transporters to risk their crucial assets when insecurity became a major threat. The sorghum supply route linking Abiemnhom to the mechanized sorghum production in Renk through Mayom and Bentiu completely closed following the conflict. Trade routes to market hubs such as Wau, Aweil and Kuajok (which were undersupplied since the border closure) were limited by poor road conditions and insecurity. Combined with poor infrastructure the prevailing context prevented prepositioning of essential supplies in preparation for the rainy season (the normal practice in South Sudan).

**Specific challenges to market systems**

Traders, transporters and households were displaced; some lost their capital while others were driven out of business. As the number of checkpoints, fees, and taxes increased (fees for a 50Kg bag increased from 9 SSP to 40 SSP ($2-$12)) along trade routes, and with less appetite to risk lives and assets operating in conflict areas, the transporters (mainly Darfurians) retreated further into the northern borders. Bicycles and motorbikes are currently the main modes of transporting sorghum between markets - the volumes are small and the costs are high. For example, a motorbike transporting 200Kg of sorghum is charging up to 200 SSP ($62) between Anet market in Agok and Abiemnhom (about 45km).

Retailers reported a reduction in the overall amount of items, including sorghum, available in the market; and in addition, people have little to no purchasing power. The number of retailers in business dropped by 40%, with a 54% reduction in the volume of sorghum traded in the retail market (in the post-crisis context retailers sold eight to ten *malwas* per day (approximately 25-32kg)).

The number of millers dropped from 13 to 6 due to the increase in the cost of running the mill from 615 SSP to 800 SSP per week. This was due to the increase in the price of fuel, oil, grease and other consumables, at a time when the quantity of sorghum milled per day dropped from 130 *malwas* to 48 *malwas*. To meet these higher costs, the cost of milling increased from 2 SSP to 4 SSP per *malwa* after the crisis. As a result, the majority of households were found to be consuming whole sorghum grain due to increased prices of milling.

Regarding livestock, losses occurred during displacement, and seasonal migration was disrupted as livestock were moved to safer areas to mitigate against raiding. Since herds had moved away from Abiemnhom, this denied households milk. As large herds congregated in safer areas, livestock disease patterns were reported to have changed or intensified – suspected outbreaks of hemorrhagic septicemia, as well as worms, manage and ticks were reported. Furthermore, the arrival of a large number of herds in agricultural areas increased the risk of conflict with farming communities.

Livestock markets have largely ceased or downscaled activities due to insecurity, and market actors face a number of constraints. These include limitations in the supply of, and access to livestock markets, an increase in taxation and fees, a decrease in the number of traders and producers (due to displacement), and a general reduction in the consumption of livestock and products (due to economic constraints at the household level).

The number of traders moving livestock from Mayom dropped by 50 – 60%, while the number of animals moved between the two markets (Mayom – Abiemnhom) reduced by 40%. Furthermore, it took up to three weeks to sell 10 -15 animals, whereas pre-crisis it only took one and half. The traders indicated that there were at least two to three additional checkpoints on the trekking routes, where they had to pay additional fees (54 – 65 SSP per shoat). They were no longer able to make the two to three trips per month, and were limited to a single trip every two months.

As supply dwindled, the quality of animals in the market deteriorated and prices increased. For example, a good conditioned bull usually costing 2300 SSP ($718) was selling for 2500 – 2700 SSP ($781-843) post-crisis. Meat consumption declined – the market completely collapsed due to non-existent consumer demand, as households are no longer able to afford meat. Traders noted that generally the demand for livestock was so low because South Sudanese from the diaspora were no longer coming for the Christmas season, fearing outbreaks of violence over the festive season once the roads became passable.

**Recommendations**

These market inefficiencies and local production challenges could be ameliorated through a number of interventions. In the short term, improvements in household purchasing power through food

vouchers and unconditional cash transfers is recommended, in addition to targeted support to businesses to reduce the risk of inflation.

Deliberate efforts to ease the movement of goods to markets (such as the rehabilitation of key infrastructure), advocacy to reduce fees and taxes, relaxing or removing the border ban, developing nascent business relationships (as seen in livestock trade), and linkages with hub markets, will be essential.

For livestock, interventions to address key risks of disease outbreak and conflict due to disrupted seasonal migration are recommended. In the long term, the prospect of addressing key crop and livestock market system constraints hinges on addressing the crisis, and ultimately the localized conflicts in the target areas. The underlying structural inefficacies such as the business orientation of producers; access to inputs and extension services; flood damage control strategies; and improvement in rural infrastructure should be addressed. More detailed recommendations are provided at the end of this report.

## LIST OF ABBREVIATIONS AND ACRONYMS

| | |
|---|---|
| AAA | Abyei Administrative Area |
| ACAD | Abyei Community for Action and Development |
| CAHWs | Community Animal Health Workers |
| EMMA | Emergency Markets Mapping and Analysis |
| FAO | Food and Agriculture Organization of United Nations |
| FEWSNET | Famine Early Warning Systems Network |
| FSMS | South Sudan Food Security Monitoring |
| GHA | Greater Horn of Africa |
| GoRSS | Government of Republic of South Sudan |
| GDP | Gross Domestic Product |
| IDPs | Internally Displaced Persons |
| IGAD | Inter-governmental Authority on Development |
| INSPIRE | Integrated Stimulus Package to Improve Resilience |
| IPC | Integrated Phase Classification |
| MTCs | Money Transfer Companies |
| NGOs | Non-governmental Organizations |
| PPR | Peste des Petits des Ruminants |
| SNV | Netherlands Development Organization |
| SSP | South Sudanese Pound |
| USD | United States Dollar |
| SPLA –iO | Sudanese People Liberation Army (in Opposition) |
| SPLA | Sudanese People's Liberation Army |
| WFP | World Food Program |

**Conversions**

1 USD = 3.2 South Sudanese Pound
1 Malwa = (commonly used container which holds 3.2Kgs)
1 Feddan = a unit of area equivalent to 0.42 hectares, or 1.038 acres

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**Mohamed M. Yussuf, EMMA Lead**

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## EMERGENCY CONTEXT

### Overview – The Emergency, its Causes and Impacts

Prior to the end of 2013, South Sudan was affected by deteriorating macroeconomic performance, a declining per capita Gross Domestic Product (GDP), a shortage of foreign reserves, deflation, and a high spread between official and informal exchange rates.[1]

The situation worsened when incubating tensions (due to political rivalries between factions within the Government of Republic of South Sudan (GoRSS)) erupted in the capital city, Juba on December 15, 2013 and quickly turned into ethnically motivated violence. The crisis became a protracted national conflict with Jonglei, Unity, and Upper Nile states representing the primary areas of fighting and displacement.

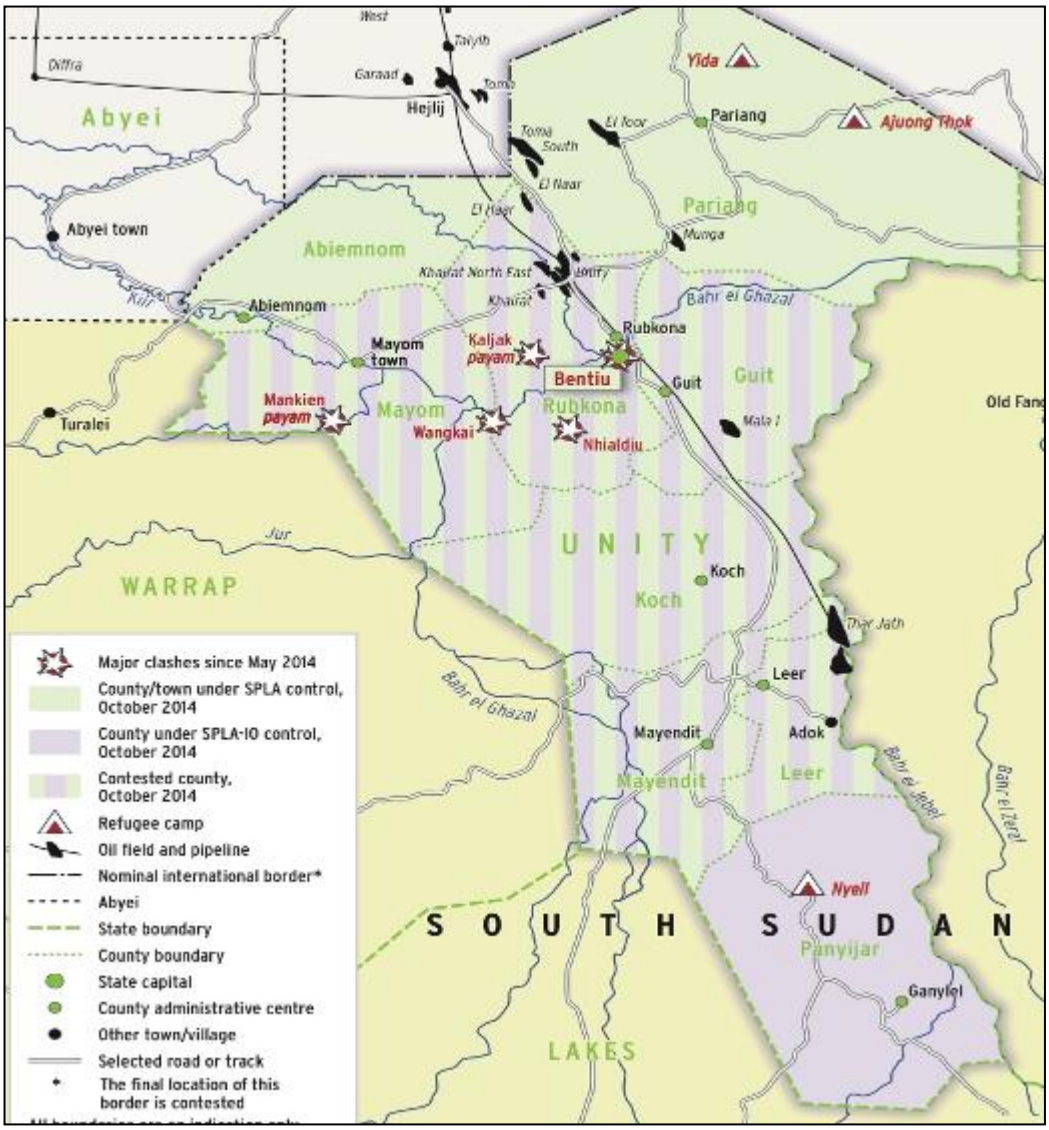



**Figure 1: Major Clash areas in Unity State,** *Small Arms Survey (www.smallarmssurvey.org)*

[1] According to the World Food Program, Special Focus Report (February 2014) on South Sudan, the country's Gross Domestic Product (GDP) plummeted (halved to SD 943 per year i.e. 2.6 dollars per day) while private and government expenditure decreased by 1.4% and 41.4%, respectively.

To date, three signed agreements have been broken and more than twelve months into the conflict, tension continues (mainly in Lakes, Unity, and Upper Nile states).

Intermittent clashes continue to generate humanitarian needs and drive displacement.[2] Several militia groups have been active in the affected states and continue to be a source of instability. This has affected local populations, leading to displacement and food shortages, as well as land mining and counter-insurgency operations. Population displacement is likely to continue as long as the conflict ensues.

Unity State is one of the states in which direct military confrontation has persisted throughout the conflict. Though the Sudanese People's Liberation Army (SPLA) has retained control of Bentiu, the capital of Unity State, the SPLA-iO (in Opposition) dominates the southern counties of Mayendit, Panyijar, Koch, and Leer (Figure 1). Even before the political fallout between actors in the GoRSS, Unity State suffered the brunt of conflict resulting from oil production, cattle raids, dry season grazing conflicts the Misseriya/Arab nomads, and internal border conflicts over tracts of land.

The conflict has created a dire food security situation. It is estimated in January 2015 that 2.5 million people are in crisis/emergency levels of food insecurity.[i] There have been widespread losses of household stocks, and an increasing cereal deficit due to impacts on the late harvested mechanized sorghum crops, as well as the widespread destruction of market infrastructure and disruption of trade routes. Markets have been affected by increased demand, the inability of traders to restock, and reduced purchasing power of displaced populations.

It is worth noting that these areas (Northern Unity) areas in Unity State had traditionally depended on trading with Sudan to address the persistent commodity shortages. However, as North-South tensions spiked ahead of independence in 2011, the Government of Sudan imposed a blockade on North-South supply routes. Despite goods being smuggled across the border, the quantities were reduced drastically, with traders have relying more heavily on supplies from Juba. The situation has been exacerbated by the current conflict. Figure 2 shows that the main trade routes pass through major conflict hotspots.

[2] The United Nations reports that a total of 1,439,400 individuals were displaced since December 15, 2013 with 102,300 seeking refuge at U.N Mission in Republic of South Sudan (UNMISS) compounds while 1,337,100 are displaced in other areas of South Sudan. Additional 488,300 have fled to neighbouring countries since December 15, 2013.

**Figure 2: Trade Routes and Conflict Hotspots on Sorghum Supply Routes**[ii]

The impact of the conflict on livestock off-take[3] is not well documented. However, considering the thinness of markets (more so for livestock), any supply and price volatility will be passed on to pastoralists, as a majority of traders are small-scale and have a limited capacity to absorb shocks. Livestock are an important component of most rural livelihoods in Unity State, providing employment and food security. Conflict has resulted in the displacement of herds into new areas, disrupting seasonal migration and increasing the risk of disease outbreaks, and conflict with farming communities. Markets are more critical for livestock producers since they are dependent on market purchases of cereals, especially in the dry season when they are no longer able to meet their dietary requirements from their herds.

Displacement and conflict are likely to result in the collapse of primary market networks, and an increase in livestock trading costs as trading/trekking routes are disrupted, thereby increasing costs and the time it takes to market livestock. Furthermore, conflict limits access to grazing areas, leading to deterioration in the condition of animals. In addition to conflict, raiding, a method of obtaining cows for marriage and restocking after drought, has become more violent, with the proliferation of small arms, breakdowns in social norms and increasing vulnerability.

[3] Off take is the percentage of the current year's herd that is removed through sales, deaths, gifts, home-slaughter or theft. However, in the current report, we will be concentrating on commercial off take of livestock.

**Location of Interest**

Abiemnhom is one of nine counties in Unity State, created in 2005; it was carved out of Mayom County following the signing of the Comprehensive Peace Agreement (Figure 3). The county has a surface area of 2,380 $Km^2$ and the main market (Abiemnhom town market) is located 35Km from Agok (a principal market town in the Abyei Administrative Area).

The county is predominantly Dinka, though the other counties in Unity State are considered Nuer homeland (except Pariang). The main economic activities in the county are agriculture and livestock rearing. While the county was not subjected to direct conflict, there were pre-emptive displacements of approximately 2,000 [4] households towards Western Bahr El Ghazal, Northern Bahr El Ghazal, Abyei Administrative Area, and Warrap State. This was followed by an influx of IDPs into the town from Bentiu and *Payams* surrounding Mayom estimated at 3,130 individuals.[5] The main priorities for the population in the county were food assistance, water supply and sanitation, hygiene promotion, health and education; support to markets and restoring and revitalizing livelihood activities It was anticipated that once all IDPs who fled the county returned, the pressure on local resources would increase, with a possible risk of local conflict.

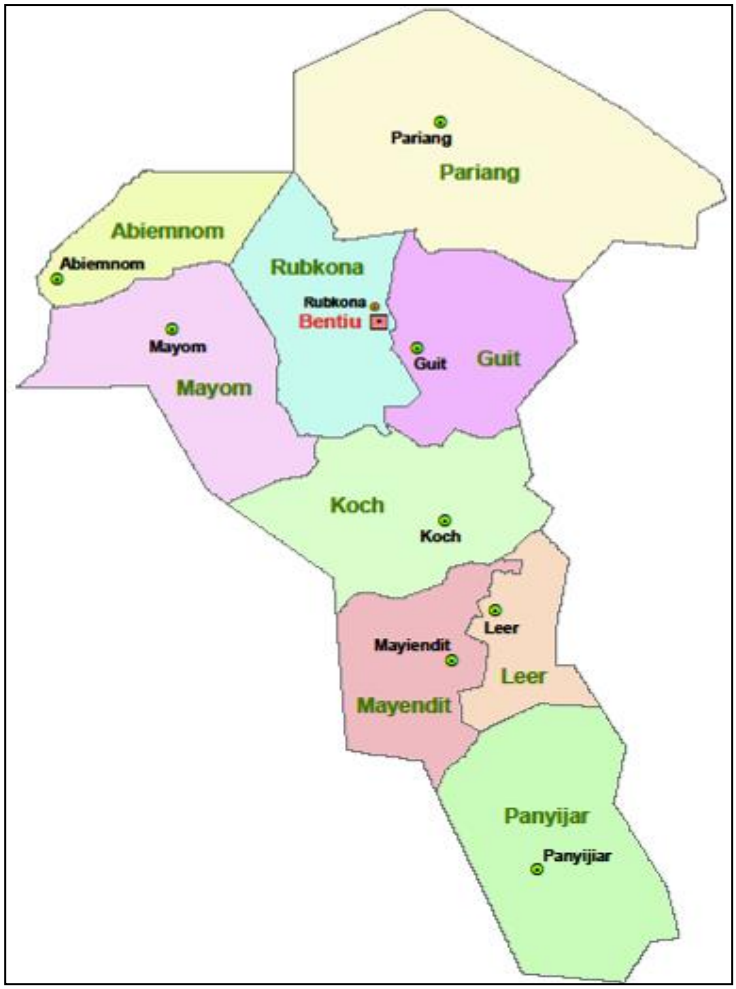



***Figure 3, Map of Unity State, OCHA***

The county remains unsettled, especially along the border, which allows for easy movement of rebel militia groups using Abiemnhom as a corridor for launching attacks in Mayom and Bentiu counties. Abiemnhom provides a military corridor for restocking supplies to Unity State. In addition to the current conflict, the county is prone to cattle raids from neighboring Nuer livestock keepers, and as the dry season approaches, the Misseriya Arab nomads in Sudan start migrating into the county in search of pastures. This coincides with the time Abiemnhom herds will be returning from the cattle camps.

[4] The Abyei Community Action for Development (ACAD), the lead agency for WFP funded blanket food aid distribution for host community and Unity State IDPs estimates the number of people displaced from Abiemnhom to AAA at 6000 individuals (currently targeted for food aid).

[5] These estimates were given to the EMMA team by the Relief and Rehabilitation Commission (RRC) Coordinator who coordinated humanitarian assistance in the County.

Though the food security situation in the county was expected to improve with anticipated harvests[6], this had not been the case, as displacements disrupted the first planting season while flooding destroyed much of the season's crop. Further, markets were not restocked due to poor roads and a lack of transportation services. The situation remains fluid and it is likely that displacement will continue as long as the conflict ensues.

**Emergency Response in Abiemnhom County**

Though conflict and tension have persisted in South Sudan, humanitarian agencies have been able to reach 3.5 of the 3.8 million people targeted this year in the country. However, aid operations will need to be sustained, as the current dry season provides an opportunity to reach remote parts of the country by road and preposition supplies.

Mercy Corps is implementing the OFDA-funded Integrated Stimulus Package to Improve Resilience (INSPIRE) program covering the Abyei Administrative Area (AAA) and Unity State, including Abiemnhom and Mayom counties, where households are supported mainly through water, sanitation and hygiene (WASH) interventions. In addition, Mercy Corps distributed seeds to 300 households in September 2014. Similarly, Caritas distributed two *malwas*[7] of sorghum to households in Abiemnhom in October 2014.

Samaritan's Purse is also implementing a WASH program that targets 30,000 individuals in Abiemnhom and Mayom. The program aims to improve access to water through rehabilitation and development of new water points; improve access to sanitation through the construction of household latrines; and promote hygiene education. Additionally, CARE International is supporting the provision of health care services in the county.

## EMMA METHODOLOGY

Within the context of the recent conflict in South Sudan and its impact on Abiemnhom County, an EMMA was launched specifically to analyze the sorghum and livestock off take (cattle and shoats) market systems in the county two critical market systems that communities rely on to earn income and access essential food. The analysis also took into account local market dynamics in terms of their connection to the wider market system. The analysis followed the standard EMMA[iii] approach, and the data collection and analysis procedures used in this assessment closely follow the EMMA 10-step process (details can be found in Annex 1) including a review of existing literature and assessment data, a focus on key critical market systems, combined with household gap, market, and response analysis.

To identify the key constraints on the market system, a comparison of the current market system to the chosen reference period (before December 2013) when the markets functioned more healthily, was conducted. Additionally, anticipated future market potential was projected in order to set out a logical strategy for the design of appropriate immediate and longer-term responses to improve food security.

**Purpose of EMMA, Approach and Tools**

The purpose of the EMMA was to understand the current and potential future livestock and sorghum market systems; in particular how the conflict and resulting insecurity contributes to the way the markets are currently functioning, and most critically, to identify weaknesses in market

[6] The Integrated Food Security Phase Classification (IPC) for the Republic of South Sudan (September 2014) indicates that of the 18,000 who are in Phase 1, 2 and 3, 3,000 will move into emergency phase by January 2015 as dry conditions set in, food stocks get depleted, and insecurity continues to disrupt markets.

[7] Malwa = 3.2Kg

systems. Secondly, this analysis will form the basis for developing a logical strategy around which appropriate immediate and longer-term responses to improve food security should be designed. The assessment included qualitative and quantitative data collection from secondary sources, key informant interviews, and individual interviews with a variety of actors in the market system. Primary data was gathered from semi-structured interviews with 12 key informants, 11 market actors, and 56 households representing host community members, IDPs, and returnees.

The EMMA was initiated in December 2014 with the participation of nine team members. A three day workshop was conducted from December 10-12th to introduce the team members to the EMMA process and prepare for the assessment. The team members were divided into three sub-teams, each focusing on one market system and led by a designated team leader (a Mercy Corps staff). An overall EMMA lead (external consultant) and a Co-Lead (Mercy Corps, Livelihoods and Market Systems Advisor) provided technical support and guidance throughout the assessment and analysis process. Data was collected between December 14-18th followed by an analysis workshop and feedback session with the Mercy Corps team in Juba. To ensure an adequate representation of the different market systems, the EMMA concentrated on nine villages within the county.

**Limitations**

The market networks from the county extend into other areas, such as Aweil, Wau, Bentiu, Abyei and Sudan, which the EMMA team could not reach to interview the actors. Some of the actors, such as Darfurian traders and transporters, had fled the conflict, returning to Sudan as well as urban centers in South Sudan. Unfortunately, it was not possible to locate them within the study timeframe. Furthermore, data from secondary sources was triangulated to create a detailed picture of the situation before the crisis. Households and informants were asked to recall incomes, expenditures, trade volumes, prices, and numbers of the past week, a difficult feat for people who do not write or keep records. As a result, the figures given in the report remain estimates.

To address this gap, the team had to probe, crosscheck and triangulate information from different sources to address any biases that may have arisen. In addition, interviews were conducted with traders and small transporters from the Anet market (Agok), the current supply market for sorghum and terminal market for cattle and shoats for Abiemnhom. This helped identify the pre-conflict status of the markets and trade networks that existed in the area before the crisis.

Seasonal fishing was identified as an important secondary livelihood in Abiemnhom, highly important following crop failure. If fully developed in South Sudan, the sector has the potential export earning of half a billion USD and could provide over 80,000 South Sudanese employment and food to eat.[8] **Unfortunately, due to the scope of this assessment, assessment did not investigate further the fish market but however recommends future assessment to consider the fish market.**

[8] FAO in Emergencies: Potential of Fishing in South Sudan (http://www.fao.org/emergencies/fao-in-action/stories/stories-detail/en/c/152864/)

## POPULATION AND AREAS COVERED BY THE ASSESSMENT

### Target Population and Principle Livelihoods

The target population for the EMMA was the host communities in Abiemnhom County and the IDPs and returnees living in the same area. Though no formal census was conducted in Abiemnhom recently, the total population in the county at the time of study was estimated at 61,930.[9] In terms of residential status, the Abiemnhom population is composed of original residents of *Payams (*previously under Mayom County), returnees from Khartoum, and IDPs from the latest conflict. Key informants indicated that although 60-70% of the population was pre-emptively displaced, about 50-60% had returned, and more would be returning as the situation improved. However, the county remained host to 13,930 IDPs who were displaced from Pariang, Mayom, Rubkana, Mankin and Bentiu areas, unable to return to their homes (Table 1). The majority of the population currently lives in the main town, fearing roaming militia in rural areas.[10]

**Table 1: The EMMA target population**

| Target Population | Numbers |
|---|---|
| Host in Abiemnhom<br>IDPs in Abiemnhom<br>Returnee communities in Abiemnhom County, Unity State, South Sudan | Estimated population of 48,000 individuals<br>IDPs from other counties in Unity State = 13,930 |

### Principle Livelihoods

According to the South Sudan Livelihood Zones[iv], Abiemnhom is located within the Northern Sorghum and Livestock Zone (Livelihood Zone 11). The zone is characterized by a unimodal rainfall pattern, with average precipitation of 500mm per annum. Diverse livelihood activities are common; (for example, the households interviewed indicated that they engaged in between 3-5 livelihood activities), livestock rearing and rain-fed farming being the principle activities, with fishing and wild foods as important supplements.

Poor households are engaged in agricultural labor while fishing, vegetable production, the sale of firewood, charcoal and building materials were also considered important livelihood activities, especially following the crisis and flooding. Both poor and wealthier households (Table 2) were engaged in crop production and livestock rearing.

**Table 2: Different wealth groups among target population**

| Asset | Rich | Medium | Poor | Very Poor |
|---|---|---|---|---|
| Cattle | 100-200 | 60-100 | 1-5 | Nil |
| Shoats | 50-60 | 20-30 | 10-15 | 1-5 |
| No. *Feddan* | 10-20 | 5-10 | 1-2 | Below 1 |
| No of wives | 2-4 | 1-2 | 1 | 1 |

[9] Data from the 5th Sudan Population and Housing Census (2008) estimated the population of the county to be 17,012. However, more recent estimates from the RRC Coordinator put the population at 61,930 (48,000 hosts and 13,930 IDPs).

[10] SPLA–iO controls rural areas of Unity and Upper Nile States while SPLA holds urban areas, as a result in conflict areas, populations are concentrated in urban centers or in United Nations Mission in South Sudan (UNMISS) Protection of Civilian camps.

**Pastoral and Agro-pastoral Production**

Southern Sudanese pastoralists and agro-pastoralists have highly mobile approaches to grazing their cattle and small ruminants that allow them to capitalize on available grazing, itself determined by the highly variable distribution of rainfall. Thus, the system is well adapted for the optimum use of agro-ecological resources. Cattle are generally moved closer to the home villages (which are situated on relatively high ground to protect from flooding) during the rainy season. However, as the dry season progresses, cattle are moved further from the home villages into the *toiches* (marshy areas where vegetation persists well into the dry season)[11]. Movements are transhumant, i.e. seasonally driven by rainfall, and this movement is a critical feature of livestock production in the area. These movements are fundamental to the agro-pastoral way of life, with regular interchanges between the herds managed in cattle camps and the villages where cropping is often practiced, usually as a supplemental livelihood activity. The household is often divided into two linked units to accommodate labor requirements for such a strategy of seasonal mobility. One part of the household moves to the cattle camps in the *toiches* (mostly younger men but led and guided by elders). The other part remains in the home village (generally the women, the young and the elderly) with some pregnant and milking cattle plus some small ruminants and often poultry.

Livestock play an important role in terms of food security as well as economic, nutritional, cultural roles in the county as they do across large parts of South Sudan. The principle off take is milk with strategic, usually seasonal, animal sales used to enable the purchase of grains for household consumption. Production is also severely constrained by high livestock mortality and morbidity rates. It is worth noting that as households lose animals to raiding and diseases, they are less likely to have surplus animals for commercial sale[12]. It is reported that mortality in cattle may exceed 10% per annum[13], possibly double that for young animals, significantly in excess of even relatively poor sub-Saharan standards. This means that South Sudan loses millions of cattle each year, reducing the proportion of the herd most suitable for commercial trade (mature but relatively young animals).[v]

> *"It is estimated that Unity State holds about 12.2% of the national herd (Table 4), with Abiemnhom being among the counties with the largest livestock population in Unity State.*
>
> - EMMA Report

**Livestock Trade**

Livestock production represents a significant proportion of agricultural activity in South Sudan – 85% of households own one or more animals, meaning South Sudan has the highest per capita livestock ownership in the whole of Africa. According to conservative estimates, there are almost 12 million cattle, 14 million goats and 13 million sheep in the country (State-level estimates suggest possibly far higher livestock populations).

Livestock in agro-pastoral systems are sold for cash, and generally only in exchange (or barter) for grain when household production stores run low, or when cash/barter is required to make essential purchases. Typically this involves the sale of old and/or unproductive animals while breeding female

[11] The Nilotic tribes practice transhumance production. A system of more continuous movement of livestock to access grazing is typical of livestock production systems in the drier areas of South Sudan.

[12] Surplus is defined here as the quantity of animals that is available for sale after meeting the family needs, wage payments and gift to relatives and friends. It will depend on herd size and characteristic, herd productivity, access to social support and other safety nets, and market prices of animals.

[13] This high mortality rate (normal rate for older stock is usually below 3% and 10% for younger stock) is associated with high incidence of diseases such as pneumonia, liver flukes, and trypanosomiasis. These mortalities could be prevented through better animal husbandry practices and animal health service delivery system.

animals are less frequently sold, unless as stress sales. Small numbers of cattle may also be slaughtered for cultural practices; live animals are transferred as payment for customary penalties, and given for dowry (the latter can involve a considerable number of animals). The preferred production system is to obtain milk from the herd whilst building herd size, a strategy which is a core support to household nutrition, and which at the same time allows the asset base (the animals) to remain untouched and indeed grow.

The livestock sector generates an estimated income of 1.4 billion SSP annually. However this is equivalent to only 20% of the potential off-take when considering the size of the national herd.[vi] The low level of commercialisation is a result of a number of factors relating to the multi-purpose nature of livestock ownership, including the production of milk (economically close to the same value as meat production), the role of livestock in providing risk management and financial services (in the absence of formal banking and insurance services), and the important role livestock (cattle in particular) play in the culture of South Sudan (conferring status, strengthening kinship networks, building social capital, and in providing dowry to secure brides and thereby permitting male youth to marry and reach adulthood). Livestock production does have a commercial, market orientation dimension and this is increasing as a trend, responding to growing market opportunities both through urbanisation and increasing incomes within South Sudan and due to strong regional markets and slowly improving infrastructure linking pastoral areas and evolving market systems.

An analysis of the livestock value chain in South Sudan shows that although all other segments are operating commercially, the foundational segment of the chain- production- is driven by multiple, and at times divergent priorities, only one of which relates to maximizing commercial offtake. The suite of livelihood strategies employed by agro-pastoralists represents a dynamic balance in optimizing natural resources and market systems to generate a blend of cultural, nutritional and income-related outcomes which do not easily conform to western systems of measurement, but rather focused greatly on the value of commercial offtake.

As the agricultural sector in South Sudan increasingly engages with markets, major transformations will take place, and the trend is increasingly moving towards a greater commercialization of production. Data on off-take rates in the country does not exist. However, a study by the Netherlands Development Organization (SNV) in 2007[vii] estimates commercial off-take rates for cattle and shoats to be 4% and 10%, respectively. The study found that households usually sold older cows, bulls and barren animals in order to purchase food, pay medical or school fees, and during marriages.

The poorer producers have higher market off-take rates (as a percentage of the herd) compared to wealthier pastoralists who have greater liquidity through non-livestock assets, and are less likely to sell animals to meet essential financial needs. However, pastoralists are reluctant to sell livestock under certain circumstances, notably when their herd size or structure is dropping towards a critical threshold for viability.

**Agricultural Production**

With relatively fertile sandy and loamy soils, the county has two agricultural seasons: a rainy season, from May to October, and a dry season from November to April. However, agricultural production is largely traditional, with sorghum being the primary crop. Using hand tilling as the main form of soil preparation, households cultivate an average of one hectare per season. In addition to sorghum, more households are taking up vegetable production (tomatoes, okra and kale), which are supplied to Wau, Kuajok, Aweil, Agok and Bentiu (before the crisis). However, they were constrained by access to seeds – which were mainly sourced from Sudan through Aweil and via emergency seed supply from NGOs. In regards to coping strategies, apart from planting drought resistant crops such as sorghum, households conserve food stocks they harvest, they engage in fishing and wild food gathering, the sale of natural products, and seasonally migrate in search of labor and access to aid.

**Gender roles in livelihoods in Abiemnhom County**

Gender is an important determinant of engagement in different agricultural tasks and income opportunities as it helps define access and control of key household assets and incomes.

For example, women participated in much of the families' agricultural activities such as cultivating, planting, weeding and harvesting, as well as operating small tea kiosks and collecting and selling firewood. On the other hand, men were engaged in the sale of building materials, charcoal and fishing. Even from these activities in which women are engaged, men have greater control of the incomes from them. Husbandry activities such as tending to young animals, milking, and the sale of milk was done by women; while men were engaged in leading the cattle camp, the sale of livestock, surveying for pasture areas, and the provision of security. In terms of cattle camp dynamics, young men, women and older children seasonally move with most of the livestock, whereas families with young children and the elderly stay in semi-permanent homesteads or settlements, keeping few animals and engaging in agriculture and other income generating activities.

In terms of decision-making, men are the main decision makers, representing the family in public spheres. Prevailing cultural norms, especially in the countryside, marginalize women from participation in any level of political activity or decision-making.[viii] Violence against women is frequent and possibilities to seek and obtain redress are very limited.

> *"In regards to coping strategies, apart from planting drought resistant crops such as sorghum, households conserve food stocks they harvest, they engage in fishing and wild food gathering, and the sale of natural products*
>
> - EMMA Report

**Typical shocks to predominant livelihoods**

Inter-communal conflicts, including cattle raiding and competition over pastures and water, seasonal flooding, livestock diseases, crop pests and diseases are the main hazards in the county. Seasonal livestock movement into neighboring counties within Unity State and greater Bahr El Ghazal also leads to frequent conflict over pastures, water and cattle raiding. In times of crisis, the main coping strategies adopted are increased migration in search of labor, increased consumption of wild foods, increased sale of natural products such as grass, increased sale of livestock, and increased reliance on formal employment and cash remittances.[ix]

**Seasonal Calendar**

The seasonal calendar identifies the most important features that relate to livelihoods and critical market systems in the target locations. It collates and summarizes important factors, including priority activities, risk factors, and variations in peoples' lives and the market system. For example, the seasonality of rainfall[14] impacts the most important socio-economic activities of agricultural production, cattle keeping, fishing, and local trading.

For agriculture, land preparation starts in March-April, followed by planting in April-May, weeding in June-July and the first harvest in late October-November. The second round of weeding and gap filling occurs in August in anticipation of the second harvest in December-January.

For livestock, herds move to higher ground away from the settlements during the wet season, moving back as the dry season sets in. The herds remain in cattle camps between November and

[14] The county has a dry season and a wet season with the average wet season usually lasting from May to November.

March. Lambing, kidding and calving take place from November to February during the dry season. Milk production peaks during the rainy season from June to December.

The lean season falls from May to August, leading some farmers to practice "green harvesting"[15] while livestock keepers sell or barter livestock for sorghum. The terms of trade between livestock and sorghum decline during the dry season when animals lose their body condition. It is worth noting that though sales occur more during the lean season, they are ongoing throughout the year, as livestock producers meet most of their needs from the sale of livestock. The seasonal calendar below (Figure 4) shows a production year in the county.

[15] Locally referred to as "amak", green harvest was defined as the practice of harvesting sorghum before it had ripened, usually as hunger set in once households had depleted their sorghum reserves.

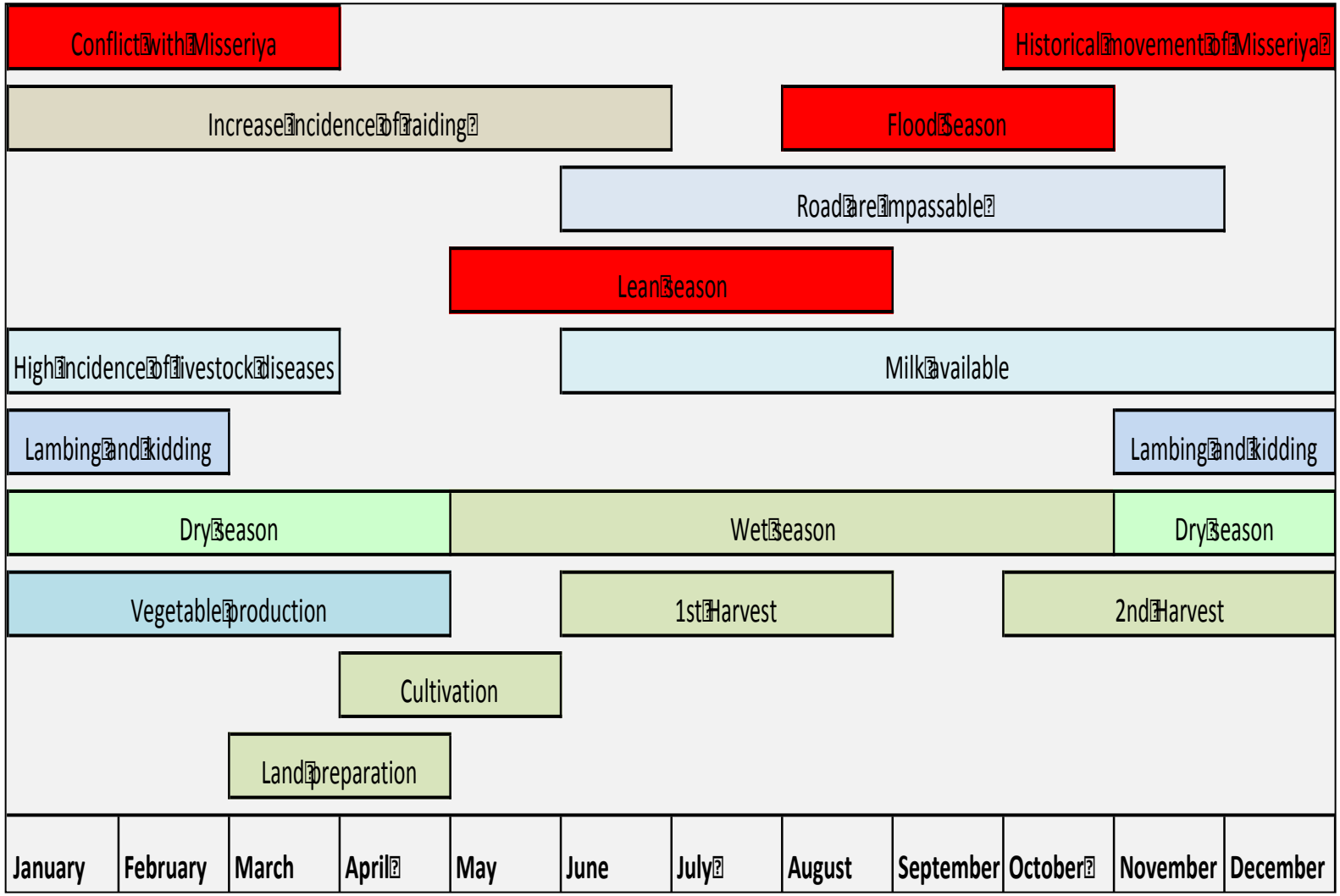



**Figure 4: Seasonal Calendar**

**Highlights of key changes in livelihoods and seasonal calendar due to the crisis**

The conflict undermined access to markets and migration, and denied households the opportunity to address structural seasonal food deficits that typically occur during the lean season. The conflict added to the already existing trade restrictions with Sudan that have been in place since 2011. In the northern markets, sorghum prices used to be 20-40% lower than in Juba. However, as traders became more reliant on Juba for supplies, prices were reported to have become 30-50% higher than in Juba due to transportation costs, multiple checkpoints, roadblocks and payment of several formal and informal taxes[x]. The restriction on animal movements also limited sales (principal income source for the purchase of cereals) and the supply of milk to households. Due to these changes in the market, households began switching to fishing and wild foods for consumption.

> *"Following the conflict and after floods destroyed our crop season, God blessed us with fish*
>
> - Local Elder

A number of changes in livelihood activities were evident from the crisis and the flooding that followed. Though no critical changes in livelihood activities were recorded, a large number of households were said to be using crisis and stressed livelihood strategies. Households reported that they were not able to participate in the collection and sale of firewood and charcoal, the sale of local building materials (poles, grass and reeds) and the harvesting of wild fruits, due to fear of the roaming militias. Agricultural producers saw a delay in the first planting season of sorghum (the primary crop for Abiemnhom) in 2014. This was due to the displacement of households who fled in fear of attacks, and led to a below average first harvest.

Some of these displaced households returned for the second season and cultivated and planted their farms; however, localized seasonal flooding[16] in August and September destroyed almost all crops. Based on estimates from the FAO/WFP Crop and Food Security Assessment Mission Report for South Sudan (February 2014), the total area of cereals harvested in the county was 835ha with a gross yield of 0.40 tonnes per hectare, giving a total cereal production of 334 tonnes. Based on an estimated population of 20,247 (mid-2014), the county cereal requirement was 1,721 tonnes, resulting in a deficit of 1,453 tonnes. These estimates were based on calculations before the anticipated second harvest, which was completely destroyed due to flooding. In regards to livestock-keeping households, most of the herds were moved to Twic County and Agok (under Abyei Administrative Area) to avoid the risks of raiding (though some animals remained within the main town). As households were fleeing the conflict some animal were stolen (mainly shoats). Milk, important in bridging the hunger gap, was unavailable in the market, and the prolonged absence of most of the herds from the area reduced milk availability considerably. Households would usually consume milk, with a surplus left over for selling and bartering; and therefore the lack of milk in the markets highlights that households do not have a surplus to sell due to a deficit in milk production.

Access to meat was found to be limited due to the reduced purchasing power of consumers and financial constraints on butcheries and traders,[17]as well as a reduction in the number of slaughters resulting from the near collapse of the livestock market.

Fishing has become an important livelihood activity following the flooding – a number of households reported taking to fishing as an additional livelihood activity. Fish, both fresh and dried, was available in the market and sold to the neighboring market of Anet in Agok County. However, fishing

[16] While seasonal flooding is common is South Sudan, the rain came ahead of time (in mid-March), making a bad war worse by making movement difficult, presenting a logistical nightmare for traders and humanitarian workers, collapsing homes and shelters, displacing cattle, and disrupting crop development.

[17] The actors in the meat sector were all small scale; they were not able to raise enough cash to buy livestock. As for the consumers, once conflict occurred incomes dropped and food expenses increased, thus meat was no longer a priority.

in some areas was dangerous due to raids carried out by Misseriya nomads in the northern *Payams* of Abiemnhom. At the time of the assessment, fishing was no longer undertaken as the floodwaters had dried up. Due to the above factors, the lean season was reported to have extended.[18] Hence, the county was experiencing an extreme food insecurity associated with higher cereal deficits, higher food prices and insecurity. During the assessment, some households were said to have migrated to the Abyei area (Magar IDPs camp, Magak Deng Kaya, and Rumkor) to stay with relatives or seek assistance from aid agencies, and seek opportunities for casual labor.

Given the worsening food insecurity levels, the prospects look dim considering that households are getting into the dry season without any savings from the previous season. Furthermore, the livestock markets have yet to recover from the impact of the crisis and the herds have yet to return as the conflict situation remains uncertain. According to the Crop and Food Security Assessment Mission Report for South Sudan, 2014[xi] the situation will be even worse for households engaged in the sale of natural resources, followed by those in the sale of alcohol. The most secure livelihood prospects include the sale of cereals, livestock, and people involved skilled work.

[18] The normal lean season usually runs from May to August. However, due to the disruption of agricultural season, the lean season was prolonged beyond August (FEWSNET, South Sudan Special Report – March 2014). Further, with the significant reduction in food and income sources, the households are at risk of early lean season in 2015.

## INCOME GAP ANALYSIS

The EMMA team used secondary data sources, as well as household and key informant interviews to analyze income and expenditure patterns. The team triangulated information from households with trader interviews from Abiemnhom and Anet markets. Key informant interviews included food distribution statistics from 'Abyei Community for Action and Development' (ACAD) (the lead agency for food aid distribution in Abyei Administrative Area). It was difficult to obtain accurate data from households, as they had to recall incomes and expenditures from the previous year.

**Household Income**

Pre-crisis, the average household income for households ranged from 580-1010 SSP (103-180 USD) per month among the surveyed households. However the crisis has had a negative impact on all income sources, especially incomes from the sale of crops and livestock. For example, these households reported a 30-42% drop in monthly incomes from the different sources.

The majority of households were engaged in sorghum production and livestock rearing pre-crisis. Following the crisis, the majority of households (85%) reported disruptions in the first planting season due to displacement, and a 40% loss of second season crop production due to flooding, with additional loss of livestock due to theft or cattle raids. Before the crisis, households received 35-40% of their food from markets, 25-30% from their own production and 5-25% from other sources. During the years of good production, sorghum crops provided better off households with a modest source of income. However, in the season following the crisis, low yields resulted in a switch from households who could have potentially generated income from crop production to a situation requiring them to purchase basic foodstuffs, notably sorghum and maize. The shortages of both locally produced and imported sorghum into the area have doubled prices.

The EMMA assessment shows that the livestock sales previously contributed to approximately 30-35% of the overall financial needs of the target population. The contribution of livestock sales has been lower following the crisis, as livestock were lost, stolen or moved to cattle camps in Twic County and Agok. Regarding the latter, the movement of livestock to cattle camps resulted in a loss of access to established pre-crisis livestock markets, and although assets were protected inside the camps a vital source of income was nevertheless cut off.

Income sources were not particularly diverse before the crisis, and were mostly limited to agriculture and livestock related activities. Sale of crops and livestock, supplemented by trading, were the main income sources for better-off households, while income generating opportunities for poorer groups were very limited and related mostly to agriculture and other forms of casual labor[19] (including brewing alcohol, selling goats, thatching grass, and wild foods and other natural products). About 4% of households[20] interviewed indicated that they were receiving remittances from relatives in Juba and abroad. However, access to money transfer companies was limited, as they had fled the conflict and were located far from outlets that could remit their money. The closest money transfer company offices are located in Anet market. To travel to Anet to receive remittances would incur transportation costs of up to 300 SSP (about 55 USD) for a round trip.

Since the crisis, additional income earning opportunities have been limited, shocks directly and indirectly disrupting livelihoods have affected the community as a whole; even livelihoods actors operating in apparent silos are dependent on and connected to the market system as a holistic entity for their wellbeing. In terms of alternative livelihoods opportunities post-crisis, fishing became

[19] The average income from casual labor (construction of shelter, digging latrine, and farm labor) ranged between 10-70 SSP/day.

[20] Based on information gathered from HHs and KIs there was significant reduction in both the amount and number of HHs receiving remittances as a result of the impact of conflict on income earning opportunities in main cities such as Juba.

an additional strategy, made possible because of flooding and providing compensatory food security and gains to offset crop losses. However, fish markets are poorly developed, and fishing as an alternative livelihood strategy still has limited income-generating impact.

**Household Expenditure**

Most household expenditure pre-crisis was spent on food (primarily sorghum); a household of seven members would typically consume one **1.5- 2 *malwas* (4.8-6.4Kg)** per day.

Other sources of purchased food include wheat flour, rice, milk and milk products, sugar, roots and tubers, meat and offal, fish, beans, okra and *kudra* (wild vegetables).

However, following the crisis, most household expenditures went towards sorghum, pulses, *kudra* and okra – a clear indication of the deterioration of the diversity in diet following the crisis. Market price information collected by the EMMA team indicates a sharp increase in prices for essential commodities following the crisis due to major constraints on supply, and also, to a lesser extent, due to inflation[21] (Table 3).

**Table 3: Prices of commodities in Abiemnhom Market**

| Item | Unit | Pre -crisis (SSP) | Now (SSP) | Percentage change |
|---|---|---|---|---|
| Sorghum | *Malwa* | 8 | 18 - 19 | +125% |
| Sugar | *Malwa* | 25 | 35 | +40% |
| Sugar | Kg | 3 | 5 | +67% |
| Rice | Kg | 7 | 15 | +114% |
| Oil | Bottle | 5 | 15 | +200% |
| Milk powder | Kg | 6 | 15 | +150% |
| Whet Flour | Kg | 6 | 12 | 100% |
| Salt | Kg | 2 | 7 | +250% |
| Okra | *Kom* | 2 | 3 | +50% |
| Onion | *Malwa* | 30 | 70 | +133% |
| Meat | Kg | 15 | 18 | +20% |
| Charcoal | Sack | 25 | 45 | + 80% |

In normal seasons, the typical cost of meeting the daily requirements of a household of seven was estimated at 25-30 SSP. However, following the crisis, the daily household expenditure requirement rose to 50-55 SSP per day. Conservative estimates of the potential gap in household access to different food sources following the crisis (based on proportional piling at the household level) indicated a 30-35% gap following the crisis.

With limited access to agricultural land and few livestock assets, poor households were reliant on income generation and functional markets to meet household needs. Due to the crisis, household

[21] According to Africa Economic Outlook, South Sudan, 2014, there was 11% jump in inflation due to depreciation of SSP and volatility in supply of goods due to insecurity. For example, the official exchange rate from the Central Bank of South Sudan rose from 1 USD = 2.8 SSP (pre-crisis) to 3.2 SSP while the unofficial rate widely accepted in the market transactions shot from 4.6 SSP to 5.6 SSP in December 2014.

income for poorer households fell due to reduced income from livestock sales, little if any surplus crop production, and far fewer casual labor and other income generating activities. Remittances, which previously filled income gaps in the form of an informal safety net transfer, have been severely curtailed due to hazardous operating conditions and the consequent withdrawal and relocation of money transfer companies, leading to decreased financial flows and increased transaction costs.

Increasing food prices on local markets have significantly increased household expenditure at a time when household purchasing power has been drastically eroded. The combination of reduced incomes and increased expenditures has invoked traditional coping strategies relating to the household balance sheet, such as dietary restrictions and additional income generating actions (e.g. wild food and sale of other natural materials). These approaches only partially bridge the expenditure and income gap, and are only viable in the short-term. Destructive coping mechanisms (i.e. those with possible short term benefits but long term negative effects), such as dropping out of school to reduce expenditure, over-extraction of natural resources, **reducing number of meals**, and the forced sale of core herd livestock are also being employed.

## CRITICAL MARKET SYSTEMS

**Selection of critical market systems**

The methodology for the EMMA is based on the selection of specific market systems that "played, play, or could play a major role in ensuring survival and/or protecting livelihoods of the target population in an emergency context."[xii] The selection process was based on the following criteria:

1. The market is the most significant in contributing to food security and income opportunities;
2. The market system is affected by the target population;
3. Programming options in the market system are likely to be feasible;
4. The market system fits the competencies and mandates of participating agencies;
5. Seasonal factors and timing are appropriate.

The critical markets in Abiemnhom County include sorghum, livestock off-take, and to a lesser extent, vegetable and fish markets. As previously noted, this EMMA focuses mainly on sorghum and livestock due to their importance in the target area, both as sources of staple food and to generate income through market exchange. The livestock market systems (off-take of cattle and shoats) are critical for earning incomes to fill income-expenditure gaps. There is a close inter-relationship between livestock and sorghum markets since the terms of trade (relative prices of livestock and sorghum) determine the number of livestock that need to be sold to purchase a given quantity of sorghum. The two principle markets for prevailing livelihoods were analyzed, with the intention of developing a logical strategy around which appropriate immediate and longer-term responses to improve food security could be designed.

**Sorghum Market Networks in North Unity State**

**Trade networks before the crisis**

South Sudan had a net cereal production of 892,004 tonnes in 2013, which supplies only 68.6% of the total requirement.[xiii] The country therefore continues to rely on imports and food assistance to meet the food needs of the population. The only areas with production surpluses are Western Equatoria, Raga County (Western Bahr el Ghazal), a handful of counties in Central Equatoria, and border areas with Sudan.

Poor road conditions make it challenging for inter-state trade in local produce within South Sudan, leading to localized deficits, most notably in the Greater Upper Nile States. According to the South Sudan Food Security Monitoring (FSMS) Report in March 2014.[xiv]

> *Over half the households in South Sudan obtain their cereals from markets during the hunger season. Even in the post-harvest season, at least 40% of households still depend on markets to supply sorghum*
>
> - EMMA Report

Southern Unity State and part of the greater Upper Nile is classified as a sorghum deficit zone that largely depends on a healthy market supply. Other than locally distributed food aid, these counties are dependent on sorghum flows from nearby surplus areas and imports from neighboring countries: mainly Sudan and a relatively modest, but growing, trade from Uganda (Figure 5 & 5a). It is worth noting that although goods such as sorghum, wheat flour, cooking oil, sugar, fuel (diesel and petrol), beans, millet, and other general merchandise were imported informally via border points with Sudan (in the states of Western Bahr el Ghazal, Northern Bahr el Ghazal, Upper Nile State, Unity, and Warrap),[xv] they are now limited to high profit margin commodities such as electronics, textile products, spices and sugar. It is less viable to import bulkier commodities such as sorghum as

they further increase the already high transportation and other transaction costs relating to insecurity and the logistical difficulties of operating within poor infrastructure systems.

The markets in the northern states of South Sudan, including Unity (previously reliant on cross-border trade with Sudan), had to adjust to unreliable supplies due to the border closure; becoming increasingly dependent on sorghum imports from Uganda through Juba. For example, in an EMMA conducted shortly after the political crisis in March 2014,[xvi] retailers in Agok reported that there had not been any sorghum from Sudan in the market since the border closure in 2012.

Abiemnhom County has experienced a deficit in the supply of essential household commodities, including sorghum. This was previously due to the border closure, and more recently compounded due to the conflict and road closure because of the rains. For essential commodities, such as sugar and sorghum, the county was linked to the three main trade hubs of Wau, Aweil and Kuajok, which were supplied throughout the year from Juba, and sometimes from goods smuggled across the Sudanese border. Roads linking the county to these markets are subject to seasonal closures due to rains and flooding; therefore, local traders also sourced goods from Anet and Bentiu markets.

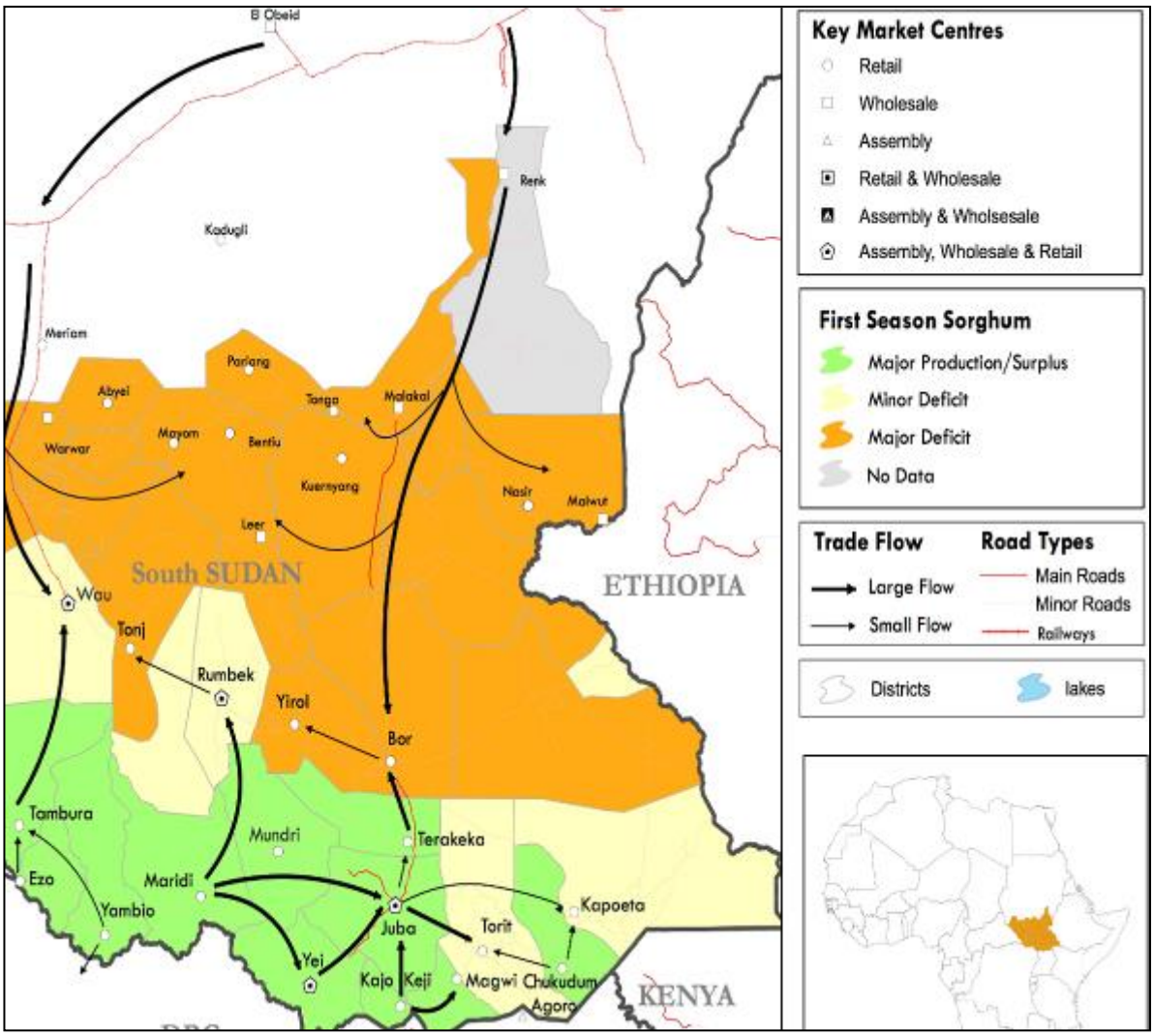
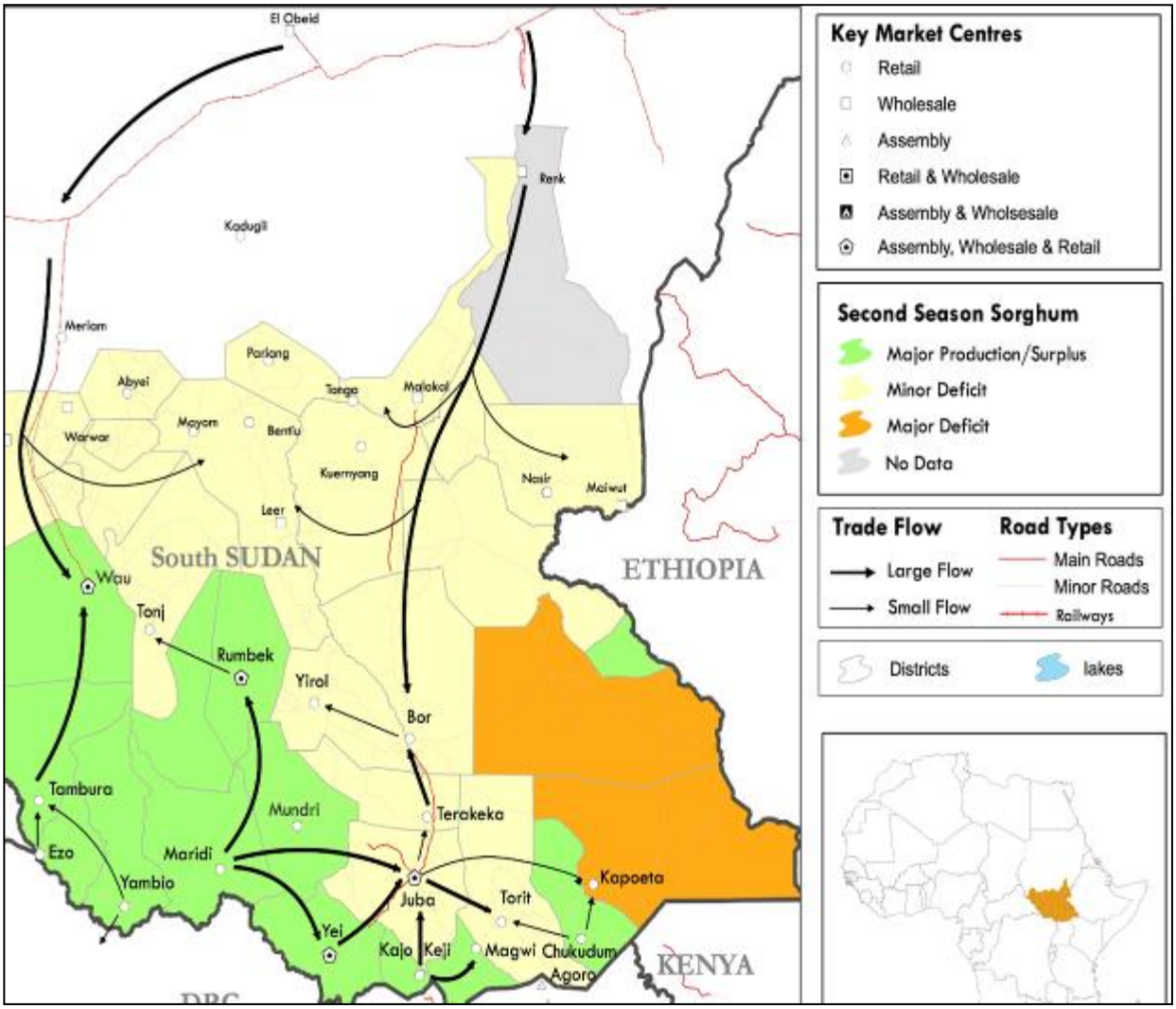



**Figure 5 and 5a: Sorghum production and market flow in South Sudan,** FEWSNET




**Trade networks following the crisis**

A number of disruptions have occurred in the supply chain of commodities to the county:

1. The closure of the Sudanese border in 2012 reduced the amount of commodities available in market hubs, including sorghum imported from Sudan.
2. Flooding in 2014 resulted in the closure of roads linking market hubs to secondary markets.
3. The current conflict resulted in the closure of trade routes and reluctance among the main transporters to risk their crucial assets when insecurity became a major threat.

As shown in Figure 6, a number of trade routes linking Abiemnhom to other markets were disrupted. The sorghum supply route linking Abiemnhom to the mechanized sorghum production in Renk through Mayom and Bentiu was completely closed. As a result, both Mayom and Abiemnhom counties became reliant on locally produced sorghum and, more recently, sorghum supplied from Anet market in Agok. Furthermore, as a result of the conflict, the main transporters that used to truck goods (reported to be mostly Darfurians and, in few cases, Misseriya Arabs, originating from Sudan) have fled,[22] while the few local transporters do not want to risk their assets in conflict and on bad roads. Currently, the sorghum trade is reliant on motorbikes and bicycles and, as a result, the volumes moved between markets are very low (mainly from Anet market).

[22] According to Radio Tamazuj, over 1500 traders were affected in Mayom market alone with 280 of them reaching Abiemnhom (Unity State economy in collapse as traders flee to Abiemnhom – Radio Tamazuj - https://radiotamazuj.org/en/article/unity-state-economy-collapse-traders-flee-abiemnhom).

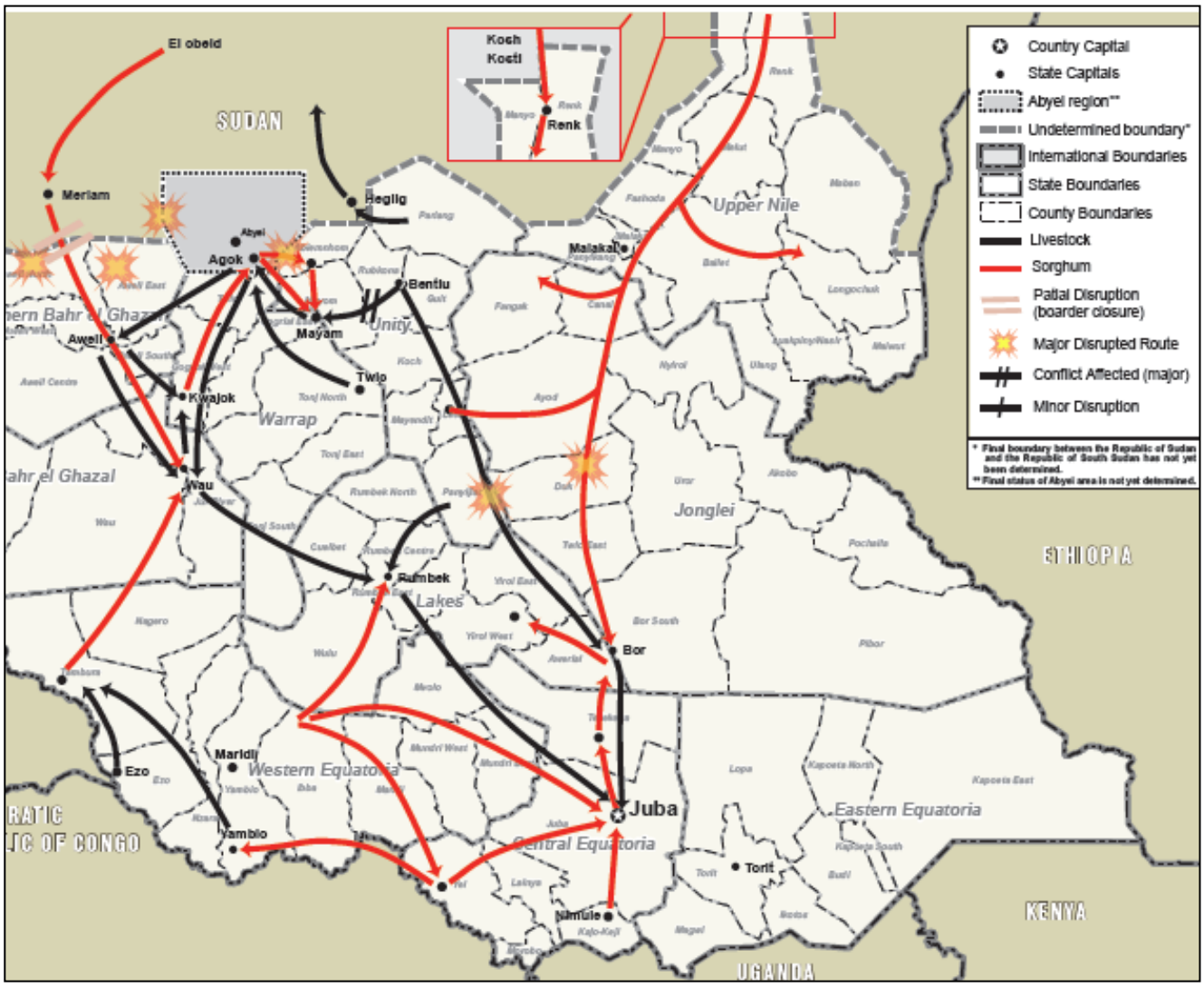



***Figure 6: Disruption of sorghum and livestock trade routes to other markets***

**Sorghum Market System before the Crisis**

Households in Abiemnhom utilized sorghum produced locally, turning to market supplies when their own produce ran out. The length of time households were dependent on markets varied with their level of productivity, which was in turn affected by access to farms (security), farming practices, availability of rainfall, seasonal flooding, access to inputs (seeds and labor), and pests, diseases and weeds. Poorer households engaged in a number of livelihood activities, and some families do not have enough members or enough capacity to help engage with the vast amounts of cultivation, planting, weeding, and harvesting. The quality of seeds was said to be poor, and as a result, subsequent harvests were said to deteriorate even in normal seasons.

Observations during the assessment clearly showed that the use of good crop husbandry practices among households in the target populations was low. For example, farms were swept bare after harvest, increasing the risk of erosion, whilst the absence of deep ploughing resulted in the development of hardpans[23] during the rains, increasing the negative impact of flooding.

[23] Hardpans are a dense layer of soil that is difficult for water and roots to penetrate. It usually is formed when the soil is at most shallow ploughed or hoed at the same depth season after season.

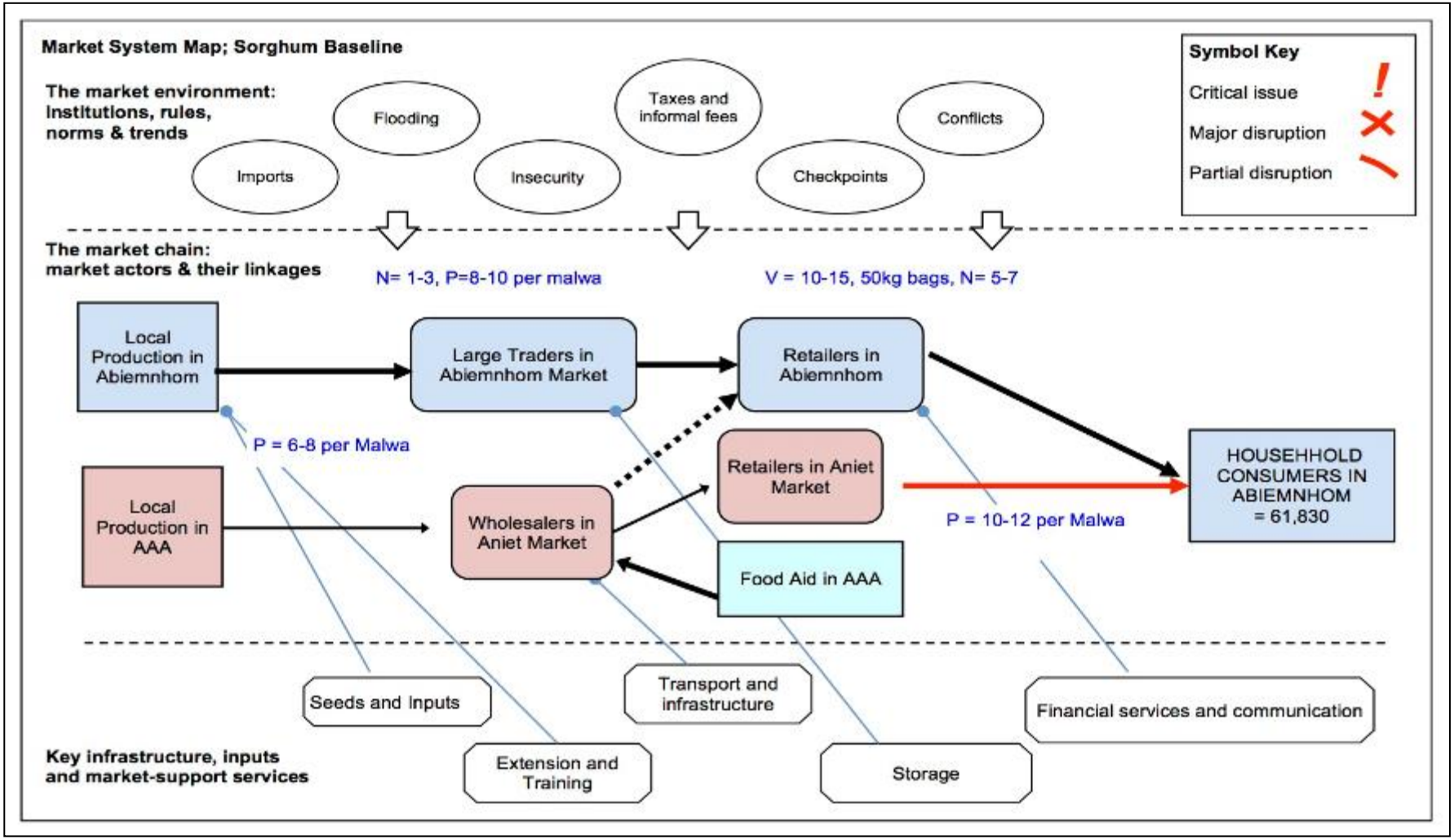



*Figure 7: Sorghum Baseline Map, a visual depiction of the sorghum market system pre crisis*

**Sorghum imports**

South Sudan is cereal deficient;[24] the country was the main staple food importer in the region, accounting for 57% of total imports in 2013. For example, exports from Uganda, which accounts for 95% of the sorghum from the Greater Horn of Africa (GHA) were destined for South Sudan, which originally relied on imports from Sudan. Additionally, informal trade across the Sudan/South Sudan border continues, though constricted and increasingly costly to achieve, and is widely dispersed across many border crossing points to circumvent the official border closure.[xvii] As with other essential staple food commodities, the prices of sorghum are persistently high due to a number of factors including low domestic production, thinness of markets, high transport costs due to poor roads linking rural markets, high risks due to insecurity, and trade bans. Local production deficit against cereal demand was reported in all states except Western Equatoria. The conflict affected states of Jonglei (30%) and Unity and Upper Nile (30%) accounted for the highest cereal deficits in the country. Hence, South Sudan needed to import half its cereal production in 2014 to fill the deficit and secure consumption needs.[xviii] Furthermore, the long distance, poor roads, increasing prices of fuel, increasing official and unofficial taxes, and unfavorable exchange rates have contributed to high prices of goods in recent years.

**Food Aid**

Food aid was not distributed in Abiemnhom, but ACAD, a local NGO, with funding from the World Food Program, was providing food aid in the neighboring Abyei Administrative Area (including host communities and over 6000 IDPs from Unity State, mainly from Abiemnhom). The beneficiary households in Agok sold some of their food ration[25] to traders in Anet market. During the visit to Anet market, the team observed relief sorghum being sold by both retailers and traders. Although when distribution was carried out in the harvest season, it was reported to have contributed to depressed prices in Agok. At the time of assessment, **food aid distribution** helped stabilize prices, easing price burdens on households in Abiemnhom, as this was the main source **of food** for the market. ACAD reported that no distribution was carried out in the previous five months **(September – December 2014) due to impassable road**, although once roads are passable, delivery of sorghum to rural settlements is planned.

**Market Chain**

The main actors in the sorghum value chain were the producers, traders and transporters, retailers, millers, food aid distribution, and consumers.

**Sorghum Farmers**

The majority of the farmers in Abiemnhom cultivated between one to two *feddans* (one feddan = 0.42 hectares, or 1.038 acres) in the previous season. As there were cultural constraints on using animal draught power to cultivate land, the majority of farmers (except six large scale farmers who used hired labor) were dependent on family labor – mainly women- to cultivate, plant, weed and harvest sorghum. Usually the farmers had two harvests per year. Following the first harvests where the estimated yield per *feddan* is seven *malwas* in a normal season, the farmers completed the second cultivation and gap filling in anticipation of a second harvest. The yields in the second harvest were reported to be lower by about 15 -20%, as the fields were invaded by pests and diseases, and soil productivity was lower. The market price of sorghum in the normal season ranged between 150 – 160 SSP/50Kg per bag. The main constraints facing producers included inadequate access to quality seeds and inputs (a majority depended on seed from the previous season, which they

[24] It was estimated that South Sudan had a total deficit of 0.371 metric tonnes of cereals in 2013 (this represents about 33% of the total needs), implying its reliance on food imports from neighbouring countries and food aid distribution (Andrew Muganga Kiziti, A Comparative Assessment of the Structure of Staple Food Markets in South Sudan Before and After Independence, and Implications for Food Security, February 2014).

[25] Each individual targeted received 15Kg sorghum, 0.15Kg salt, 0.9Kg vegetable oil, and 1.5Kg lentils.

sometimes consumed as food); they are also reliant on rains – no irrigated farming was practiced along the river or after flooding.

**Traders**

The larger traders with links to other markets were said to be mainly Darfurians who had their own transport. Depending on where sorghum was produced in surplus, the traders travelled to the markets to buy it, or sourced it directly from producers. The larger scale producers within Abiemnhom also acted as traders, availing their own produce and that which they bought from the neighboring farms. Other than Abiemnhom, these traders were also serving the Mayom market.

**Millers**

There were 13 millers processing sorghum into flour. The millers bought directly from the traders who brought it to their mills, but in the majority of cases, they only provided milling services at 2 SSP per *malwa*. The main inputs used were fuel, spares, and lubricants; all sourced from Anet, Wau and Aweil markets. There was one skilled person who provided maintenance services to the grinding machines at 200 SSP per session (usually one to two sessions were required per month).

**Retailers**

Abiemnhom market is a retail market (with no wholesalers) where merchants display sorghum on plastic sheets. They source sorghum from larger traders or directly from producers. On average, each of the 15 retailers was selling eight to ten *malwas* per day. Occasionally, the retailers travelled to Anet market to buy cheaper sorghum, especially following a good harvest in AAA or food aid distribution.

**Consumers**

The two main sources of sorghum were personal production and from the markets. Nearly all the residents of the county bought sorghum regularly from the market. On average, a household of seven people consumed one and a half to two *malwas* per day and up to three bags of 50Kgs each per month, and consumers bought sorghum directly from retailers. Additionally, poorer households were able to access support from relatives (**as gifts**) who had realized better harvests.

**<u>Key Infrastructure, Seeds and Inputs</u>**

**Seeds and inputs**

While the majority of farmers reported depending on the previous season's harvest for seed in the following season, some organizations have distributed seed while others have used sorghum from the market to plant. The practices and tools used (a hoe, panga/machetes, spade, or sickle) were those of subsistence farming. These inputs were sourced from Anet market, as there were no inputs or seed traders in Abiemnhom. It is worth noting that if households had either consumed or lost their seeds, they would depend on the traditional seed supply system or the emergency supply from NGOs.

**Storage**

Proper storage is critical for farmers who need to keep sorghum safe from pests and moisture, and to be able to sell or consume it later in the year. Sorghum was stored in bags in houses and was prone to spoilage during the rains. Vegetable producers who had to sell their perishable products in distant markets such as Aweil, Kuajok, Wau and Bentiu also identified storage as an important constraint to increasing productivity.

**Transport and infrastructure**

The majority of transporters were said to be Darfurians and a few locals who owned trucks. Since the crisis they no longer operate. As a result, the main transportation system between the different markets is now bicycles, motorbikes, and women carrying goods on their backs (8-10 hour walk). The

cost of transportation was very prohibitive for the retailers, as they had to travel to Anet when previously they would be supplied while in Abiemnhom. The average cost of transportation between Anet and Abiemnhom was 200 SSP per 200Kg of sorghum and 150 SSP per 75Kg of sorghum. The **high transaction cost** was associated with the **deplorable condition** of the roads in the rainy season and increased fuel prices.[26]

**Extension services and training**

As indicated earlier, agricultural production in Abiemnhom is rain-fed and traditional with no access to government extension services and training. The farmers are using age old skills including the burning of crop stover and top-layer cultivation, increasing the risk of wind and rain erosion of the top soil in case of heavy rains and flooding.

**Financial Services and Communication**

There were three money transfer companies and two mobile network companies in Abiemnhom.

**Sorghum Market System after the Crisis**

The crisis impacted directly on local production and trade in sorghum. In addition to acquiring inputs, farmers need the correct timing for successful cultivation and planting. As will be discussed later, during the planting season (April to May) farmers were displaced, inputs destroyed or stolen, and due to the crisis, seeds for planting were consumed. Furthermore, flooding destroyed the crop and rural infrastructure (roads and culverts) limiting the movement of commodities from other markets. The insecurity curtailed the movement of goods by disrupting trade routes, transportation, and generally increasing transaction costs. These factors resulted in a drop in the local production of sorghum and supply from other markets, and thereby an increase in the price consumers had to pay to acquire sorghum (see detailed discussion in the next section).

**Map of Sorghum Market System after Crisis**

Figure 8 maps the sorghum market system after the crisis. As indicated in the map, major disruptions occurred in the supply of sorghum, ranging from production, access to markets and transportation, and market relationships and linkages. For example, as there were no longer large traders of sorghum in Abiemnhom, traders and even household consumers were travelling to Anet/Agok market (approximately 45Km away) to purchase sorghum and other essential commodities, as the prices were lower there. Furthermore, as the larger transporters had either fled the conflict or were avoiding risking their assets, larger trucks were no longer operating along the main trade routes and traders became more reliant on motorbikes and bicycles to transport commodities. The poor condition of the roads also added to the disincentives for the transporters, as the risk of breakdown and costs of repair and maintenance increased. The prevailing insecurity and poor infrastructure combined together, and prevented the prepositioning of essential supplies in preparation of the rainy season, which is common practice in South Sudan.

[26] The fuel prices rose from 1 USD to 1.45 – 1.50 USD per litre.

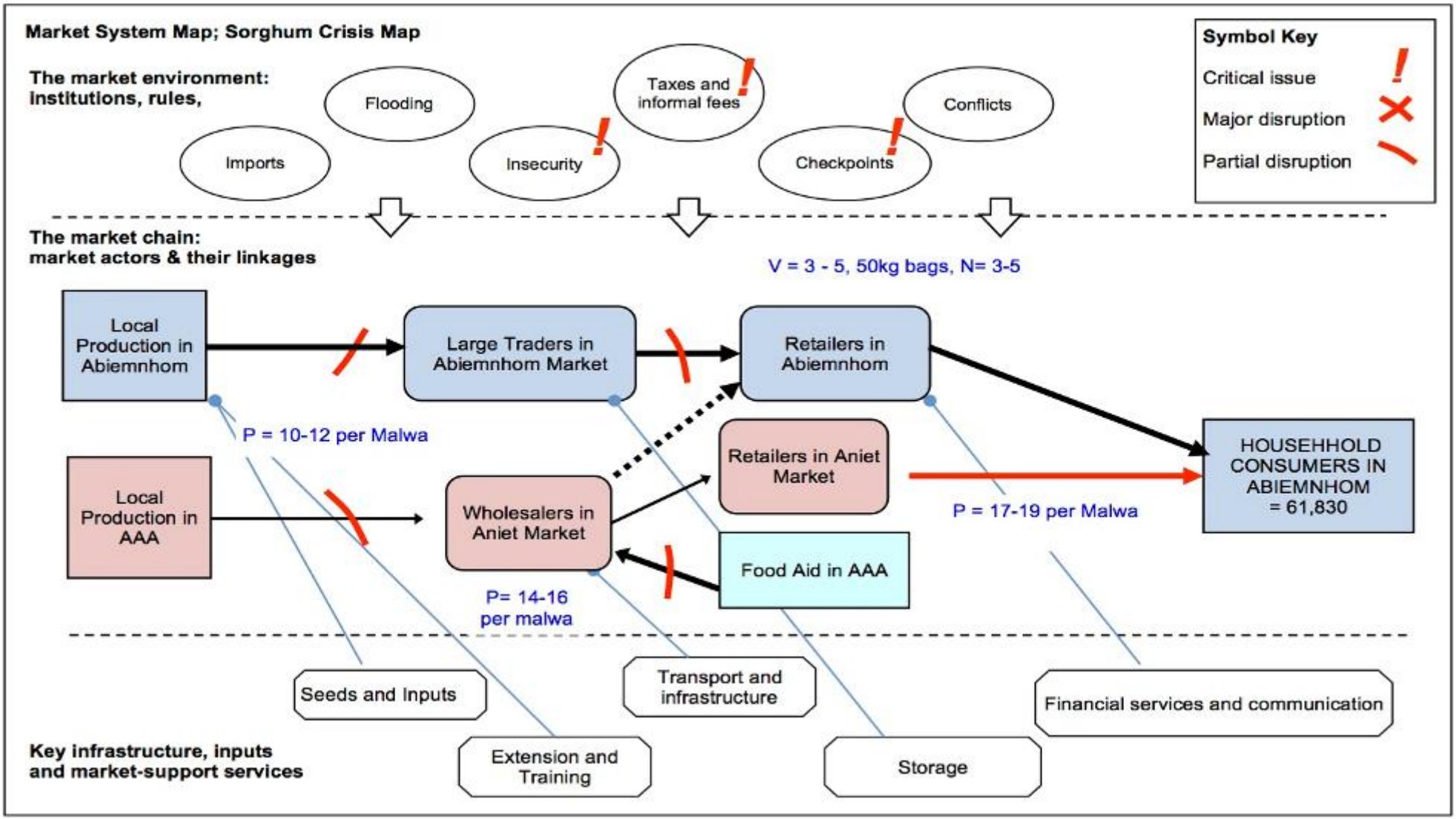



**Figure 8: Sorghum crisis map**

**Highlights of disruption in sorghum market system due to the crisis**

A combination of long-standing underlying low productivity for sorghum and the compounded impacts of both insecurity (affecting seed supply and planted areas), plus the impact of flooding on the second season crop, has significantly reduced local production. In addition, pre-crisis markets, which supplied sorghum to meet normal deficits, were initially completely closed. Their only very partial recovery is marked by significantly reduced flows and high transaction costs, resulting in a more than doubling of the price of sorghum at a time when households have weakened purchasing power (also see next section on livestock trade). The prices of essential commodities such as sorghum, maize and sugar have increased. Traders are finding it riskier to engage in business,[27] and roads remain poor after the rainy season. Household access to sorghum and other commodities is constrained and the resultant high prices deteriorated the purchasing power of households relying mostly on markets – 63% of households in Unity State were buying sorghum from the market prior to the conflict.[xix]

**Impacts of the Displacement**

Pre-emptive displacement of populations occurred within the first planting season. As a result, the displaced households had either not planted or were late in planting. Even though households were able to carry out late planting, farm labor was not adequate, as not all family members had returned. Households located in rural corridors utilized by combatant troops saw most of their harvest looted, and had to source seeds from the market or rely on emergency seed supplies provided by NGOs. All these factors affected the first season's harvest. As for the second season, access to distant farms still remained a challenge.

During the assessment, IDPs expressed their unwillingness to return while armed groups were still present in the area. The market supply for seed was also constrained by poor roads and insecurity. Due to the above factors, the domestic supply of sorghum was reported to be below average in this year (2014). For example, households interviewed reported that the amount of sorghum produced had decreased by 30 - 40% for the two seasons combined. The prices at farm gate at the first harvest were 150 SSP/50Kg a bag, and later increased to 200 SSP and retailed at 300 – 325 SSP/50Kg a bag at the time of the EMMA. There is anecdotal evidence of increased substitution of relatively cheaper varieties of sorghum that were sourced from Anet market.[28] Other than access to seed and inputs, and challenges from pests and disease, sorghum farmers were confronted by the high costs of bush clearing and cultivation in the initial establishment of the farms.

> *"Bicycles and motorbikes are currently the main modes of transporting sorghum between markets - the volumes are small and costs are high. For example, a motorbike transporting 200Kg of sorghum is charging up to 200 SSP ($62.50) between Anet and Abiemnhom*
>
> - EMMA Report

[27] All the traders interviewed (both livestock and sorghum) reported that they lost money and stocks in source markets when the conflict broke out. Given that the assumption was that fighting might escalate once the road conditions improved, they were hesitant to commit large capital in their businesses.

[28] There were four varieties of sorghum that were available in the market: *Rath, Amarag, Red Sorghum* (distributed by WFP), and *Fitrida* that retailed at 17 SSP, 16 SSP, 15 SSP and 14 SSP per *malwa*, respectively. Of these the red WFP sorghum was the least desired variety.

**Impacts of the heightened tension and insecurity**

Following the crisis, market actors (transporters and larger traders) with the capacity to move large volumes between markets in north Unity were displaced. The majority of transporters plying trade routes were said to be Darfurians, a number of whom retreated back further into the northern borders while some were reported killed in Bentiu. As a result, both local and foreign transporters have less appetite for risk. The situation was made worse by the condition of the roads following the flooding. An improvement of the road infrastructure (backfilling of potholes and gullies (created by the rains) through cash for work interventions will facilitate the use of pick-up trucks for the transportation of sorghum.

Trade has been affected by the lack of market access from Mayom and Bentiu. Abiemnhom used to rely on supply from Bentiu, which was in turn sourced from mainly mechanized sorghum production in Renk county and surrounding areas (this trade route has collapsed following the crisis), and a supply of a smaller quantity of sorghum from Juba (through the Nile River trade). Since the onset of the crisis, the flow of commodities along the Bentiu- Abiemnhom route has decreased dramatically. Transporters who make the trip reported a number of checkpoints operated by local security forces, which in most cases required the payment of informal fees. For example, between Anet and Abiemnhom, one additional checkpoint was mounted at Biyom Kat (in addition to three established checkpoints), and fees charged at each checkpoint increased. The fees for a 50Kg bag of sorghum increased from 9 SSP to 40 SSP after the crisis (an increase from 2% of the value to 10% of the value, based on a price of 8 SSP/Kg).

Livelihoods, including small businesses, have been severely affected. The retailers report a reduction in the overall amount of items, including sorghum, available in the market; furthermore, people have little to no purchasing power because they have already exhausted what little cash savings they have, and also as a consequence to unfavourable terms of trade between livestock and sorghum. The number of retailers in business dropped by 40% with a 54% reduction in the volumes of sorghum traded in the retail market (post-crisis the retailers sold eight to ten *malwas* per day). The number of millers dropped from 13 to 6 due to the increase in cost of running a mill which rose from 615 SSP to 800 SSP per week due to increases in prices of fuel, oil, grease and other consumables at a time when the quantity of sorghum milled per day dropped from 130 *malwas* to 48 *malwas*. To meet the higher costs, the cost of milling increased from 2 SSP to 4 SSP per *malwa* after the crisis (representing an increase of from 0.625 SSP/Kg to 1.25 SSP/ Kg). Furthermore, the majority of households were consuming whole sorghum grain due to increased prices of milling.

**Impacts of the flooding**

Subsequent to the crisis, direct losses resulted from flooding, with some of both households and key informants reporting the loss of the entire season's harvest. For example, one of the most successful farmers, who doubled as a wholesaler, had harvested 7500 Kgs of sorghum from 25 *feddans* cultivated in the first season, but in the second season the entire crop was destroyed. The losses had the greatest impact among poor households who cultivated 1-3 *feddans*, as they harvested nothing. Those who cultivated 25-30 *feddans,* whilst experiencing meager yields of only up to five bags (50Kg) did at least harvest enough to meet household needs. It is unclear where seed and inputs will be sourced next season, as a majority of households had consumed all their sorghum following the failures of last season due to flooding.

**Impacts at household level**

Supply was also constrained due to the displacement of the majority of larger scale traders and the drop in production levels as farmers either missed the planting season or were late in planting (with flooding destroying the crops). As local sorghum supplies dwindle, retailers are now more

dependent on the Anet market, which is in turn supplied from local production, food aid and important linkages to Wau, Aweil and Kuajok markets, themselves connecting to the sorghum production surplus areas of Western Equatoria.

## Cattle Off-Take Market Systems

### Overview of Livestock Market System in northern Unity State

When discussing livestock marketing in South Sudan, one must take into account the changes that have occurred in the sector over the years, particularly since the end of the civil war with Sudan and the impact this has had on internal and export markets.

The South Sudan Infrastructure Action Plan of 2013 notes that in the recent past, South Sudan used to export cattle to Uganda and Kenya, and through the Port of Sudan to Saudi Arabia and other regional markets. In 2000, South Sudan exported livestock to Uganda through the following entry points: 1) Bazi-Kaya to Oraba-Koboko-Arua; 2) Kerwa-Merwa-Nyumbe; 3) Kajo-Keji to Afoji-Moyo; 3) Nimule-Ajumani; and, 4) Tsertenya-Agoro-Kitgum.[xx]

Paradoxically, South Sudan has more recently begun to import modest numbers of live animals from Uganda in spite of its vast livestock resources. This is a result of the rapid growth of Juba as an urban center (the current population is an estimated 230,000 with an estimated growth rate of 20% per annum in 2010). To the south there are two main supply routes linking the Equatorial States to northern Uganda – the Nimule-Juba route, generally utilized for imported livestock from Uganda, and the Kapoeta-Torit-Juba route - traditionally an important livestock supply route into Juba. For exports northwards from central and northern parts of South Sudan into the Sudan, the main supply routes are Bentiu-El Obeid, Nasir-Renk and Judah-Kosti. While the internal market for livestock products will continue to grow, in order to sustain growth of the livestock sector, the export markets will need to be developed and have the potential for expansion.[xxi]

In a Southern Sudan study of 2010, the SNV Livestock Sector reported that market routes were constrained by insecurity brought about by cattle raiding, particularly concerning trade from Jonglei into Juba (Bor – Juba; and Pibor – Kapoeta – Juba) as well as parts of Central Equatoria. Secondly, the high and multiple taxations along the trade routes accounted for the highest cost item - taxes account for 15.8% of the total value of livestock landed in terminal markets. Finally, as a result of the poor infrastructure, some routes are impassable during the wet season and therefore completely block the supply (for example, the Juba – Torit road has made Kapoeta livestock trade route/s? into Juba almost dry up, as well as large areas bordering the Sudd[29]). Table 3 shows the main livestock trade routes in South Sudan.

Following disputes between South Sudan and Sudan, the border between the two countries was closed. Previously these cross-border movements provided the main trading route for livestock exported out of the area, and offered a viable alternative to southern routes should trading conditions in a northerly direction be more favorable. The ban essentially restricted options down to the southerly trade routes, making the trading system considerably less resilient.

Reduced trade, not a complete cessation of trade, impacted large-scale cost effective trucking of livestock. Livestock marketing systems pivoted towards Juba as an emerging market whilst correspondingly, linkages to Sudan were weakened with connections to livestock markets in Southern Kordofan and other Sudanese states were lost or significantly reduced. The system had recently (only partially) adjusted to the constraints and was evolving to capitalize on opportunities from internal markets.

[29] The geographically low lying flood prone marshy areas of central-northern South Sudan relatively close to the Nile River, which seasonally become cut off due to the rains.

| State/Route | Route Description |
|---|---|
| **Eastern Equatoria** | Soroti → Gulu (Uganda)→Nimule → Juba<br>Masindi → Gulu → Nimule → Juba |
| | Narus →Kapoeta →Camp 15 →Torit →Juba |
| | Kotido → Kitgum – Tsertenya → Torit |
| **Central Equatoria** | Terekeka → Juba |
| **Upper Nile** | Nasir→Renk→Judah→Rabak/Kosti in White Nile State |
| | Manyo (Wadakona, Umjalalah and Ayat) →Rabak/Kosti in White Nile |
| **Jonglei** | Akobo →Nasir →Renk → Kosti → Khartoum |
| | Akobo → Nasir → Malakal |
| | Akobo → Bor |
| | Duk → Ayod → Fangak → Malakal |
| | Duk → Twich East → Bor |
| | Uror → Ayod → Figi → Malakal |
| | Uror – Bor |
| | Pibor – Bor |
| | Pibor → Juba |
| | Pibor → Kapoeta → Juba |
| | Bor → Juba |
| **Unity** | Bentiu → Rubkona → El Obeid |

**Table 3: The main livestock trade routes in South Sudan**

**Cattle Market System before the Current Crisis**

It is estimated that Unity State holds about 12.2% of the national herd (Table 4) with Abiemnhom being among the counties with largest livestock population in Unity State.[30] As in other areas, in Abiemnhom, cattle play a crucial role in the sale and exchange for sorghum. In addition to sales, sheep and goats are also consumed at a household level. In normal seasons, producers sold their animals in Abiemnhom market and the neighboring connected markets of Anet and Mayom. Because of its size and the prices offered, the Anet market was the preferred market and served as a wholesale market through which livestock would frequently be traded onwards. Sales were more common during the lean season when herd productivity was low and households needed cereals in their diets to supplement their livestock products. The decision of which species to sell was determined by livestock numbers, herd structure and level of need of the household – cattle were sold to meet needs that required bigger cash outlay.

**Table 4: Livestock Population in South Sudan and Unity State**

| Species | South Sudan | Unity State | % of national herd in Unity State |
|---|---|---|---|
| Cattle | 11,735,159 | 1,180,422 | 10.1% |
| Goats | 12,424,760 | 1,754,816 | 14.1% |
| | | | |
| Sheep | 12,062,883 | 1,487,402 | 12.3% |
| **Total** | **36,222,802** | **4,422,640** | **12.2%** |

*Source: FAO Livestock Section 2009/2010*

For Abiemnhom, the main supply areas were in Unity State, from which livestock moved through Mayom market (where aggregation occurred), transited in Abiemnhom market (where some were slaughtered for local consumption) where further aggregation occurred in Anet market (Figure 9). The Anet market was also supplied locally from AAA and Warrap State to the south and animals were then moved to the Aweil and Paliat markets and then to Wau from where cattle were moved to terminal markets in Juba. It is also worth noting that unofficial livestock movement through the closed Sudan border has occurred but due to the informal nature of this trade an estimate of the volumes were not able to be determined. Previously, counties in Unity State and Bor (Jonglei State) also supplied Juba.

[30] Estimates indicate that there are over 250,000 herds of cattle in Abiemnhom County.

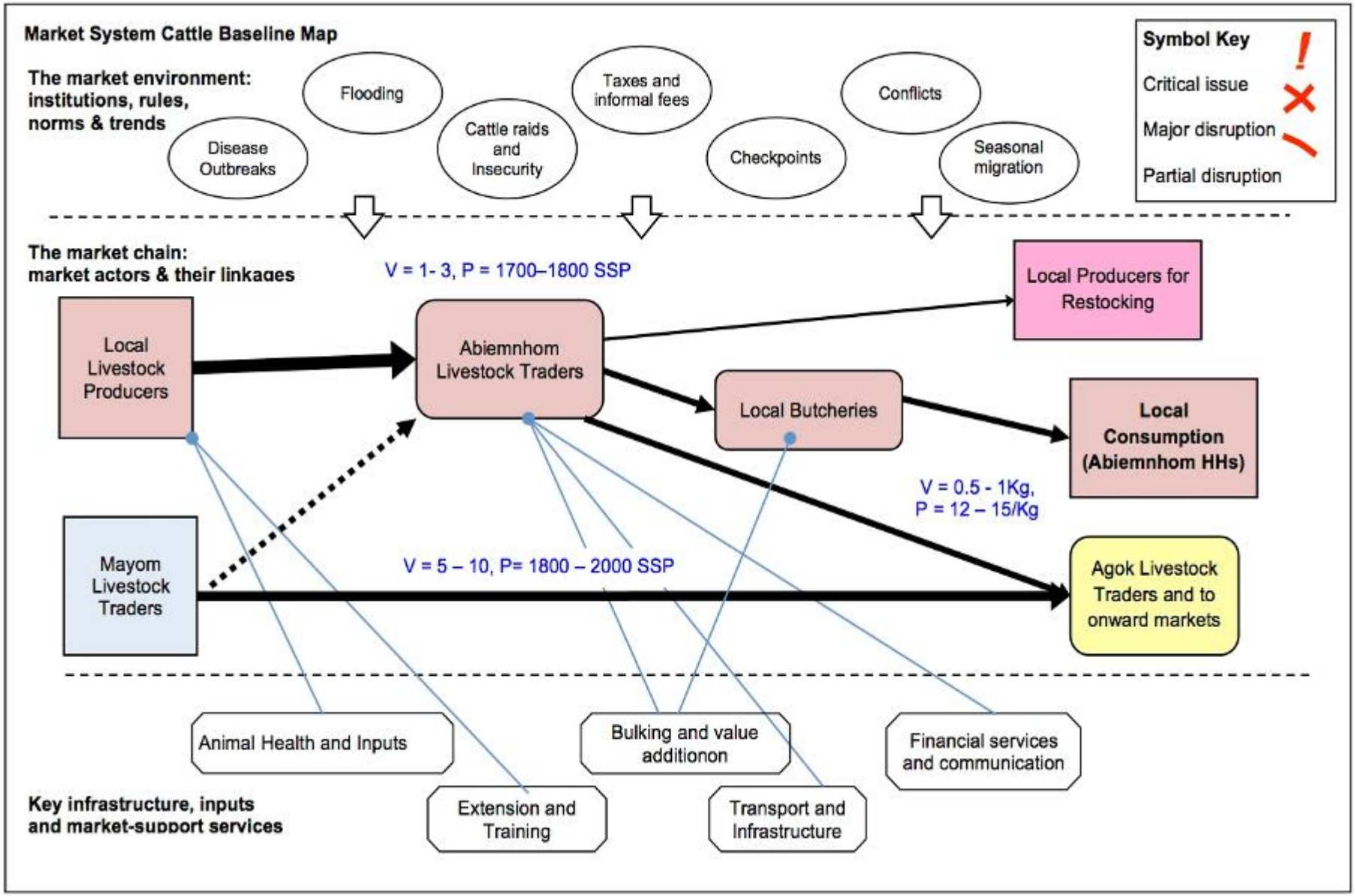



**Figure 9: Cattle off-take market system baseline map**

## Market Environment: Institutions, Rules, Norms and Trends

### Cattle raids and insecurity

While different ethnic communities migrate seasonally with large herds of cattle, (triggering conflict over access to water and grazing areas), cattle raiding finds its roots around a socio-economic tradition of acquiring sufficient cattle to pay dowries for marriage and to achieve the status of adulthood. Other than the impact of the current crisis, the predominantly Dinka county is prone to attacks by Misseriya Arab pastoralists and Nuer cattle raiders. Furthermore, theft of animals en route to markets was reported to be common. Cattle raids and insecurity cause considerable uncertainties in investing in the sector.

### Supply of adequate quantity and quality of animals to market

The livestock market in Abiemnhom was primarily a retail market, a basic point where producers could trade in low performing and inefficient animals destined for slaughter and not the more preferred live animal markets with the associated price premiums. In addition to the high prevalence of diseases, the seasonality of rainfall and the traditional migration patterns affected the number and quality of animals present in the market. Depending on the need, producers generally brought animals that they thought would fetch them the amount of money they needed. Therefore, rather than meet the market requirement, they brought animals that were weak, barren, old or young.

### Trade ban imposed by Sudan

The trade ban limited opportunities for marketing livestock; as a result, traders were more reliant on meeting the demand in Juba. Livestock was therefore moved to Anet, Aweil and Wau markets for onward movement to markets in Rumbek and Juba.

## Livestock Market Chain

### Livestock Producers

Although livestock are sold to meet household needs, the primary production objective remains firstly as asset accumulation with a socially oriented purpose (i.e. dowry and strengthening of social status), plus the production of milk. As a result, producers rarely take advantage of periods when prices are good; they also do not generally focus attention on the use of animal health and feed inputs and better management that will allow them to reap the benefits of producing livestock.

> *“There was clear partnership between Nuer and Dinka traders, especially those from Mayom trekking animals overland…the trekking route crosses through both Nuer and Dinka territories and without the partnership, movement through another ethnic groups’ area would be extremely vulnerable to cattle raids... trekkers pooled animals for security and to reduce costs.*
>
> - *EMMA Report*

### Traders

All livestock traders in the market were small scale buyers and sellers of 15-20 animals per trip (traders made 3-4 trips per month), mainly from Mayom, selling a few in Abiemnhom and moving the surplus to Anet market. They were poorly organized; even where traders unions existed, few traders were members and most did not recognize the potential benefits that may have gained from membership. Members of the trade union were charged 5 SSP per cow sold/bought in the market. However, Abiemnhom market acted as a transit point en route to larger markets such as

Anet, where livestock were aggregated for onward movement to Aweil, Wau and Kuajok, then down to Juba. All the animals sold in Abiemnhom were destined mainly for slaughter, though a few young females were kept for restocking.

**Butchers and slaughter men**

The animals that sold in Abiemnhom were mainly for slaughter, though a few young females were bought for restocking. On average two animals were slaughtered per day. It was observed that slaughter occurred in unhygienic conditions, with animals slaughtered in the open and meat sold in unhygienic makeshift butcheries. In addition to a 25 SSP inspection fee and local taxes, the traders paid 100 SSP per animal for labor (to the slaughter man).

**Consumers**

Mutton, beef and goat were favored over other types of meat. It is estimated that the average meat consumption rate is 4.745 Kg per person per year.[xxii] In Abiemnhom, each household purchased 0.5-1Kg per day spending on average 18-20 SSP (higher for boneless meat) per day.

**Key Infrastructure, Services and Inputs**

To attain competitiveness, the sector requires a number of support services including health and inputs, technology related services for upgrading and value addition; business management, advisory services for profitable operations; and other business support services such as financial services. These perhaps were the most important challenges facing market actors in the county.

**Animal health inputs and services**

Generally, due to the weak animal health system, livestock mortalities are high in South Sudan.[31] Information from key informant interviews indicate that there were a number of Community Animal Health Workers (CAHWs)[32] trained in the *payams* who provided the only treatment and advisory services. However, since their basic medicine kits were not replenished by the NGOs who generally supply them, they were reported to be inactive.[33] The CAHWs also participated in disease surveillance and reporting, and vaccination and treatment campaigns. Veterinaries Sans Frontieres – Suisse (VSF-Suisse) has supported occasional vaccination and treatment (up to early 2013) but no other direct support was provided. There was one private sector veterinary drug seller in Abiemnhom who sourced drugs from a private drug supplier in Bentiu. In addition, there were six livestock officers and 13 CAHWs employed by the government. The common diseases reported in cattle were pneumonia, trypanosomiasis, ticks and tick borne diseases, and helminths, while in shoats, contagious caprine pleuropneumonia, mange, ticks and tick borne diseases, helminths and Peste des Petits Ruminants (PPR) were reported to be prevalent.[34] Without animal health inputs and services provided on a commercial basis to producers, their accessibility would remain limited, thereby contributing to the low productivity of the sector.

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[31] A livestock value chain in South Sudan in 2007 by SNV indicated a 50% mortality rate among calves and 15% mortality among adult cattle, and cattle population growth rate of 1% per annum. The mortalities were mainly due to trypanosomiaisis, pneumonia, and liver flukes. The growth rate for shoats was estimated at 10%.

[32] Community animal health workers have typically been selected by their community and are recognized as competent stockmen (and in fewer cases stock women). They received short basic training (generally from an NGO) in vaccination and basic curative services (treatment with antibiotics and anti-parasitic medications). The quality is highly variable, linked most closely to the levels of support they receive through the NGO as well as the capacities and incentives of the individuals.

[33] Due to the poor roads, long distances and inadequate private sector involvement, the drug supply chain for CAHWs remains weak – inputs are expensive, unreliable and difficult to access for CAHWs once NGOs supporting them exit their programs.

[34] According to the FAO South Sudan Livestock Alert (December 2014) some pastoralist groups are reporting livestock deaths on an alarming scale, some claiming that they have already lost up to 50 percent of their herds to disease.

**Transportation/Trekking**

From interviews with traders in both Abiemnhom and Anet markets, it was clear that livestock movement to market, mainly by trekking, was the largest cost component. The two main costs were official taxes and unofficial payments at checkpoints, and trekking costs (of herding animals en route to markets). Taxes and unofficial payments at checkpoints were the highest costs incurred by traders in moving animals from one market to another; most of these fees are not receipted. For example, in addition to 25 SSP market fees (another 2 SSP was paid by buyers), the traders would incur 5 SSP and 14 SSP on checkpoints on Mayom-Abiemnhom and Abiemnhom-Anet roads. Another cost related to trekking was security related to cattle raiding and theft along trekking routes. The cost of trekking was 40-100 SPP per animal.

**Financial and communication services**

Pre-crisis, Abiemnhom was served by three money transfer companies (MTCs): Mountain View, Bumat and Chopkuer, and two mobile phone companies: MTN and Zain. These services are essential for traders and producers to access market information and pass information security along trekking routes.

**Livestock Off-take Market Systems after the Crisis**

Following the crisis, the market actors faced a number of constraints: limitation in supply and access to markets, increase in taxation and fees, decrease in the number of traders and producers (due to displacement) general reductions in the consumption of livestock and products due to economic constraints at the household level.

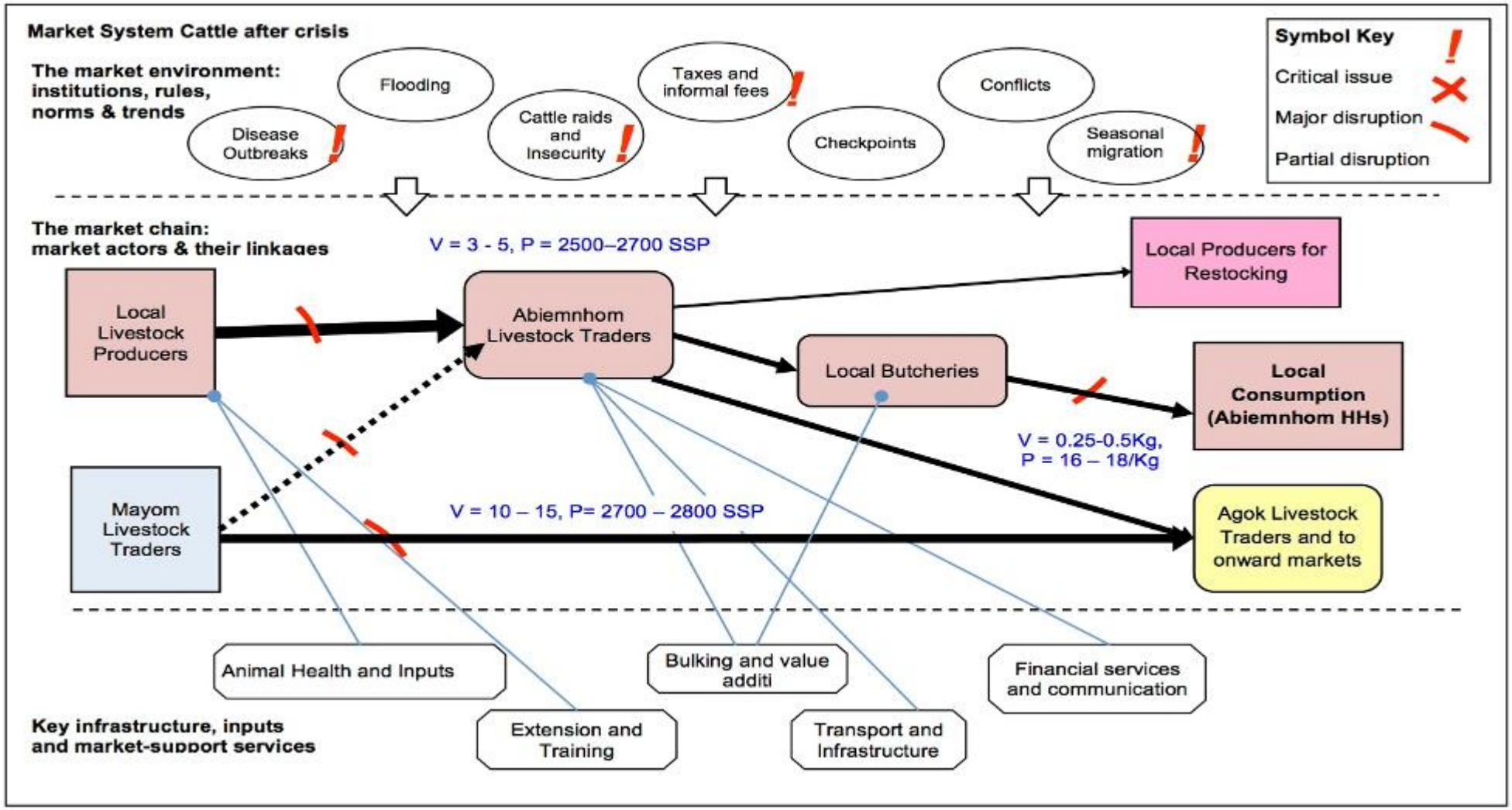


*Figure 10, Cattle off-take systems after the crisis*

Following the crisis, trade from local producers was disrupted, as some animals had been lost while the other herds migrated. Further, the number of traders in the market has been reduced due to insecurity and reduced local purchasing power. For example, it took at least two days to sell a bovine carcass. Furthermore, even major customers such as hotels and restaurants have reduced their purchases by 35%. Similarly, Mayom has been severely disrupted, firstly because local trade relationships were weakened. Secondly, the risk of theft and cattle rustling are higher **due to general lawlessness**, and the cost of doing business has increased due to the increase in checkpoints, and the informal and formal fees charged at each of the checkpoints. Hence, the number of animals in the market was reduced – as well as the number of animals being moved to Anet market. In general, as a result of the conflict, it is too risky to invest in livestock trade.

> *While pastoralists are generally well-armed and more experienced fighters (relative to agro-pastoralists), the arming of the civilian population has increased the level of violence in cattle raids and tribal clashes. With an increase in the number of roaming militias, especially in rural Unity State, livestock theft and looting have spiraled out of control.*

In terms of support services, the financial and communication services collapsed, while input services operated below the baseline state. As the MTCs were looted in Bentiu, they closed shop once fighting got closer to Abiemnhom. The government also switched off the mobile network for security reasons. Currently, even with all the security challenges, traders reported that they had to physically transport cash from one market to another. Considering the lack of financial services in rural areas such as Abiemnhom, livestock remain the only known and available way to store value. Since the crisis and rainy season, access has been limited to Anet and Aweil markets, and since motorbikes have to be used to transport goods, only smaller volumes can be procured compared to the pre-crisis time period.

**Shoat Off-take Market System**

Small ruminants play a dual-purpose role, providing milk and as a ready source of cash when required. They are generally more drought tolerant but less able to undertake long-distance treks compared to cattle. While cattle make the seasonal trek to cattle camps, small ruminants are generally less mobile and a greater proportion are located around the homestead. They are typically under the care of household members who remain in the village, namely women and children.

**Shoat off-take Before the Crisis**

As most shoats were kept within a small radius of the town (due to fear of stealing), grazing on pasture was restricted and their body condition was not suitable for market (under-nutrition, which also affects milk production). Based on the trader interviews, shoats sold were usually lean and lacked the quality and carcass weight desired; as a result the carcass yields were low. Thus butcheries preferred to slaughter cattle instead of shoats. The sale of livestock, especially small ruminants, offers significant income generation opportunities for livestock keepers, and largely determines their capacity to purchase food items. For example, producers reported that they would have to sell five to six shoats to secure an adequate amount of cereal for the household while one cow would serve the same purpose. In Abiemnhom, cattle are sold mainly to external markets (and locally for consumption and restocking). In a few instances, shoats were moved to Anet market where they were slaughtered for local consumption in Agok. As indicated in the map, shoats were sold directly to the trader who would then slaughter them, or in few instances move them to Anet market. Thus small ruminant marketing is more orientated towards local consumption than cattle, for which trade to distant markets is more common.

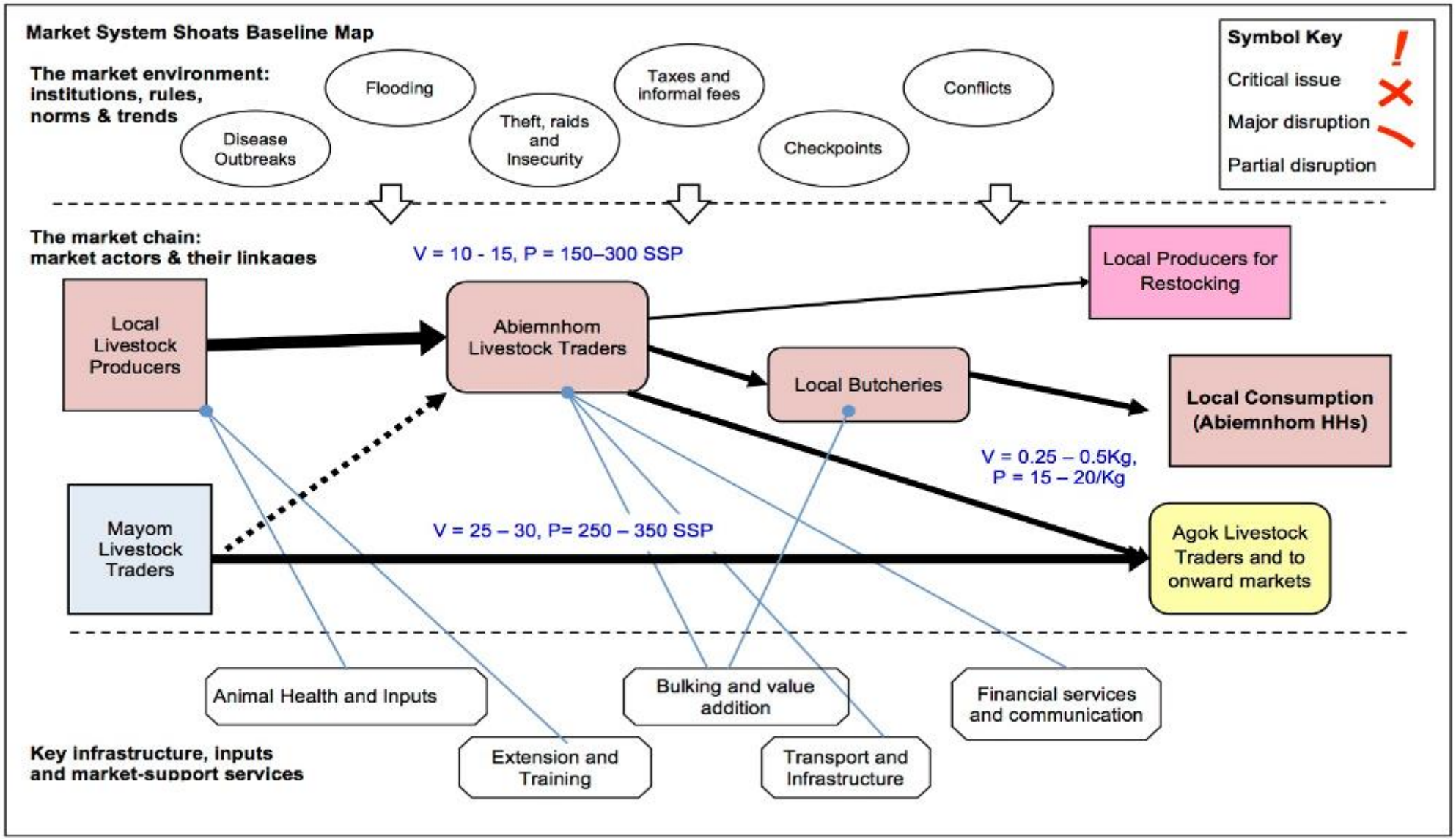


**Figure 11: Shoat off-take market system before the crisis**

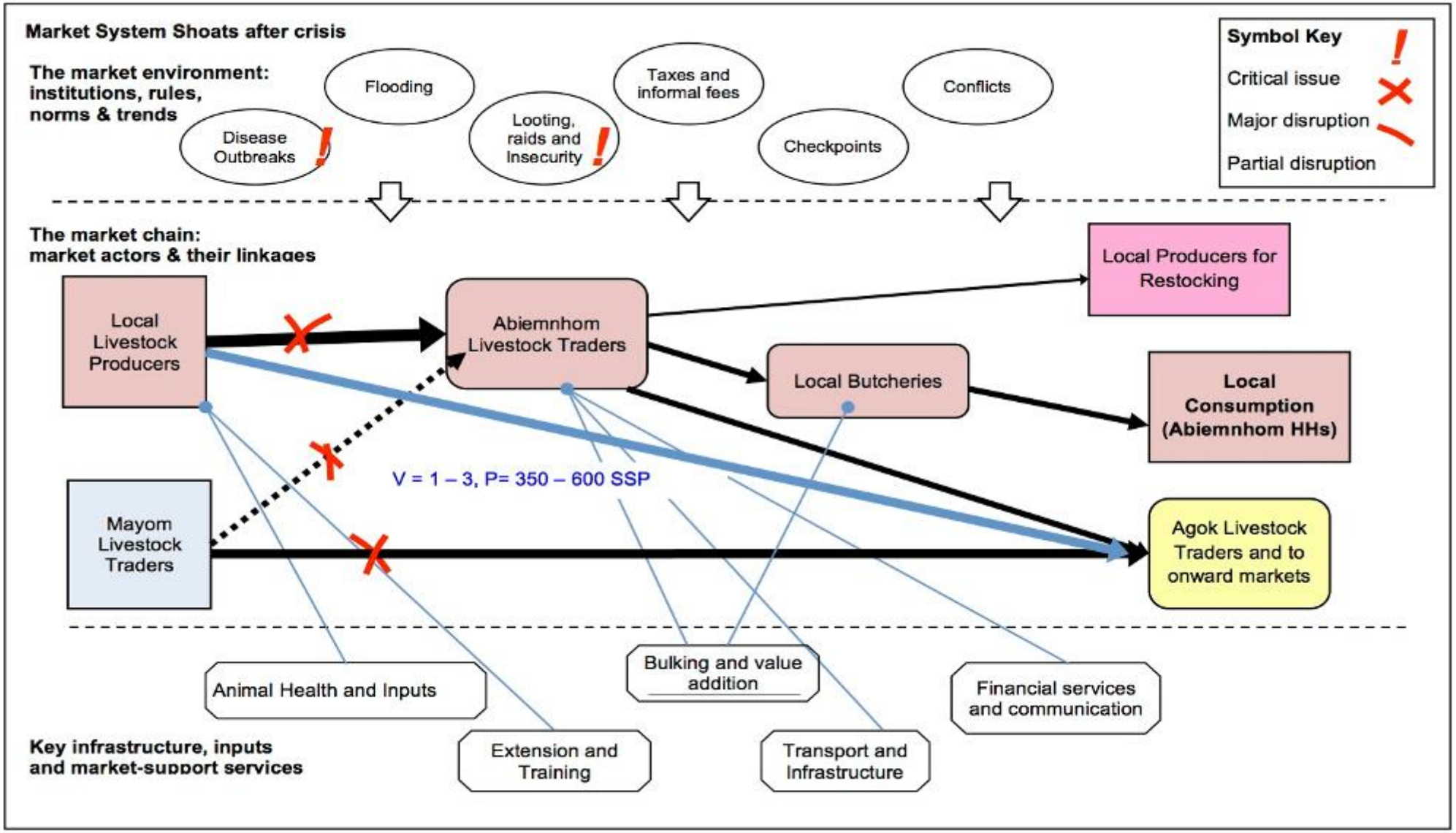


**Figure 12, Shoat off-take system after the crisis**

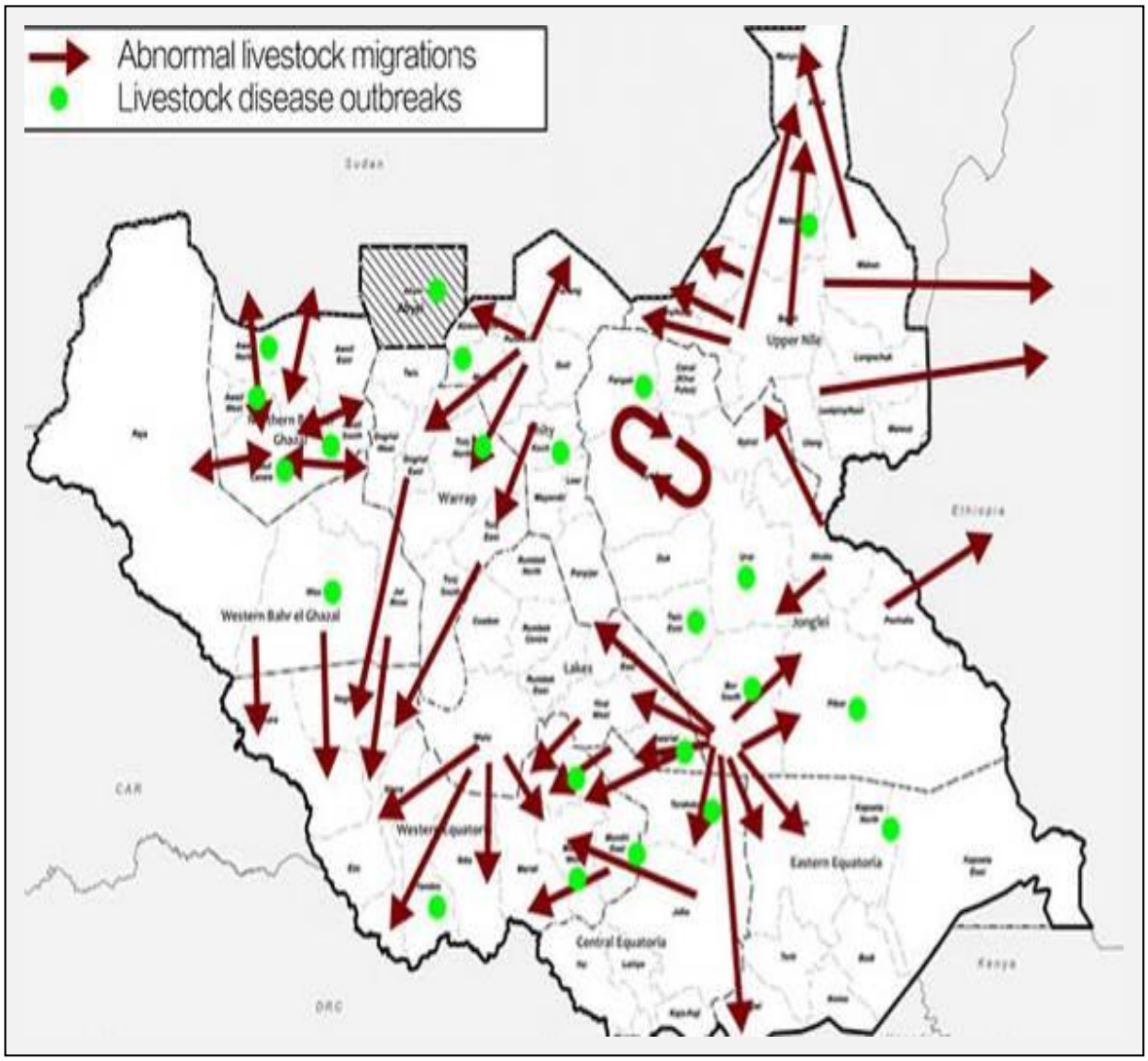


**Figure 13: Livestock migration and disease outbreak**, *FAO South Sudan Livestock Alert, Dec 2014*

The conflict has also affected the seasonal migration of livestock, who move to high ground during the rainy season, and towards settlements in the dry season. Livestock body conditions, already poor due to dry season stresses, have been exacerbated by the shocks and changes of grazing and migration patterns.

As large herds congregated in safer areas, the livestock disease patterns were reported to have changed or intensified – including a suspected outbreak of hemorrhagic septicemia - as well as reports of worms, mange and ticks. Of concern were diseases that would impact heavily upon the national herd such as foot and mouth disease, hemorrhagic septicemia and, trypanosomiasis plus the introduction of diseases into new areas, notably the expanded distribution of East Coast Fever due to abnormal cattle movements.[xxiii] FAO has reported disease outbreaks in Abiemnhom/Mayom, and Abyei areas since the conflict.

The arrival of large numbers of herds in agricultural areas has also increased the risk of conflict (particularly resource based conflict) with settled farming communities. Decisions concerning the relocation of livestock during the crisis followed similar patterns to the displacement of human populations – influenced more by access to pasture and disease prevalence (Figure 13). For example, livestock from areas in Abiemnhom were reported to have moved to Twic County (N. Warrap State) where security was better and livestock had access to adequate amounts of pasture. With improvement in security, it is anticipated that livestock will be moving back to Abiemnhom.

**Impacts on Livestock Trade and Marketing**

The traders have faced several risks as a result of the crisis including rebel attacks, robbers, loss of capital, cattle raids, poor roads, and an increased number of checkpoints with associated fees. The livestock markets have largely ceased or downscaled their activities due to insecurity. The number of traders moving livestock from Mayom dropped by 50-60% while the number of animals moved between the two markets (Mayom – Abiemnhom) reduced by 40%. [35] Furthermore, it took up to three weeks to sell 10-15 animals, while it previously took 7-10 days before the crisis. It is important to note that in times of crisis, the South Sudanese depend on kinship networks – their social capital – to weather external shocks. They share resources and redistribute risk across networks. The ability of a household and market to cope amidst crisis, and the speed at which they are able to recover post-crisis, are also linked to their network connections, across both homogenous and heterogeneous groups.

**Table 5: Livestock Prices in Abiemnhom Market**

| Category | Price before crisis (SSP) | Prices after crisis (SSP) |
|---|---|---|
| Bull | 1700 – 1800 | 2500 – 2700 |
| Cow – Pregnant | 1800 – 1900 | 2800 – 3000 |
| Cow - Heifer | 1500 – 1600 | 2500 – 2700 |
| Small Bull | 700 – 800 | 1500 – 1600 |
| Goat | 300 – 350 | 550 – 600 |

Cattle are critical in building social connections within communities and ethnicities as "bonding" capital. While this bridging capital is weakened by the current crisis, the Dinka traders reported that while they could not access the Mayom markets (as well as and other Unity State markets), they were dependent on their Nuer counterparts – though they indicated that they were not satisfied with the prices and quality of animals they were receiving. The prices of cattle and shoats have risen, as shown in Table 5 that highlights the prices of different categories before and after the crisis. It shows that while the traders were paying more for cattle due to a decrease in supply and increases in the costs of getting animals to points of sale, producers were not taking advantage of the higher post-crisis prices.[36] This is because herds were displaced and it was not easy to re-connect to traditional markets, in addition to the general livelihood strategy of accumulating assets and retaining them unless there was a specific need to be met, for which the cash would be used.

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> *The traders indicated that there were at least two to three additional checkpoints on the trekking routes where they had to pay additional fees of 54-65 SSP ($16-20) per shoat*
>
> - EMMA Report

They were no longer able to make the two to three trips per month and were limited to a single trip every two months. As the mobile phone networks and money transfer companies closed, it has been difficult for traders to acquire market information and send money to agents and partners in distant

[35] To reduce the risk of loss of animals to roaming militias, the Nuer livestock traders would move the animals to Abiemnhom and Anet from where Dinka traders would take over to deliver the animals to other markets.

[36] Pastoralists don't generally make sales decisions based on highest price. They may also be holding their livestock since they fear further instability and further isolation from markets (i.e. they see livestock as a more self sufficient strategy (through the provision of milk) which they feel may be required if they are again cut off from grain markets for a significant period of time).

markets. Cash is transported physically, a risky endeavor considering the roaming Misseriya Arabs and rebel militia. Two of the traders interviewed reported that they lost their capital when they were caught up in the taking over of Mayom by the SPLA. The traders noted that generally, the demand for livestock was depressed because South Sudanese from the diaspora were no longer returning home for the Christmas season, fearing an outbreak of clashes over the festive season once the roads became passable. At the Anet market, traders reported that they had to incur additional costs on security, and as they now have additional herders to guard the animals – they incur an additional 6 SSP per guard per day (traders use? at least two guards per day). To move animals to Aweil, traders had to negotiate three additional checkpoints – paying 100 SSP per animal, up from 40 SSP per animal before the crisis.

The only private animal health service provider in Abiemnhom reported a 50% reduction in the number of customers served. The majority of the customers asked for credit – mainly for veterinary drugs e.g. Novidium, Albendazole, Noromectin, and Penstrep. Although drugs used to be sourced from Bentiu, that market was no longer accessible and as a result drugs have to be procured from Aweil. Transportation costs have increased by 65% due to the much longer distance from the source market. Motorbikes are used to transport the medications and therefore the service provider has only been able to restock in small volumes (60% reduction in volumes of stock purchased). To cover overhead costs, the prices of common veterinary drugs such as dewormers, antibiotics, and trypanocidals increased by 55-90% following the crisis. As a result of all of the above challenges, the drugstore owner indicated that profit has dropped from 15,000-20,000 SSP per month to 5,000 SSP.

## HOW MARKET SYSTEMS ARE LIKELY TO EVOLVE IN THE FUTURE

When projecting the future of the livestock off-take and sorghum market systems, one needs to take into consideration the uncertainty about how the conflict will evolve once roads become accessible.

**Three scenarios are considered**

1) Conflict remains at a relatively low level; 2) the situation destabilizes and conflict significantly increases; and 3) some form of settlement to the wider political crisis is reached and the situation on the ground begins to gradually return towards the pre-crisis period. Each scenario incorporates a number of assumptions, which need to be tracked as responders adjust their interventions in as close to real time as operational constraints will allow.

**Conflict remains at a relatively low level**

In the current scenario (no renewed conflict), it is projected that 2.5 million people will be in IPC phases of crisis and emergency from January to March 2015[xxiv]. The FEWSNET, South Sudan outlook for October 2014 to March 2015 projects that acute food insecurity will intensify and an Emergency (IPC Phase 4[xxv]) is expected across much of Unity State.[xxvi] Unity State was among the states that registered a cereal deficit in the 2013/14 season and sadly, the population is in the dry season, which lasts typically from December to April. Considering that most sorghum reserves have been depleted, it is anticipated that the population will have a much longer hunger season than normal. Similarly, considering the forecasts and information from KIIs, the prospect for the livestock sector is fragile. In assessing the functionality of the markets in the near future, it is likely that with improvement in road conditions, traders will be able to link with market hubs such as Wau, Aweil and Kuajok. However until larger traders and transporters feel more confident of the emergent security situation, trade will not reach baseline levels (before the crisis). With the cessation of hostilities, it is likely that larger market actors will return, allowing faster replenishment of stocks to the markets. As the roads become passable, traders and transporters will be able to source sorghum from other market hubs. As goods start flowing, prices of essential commodities will be reduced, lessening the burden on households that access them.

Additionally, as the commercial markets for cattle develop and the value chain revives and expands, more livestock market actors from warring tribes and ethnicities may populate the market chain. For actors to participate in the market chain, they must rely on "bridging capital" – links that have allowed people to build connections outside of their community or ethnicity. Bridging capital is built over generations, and while it is more fragile, it fosters links for social and economic inclusion. For example, livestock market actors from Mayom (Bul Nuer) have depended on economic relationships developed pre-crisis to access livestock markets in Abiemnhom. These heterogeneous relationships have allowed Nuer livestock market actors access to a market in crisis, where they otherwise would have had none.

Displaced herds will also return, improving the availability and access to milk, and as livestock markets improve and sorghum prices fall, the terms of trade for livestock keepers will also be expected to improve. However, poorer households will still be dependent on natural resources for their livelihoods, putting them in a precarious food security situation. Therefore, supporting their purchasing power and addressing supply chain constraints of sorghum traders to reduce the risk of inflation will be critical. Hence, vouchers (highly targeted) or unconditional cash transfer programming is recommended whilst ensuring adequate supplies by providing some selected traders with smart, time-bound subsidies aimed at facilitating the flow of cereals to accelerate early market recovery. In addition lobbying for the removal of checkpoints and reduction in taxes and informal fees should be instigated, and improving market linkages are recommended. Access for humanitarian assistance (as well as commercial trade) will be important considering that Abiemnhom is among the most difficult places to reach for NGOs and traders. Furthermore, the poorer households will only be able to meet their minimal needs from markets as they would not be able to afford food. However, a more targeted approach in identification of beneficiaries should be undertaken (rather than a blanket distribution) to reduce the risks of market distortions, assuming that the markets regain some basic functionality. In advocating for market approaches, this requires that market performance be monitored to ensure that basic pre-conditions for market interventions remain in place and to monitor the impact and potential unintended consequences of market based interventions. FEWSNET, in collaboration with FAO, have recently re-established a multi-agency market price monitoring system for South Sudan. This should be supported and the resulting information and analysis widely disseminated, including to the commercial sector.

**The situation destabilizes with a significant and widespread increase in violence and related insecurity**

While it is hoped that a peace agreement will be signed and hostilities ceased, the prospect of renewed fighting is high considering that the dry season provides a window for replenishing military supplies and restarting troop movements. The risk for Abiemnhom is likely higher, as it is a strategic military area for both the SPLA and SPLA iO. In the scenario of heightened clashes, insecurity will continue to limit market revival and integration[37] – some markets and trade routes will remain inaccessible. Furthermore, a new wave of displacements will occur. In such a scenario, considering the consumption patterns and granting the predominant role of sorghum in household diets, prolonged supply deficits and subsequent increase in prices will further hinder household purchasing power. The return of cattle from cattle camps that would have provided temporary access to food (from milk) and income (from sales) will be less likely in conflict areas. The terms of trade for livestock producers and poor households will decline further, pushing them into an emergency.[38] Furthermore, as the dry season sets in and needs for cereals increase, schools re-open, and herds

[37] Integrated markets can be defined as markets in which prices for comparable goods do not behave independently. When markets are integrated, food flows among regions and prices fluctuate less, enhancing food security.

[38] According to IPC classification, an emergency occurs when even with any kind of humanitarian assistance at least one in five HHs in the area have the following or worse: large food consumption gaps resulting in very high acute malnutrition and excess mortality **OR** extreme loss of livelihood assets that will lead to food consumption gaps in the short term.

become infected (as immunity decreases), producers will require more transactions to underwrite[39], thus the need to sell more. Households will fall back on the environment (sale of natural products and consumption of wild foods) and risks of malnutrition and crisis will increase. Humanitarian activities will need to be scaled up to reach large crisis-affected populations. Therefore, lobbying for humanitarian access from different actors in the conflict will be essential.

**Political settlement between the main parties**

This requires that the Inter-governmental Authority on Development (IGAD) peace talks or any subsequent initiatives are successful. This will be a very welcome step but represents only one on a long road to reuniting South Sudan. Much of the analysis given in the first scenario will be applicable but the rate of improvement will be faster. The timing of any such settlement in relation to the seasonal calendar would clearly influence early actions to address livelihoods and food insecurity.

## CONCLUSIONS AND RECOMMENDATIONS

The findings of the EMMA indicate significant impacts on sorghum and livestock off-take market systems resulting from the fallout in Juba. At the time of writing the report (January 2015), the situation remains fluid and highly uncertain. While even before the crisis, households in Abiemnhom faced some deficit in accessing adequate quantities of sorghum, the situation was made worse by market disruptions and supply constraints resulting from the conflict and flooding. The crisis has resulted in a reduction in volumes of essential commodities in the market, increased costs of doing business in the area, and reduced purchasing power of households due to limitations in income earning opportunities and unfavorable terms of trade for livestock keepers.

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> *Trade agreements exist between Nuer and Dinka traders ...Considering that Mayom is one of the main market outlets for livestock from other counties in Unity State, supporting these relationships and strengthening linkages with end market hubs in the market chain may be the foundation for increasing off-take from Unity State*
>
> - EMMA Report

Traders, transporters, and households and their livestock have been displaced; some losing their capital while others were driven out of business. Flooding destroyed the seasonal crop and made roads impassable, further constraining the movement of goods. The number of checkpoints and informal fees charged increased tremendously. Livestock traders have had limited access to many source and end markets. Livestock markets nearly collapsed, trade in live animals, and consumption of meat and milk were drastically reduced. “Bridging capital” - links that have allowed people to build connections outside of their community or ethnicity for trade - have been severely weakened. Households have faced increased deficit in their ability to purchase sorghum, due to the combined impact of reduced production, limited market availability, and reduced incomes.

**Short Term Interventions**

Currently, household purchasing power is very low. Therefore, an improvement in household purchasing power through food vouchers and unconditional cash transfers to the most vulnerable

[39] In the dry season livestock keepers will need to sell more animals to meet household needs including cereals, veterinary drugs, and to purchase water for livestock.

households is recommended (conditional on markets being able to meet the demand). Supporting purchasing power will not be sufficient in easing access without the possibility of leading to price increases. It is therefore advisable to also undertake targeted support to business actors (such as targeted transport subsidies, improvement in market linkages, and linkages with credit and financing) to ensure a steady supply of goods in the market prior to undertaking cash transfers that would increase the demand for goods. Further, rehabilitation of key infrastructure (e.g. backfilling of potholes through cash for work) will be necessary to ease the movement of goods between markets while allowing households' access to cash incomes. Lobbying for the removal of unnecessary checkpoints and reductions in the amount of taxes and informal fees charged will reduce the cost of doing business.

For livestock, a number of short-term interventions are recommended. Firstly, the promising nascent market relationships those are developing need to be supported.[40] For example, in Mayom, Abiemnhom and Anet markets, (Mayom was previously central and a well-connected node in the wider but currently partially fragmented market network).

This type of inter-ethnic relationship might be broadened to encompass a wider inter-communal system, building on longstanding ties between communities that may extend in some cases to inter-marriage and will allow for the safe movement of people, livestock and goods for the mutual benefit of both communities. A wider agreement would require engagement from community leaders and an inclusive process, and potential peace dividends would be considerable.

Secondly, even though livestock were one of the most highly taxed commodities before the conflict, the additional informal fees and taxes (due to an increased number of checkpoints) have tremendously increased following the conflict - reducing the competitiveness of the livestock trade. There will be a need to lobby and address the issue of checkpoints and review the fees charged and facilitate movement of livestock between markets. Furthermore, trade support services such as communication, market information and financial services that were closed after the crisis need to be revived, as they are essential for the smooth operation of business.

The demand for livestock (consumption of meat and milk) needs to be addressed by improving the purchasing power of households through direct cash transfers or meat vouchers to households to stimulate higher off-take.

As the principle livelihood asset, livestock require consistent and timely access to quality animal health services and products. As market systems strengthen, access to animal health services will also become an imperative to support penetration of more lucrative markets, and also in addressing food safety issues. It is clear that this will require substantial improvements to the current animal health service delivery system. There is a need to identify sustainable models for animal health service delivery and to support the Government of South Sudan in developing a progressive strategy and enabling environment to realize that goal.

Finally, considering the historical trade relationships between South Sudan and Sudan, opportunities to improve cross border trade in both sorghum and livestock (by advocating for removal of the cross border trade ban or partial removal on key commodities) should be seriously considered.[41] There are mutual benefits for both countries in negotiating such trade liberalization, although political differences are clearly a significant hurdle to overcome.

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[40] Radio Tamazuj reported December 26, 2014 that cattle trade between Nuer and Dinkja in Unity and Lakes had resumed and was expected to pick up once the roads dry up (https://radiotamazuj.org/en/article/cattle-trade-between-unity-and-lake-states-resumes).

[41] The Humanitarian Aid Commission has announced an extension of the Memorandum of Understanding (MoU) on the transit of humanitarian aid to the neighbouring South Sudan for another six months. This may provide for opportunity for lobbying for the complete removal of cross border ban.

**Long Term Interventions**

The prospect of addressing key crop and livestock market system constraints hinge on addressing the crisis and ultimately conflict in the target areas. There were structural issues that were affecting sorghum markets before the crisis, including the high cost associated with movement of goods (taxes and infrastructure), low capacity of market actors, impacts of seasonal flooding, and poor agricultural practices.

In response, longer term programming to address the functionality of the sorghum market is recommended. First, the key to unlocking the enormous potential of the agricultural sector lies in supporting producers to recognise and capitalise on expanding local and distant market opportunities while remaining sympathetic to the requirement to balance and integrate market and non-market based livelihood strategies.[42] It is therefore necessary to identify and work with change agents through a robust behavior change program among the communities with whom NGOs can partner with to pilot innovative agricultural practices and investment in agricultural inputs, such as use of animal draught power, contract cultivation (weeding and harvesting), to fully understand the incentives and disincentives from the producers' perspective and help them over-come these barriers. [43] Furthermore, this will lay the foundation for strengthening seed and other input systems by introducing improved seed varieties and linking with a more sustainable input supply chain – a model aimed at weaning producers away from the unsustainable emergency seeds supplied by NGOs.

For livestock, the main challenges remain the quantity and quality of animals marketed, which are linked to levels of commercialization of livestock production, animal health system strengthening, livestock marketing infrastructure, and related technical and financial support services.[44] Therefore, as shown earlier for sorghum producers, it will be important to assist livestock keepers to engage productively in growing livestock market opportunities. Furthermore, South Sudan has a meat supply deficit whilst it holding one of the highest cattle and shoat populations in the world. As for the traders, the high transaction costs and structural inefficiencies (e.g. distances to market, transport costs, taxation, and insecurity) affect the number of animals they move between markets.

While not the focus of this EMMA, the production and potential for increased marketing of milk and milk products is great and highly compatible with current agro-pastoral livelihood strategies in the target communities. Rapid urbanization is likely to be a significant driver although considerable challenges lie ahead.

**Areas for Further Research**

1. Fishing and horticulture (mainly off season vegetable production) offers opportunities for diversification into other agricultural activities. The potential to promote these production systems should be investigated.
2. As the area is prone to seasonal flooding that results in the destruction of crops, there is a need to develop flood damage reduction strategies. This goes beyond the scope of this EMMA but it is recommended that an assessment examine practical interventions[45]. Finally, investment in agriculture should be accompanied with improvement in rural infrastructure that would ease movement of produce to markets.

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[42] Only 4% of arable land is cultivated and only 20% of livestock production potential has been realized (WFP, Southern Sudan: Annual Needs and Livelihoods Assessment 2010–2011 (Rome: WFP, 2010).

[43] The use of barrier analysis as a tool to develop a strategic behavior change approach may be suitable.

[44] Market supply is dependent on seasonal liquidity demands of pastoralists associated with periodic payment of school or medical fees, seasonal increases in prices of cereals and demand for grains to supplement milk diets, and seasonality in demands in terminal markets.

[45] Current investments in flood management have been mainly in the construction of dykes and distribution of fast maturing seed varieties.

3. When considering economic growth, it will be necessary to identify non-agricultural income and employment opportunities for youth and women that can be linked to growth in the agricultural sector. Further, a more targeted study to understand the roles and opportunities for both genders will be needed as gender disaggregated data is hardly available in South Sudan.

**Response Option Framework**

The framework below (Table 6) lists potential intervention options, based on the findings of this EMMA. Each option is reviewed in terms of its advantages and disadvantages and the practical feasibility of implementation. This screening process is used to identify best-bet options, which are presented immediately after Table 6.

**Table 6: Response Options**

| Response Option | Advantages | Disadvantages | Feasibility and Timing |
|---|---|---|---|
| Target business support and strengthening of linkages between local markets and end/hub market actors: financial and infrastructure investment such as cash transfers and capacity development. | A good way of laying a foundation for a longer-term market-based approach in access to inputs, services and infrastructure. | Low impact on household incomes. Need to address other causes of supply constraints such as conflict in order to get returns. | Feasibility – medium.<br>**More feasible once the conflict situation subsides** |
| Food voucher and unconditional cash transfers to the vulnerable households. This is linked to business support to market actors to reduce risk of inflation (see option above). | Households will be able to access essential commodities while retailers will be guaranteed demand. The support to the market actors will ensure that market is functioning well and cash will not result in increased prices. | The traders will need to stock adequate quantities of essential commodities – capacity of market to replenish may be limited until larger traders and transporters who fled return. Cash injection can lead to inflation in already disrupted markets. | Feasibility – high. Can be implemented within good time. It is a quick short-term intervention. |
| Address supply constraints including addressing infrastructure, informal fees and taxes, and opening of the border. | Holds key to addressing the persistent supply chain deficits in sorghum. | Requires large investment and political goodwill both locally (within the counties) and nationally (in South Sudan and Sudan). | Low feasibility.<br>High impact. |
| Emergency vaccination and animal treatment. This should be conducted in collaboration with existing market actors. | Prevent and mitigate risk of disease outbreaks following the disruption of livestock migration. | Risk of further undermining the nascent private sector service providers if the program is not targeted well or is designed without private sector involvement. | Short term intervention, but can build foundation for the development of market led animal health and input services.<br>**LEGS recommends that animals be dewormed** |

| | | | |
|---|---|---|---|
| | | | **and vaccinated regularly, preferably before the dry season/ drought conditions set in.** |
| Provide business support & facilitate linkages among livestock market actors in the local and end markets while enhancing bridging capital across the value chain to build on success stories where conflicting communities are bridging the ethnic divisions to establish trade deals (fostering new relationships) | Ease movement of livestock between markets, thus increasing the trade volume and off takes. | Needs investment in infrastructure and addressing of policy and legal issues such as informal fees and taxes and proliferation of checkpoints. Slow, challenging and risk perceived as parallel governance system that could be counterproductive. | Medium to long term with low feasibility especially for revising informal fees, taxes and checkpoints. |
| Support long term improvement in livestock and agricultural sector through market based approaches. | Sustainable way of addressing systemic constraints to production. It is also scaleable to cover the whole of Unity State. | Current seasonality of production may delay direct implementation of some of the activities. | Feasibility – medium. Takes time to set up and achieve returns, but has medium to long term impacts. |
| Identifying and promoting indigenous conflict management mechanisms and working with local governance systems. | | Many of the customary leaders have vast experience and have the potential to be either supportive or destructive depending upon how they are engaged. | Long term.<br>Feasibility – medium to low. **Appropriate in the current situation to address the conflict through local governance** |

**Response Recommendations**

Of the different options given above, we recommend the following interventions for each market system. For sorghum, the following *short-term interventions* are recommended:

1. Provide business and financial support to market actors to enable them to replenish markets immediately to meet the anticipated increased demand as households move into the lean season.
2. Cash and voucher program to improve household purchasing power and close the income gap in the lean season. **The mechanism of cash/voucher program should be informed by a market analysis that will be informed by technical feasibility of the different options, security of beneficiaries, staffs and communities, beneficiaries preference and needs, and gender and protection consideration. However, the program should be linked to direct and indirect market support to ensure that the program does not result in unnecessary market distortions**.
3. Address supply constraints that result from increased cost of doing business due to poor infrastructure, increased informal fees and taxes, and proliferation of checkpoints.

In the *long term*, it will be important to address major constraints in production practices by:

1. Strengthening inputs, service supply systems, and farm business management – use of animal draught power and flood mitigation tools. Promote intercropping sorghum with flood resistant crops and use of community radios to provide extension services (weekly or daily agricultural hour broadcasts).
2. **Improve sorghum storage by field testing alternative storage facilities and building local capacities in making these facilities. This will improve supply of sorghum and reduce price volatility. This will also encourage farmers to 'bank' surplus produce in order to insure against crop failure and drought in the future**.
3. Coordinate long-term policy approaches to prevent creation of disincentives.
4. In order to address aid-dependency in the agriculture sector there is a need to develop and implement a long-term agricultural revitalization plan, which has broad stakeholder ownership and which combines and preserves longer-term, more developmental programming, alongside periodic requirements for humanitarian responses including transfers and social safety nets, delivered in such a way that they have minimal negative impact and ideally a positive impact on the longer-term development trajectory. Such an approach will benefit from innovative, flexible financing mechanisms.

For the livestock sector, the following *short-term interventions* are recommended

**1.** Emergency vaccination and treatment of livestock to prevent the outbreak of livestock diseases. This should seek to support recovering private sector input supply systems and strengthen public sector epidemic disease control through support to cold chain infrastructure and management as well as vaccine delivery and disease surveillance. **While we advocate stronger role of the private sector in the delivery of emergency vaccination and treatment, it was clear that the private sector is currently weak and will need to be enabled to develop their services. At the time of this assessment we did not come across active CAHWs; we were informed that due to the lack of support from NGOs after the crisis and the blockages in the trade routes for the private drugs providers, the CAHWs were not able maintain their services. Therefore, it would be necessary for the partners to catalogue and carryout an analysis of CAHWs network to understand further the status of CAHWs in the current crisis and opportunities to revitalize their services. This should include but not limited to providing trainings to a new cadre of CAHWs and refresher for the existing CAHWs, supporting service delivery through CAHWs and linking private vet pharmacies (PVPs) with the CAHWs to further orient the CAHWs services into a sustainable model.**

   **It is important to note, before the current crisis there was an emerging private sector that was providing animal health inputs and livestock keepers are familiar with paying for services. That said, any support to private input suppliers in the current context should consider 'do no harm' 'smart' subsidies using local private service providers including CAHWs and the public extension services (where they exist) to deliver better quality targeted services to the most vulnerable livestock keepers and prime local markets for quality service.**

2. Business support and restoring inter-community trading linkages – facilitating trade exploratory missions and potential trade dialogue processes, facilitate exposure visits to experience where inter-communal trading initiatives have made progress, examine with local stakeholders options for 'peace market' in neutral areas, and facilitate business support and financial services.
3. Support the return of displaced livestock to restore normal migratory movements. **The restriction in seasonal movement of livestock limits livestock keepers' capacity to minimize risks and cope with shocks. Mobility can be secured by addressing the conflict, supporting local/customary institutions in conflict areas that facilitate collaboration between different**

**clans during mobility seasons, and establishing framework for sharing natural resources among communities.**

4. Support traditional conflict mitigation/resolution approaches targeting areas where livestock have been displaced. **This can be done through the establishment and support of a collective, community-led conflict resolution mechanism that builds upon traditional systems and includes members from representative ethnic groups to mediate potential conflicts**.

5. Address demand and supply issues in meat and milk – improving productivity through improved health care, improving hygiene and handling, infrastructure for delivery systems to markets (roads, containers and motorbikes), improving storage and processing, and meat and milk vouchers to vulnerable households. **As indicated earlier, potential for improving livestock sector capacity to increase contribution to producers' incomes and food security lies in improved productivity and enhanced marketing efficiency, and changing producers' behavior in favor of greater off-take. A key activity could be to analyze what are the barriers (through Barrier Analysis) for livestock keepers to adopt a healthy herd and employing an effective behavior change communication (e.g., changing social norms) strategy and support activities that break through the barriers.**

In the long term, there will be need to assist livestock keepers to engage productively in growing livestock market opportunities and investment inputs including better use of inputs, extension services and marketing of livestock, supporting development of livestock processing infrastructure, and addressing policy and legal issues acting as disincentives of trade.

Mechanisms to explore incentivized private sector delivery of vaccines (under contract to government services) should be considered, in addition to capacity development ensuring effective coordination between public and private sectors. For both market systems, there is need to invest in long term market monitoring and early warning systems with appropriately linked response mechanisms e.g. the application of drought cycle management best practices including commercial livestock destocking, fodder provision for core breeding stock, and restocking.

**To address the lack of access to nearby points for money transfer to receive remittances; it will be necessary to further identify the current barriers and fears of money transfer companies (MTCs) who were previously operational in Abiemnhom and identifying ways to work out incentives that may include buying down their risks. Additionally, further linkages and partnership can be developed between the MTCs in Anet market and local traders who may be interested to be local agents for the remittance companies. However, it will be critical to address the security and communication concerns of the MTCs, as insecurity is likely the main disincentive and of course functional mobile/communication networks that facilitate remittance.**

## B) ANNEXES

**Annex 1: EMMA Ten Steps**

The assessment used the methodology in the EMMA Toolkit, comprising ten steps.

| | |
|---|---|
| 1. *Essential Preparation* | Background research; arrival; consultation with colleagues; agency mandate, target population needs & profiles. |
| 2. *Select Markets* | Selection of critical market-systems; and identification of key analytical questions for each system. |
| 3. *Preliminary Analysis* | Production of initial profiles, seasonal calendars, maps of the market-system; identification of key informants or leads. |
| 4. *Fieldwork Preparation* | Setting the fieldwork agenda; devising interview structures & questionnaires; data-sheets and recording formats. |
| 5. *Fieldwork Activities* | Conducting the fieldwork activities – who, where, when. Section includes guidance on interview methods and tips. |
| 6. *Mapping the Market* | Finalizing baseline & emergency maps, seasonal calendars; description of key features, bottlenecks, and constraints. |
| 7. *Gap Analysis* | Comparison of household economic profiles, analysis of priority needs, access and gaps. |
| 8. *Market Analysis* | Analyzing impact on availability, conduct, performance, supply and demand, capacity of market-system to react. |
| 9. *Response Analysis* | Exploration of response options, cash and other intervention feasibility; response recommendations and their logic. |
| 10. *Communicate Results* | Consultation with colleagues; presenting conclusions to wider audiences (donors, agencies). |

**Annex 2: End Notes**

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