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This report will form part of the knowledge base for FEWS NET's food security monitoring activities in South Sudan.

ACRONYMS AND ABBREVIATIONS

CAR	Central Africa Republic
EfD	Evidence for Development
FAO	Food and Agricultural Organization
FEWS NET	Famine Early Warning Systems Network
FMA	Federal Ministry of Agriculture
FSTS	Food Security Technical Secretariat
G	Gathering, usually for wild foods or products
GRSS	Government of the Republic of South Sudan
HEA	Household Economy Approach
IDP	Internally Displaced People
IK	Payment for services in kind
IPC	Integrated Food Security Phase Classification
MARS	Ministry of Agriculture and Rural Services
NBS	National Bureau of Statistics
USAID	United States Agency for International Development
USG	United States Government
UN	United Nations
VAM	Vulnerability Analysis and Mapping
WFP	World Food Programme
OP	Own produced crops
MP	Market-purchased food
NMAF	National Ministry of Agriculture and Forestry
SMAF	State Ministry of Agriculture and Forestry
SMARF	State Ministry of Animal Resources and Fisheries

LIVELIHOOD ZONING AND DESCRIPTION METHODOLOGY

The standard Household Economy Assessment (HEA) is a livelihood-based framework for analyzing the ways people access the things they need to survive and maintain their livelihood. It helps determine people's food and non-food needs and identify appropriate means of assistance, whether short-term emergency assistance or longer term development programs or policy changes.

It is important to note that the HEA is an analytical framework, not a specific method of information collection. It defines the information that needs to be collected and the way in which it should be analyzed in order to answer a particular set of questions. It is a framework for organizing a vast array of information – some of which is local knowledge, some of which is census data, some of which is crop production data, and so on. It functions as a powerful way to make practical use of both existing secondary sources of information and also primary information.

HEA defines a livelihood zone as a geographic area in which households obtain their basic survival needs, notably food and cash income, in relatively similar ways. This means that they also typically have similar socio-economic groupings with similar asset bases, as well as relatively similar consumption patterns. These similarities apply to both good and bad years, in that coping strategies in response to shocks are also relatively similar within the same livelihood zone.

The Livelihood Zoning “Plus” product is based on the Household Economy Approach (<http://www.feg-consulting.com/resource/practitioners-guide-to-hea/practitioners-guide-to-hea/>). It includes a traditional livelihoods zoning component (<http://www.feg-consulting.com/resource/practitioners-guide-to-hea/2%20Livelihood%20Zoning.pdf>). In addition, key characteristics of socioeconomic status are explored by setting those of relatively poorer households beside those of relatively better-off households. The Livelihood zoning Plus product also provides a brief description of the zone's main geographical and climatic features, the main sources of food and cash income for each wealth group, and seasonal labor and food access calendars. Finally, the zones most vulnerable to food insecurity are identified.

Livelihood zone maps and descriptions form part of the knowledge base for FEWS NET's food security monitoring activities. These tools, however, are not designed as a comprehensive analysis of food security or as a complete monitoring tool, but rather to provide points of reference and indicate whether the conditions reported at a given time justify a more in-depth study. The results presented in this report describe how households may be affected by various shocks. They provide a geographic context for interpreting existing monitoring data on production, prices, and other indicators in order to identify potential problems. Rapid assessment teams may be able to use the zoning as a basis for sampling in their studies.

The methodology for elaborating the livelihood zone maps and descriptions in this document consisted of the following steps:

1. FEWS NET researched available secondary information regarding geography, climatology, demographics, agriculture, livestock, markets, etc. WFP and FEWS NET's previous food security reports in South Sudan were also used as a foundation for this work.
2. Approximately 10 representatives from each state came together in a regional-level workshop to divide the country into livelihood zones. The five workshops included an initial national core facilitator's workshop which took place from 20-23rd March 2013. This was followed by regional workshops in Bor (26-28th March); Malakal (6-8th June); Wau (11th-13th June) and the Juba workshop covering the Greater Equatoria States (17-19th June).
3. Participants documented the key characteristics of livelihoods, produced seasonal calendars, and set out salient market characteristics for their respective zones, providing the basic information presented in the livelihood zone descriptions.
4. An initial version of the report was circulated to workshop participants between 17-30th July 2013. This final version incorporates their comments.

For more information about Household Economy Approach principles and analysis, visit the livelihood pages at <http://www.fews.net>¹

LIVELIHOODS IN RURAL SOUTH SUDAN

Despite abundant natural resources, i.e. arable and grazing land, water resources, oil, timber, South Sudan is among the poorest and least-developed countries in the world. There are few tarmac roads, limited electronic communications and over wide areas communications and trade rely on river transport on the White Nile, particularly between the ports of Juba, Bor, Malakal and with the Republic of Sudan).

The national economy is overwhelming dependent on oil exports which account for 98% of the country's total exports and over 80% of gross domestic product although some livestock and timber are exported and there is informal trade particularly in agricultural produce across the country's borders with CAR, DRC, Uganda, Ethiopia, Kenya and Sudan. Staple foods, including food aid, accounts for the bulk of imports because of low production in some areas and because limited internal transport does not allow food to be brought from surplus to deficit areas and to Juba and other urban areas within South Sudan. The dangers of extreme overreliance on oil include lack of government revenue if and when oil exports are disrupted by problems with neighboring Sudan.

The population, estimated (2008 census) at approximately 8 million, is overwhelmingly rural and primarily dependent on subsistence farming or animal husbandry for their livelihoods and the risk of food insecurity varies markedly with rainfall, soil types, topography, drainage and access to markets and to wild plant foods, hunting and fishing, timber, gum arabic and other natural resources. Larger scale mechanized farming is limited to parts of Upper Nile, Unity and Northern Bahr el Ghazal states.

South Sudan has a tropical climate with wet and dry seasons. Most of the country receives 750–1,000mm of rain annually although the south and west receives slightly more (1,000–1,500mm), areas of the north and southeastern regions less (500–750mm) falling to less than 500 mm in the extreme southeast.

Six broad agro ecological zones are usually recognized. From northwest to southeast: (i) the Ironstone Plateau (most of Bahr el Ghazal, west of the River Nile) with lateritic soils. (ii) The Central Hills, along the Nile to the north of the Green Belt. (iii) The Green Belt, (southern parts of Eastern Equatoria, Central Equatoria and the western parts of Western Equatoria), which has two rainy seasons and the most fertile arable land in South Sudan. (iv) The Imatong mountains along the Uganda border. (v) The Flood Plains including the Sudd a vast area of swamp. (vi) The Nile–Sobat Corridor along the banks of the River Sobat which flows from Ethiopia and receives numerous tributaries before draining into the Nile. (vii) A semi desert area in the extreme southeast.

In general, the risk of food insecurity is greatest in those areas in which there is a high risk of production failure, the poorest households have limited opportunities to obtain income and the greatest difficulties in accessing markets. The following zones identified are considered to be at greatest risk of food insecurity

Greater Bahr-el-Ghazal Sorghum and Cattle (SSD7). This is a predominantly agro pastoral economy occupying a flood plain. Continuous leaching and loss of soil nutrients lead to reduced crop yields, flooding to poor crop performance and to an increased risk of livestock losses from disease, and there is overgrazing and high levels of cattle rustling. This is exacerbated by over exploitation of the natural resources, especially fish, wild foods and bush products, communal conflicts over water and grazing, and the presence of Internally Displaced People (IDP) due to political conflicts along the border with Sudan. Rural to urban migration has also deprived households of productive labor.

¹ http://v4.fews.net/docs/Publications/Guidance_Application%20of%20Livelihood%20Zone%20Maps%20and%20Profiles_final_en.pdf

Eastern Semi-Arid Pastoral (SSD5): Mainly a semi-arid livestock rearing area, with limited crop production, this zone is prone to prolonged drought, livestock losses from diseases and raiding, resource and political conflict. Multiple and frequent hazards combined with low household resilience, a heavy reliance on markets for food and difficulty with market access expose inhabitants to a high risk of food insecurity.

Eastern Plain Sorghum and Cattle (SSD6): This zone is a predominantly agropastoral area, with some seasonal fishing and is highly prone to floods, livestock and human diseases, crop pests, cattle raiding and conflict which combined with low resilience due to recurring losses of crops and livestock and limited market access exposes inhabitants to higher levels of risk of food insecurity.

Northern Sorghum and Livestock (SSD11): Livelihoods in this zone depend chiefly on sorghum production and rearing goats. Rainfall in the area is among the lowest and most unreliable within the country and frequent drought and crop failure, cattle raiding, political instability and insecurity, and changes in market conditions due to its location along the border with Sudan, expose inhabitants to food insecurity.

Nile River Fishing and Agropastoral (SSD8): This zone is predominantly agropastoral farming and fishing zone, along the Nile River. It is the least food insecure area among the five main zones. However, it is prone to flooding, particularly in low lying areas. This can result in limited access to wild foods (fish and water lilies), crop destruction, particularly the short-term variety of sorghum which is known for its low resistance to flood water, and increases in other crop pests and livestock diseases, especially among goats and sheep.

RECENT EVENTS AFFECTING FOOD SECURITY AND LIVELIHOODS

2012/13	<p>Widespread communal conflicts caused human and livestock displacement and disruption of crop production activities. The situation was exacerbated by delayed onset of rains around May 2012 and compounded by quelea birds, which destroyed cereal crops. The most significant impact was a near-total crop failure in parts of Jonglei, Unity, Upper Nile and Northern Bahr el Ghazal states, particularly of the long-term sorghum variety and reduced availability of food in regional markets.</p> <p>Other external factors which affected national food security included cross-border political conflicts and disputes with Sudan, which led to a trade embargo and an abrupt pullout of traders from Sudan. The subsequent effects included a shortfall of oil revenue and scarcity of staple foods and other basic commodities, triggering an increase in fuel prices and exceptionally high staple food prices in the country. The GRSS responded with stringent austerity measures which culminated in a lack of basic social services such as healthcare among the rural population.</p>
2011/12	<p>Widespread communal conflicts caused displacement of people and livestock and disruption of crop production activities. Large-scale riverine and localized flooding – especially in areas where soil types and topography lend themselves to accumulation of water (such as Upper Nile State) – affected food production, while also limiting physical access to markets. Other factors which exacerbated floods included poor road construction and narrow culverts, blocking flood waters in areas such as Lake and Unity States. The aftermath of the floods was characterized by disease outbreaks such as East Coast fever & anthrax, which killed large herds of cattle. This led to a lack of livestock sales, loss of income and reduced household ability to buy food.</p> <p>The overall food security situation worsened due to political insurgency and relatively moderate drought conditions within other parts of the country.</p>
2010/11	<p>Widespread inter-communal conflicts caused displacement of people and disruption of crop production activities. There were also cases of crop pests and livestock diseases across the country. This caused reductions of crop harvests and the overall availability of food, mainly in crop-producing areas.</p> <p>The frequent cattle raids also reduced livestock sales and households' ability to buy food within pastoral and agropastoral areas of the country.</p>
2009/10	<p>Widespread inter-communal conflicts caused displacement of people and disruption of crop production activities. The overall food security situation was exacerbated by long dry spells which caused crop failure and poor livestock conditions in the 2009/2010 marketing year. The early onset of dry spells around July 2009 at a critical stage of flowering for staple cereals (sorghum and bulrush millet) led to near total crop failure in four states. The most affected states were Eastern Equatoria and Jonglei. This exacerbated household food insecurity.</p> <p>Environmental pollution caused by oil companies' also negatively affected fishing, livestock and crop production activities, particularly in Upper Nile and Unity states.</p>
2008/09	<p>Widespread inter-communal conflicts caused displacement of people and disruption of crop production activities. Household food security was also at risk due to localized floods across South Sudan which reduced crop harvests and physical access to key regional markets in most states.</p> <p>Other external drivers of food insecurity included an increase in global fuel prices, which – coupled with political instability in neighboring Kenya – disrupted cross-border market and trade flows and had the immediate impact of increasing prices of basic commodities and essential agricultural inputs.</p>

EQUATORIAL MAIZE AND CASSAVA (Livelihood zone 1)

Food security risk	
Reliable rainfall and two consistent growing seasons guarantees sufficient access to food	
Main productive assets	
Poor	Better-off
Land cultivated—fewer hectares Bicycles Hand tools Chickens	Land cultivated—more hectares Motor cycles Hand tools Goats
Main foods consumed and sources	
Poor	Better-off
Maize (OP/MP) Sorghum (OP/MP) Groundnuts (OP/MP) Soya beans (OP) Cassava and sweet potatoes(OP) Vegetables (OP) Wild foods (G)	Maize (OP) Sorghum (OP) Groundnuts (OP) Soya beans(OP) Cassava and sweet potatoes (OP) Rice (OP/MP) Vegetables (OP)
Main income sources	
Poor	Better-off
Sale of natural products, i.e. charcoal, firewood, poles, bamboo and ropes etc. Sale of labor. Sale of local brew. Sale of livestock.	Sale of food crops such as maize, sorghum, cassava, groundnuts and sesame. Sale of coffee, sugarcane, tobacco, fruits and teak trees Retail trade.
Main markets	
Main external markets both for sale and purchase of commodities include Nabiapai and Bazi along the border with Democratic Republic of Congo (DRC), Kenya and Uganda. Internal and local markets include Yambio, Yei, Ikotos, Nimule, Namaku and Koliko.	
Main hazards and approximate frequency	
Prolonged dry spells from May to July, generally every two years. Crop pests and diseases during rainy season on annual basis. Seasonal flooding of rivers and streams from August to October generally every four years. Sporadic political insurgency due to presence of Lord's Resistance Army (LRA)	
Main coping strategies	
Increased consumption of wild foods. Increased reliance on sale of natural products including charcoal and firewood. Increased labor migration. Increased reliance on cash remittances. Increased sale of livestock. Increased reliance on self-employment.	

This livelihood zone borders Uganda, the Democratic Republic of Congo and Central Africa Republic. It is characterized by plains, highlands and mountains with equatorial rain forest concentrated particularly on the highlands.

This is the only part of South Sudan with a bimodal rainfall pattern and two reliable seasons. Precipitation is about 1,100-1,500 mm per annum in both rainy seasons. Rains normally commence in March-June with a break in late June and restart in July-November. Average temperatures range between 27-30° Celsius in January to February and 30-35° Celsius from December to March. Soils are mainly a mixture of loamy clay and sandy soils. The soils are fertile and provide the most suitable conditions for crop farming in South Sudan. Most cultivation is by hand and the land cultivated is small averaging 0.8 hectares, although better off households who can employ labor and hire tractors have larger landholdings. Compared to the rest of South Sudan, the zone is a high potential area for crop production due to good soils and higher rainfall amounts.

The livestock kept include cattle goats and poultry (chickens and duck) are kept for consumption and sale; wild foods consumed and sold include yams, palms, shea butter and termites, wild honey and wild game including dik-diks, gazelles and monkeys and by fishing using nets and lines.

The primary local determinants of wealth are size of land cultivated per household and types of crops grown in both seasons and the level of access to productive assets, plus other gainful economic activities.

Poorer households subsist from their own crop and livestock production supplemented by food obtained from hunting and fishing and wild foods, and food purchased with income from agricultural and casual labor. The better off are largely self-sufficient in food with saleable surpluses in years of good rainfall and do not purchase staples from the market.

Crop sales constitute the main source of income among poor and better-off group. In addition to staple crop sales, sale of labor, poultry, honey and fruit (including mangoes, oranges, pineapples and lemons) provide additional sources of income among the poor group.

Trade is conducted at border markets, e.g. Nabiapai and Bazi, with urban areas e.g. Yambio, Yei, Ikotos, and Nimule and rural trading centers e.g. Namaku, Koliko. In recent years surplus maize production in this zone has also been purchased by the World Food Program (WFP), through the purchase for progress (P4P) initiative.

Vital trade links with neighboring countries of Uganda, Central Africa Republic (CRA) and Democratic Republic of Congo (DRC) provide the much needed strategic access to external markets outside the zone. The main constraints to market access include long distances, poor road conditions, seasonal flooding and insecurity.

The main hazards are prolonged dry spells, crop pest, livestock diseases and localized seasonal floods and because of poor market access a limited ability to compensate for this by trade. Cassava is cultivated mainly as an insurance against the risk of crop failure and is left in the ground until this is required.

SEASONAL CALENDAR, ZONE 1

	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sept	Oct	Nov	Dec	
Seasons													
Rainy season				■									
Dry season	■											■	
Lean season				■									
Cropping													
maize		■	■	■	■	■	■	■	■				
sorghum				■	■	■	■	■	■	■	■	■	
cassava	■	■	■	■	■	■	■	■	■	■	■	■	
groundnut	■	■	■	■	■	■	■	■	■	■	■	■	
Livestock													
lambing/kidding/calving						■	■						
fish farming	■												
Other													
Hazards													
prolonged dry spells					■	■	■	■	■	■	■	■	
overflow of streams/rivers								■	■	■	■	■	
pests and diseases outbreak				■	■	■	■	■	■	■	■	■	
Legend	■ land preparation			■ sowing			■ weeding			■ harvest			

The two rainy seasons of this zone last from April to mid-December and are normally adequate for crop production. The main crops grown in both seasons include maize, sorghum, cassava, groundnut and sweet potatoes. Agricultural activities start with land preparation from February to March, followed by sowing and planting in April to June, weeding in July to August and harvesting of cereals through the months of September to December. There is all year round harvesting of cassava, the main root tuber in this zone.

First season consumption of green crops such as maize normally starts in late June and allows local inhabitants manage the end of the lean season.

The better-off group normally sells surplus stock in June towards the end of the lean season to take advantage of relatively high market prices and to empty food stores for the next harvest.

CONSUMPTION CALENDAR FOR POOR HOUSEHOLDS, ZONE 1

	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sept	Oct	Nov	Dec
Staple foods												
maize	own production	own production		market purchase	market purchase	market purchase	own production	own production	own production	own production	own production	own production
sorghum	own production	own production	own production	own production	own production	own production	own production	own production	own production	own production	own production	own production
groundnuts							own production	own production	own production	own production	own production	own production
cassava				own production	own production	own production	own production	own production	own production	own production	own production	own production
Income												
sale of charcoal/firewood												
labor												
sale of poles/bamboos/ropes												
Expenditures												
health care												
education												
Legend	own production	own production		market purchase	market purchase							

The poor group, purchase bulk of maize grain during lean months (April to June). The main sources of cash income during the lean season are sale of natural products, agricultural and non-farm labor employment such as construction. Most cash income is used to purchase staple foods. The main expenditures include health care services and school fees payment in the months of February and June.

IRON STONE PLATEAU AGROPASTORAL (Livelihood zone 2)

Food security risk	
Likely risk to food insecurity, during years of crisis.	
Main productive assets	
Poor	Better-off
Land cultivated—fewer hectares	Land cultivated—more hectares
Goats and sheep	Cattle
Bicycles	Goats and sheep
Bee hives	Motor vehicles/ cycles
Hand tools	Bee hives
	Power driven saws
Main foods consumed and sources	
Poor	Better-off
Sorghum (OP/MP)	Sorghum (OP)
Millet (OP/MP)	Millet (OP)
Maize(OP/MP)	Maize (OP/MP)
Groundnut (OP)	Groundnut (OP)
Sesame(OP)	Sesame(OP)
Vegetables(OP)	Vegetables(OP)
Cassava (OP)	Cassava (OP)
Sweet potatoes (OP)	Sweet potatoes (OP)
Dried fish (OP)	Dried fish (OP)
Wild foods (G)	Wild foods (G)
Main income sources	
Poor	Better-off
Sale of natural products, i.e. fire wood, charcoal, grass, mats, poles, shear butternut oil etc.	Sale of sorghum
Sale of wild foods	Sale of millet
Sale of labor	Sale of vegetables
	Sale of tobacco
	Sale of cattle
	Sale of honey
Main markets	
Main external markets where local commodities from this LZ are sold and non-local household items are purchased include Rumbek, Yirol, Cueibet, Wulu and Juba.	
Main hazards and approximate frequency	
Drought conditions normally occur after every twelve years	
Crop pest and diseases occur on annual basis during the rainy season	
Livestock diseases occur on annual basis in both the dry and rainy/wet seasons	
Inter communal conflicts and cattle raiding occur on annual basis during dry season	
Floods occur on annual basis between September and October	
Main coping strategies	
Increased goat and sheep sales	Increased sale of cattle.
Increased consumption of wild foods	Increased reliance on natural products such as bamboo and honey
Increased labor migration	
Increased sale of natural products	

This livelihood zone is concentrated within the great Iron Stone plateau, and covers parts of Bahr el Ghazal, Lakes and Western and Central Equatoria States. It lies at an altitude of 800 to 1,000 metres (2,600 to 3,300 ft) above sea level, with mountains in southern part of the zone and a cover of acacia forest and scrub and deciduous broad-leaved woodlands.

Shea butternut “lulu”, mahogany and bamboo are the main source of natural products available to local inhabitants.

The zone has sandy clay soils, which are moderately fertile and tend to be shallower towards the north of the zone, with low water retention capacity; however they do support a wide variety of crops. Average rainfall is about 1,100-1,300mm per annum, in a single season from March to November. The maximum temperature reaches 40° Celsius in March falling to about 19° Celsius in July.

This area is sparsely settled with a population of approximately 5 people per square kilometer. Shifting cultivation is practiced which maintains soil fertility. Poorer households cultivate by hand, while better off use animal traction, the average area of land cultivated per household is approximately 1.8 hectares.

The most important food crops are sorghum, millet, cow peas, green gram, groundnut, sweet potatoes, and vegetables such as okra. Maize, cassava and other crops such as pumpkins are grown on a small scale in specific areas. Cattle, goats, and a few sheep are the main livestock reared in this zone. Some poultry is also kept, but in very small numbers, for household consumption.

Despite being an agricultural zone, the key determinants of wealth are land size cultivated and livestock owned per household. Livelihoods depend chiefly on cultivation with livestock production being of lesser importance.

The livestock sector, especially cattle has been severely undermined by tsetse fly infestations and trypanosomiasis. Cultivation occurs on the plateau in the wet season with transhumant movement of livestock in the dry season to the wetter areas of the Greater Bahr el Ghazal region, particularly the Bahr el-Jebel areas of Lake Nyubor and the Toch River. Supplementary food sources include fishing along seasonal rivers using nets, lines and spears.

For the most part, crops are grown for consumption, although the better-off group have saleable surplus (sorghum, millet and vegetables). Additional food sources among poor group include kin-ship support from better-off and loans from traders especially during the lean season.

Poor households obtain most of their income from the sale of natural products (fire wood, charcoal, grass, mats, poles, shea butternut oil) and from agricultural and casual labor within and outside the zone.

The main markets are Rumbek, Yirol, Cueibet, Wulu and Juba. However in recent years rainfall and production have been poor and improvements in the road network since the comprehensive peace agreement, particularly to the Rumbek, Juba and Uganda high way have made it possible for people to travel long distances to the regional markets of Yambio and into Uganda to purchase grain.

Household incomes especially from the sale of surplus crops and natural products are heavily dependent on access to external markets.

SEASONAL CALENDAR, ZONE 2

	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sept	Oct	Nov	Dec	
Seasons													
Rainy season				■									
Dry season	■											■	
Lean season						■							
Cropping													
sorghum	■	■		■		■				■		■	
millet		■		■		■				■			
groundnuts		■		■		■			■				
Livestock													
lambling/kidding/calving	■										■		
milking						■							
Other													
seasonal livestock movement	Lowland			Highlands			Highlands						
Hazards													
livestock diseases								■					
crop pests and diseases							■						
Legend													
	■ land preparation			■ sowing		■ weeding			■ harvest				

The rainy season starts in April and ends in late October and is mostly adequate for crop production. The lean season is normally from June to July, before the main green crops are ready for consumption. The main crops grown are sorghum, millet and groundnuts with all food crops cultivated during the same months. Sorghum is the staple cereal, supplemented with millet and groundnut. Agricultural work starts with land preparation in January to March, followed by sowing or planting in April and May. Weeding starts in June to mid-August. Annual crop harvest starts with green consumption from mid-August with most of the dry grain harvest in December. The harvest season ends with threshing of grain and sesame in early January.

Lambing, kidding and calving mainly occur in dry season from November to February. Milk production peaks during the rainy season from June to early December. Seasonal livestock movement into the lowlands in search of pasture and water is during the dry season, returning to the highlands when the rain season starts.

CONSUMPTION CALENDAR FOR POOR HOUSEHOLDS, ZONE 2

	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sept	Oct	Nov	Dec
Staple foods												
sorghum	own production	own production	own production	own production	own production	market purchase	market purchase	own production	own production	own production	own production	own production
millet	own production	own production	own production	own production	own production	market purchase	market purchase	own production	own production	own production	own production	own production
groundnuts	own production	own production	own production	own production	own production	own production	own production	own production	own production	own production	own production	own production
Income												
sale of firewood	income	income	income	income	income							income
sale of charcoal	income	income	income	income	income	income	income	income	income	income	income	income
sale of honey			income						income	income		
Expenditures												
health care						expenditure	expenditure	expenditure				
education			expenditure	expenditure								
Legend	own production	own production		market purchase	market purchase		in-kind	in-kind				gathering

The poor group mostly purchases sorghum during the lean months (April to July) and millet from June to July. The main sources of income during lean period include are sale of natural products, i.e. firewood, charcoal and thatching grass. The main expenditures are for health care at the peak of the rain season June to August. There is also a lump sum school fees payment in March and April.

HIGH LAND FOREST AND SORGHUM (Livelihood zone 3)

Food security risk	
Relatively food secure areas of Greater Equatoria region and Jonglei state.	
Main productive assets	
Poor	Better-off
Land cultivated-fewer hectares	Land cultivated- more hectares
Goats and sheep	Cattle
Hand tools	Goats and sheep
	Ox ploughs
	Hand tools
Main foods consumed and sources	
Poor	Better-off
Maize (OP/MP)	Maize (OP)
Sorghum (OP/MP)	Sorghum (OP)
Millet(OP/MP)	Millet (OP/MP)
Groundnuts(OP/MP)	Maize (OP/MP)
Cow peas (OP)	Cow peas (OP)
Sweet potatoes (OP)	Sweet potatoes (OP)
Vegetables (OP/MP)	Vegetables (OP/MP)
Fish (MP)	Fish and meat (MP)
Wild foods (G)	Wild foods (G)
Main income sources	
Poor	Better-off
Sale of natural products, i.e. charcoal, bamboo, grass, wild game, honey, shear butter nut oil etc.	Sale of maize, sorghum, and millet.
Gold extraction.	Sale of timber.
Sale of agricultural labor.	Retail trade.
Sale of local brew.	
Main markets	
The main markets accessed for the sale and purchase of commodities as well as providing a labor market include Pochalla, Boma and Pibor in the eastern part of the country Central parts of the zone normally access Juba and Torit markets in the center and south respectively.	
Main hazards and approximate frequency	
Crop pests and diseases occur annually during rainy season.	
Floods occur at least once every two years during the rainy season (April to November).	
Conflict and insecurity can occur at any time of the year	
Mining accidents occur mainly during the rainy season from April to November.	
Main coping strategies	
Use of scarecrows for protection against birds	Sale of cattle
Sale of goats.	Increased gold extraction
Increased migration to urban areas for work.	Increased reliance on trade.
Increased consumption of wild foods.	

This zone is located along the mountain ranges of the Greater Equatorial region and the border with Ethiopia. Its topography is characterized by highlands and foothills with a mixture of forest, bush shrubs and grasslands.

The zone has a unimodal rainfall pattern with average precipitation of about 900-1,100mm per annum. There are two distinct seasons; a rainy season from April to November and a short dry season from December to March. Average temperatures in this area reach a maximum of about 42° Celsius in February and minimum of 30° Celsius in December to January.

Soils vary in type including sandy soils, clays and loam, and are relatively fertile compared with neighboring zones especially the Eastern Semi-Arid Pastoral zone.

The area is endowed with some natural resources such as wild honey and shea butternut trees.

The population density in this zone can be described as medium. The average land cultivated per household is about 1.25 hectares. The local inhabitants are mainly of the Murle and Kachipo tribe, with the former categorized mainly as cultivators and pastoralists, especially the hill Murle living in parts of the highlands. It is the latter, who have strong economic relationship with cattle keeper Murle's along the vast plains of Eastern Semi-Arid Pastoral zone including areas such as Pibor, Ikotos and Pochalla.

The zone is also home to Badingilo National Park, although elephants and other animal populations were severely depleted during the civil war.

Reliable rainfall and fertile soils favor rain fed crop farming and livelihood depends on sedentary cultivation with less reliance on livestock. The main food crops are maize, grown mainly in the eastern parts of the zone, short and long-term varieties of sorghum, millet, sesame, cow peas/green grass. Other crops grown on a smaller scale include sweet potatoes and cassava and

groundnut. The livestock kept are mainly goats, a few sheep and poultry with relatively few cattle mainly owned by the better-off group.

In a typical year, all wealth groups depend chiefly on their own crop production supplemented by wild foods and dry fish and for the poor by market purchases. The better-off hire labor and can cultivate more land and have surplus production for sale.

A wide variety of wild food plants are available in the hills and mountains including roots, fruits, berries and leafy vegetables gathered by both wealth groups to supplement household food needs.

For the better-off group chief source of income is from the sale of Maize, followed by sorghum and millet. Some income is also obtained from retail sales and the sale of timber outside the zone. The poor group mainly depends for cash income on labor and natural products such as charcoal and bamboo. Complementary sources of livelihood include hunting and seasonal fishing along Oboth, Pibor and Gilo rivers, some of the major tributaries of Sobat River along the Ethiopian border. There is also some gold mining although at a low level because of the lack of tools.

Due to favorable climatic conditions, this zone usually has good harvest, but lacks access to markets and good trade linkages with neighboring zones. The main markets for the sale of local products, including labor include Pochalla, Boma and Pibor in the eastern part of the country; people in the central parts of the zone can access the main regional markets at Juba and Torit. In the eastern part of the zone there is some trade with Ethiopia. The long distant trade with Ethiopia expands during the dry season.

Household incomes are constrained by a lack of roads, hilly and mountainous terrain and poor road conditions, which limits access to markets.

The main hazards in this zone are dry spells, mudslides and floods causing crop failure.

SEASONAL CALENDAR, ZONE 3

	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sept	Oct	Nov	Dec
Seasons												
Rainy season				[Rainy Season]								
Dry season	[Dry Season]											[Dry Season]
Lean season						[Lean Season]						
Cropping												
sorghum	[land preparation]	[land preparation]	[land preparation]	[land preparation]	[land preparation]	[sowing]	[weeding]	[weeding]	[weeding]	[harvest]	[harvest]	[harvest]
maize		[land preparation]	[land preparation]	[land preparation]	[land preparation]	[sowing]	[weeding]	[weeding]	[weeding]			
Livestock												
lambling/kidding/calving	[lambling/kidding/calving]	[lambling/kidding/calving]									[lambling/kidding/calving]	[lambling/kidding/calving]
milking						[milking]	[milking]	[milking]	[milking]	[milking]	[milking]	[milking]
Other												
Hazards												
floods				[floods]	[floods]	[floods]	[floods]	[floods]	[floods]	[floods]	[floods]	[floods]
conflict	[conflict]	[conflict]	[conflict]	[conflict]	[conflict]	[conflict]	[conflict]	[conflict]	[conflict]	[conflict]	[conflict]	[conflict]
accidents-gold extraction				[accidents-gold extraction]	[accidents-gold extraction]	[accidents-gold extraction]	[accidents-gold extraction]	[accidents-gold extraction]	[accidents-gold extraction]	[accidents-gold extraction]	[accidents-gold extraction]	[accidents-gold extraction]
Legend		[light green] land preparation				[medium green] sowing	[dark green] weeding			[dark green] harvest		

The rainy season starts in April and ends in November. Rains are normally adequate for crop production. The main staples grown are sorghum and maize with maize predominating in the eastern part of the zone. The lean season is normally from June to August, when green crops are still not ready for consumption. Agricultural work starts with land preparation from January to March, followed by sowing or planting in the months of April to mid-June. Weeding starts at the peak of the rainy season in June to July. Harvesting of all crops, inclusive of green consumption starts in August and continues until December when the long maturing sorghum is harvested.

Lambing, kidding and calving take place in the dry season from November to February the following year. The peak milk production is during rainy season. There is no seasonal livestock movement in this highland zone.

CONSUMPTION CALENDAR FOR POOR HOUSEHOLDS, ZONE 3

	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sept	Oct	Nov	Dec
Staple foods												
sorghum												
maize												
Income												
agricultural labor												
mining												
livestock sales												
Expenditures												
health care												
education												
Legend												
		own production		market purchase				in-kind				gathering

The poor group mainly purchase staple sorghum grain during the lean months (April to August). Sorghum and maize are purchased from March and April until August, when the new harvest is available. In the lean season the main sources of income are from the sale of agricultural labor, gold extraction and livestock sales especially goats and sheep. The main expenditures include health care services during the rainy season. There is also a lump sum annual school fees payment between March and April.

WESTERN GROUNDNUTS, SESAME AND SORGHUM (Livelihood zone 4)

Food security risk	
Highly productive crop farming zone, with less risk to food insecurity.	
Main productive assets	
Poor	Better-off
Land cultivated – fewer hectares Hand tools	Land cultivated- more hectares. Ox ploughs Goats and sheep Bicycles
Main foods consumed and sources	
Poor	Better-off
Sorghum (OP/MP) Maize (OP/MP) Cassava (OP) Groundnut (OP) Cowpeas (OP) Pumpkins (OP) Vegetables (OP) Fish (G/MP) Sorghum (In-kind payment)	Sorghum (OP) Maize (OP) Cassava (OP) Groundnut (OP) Cowpeas(OP) Pumpkins (OP) Vegetables (OP) Meat (MP/OP) Fish (G/MP)
Main income sources	
Poor	Better-off
Sale of groundnut Sale of natural products, i.e. Charcoal, grass and bamboo poles among others. Sale of honey and shea butter nut oil.	Sale of groundnut Sale of sesame Sale of cassava Sale of sorghum Sale of tobacco Sale of bamboo Sale of timber
Main markets	
The main local markets accessible for sale and purchase of commodities are Wau, Raja, Aroyo, Mapel, Bar Mayen and Aweil town. External markets include western Equatoria and South Darfur.	
Main hazards and approximate frequency	
Cross border conflict, due to presence of the LRA. Price spikes due to lack of market access particularly in crisis periods Endemic HIV and AIDS Crop pests and diseases, an annual problem from June-December. Annual dry spells, particularly in June.	
Main coping strategies	
Increased reliance on cash remittances. Increased consumption of wild foods. Increased sale of natural products including charcoal, wild foods and thatch. Labor migration.	Increased sale of goats. Increased reliance on remittances. Increased reliance on sale of natural resources such as timber

This zone is mainly located in Western Bahr el Ghazal and some parts of Western Equatoria State and is characterized by highlands, foothills and parts of the Ironstone plateau. Vegetation in the area is a mixture of forest and grasslands with mahogany and bamboo trees.

The zone has a unimodal rainfall pattern, with average precipitation of about 1,100-1,300mm. There are two main seasons; the rainy season, which starts in April to October, and the dry season from November to March. Temperatures in this zone are a maximum of 30-40° Celsius in March and a minimum of 22-30° Celsius around August.

Population density is low, approximately 3 persons per square kilometer.

Soils are mainly relatively fertile sandy clays. The average land cultivated is approximately 0.6 hectares per household. The poor cultivate by hand tilling. Animal traction is mainly used by the better-off group.

Livelihoods in this zone are chiefly based on agriculture, supplemented by seasonal fishing in shallow rivers using spears and traps and livestock products.

The main food crops cultivated include sorghum, cassava, groundnut, cow peas, sweet potatoes and vegetables. Cash crops include sesame and groundnuts, mainly grown along the Lol River, and marketed in Aweil, cow peas, sweet potatoes and vegetables which are also grown for sale and tobacco which is grown by some households.

Small numbers of livestock mainly goats and poultry are mainly kept for household consumption.

The better-off are self-sufficient in food from crop production, livestock products (milk and meat) and fish. The poor depend chiefly on their own crop production and fish for food, but depend on the purchase of staples for part of the year and practice hunting with some in-kind payment of labor to maximize access to food.

Income sources within the zone are limited. Crop sales are mainly dominated by better-off group, who have surplus production and supplemented by the sale of high value

natural products including timber and bamboo. The poor mainly rely on agricultural labor and particularly during the dry season on lower value natural products such as charcoal, thatching grass, wild honey and shea butternuts for income. They are also unable to engage in timber and other high value production because they lack the resources to purchase power saws.

In years of poor rainfall, the poor group increase consumption of wild foods and sale some natural products such as charcoal to maximize food access.

As in other areas of south Sudan access to markets is seasonal and limited by poor roads and insecurity. Access to markets is on foot or by bicycle. Surplus food and cash crops produced in the zone are sold in permanent rural markets (Namatina, Duma and Nagero). The main commodity flows are with Wau in Western Equatoria and South Darfur in the Republic of Sudan. In years of poor crop production staple foods may not be available in markets. Access to markets is sometimes constrained by insecurity due to the presence of the Lord's Resistance Army (LRA) in neighboring CAR.

The main hazards include drought and crop pests and diseases. In years of poor rainfall local inhabitants cope by bartering natural products with grain in places like Aguok and Paliet, Wau.

Although this zone is regarded a food sufficient area, the reliance on rain fed crop production, the low level of income diversification and restricted access to reliable markets means that there is a risk of food insecurity in years of low production.

SEASONAL CALENDAR, ZONE 4

	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sept	Oct	Nov	Dec	
Seasons													
Rainy season				■									
Dry season	■											■	
Lean season						■							
Cropping													
groundnuts		■		■		■			■				
sorghum		■		■		■			■				
sesame	■		threshing										
Livestock													
lambling/kidding	■										■		
Other													
seasonal fishing						■							
wild foods-shear butter nut, honey, wild game etc	■			■			■			■			
Hazards													
price spikes						■		■					
crop pests and diseases						■							
Legend	■ land preparation			■ sowing			■ weeding		■ harvest				

The rainy season starts in April and ends in October. These rains are normally adequate for crop production. The main crops grown are groundnuts and sesame for cash income and sorghum mainly for household consumption. Agricultural work starts with land preparation in February to April, followed by sowing or planting in the month of May until mid-June and

weeding in mid-June to July. Harvesting of all crops starts with green consumption in September and the main crop of long term maturity sorghum and sesame is harvested in March the following year.

Lambing and kidding takes place in the dry season from November to February. Milk production is not typical in this area, due to extremely low number of cattle among local inhabitants in this zone.

Wild foods such as wild game meat, mangoes, shea butter nut and honey provide a critical source of food during the dry season. They are also part of coping strategies employed to preserve staple foods for consumption during the lean period. Shea butter nut oil production is mainly available in the month of May.

CONSUMPTION CALENDAR FOR POOR HOUSEHOLDS, ZONE 4

	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sept	Oct	Nov	Dec
Staple foods												
sorghum	own production	own production	own production	own production	own production	market purchase	market purchase	market purchase	own production	own production	own production	own production
cassava	own production	own production	own production	own production	own production	own production	own production	own production	own production	own production	own production	own production
groundnuts	own production	own production	own production	own production	own production	market purchase	market purchase	market purchase	own production	own production	own production	own production
Income												
sale of groundnuts	income	income	income	income	income	income	income	income	income	income	income	income
sale of charcoal, firewood etc	income	income	income	income	income	income	income	income	income	income	income	income
sale of shea butter nut	income	income	income	income	income	income	income	income	income	income	income	income
sale of honey	income	income	income	income	income	income	income	income	income	income	income	income
Expenditures												
primary education	expenditure	expenditure	expenditure	expenditure	expenditure	expenditure	expenditure	expenditure	expenditure	expenditure	expenditure	expenditure
health care	expenditure	expenditure	expenditure	expenditure	expenditure	expenditure	expenditure	expenditure	expenditure	expenditure	expenditure	expenditure
Legend	own production	own production	own production	own production	own production	market purchase	market purchase	market purchase	in-kind	in-kind	in-kind	gathering

The poor group mainly purchase staple sorghum grain during the lean months (June to August). There are no major sources of income during the lean months. This poses a great challenge for the poor group. The main cushion is normally the availability of the cassava crop throughout the year, in-kind agricultural labor payments and wild foods. Priority expenditures include health care services, especially during the rainy/wet season when malaria is prevalent. Secondly the one off payment of school fees, normally at the beginning of a new school year within the months of March and April.

EASTERN SEMI ARID PASTORAL (Livelihood zone 5)

Food security risk	
High food security risk area, due to semi-arid conditions and re-current shocks.	
Main productive assets	
Poor	Better-off
Small herds of cattle Fewer goats Fewer sheep Hand tools	Large herds of cattle More goats More sheep Camels and donkeys Hand tools
Main foods consumed and sources	
Poor	Better-off
Sorghum (MP/OP) Milk meal (OP) Animal blood meal (OP) Meat (OP/MP) Vegetables (OP/MP) Wild foods (G)	Sorghum (MP/OP) Milk meal (OP) Meat (OP) Animal blood meal (OP) Vegetables (OP/MP) Wild foods (G)
Main income sources	
Poor	Better-off
Sale of goats Sale of sheep Herding Domestic work Sale of gold Sale of natural products including charcoal and wild foods.	Sale of cattle Sale of goats Sale of sheep Gold extraction,/sale of gold Sale of milk, ghee and yoghurt
Main markets	
The main markets in this zone include Nadapal, Kapoeta and Pibor within and Juba outside the zone	
Main hazards and approximate frequency	
Inter communal conflict and cattle raiding occur mainly during dry the season, from November to February. Floods occur in the months of July to October. Livestock diseases are endemic across the zone.	
Main coping strategies	
Increased consumption of wild foods Increased labor migration. Increased reliance on in-kind remittances	Increased bartering of livestock for grain. Increased sale of cattle, goats and sheep. Increased reliance on cash remittances.

This livelihood zone is mainly located within Eastern Equatoria and parts of Jonglei State. It is a vast plain which stretches towards the foothills of the mountainous ranges near the Ethiopian border. The vegetation is characterized by dense thickets, bush shrubs and savanna grasslands, which are more suitable for rearing livestock than growing crops.

The zone is also home to Boma National Park, one of the main tourist attractions of this area.

This zone has a unimodal rainfall pattern, with average precipitation of about 500-600mm per annum. There are two seasons, namely the rainy season which lasts from around May to November and the dry season from December to April. Average temperatures are about 38-40° Celsius, with a minimum of 32° Celsius in December-January and maximum of 42° Celsius in March.

Soils in this area are mainly black cotton clay. Though suitable for crop farming, the semi-arid conditions limit crop production. Average land cultivated per household is only about 0.4 hectares.

This zone is generally sparsely populated area mainly occupied by the Toposa Didinga and Murle tribe.

The dominant production system of this zone is pastoralism, with very limited crop production. The main food crops produced are sorghum and on a small scale okra and other vegetables. The livestock kept include cattle, camels, goats, and sheep and to a lesser extent poultry, mainly for household consumption. In the dry season the inhabitants normally move in search of water and pasture into Ethiopia and Kenya.

The primary determinant of wealth in the zone is number and type of livestock owned per household.

The poor group produces approximately two months of their staple foods from their own crop production, the better-off group slightly more and all households depend for food on market purchases of staple foods, supplemented by milk, meat and animal blood especially during the rainy season. Milk consumption is normally throughout the year, although the quantities consumed are higher during the rainy season.

However most of the livestock products consumed by poor group are obtained through in-kind labor payment (herding livestock) of the better-off group. There is also some hunting of small animals, and wild foods and honey are also collected, although these do not contribute much to the annual diet.

Livestock sales are the most important source of cash income for the poor and better-off group. The better off group also obtain income from sale of milk and milk products and gold mining. Much of the milk is sold during seasonal movements in search of water and pasture. The poor group obtains income from the sale of livestock, and is also engaged in charcoal making, firewood sales, and wild food sales as a supplementary source of income. The two wealth groups both engage in gold extraction to complement annual income.

Trade is conducted chiefly at the markets of Torit, Kapoeta and Juba although market access is limited, by poor road conditions both within and outside the zone, cattle raiding and poor relations with neighbour zones, civil insecurity and the unreliability of markets. External traders also travel to sell maize grain and vegetables locally and in turn trade livestock to Ethiopia and Uganda. Households also exchange livestock for grain and other household items with Murle cultivators in zone 3(Highland Forest and Sorghum) with whom they have strong economic links.

Hazards include drought, livestock diseases and periodic conflicts with other pastoral groups. The heavy dependence of livelihoods on livestock and trade for staple foods makes these vulnerable to interruptions in market access particularly during seasonal livestock movement, when there is less milk and animal blood for consumption for people who do not move with the animals and in drought years to falling livestock prices. The zone experiences frequent food shortages.

SEASONAL CALENDAR, ZONE 5

	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sept	Oct	Nov	Dec
Seasons												
Rainy season												
Dry season												
Lean season												
Cropping												
sorghum												
Livestock												
calving/lambing/kidding												
milking												
Other												
seasonal livestock movement												
Hazards												
dry spells												
cattle raiding												
Legend												

The rainy season starts in June and ends in October. Although this area is mainly suitable for rearing of livestock, small quantities of the sorghum and some vegetables are grown. The crop is harvested in.

Cultivation starts with land preparation in April to May. This is followed by wet sowing in June and weeding in July. Crops are harvested green for consumption from September and the main harvest is in September and October.

Seasonal livestock movement takes place from November to December, with livestock returning around the end of April to May.

Lambing, kidding and calving takes place from March to June. Peak milk production is during the rainy season.

CONSUMPTION CALENDAR FOR POOR HOUSEHOLDS, ZONE 5

	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sept	Oct	Nov	Dec
Staple foods												
Sorghum	market purchase	market purchase	market purchase	market purchase	market purchase	market purchase	market purchase	own production	own production	market purchase	market purchase	market purchase
Blood for consumption					in-kind	in-kind	in-kind	in-kind	in-kind	in-kind		
Milk consumption	in-kind	in-kind	in-kind	in-kind	in-kind	in-kind	in-kind	in-kind	in-kind	in-kind	in-kind	in-kind
Income												
herding, gold extraction/domestic work					in-kind	in-kind	in-kind	in-kind	in-kind	in-kind		
charcoal sales	in-kind	in-kind	in-kind	in-kind							in-kind	in-kind
milk sales					in-kind	in-kind	in-kind	in-kind	in-kind	in-kind	in-kind	in-kind
Expenditures												
livestock drugs	in-kind	in-kind	in-kind	in-kind	in-kind	in-kind	in-kind	in-kind	in-kind	in-kind	in-kind	in-kind
health care					in-kind	in-kind	in-kind	in-kind	in-kind	in-kind		
Legend	own production	market purchase	in-kind	gathering								

The poor group purchases sorghum for most of the year from October until July the following year. The purchases also cover the lean months (January to April) during which period the only source of income available is sale of charcoal. This poses a great challenge to the poor group. This is the only cash income used to purchase sorghum grain during the lean months. Other priority expenditures include health care services (especially during the rainy season, due to mosquitoes) and school fees, paid at the beginning of a new school year between the months of March to April.

EASTERN PLAIN SORGHUM AND CATTLE (Livelihood zone 6)

Food security risk	
Relatively at less risk, seasonal food insecurity, mainly due to recurring floods.	
Main productive assets	
Poor	Better-off
Goats Land cultivated- fewer hectares Hand tools	Land cultivated- more hectares Cattle Goats Hand tools
Main foods consumed and sources	
Poor	Better-off
Sorghum (OP/MP) Millet (OP/ MP) Groundnut (OP) Sesame (OP) Pumpkins (OP) Wild foods (G) Milk (OP/ MP) Meat (OP/MP) Gifts Food Assistance	Sorghum (OP) Millet (OP/ MP) Groundnut (OP) Sesame (OP) Pumpkins (OP) Wild foods (G) Milk (OP/ MP) Meat (OP/MP)
Main income sources	
Poor	Better-off
Sale of goats Sale of local brew Sale of natural products, i.e. firewood, charcoal and poles etc.	Sale of sorghum Sale of millet Sale of cattle Sale of milk
Main markets	
The main markets for the sale and purchase of local commodities include Bor Marol which is well linked to Juba and to external markets across the border with Uganda and Kenya.	
Main hazards and approximate frequency	
Inter communal conflicts and cattle rustling occur during both the wet and dry seasons. Flooding occurs on an annual basis from July to October. Livestock diseases occur annually from May to November. Crop pests and diseases occur annually from June to September. Drought conditions generally occur once in every three years. Health problems among the population are greatest from August to November.	
Main coping strategies	
Migration for work Building of dykes Increased collection of wild foods.	Increased reliance on the market for food purchases.

This livelihood zone is located in central parts of Jonglei state and covers the vast eastern flood plains.

The area has a unimodal rainfall pattern, with precipitation of about 800-900mm per annum. There are two distinct seasons, the rainy season from May to November and the dry season from December to April. During wet years most agropastoralists remain along the main water courses which intersect their territory, but in dry years lack of water makes inland pastures unusable within this vast zone.

The area is characterized by sandy clay soils, which are relatively more fertile than those in neighboring areas like the eastern semi-arid pastoral zone.

The zone is mainly occupied by the sparsely-settled Dinka and Nuer tribes, with approximately one person per 12 sq. km. The economy is agropastoral. Crop farming and livestock rearing are both important sources of livelihood. However, frequent floods and other hazards make crop cultivation a precarious activity.

The average land area cultivated is about 0.7 hectares per household. The main crops grown by both poor and better-off group are sorghum, millet, groundnut, sesame, pumpkins and some vegetables. The livestock reared in this zone are cattle, goats, sheep and to a lesser extent poultry, especially chicken mainly for household consumption. The Nuer have rather more cattle than the Dinka.

Cattle are mainly kept within the grass and woodlands and cultivated areas during the wet and early dry season. In the dry season cattle (particularly Nuer) migrate towards the south-east bank of the Sobat River. The Jonglei canal although now dysfunctional continues to restrict the seasonal movement of livestock. Sheep and goats are kept closer to homes. Goats far

outnumber sheep in this area, are mainly kept within homesteads and are vitally important to household food security.

Local determinants of local wealth in this zone are type and number of livestock owned and area cultivated per household as well as access to productive assets such as canoes and fishing equipment.

The poor and better-off group chiefly depend on own crop and livestock products for food although the poor group who own fewer livestock, and have limited access to milk, ghee and meat relies more heavily on the purchase of staples. The poor increase their access to livestock products from in-kind payment for herding livestock for the better-off.

All households supplement their food supply with wild foods such as desert date, water lily, tamarind, and other wild fruits, roots and leaves.

The main income sources of the poor group are from the sale of firewood, charcoal, construction poles, goats and brewing. The better-off group depends on sale of surplus crop harvest, cattle and milk. The poor groups have more irregular and unpredictable income, due to reliance on natural products, for which there is a limited market in the zone.

Market access in this zone is relatively good due to improvements in road communication with Bor and Juba. The main markets include Bor Marol Panyagor, Akobo and Langkien. Akobo and Langkien are mainly supplied from Malakal, although Akobo also has seasonal trade with Ethiopia through the Sobat/Pibor River. However, Bor which supplies Panyagor is well linked to Juba and other external markets along the Uganda and Kenya border.

These markets enable local traders to sell livestock and purchase commodities such as grain and household items. The constraints to market access in the zone are insecurity, livestock diseases and a lack of feeder roads in the most rural parts of the zone.

Hazards in the zone are from conflict, floods, livestock diseases, pests and drought which reduce crop and livestock production and chiefly affect the poor who are least resilient. In years of poor rainfall and production, the poor group obtains gifts from the better-off group and external food assistance.

SEASONAL CALENDAR, ZONE 6

	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sept	Oct	Nov	Dec	
Seasons													
Rainy season				■									
Dry season	■	■	■								■	■	
Lean season					■	■	■						
Cropping													
sorghum	■	■	■	■	■	■	■	■	■	■	■		
other crops	■	■	■	■	■	■	■	■	■	■			
Livestock													
lambing/kidding/calving	■	■									■	■	
milking						■	■	■	■	■	■	■	
Other													
seasonal livestock movement	■	■	■									■	
Hazards													
intercommunal conflicts	■	■	■	■	■	■	■	■	■	■	■	■	
floods							■	■	■				
Legend	■ land preparation			■ sowing			■ weeding			■ harvest			

The rainy season starts in April and ends in November. The lean season is normally from May to July, before green crops are ready for consumption. Sorghum is the main staple cereal. Agricultural work starts with land preparation in January and February, followed by sowing/planting in the months of April to June. Weeding takes place from June to August and is mainly carried out by the poor group for both themselves and other wealth groups. Harvesting of all crops happens in the months of August to November. Seasonal livestock movement takes place from December to March and the livestock return around April, at the onset of rainy season.

CONSUMPTION CALENDAR FOR POOR HOUSEHOLDS, ZONE 6

	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sept	Oct	Nov	Dec
Staple foods												
sorghum												
Income												
agricultural labor												
charcoal sales												
livestock sales												
Expenditures												
livestock drugs												
health care												
Legend												
		own production		market purchase				in-kind		gathering		

The sorghum harvest (collected between late August and early November) of the poor group normally lasts them for nine months from August until April the following year. This includes green consumption. Market purchases of sorghum coincide with the lean period. The main sources of income available during the lean months include agricultural labor such as sowing or planting and weeding, and the sales of charcoal and livestock. Poor households sell livestock during the lean season, while better-off households sell from November to May. The priority expenditures of the poor group in this zone include livestock drugs and health care services. These expenditures are mainly during the rainy season, when livestock diseases and human sickness are most common.

GREATER BAHR EL GHAZAL SORGHUM AND CATTLE (Livelihood zone 7)

Food security risk	
Greater risk food insecurity area caused by recurring hazards, shocks and diminishing natural resources.	
Main productive assets	
Poor	Better-off
Land cultivated- fewer hectares Goats and sheep Bicycles. Hand tools	Land cultivated- fewer hectares Cattle Hand tools Bicycles Motor cycles and vehicles
Main foods consumed and sources	
Poor	Better-off
Sorghum (OP/MP) Maize (OP/MP) Ground nuts (OP/MP) Rice (OP/MP) Milk (OP/MP) Wild foods (C)	Sorghum (OP/MP) Maize (OP) Ground nuts (OP) Rice (OP/MP) Milk (OP) Fish (OP/MP) Meat (OP/MP)
Main income sources	
Poor	Better-off
Sale of goats and sheep Sale of natural products, i.e. grass, firewood, charcoal. Sale of labor Sale of wild foods/fish Sale of local brew	Sale of cattle Sale of sorghum, maize Sale of timber Sale of fish Retail trade
Main markets	
The main markets for sale and purchase of commodities include Wau/Rumbek, Cueibet Yiroi West, Wau and Tonj.	
Main hazards and approximate frequency	
Floods occur annually during the wet season Livestock diseases occur annually during the dry season. Dry spells occur every two-three years at the middle of the wet season. Inter communal conflicts and cattle rustling occur annually during dry season. Human diseases are at their height every year during the wet season.	
Main coping strategies	
Increased search for work in neighboring zones /urban areas. Increased consumption of wild foods. Increased sale of natural products such as charcoal.	Increased sale of cattle Increased barter trade especially grain for livestock. Purchase of livestock drugs placing livestock in quarantine to control disease. Migration to urban centers.

This livelihood zone is located in the lowlands of the Greater Bahr el Ghazal region, stretching across the vast western flood plains towards the northern border of the Iron Stone Plateau. It is characterized by grassland and swampy areas with papyrus reeds and pockets of forest cover. Trees include acacia species such as gum Arabic. The main rivers draining the zone include Lol, Jurand Kuom, Kueng; lakes include Yany-Yom, Ban-Nyon, Ban-Luony and Ban-Dhikhik.

The zone has a unimodal rainfall pattern, with a dry period from November to April and rainy season from May to October. Average precipitation is about 800-1,100mm per annum, with average temperatures ranging from 20-27° minimum and a maximum of 30 to 35° Celsius in the dry season.

Population density is relatively high with average land cultivation of about 1 hectare per household. Crop production is mainly rain fed. Soil types vary, with sandy soils in the northern parts bordering Sudan and clay soils mainly in the swamps and dark alluvial loams along the western border of the flood plains. The sandy soils are the most fertile. Animal traction used only by the better off. However, a shortage of suitable agricultural land means that average household production is low even in good years and in bad years there are high levels of food insecurity characterized by near famine situations and starvation.

Although this is a mixed, agro-pastoral area, with all wealth groups cultivating some crops, livestock rearing is the most important source of income.

The main food crops grown include maize, sorghum, rice, groundnuts, sesame, cow peas and vegetables such as okra and pumpkins. Livestock include cattle, goats, sheep and poultry.

Sorghum is by far the most important staple food. However, unfavorable conditions (water logging

and flooding) means that food produced from household cultivation is rarely expected to last until the next harvest, despite increased crop production in recent years, with the poor households relying on food aid for approximately 6 months of the

year. However livestock owners in this zone normally cultivate a second crop in flood retreat areas. River fish (both fresh and dried), wild foods and bush products are an important part of the local diet and form a supplementary livelihood source. Traps, hooks, and nets are used for fishing.

Seasonal transhumance takes place around the Jur and Lol rivers, where livestock are moved in the dry season. Sufficient wet season grazing is generally available around the permanent settlements of the flood region and along the edge of Iron Stone Plateau. However in crisis years, livestock are moved towards the Nile River.

The poor group subsist on their own crops and external food assistance, supplemented with milk and wild foods mainly collected in swampy areas of the flood plain. The better-off largely depend on their own production and livestock products. However all wealth groups must purchase staple grain especially during the lean months of the year to make up their requirement.

The poor group obtains significant levels of income from labor migration across into Sudan, and supplement this with goat and sheep sales, local brew and the sale of wild foods and charcoal. The distant employment opportunities is mainly inform of agricultural labor such as land preparation, wedding and harvest with peak season in the months of January and February. The better-off group relies on their cattle for income with additional income from the sale of surplus crops and timber and retail trade.

Physical access to the markets of Wau, Rumbek, Cueibet Yirou West, Wau and Tonj is fairly good although sometimes limited by floods and inter communal conflicts and by livestock quarantines due to disease. Hazards include cattle rustling, flood, drought and livestock diseases. During years of poor production the poor survive by collecting wild foods, cutting fire wood for sale and migrating to find work in towns and neighboring zones.

Overall, food insecurity in this zone is mainly due to low crop production, over exploitation of fish, wild foods and bush products compounded by loss of livestock due to natural hazards such as seasonal flooding in the months of July and August.

SEASONAL CALENDAR, ZONE 7

	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sept	Oct	Nov	Dec	
Seasons													
Rainy season					■								
Dry season	■											■	
Lean season						■		■					
Cropping													
sorghum		■		■	■				■				
maize		■		■	■				■				
groundnut		■		■	■				■				
sesame		■		■	■				■				
Livestock													
lambing/kidding/calving	■					■						■	
milking					■								
Other													
seasonal livestock movement	■												
Hazards													
cattle rustling		■											
floods							■		■				
animal diseases					■								
human diseases	■												
Legend	■ land preparation			■ sowing		■ weeding		■ harvest					

The rainy season starts in May and ends in October. The lean season is normally from June to August, before green crops are ready for consumption. The main food crops are all cultivated during the same months. Agricultural work starts with land preparation in February to March, followed by sowing or planting in the month of May and weeding from May to August. Harvesting of all crops including green consumption starts in September and ends in December with threshing of the long term maturity sorghum.

Lambing, kidding and calving takes place within the dry season. The peak of milk production is during the rainy/wet season from May to September. Internal seasonal livestock movement within the zone is from November to April the following year.

CONSUMPTION CALENDAR FOR POOR HOUSEHOLDS, ZONE 7

	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sept	Oct	Nov	Dec
Staple foods												
sorghum	own production	own production	own production	own production	own production	own production	own production	own production	own production	own production	own production	own production
maize									own production	own production	own production	own production
groundnuts	own production	own production	own production	own production	own production	own production	own production	own production	own production	own production	own production	own production
Income												
sale of grass	market purchase	market purchase	market purchase	market purchase	market purchase	market purchase	market purchase	market purchase	market purchase	market purchase	market purchase	market purchase
sale of firewood/charcoal	market purchase	market purchase	market purchase	market purchase	market purchase	market purchase	market purchase	market purchase	market purchase	market purchase	market purchase	market purchase
agricultural/other labor	market purchase	market purchase	market purchase	market purchase	market purchase	market purchase	market purchase	market purchase	market purchase	market purchase	market purchase	market purchase
fishing			market purchase	market purchase	market purchase	market purchase	market purchase	market purchase	market purchase	market purchase	market purchase	market purchase
sale of wild foods	market purchase	market purchase	market purchase	market purchase	market purchase	market purchase	market purchase	market purchase	market purchase	market purchase	market purchase	market purchase
Expenditures												
food						market purchase	market purchase	market purchase	market purchase	market purchase	market purchase	market purchase
health care						market purchase	market purchase	market purchase	market purchase	market purchase	market purchase	market purchase
education			market purchase	market purchase	market purchase	market purchase	market purchase	market purchase	market purchase	market purchase	market purchase	market purchase
Legend	own production	own production	own production	own production	own production	own production	own production	own production	own production	own production	own production	own production
	market purchase	market purchase	market purchase	market purchase	market purchase	market purchase	market purchase	market purchase	market purchase	market purchase	market purchase	market purchase
	in-kind	in-kind	in-kind	in-kind	in-kind	in-kind	in-kind	in-kind	in-kind	in-kind	in-kind	in-kind
	gathering	gathering	gathering	gathering	gathering	gathering	gathering	gathering	gathering	gathering	gathering	gathering

The sorghum harvest of the poor group in this zone including green consumption in September normally lasts for five months from October to January the following year. The green consumption is also supplemented by in-kind payments for labor by wealthier groups. Market purchases normally commence in February and extend to August. The poor group purchases most of their food in the lean months (June to August). Food access especially among the poor group is increasingly dependent on money and the market, due to accelerated rural urban migration. Agricultural and non-farm labor and sale of natural products, provide the income required for purchase of staple foods, during the lean period. Other priority expenditures include purchase of staple foods, health care services and a lump sum payment of school fees in March and April.

NILE BASIN FISHING AND AGRO PASTORAL (Livelihood zone 8)

Food security risk	
Food secure zone with surplus maize production, sold in external markets.	
Main productive assets	
Poor	Better-off
Land cultivated- fewer hectares	Land cultivated- more hectares
Goats	Cattle
Sheep	Goats
Hand tools	Sheep
	Ox ploughs
Main foods consumed and sources	
Poor	Better-off
Maize (OP/MP)	Maize (OP)
Sorghum (OP)	Sorghum (OP)
Cow peas (OP)	Cow peas (OP)
Pumpkins (OP)	Pumpkins (OP)
Okra (OP)	Okra (OP)
Milk (MP/IK)	Milk (OP)
Fish (G/MP)	Fish (G/MP)
Wild foods (G)	Wild foods (G)
Main income sources	
Poor	Better-off
Sale of goats	Sale of cattle
Sale of sheep	Sale of maize
Sale of vegetables	Sale of sorghum
Sale of natural resource products including grass, charcoal, firewood	Retail trade
Domestic work	Formal employment
Main markets	
The main markets for selling and buying of commodities are Bentui and Mayom.	
Main hazards and approximate frequency	
Inter communal conflicts/ cattle raiding occur annually during the dry season.	
Floods occurs annually during the rainy season	
A livestock disease occurs annually during rainy season.	
Crop pests and diseases occur annually during rainy season	
Main coping strategies	
Increased migration in search of labor.	Increased sale of livestock
Increased consumption of wild foods	Increased reliance on formal employment.

is normally constrained by excessive flood water.

Local determinants of wealth in this zone are type and number of livestock owned, land size cultivated and access to fishing equipment such as canoes and nets.

This livelihood zone is located along the Nile River extending into parts of the eastern and western flood plains. The zone is characterized by swampy vegetation of papyrus, reeds, Napier grass and bush scrub. Other water resources within the zone include lakes Namm and Nang.

The zone has a unimodal rainfall pattern with average precipitation ranging from 800-1,100mm per annum. Temperatures range from a maximum of 30° to 36° Celsius in March-April and fall to 18 to 25° Celsius from June-December.

Soils are mainly clay along the banks of the Nile with relatively fertile sandy loams in the outer boundaries of the River bank.

Population density is fairly low (approximately 500 people per square kilometer) and average land cultivation is about 0.6 hectares per household. The small size of cultivated land can be attributed to limited draft power with animal traction only accessible by better-off group.

This zone is predominantly occupied by agropastoralists. Crop production is rain fed. The main crops grown in the area include sorghum, maize, groundnut and cow peas. Sesame and vegetable crops such as okra, tomatoes and pumpkins are grown on a smaller scale.

The main livestock kept are cattle, goats and sheep. Livestock are moved towards the River Nile from February to April and return to homesteads from May- June. Fishing using nets, lines, spears and hooks takes place throughout the year and is a source of both food and cash income for all wealth groups. Wild foods are abundant and include fish, laloub nuts, dolieb palm nuts, water lilly, and "leau" a very bitter nut growing in sandy places. However access to these natural products

The primary source of food for consumption for poorer households is from fishing, their own crop production milk and the collection of wild foods. Fishing is more important than agriculture among this group. Poorer households rely on purchased staples for about five to six months of the year. In years of low rainfall the group intensifies their fishing activities. Better-off households mainly rely on own production and livestock products with market purchases of mainly staple foods.

The main sources of income for the poor group include the sale of fish, goats, charcoal, papyrus mats, local brew and wild foods, supplemented by the sale of labor especially during years of low rainfall. The better-off group sell livestock products (mostly milk, ghee and yogurt) as their main source of income but may sell cattle to purchase food in years of low production. In addition, the better-off group engage in retail trade, sale of fish, timber, vegetables and a small number of people are in formal employment.

This zone has limited physical access to markets due to poor road conditions especially during the rainy season particularly in August and September when excessive flooding takes place. This is despite its strategic location on the main road linking the four states of Upper Nile, Unity, Jonglei and Lake. Because of its close proximity to the border with Sudan market access is also constrained by insecurity. However this zone also enjoys exclusive access to five major ports along the Nile River on the western side bordering Unity State which provide the opportunity for better-off group to sell livestock and milk, ghee and other livestock products and fish to traders from Juba and a wider area who travel along the main highway linking Bor, Malakal and Rumbek with Juba.

The main hazards are floods which tend to limit fishing activities, reduce crop and livestock and wild foods production (particularly water lilies) and cause a loss of income for the better off and put the poor group at greater risk of food insecurity.

SEASONAL CALENDAR, ZONE 8

	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sept	Oct	Nov	Dec
Seasons												
Rainy season												
Dry season												
Lean season												
Cropping												
maize												
sorghum												
vegetables												
Livestock												
lambing/kidding/calving												
milking												
Other												
fishing												
Hazards												
floods												
inter communal conflict/cattle raiding												
Legend												
	land preparation				sowing		weeding		harvest			

Although river fishing in this zone takes place throughout the year, it is less important during the period of peak seasonal rainfall and flooding (June to September). During this period fishing activity is concentrated in the flood plains and swamps. Agricultural work starts with land preparation from February to April, followed by sowing or planting in the months of May and June. Weeding takes place from June to August. Harvesting of cereal crops starting with green consumption begins in September and continues into November. Vegetable production is mainly carried out in the dry season, from November-April.

Livestock prices tend to peak from February to March. This is due to seasonal migration of herds away from homesteads and social events, i.e. payment of dowry and weddings. Prices fall in the lean months of June and July, when livestock are sold off in exchange for grain, thus depressing prices. Milk, cheese and ghee production is greatest during the rainy season, when livestock are in good condition and have returned to homesteads.

CONSUMPTION CALENDAR FOR POOR HOUSEHOLDS, ZONE 8

	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sept	Oct	Nov	Dec
Staple foods												
sorghum												
maize												
wild food collection												
Income												
sale of firewood												
sale of papyrus mats												
sale of fish												
sale of goats												
sale of local brew												
sale of wild foods												
Expenditures												
health care												
education												
Legend												

The food production (sorghum) of the poor normally lasts six and a half months from mid-August to February the following year. Market purchase of sorghum and maize starts in March and January, respectively. The main sources of income during the lean season are from sale of firewood, papyrus mats, local brew and in some cases a few goats. The poor group normally derives more income from fish sales from January to April and August to November. The main expenditures include the purchase of staple foods, health care services and school fees, normally paid in three installments over the course of the year (April, July and October)

OIL RESOURCES, CATTLE AND MAIZE (Livelihood zone 9)

Food security risk	
Food secure zone with surplus maize production, sold in external markets.	
Main productive assets	
Poor	Better-off
Land cultivated- fewer hectares	Land cultivated- more hectares
Goats	Cattle
Sheep	Goats
Hand tools	Sheep Ox ploughs
Main foods consumed and sources	
Poor	Better-off
Maize (OP/MP)	Maize (OP)
Sorghum (OP)	Sorghum (OP)
Cow peas (OP)	Cow peas (OP)
Pumpkins (OP)	Pumpkins (OP)
Okra (OP)	Okra (OP)
Milk (MP/IK)	Milk (OP)
Fish (G/MP)	Fish (G/MP)
Wild foods (G)	Wild foods (G)
Main income sources	
Poor	Better-off
Sale of goats	Sale of cattle
Sale of sheep	Sale of maize
Sale of vegetables	Sale of sorghum
Sale of natural resource products including grass, charcoal, firewood	Retail trade
Domestic work	Formal employment
Main markets	
The main markets for selling and buying of commodities are Bentui and Mayom.	
Main hazards and approximate frequency	
Inter communal conflicts/ cattle raiding occur annually during the dry season.	
Floods occurs annually during the rainy season	
A livestock disease occurs annually during rainy season.	
Crop pests and diseases occur annually during rainy season	
Main coping strategies	
Increased migration in search of labor.	Increased sale of livestock
Increased consumption of wild foods	Increased reliance on formal employment.

This livelihood zone lies in the western flood plain of the Nile, bounded by permanent swamps which link rivers and lakes, including the river Naam and Lakes Pooltocha and Rubkona. Vegetation is characterized by a combination of forest, bush scrub and grasslands. The area also has natural resources including oil, timber, gum Arabic, fish in Lake Rubkona and special grasses suitable for thatching in some parts of Koch. The main oil wells are in Higlig and Adok, and zinc sulphate is found in Mayom.

Seasonal water courses run south from Bentiu to the Nyuong Nuer branching off from Leer to Adok Bahr. To the east are permanent swamps and seasonally flooded grasslands; to the west are mainly open grasslands with some permanent villages. During the rainy season, the extensive swamps in the south normally cut off other areas from lower parts of the zone, especially areas such as Leer County with total isolation of western Nuer ethnic group.

This area has a unimodal rainfall pattern with average precipitation of about 800-900mm per annum. The rainy season generally lasts from May to November. Temperatures with a minimum of 20 to 25° Celsius from May to November and maximum of 25 to 30° Celsius from February to April. Soils vary from clay near the rivers, swamps and water courses to sandy ridges and outcrops across the grasslands where permanent villages are sited.

Compared with its neighbors, this zone is fairly densely populated, with approximately 45 people per square km. The areas of highest population include Rubkona, Mayom and Koch counties.

The main crops grown are maize, and long (*'dura'*), and short (*'der'*) maturing sorghum varieties. The "*der*" sorghum is grown as a stop gap during the lean season and is usually harvested in early August, along with maize. Cowpeas, pumpkin and okra are planted in the second season in flood recess areas, and harvested in January. In years of excessive floods a third crop of maize and "*der*" may also be harvested. Transhumance is practiced along the Naam River and Pooltocha Lake, with migration to these water sources taking place from January to April.

Own crops, milk and fish are the main food sources in this zone. Fishing in rivers, swamps and water courses is an important dry season activity using spears and traps in shallow waters, with nets and hooks mainly used in deep waters. Household diets in this zone are supplemented with wild foods such as fish, laloub nuts, dolieb palm nuts, water lilly, and “leau” a very bitter nut growing in sandy places.

To obtain income both the poor and better-off groups sell livestock (especially goats, sheep and cattle) every year increasing the quantities sold in bad years. In addition the poor group sells charcoal, firewood, grass and does some domestic work to supplement their income. The better-off sell surplus maize, engage in retail trade and some are engaged in formal employment. The poor group purchase about five and half months of their staple cereals from the market.

Market access to Bentiu, Juba and Malakal is, as in other zones, limited by poor roads, flooding and insecurity.

The main hazards include reduced crop and livestock production from flood, drought, bird attack, plant and animal diseases (particularly when livestock are confined due to delayed receding of flood waters), conflict and livestock raiding and low livestock and high food prices. Poor households cope through increased reliance on wild foods, migratory labor in Bentiu and in some cases external food assistance. The better-off group normally increases livestock sales.

SEASONAL CALENDAR, ZONE 9

	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sept	Oct	Nov	Dec
Seasons												
Rainy season												
Dry season												
Lean season												
Cropping												
maize												
vegetables												
Livestock												
lambing/kidding/calving												
milking												
Other												
employment by oil companies												
Hazards												
livestock diseases												
conflict/cattle raiding												
Legend		land preparation				sowing		weeding			harvest	

The rainy season starts in May and ends in October. The lean season is generally from June to July, before green crops are ready for consumption. Sorghum is the staple cereal. Agricultural work starts with land preparation from February to April. This is followed by sowing or planting in the month of May to mid-June and weeding from the end of June until August. Harvesting of all crops including green consumption starts in September and continues until the end of October.

Lambing, kidding and calving takes place in the dry season months of November to February.

The peak milk production period is the rainy season from June to October and falls from the start of the dry season in November to December. There is no major external seasonal livestock movement outside this zone.

CONSUMPTION CALENDAR FOR POOR HOUSEHOLDS, ZONE 9

	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sept	Oct	Nov	Dec
Staple foods												
maize												
vegetables												
wild food consumption												
Income												
sale of firewood												
sale of elephant grass												
domestic work												
Expenditures												
health care												
education												
Legend												

The maize harvest of the poor group normally lasts from mid-August to February the following year. Market purchases especially of maize and vegetables start in March and continue until the end of September. These purchases also cover the lean months of June to July.

The main sources of income available during the lean season include sale of firewood, elephant grass and domestic work.

The main expenditures include purchase of staple foods, health care services (with higher demands during the rainy season due to malaria) and three installments of school fees.

NORTH EASTERN CATTLE AND MAIZE (Livelihood zone 10)

Food security risk	
Low risk food insecurity zone, the area has very diversified sources of livelihood.	
Main productive assets	
Poor	Better-off
Land cultivated- fewer hectares Goats Sheep Pigs Fishing gears i.e. nets and hooks.	Land cultivated- more hectares Cattle Goats Sheep Pigs Fishing gears, i.e. canoes, nets and hooks.
Main foods consumed and sources	
Poor	Better-off
Maize (OP/MP) Sorghum (MP) Cow peas (OP) Vegetables (OP) Pumpkins (OP) Fish (OP) Milk (OP) Wild foods(C)	Maize (OP) Sorghum (OP) Cow peas (OP) Vegetables (OP/MP) Pumpkins (OP) Fish (OP/MP) Milk(OP) Meat (OP/MP)
Main income sources	
Poor	Better-off
Sale of goats Sale of labor Sale of natural products, including charcoal, firewood, grass Sale of fish.	Sale of cattle Sale of goats Sale of fish Sale of maize. Formal employment. Retail trade.
Main markets	
The main markets both for selling and buying of commodities are Malakal, Nasir and Juba with external markets mainly in Ethiopia and Sudan.	
Main hazards and approximate frequency	
Floods generally occur once in every three years during the rainy season. Quiilea birds feed on crops annually at the end of the rainy season. Drought generally occurs once in every five years. Inter communal conflicts occur annually mainly during the dry season.	
Main coping strategies	
Increased sale of goats and sheep. Increased migration in search of labor Increased collection of wild foods	Increased sale of livestock and other assets. Increased reliance on self-employment. Increased reliance on savings

This livelihood zone is located in Upper Nile State, along the Nile's eastern flood plain, covering Nasir County and extending southwards along the River Sobat and its tributaries and northwest from Nasir to Melut. The zone is characterized by grasslands, forests and swamp. Normal flooding of the river Sobat provides excellent pasture during the dry season above Nasir County.

This zone has a unimodal rainfall pattern with average precipitation of 500-700mm per annum. Average temperatures range from 18 to 25° Celsius in March and 30 to 40 Celsius from July to August. There are two seasons, a dry season lasting from November to April and a rainy season from May-October.

Population density is low, with 12 people per square km. land holdings average approximately 2 hectares per household.

Natural resources include oil, with the nascent oil industry already providing some employment, gum Arabic, fish and wild game.

Livelihood patterns in this area are largely determined by the annual distribution of rainfall and water courses, including the River Sobat and tributaries running from Ethiopia into South Sudan.

The soils in this low lying flood plain are mainly grey and black cotton. Cleared areas are used for rain fed cultivation, including flood recess cropping from September to October with crop harvests in March.

This is an agro-pastoral area, with a majority of households practicing agriculture, livestock and fishing.

In a typically good year, the main food crops grown include maize, sorghum, cow peas,

pumpkins and green vegetables such as okra. (Maize is a hard corn type of red, violet and yellow color.) The main livestock reared are cattle, and goats with smaller numbers of chicken primarily for domestic consumption.

The fish consumed in the zone is seasonal and mainly from the Sobat River, its tributaries and ponds. Fishing is mainly carried out using hooks and nets.

The better-off are mostly self-sufficient in food and in years of good rainfall produce a surplus of maize for sale and purchase only non-staples such as dry fish, meat and vegetables. The poor are self-sufficient only for about 6 months of the year and rely on staple purchase for the remainder.

Better-off households derive much of their cash income from the sale of cattle, goats and maize, supplemented with retail trade and for a few households formal employment. The main sources of income among the poor group include the sale of goats, charcoal, firewood, grass, labor and in good years fish from the Sobat River.

In years of poor rainfall, the poor group maximizes their access to food, through increased wild food collection, migratory labor and the sale of some goats and sheep.

Trade in this zone is mainly within South Sudan, in the markets at Nasir, Malakal and Juba in Central Equatoria. Local grain and livestock are all traded in Upper Nile State and Akobo County in Jonglei state as well as Juba. The good physical access to Ethiopia also allows this zone to trade surplus maize and livestock (especially cattle) with Gambella. Trade volumes normally increase during the dry season (January to April).

As in other areas of South Sudan the major hazards are from floods, drought, bird and pest damage to crops and inter communal conflict. In parts of the Sobat Valley the economic impact of heavy rainfall on grazing milk and crop production is exacerbated by swings between floods and dry spells and drought conditions, when the river level falls. Although a low food security risk area, excessive and recurring floods can negatively affect crop production and livestock rearing, the main sources of livelihood of the inhabitants of this zone.

SEASONAL CALENDAR, ZONE 10

	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sept	Oct	Nov	Dec
Seasons												
Rainy season												
Dry season												
Lean season												
Cropping												
maize												
vegetables												
flood recess-maize cropping												
Livestock												
lambling/kidding/calving												
milking												
Other												
employment by oil companies												
Hazards												
livestock diseases												
conflict/cattle raiding												
Legend												
		land preparation				sowing		weeding		harvest		

The rainy season starts in May and ends in October. The lean season normally lasts from mid-May to mid-August, when green crops are still not ready for consumption. All major food crops are cultivated during the period February–October. Unlike other zones, maize is the staple cereal. Agricultural work starts with land preparation from February to April, followed by sowing or planting from May to mid-June. The agricultural workload intensifies with weeding towards the end of June to August. Harvesting of all crops including green consumption starts in September until end of December. Vegetable production is mainly carried out in the dry season months, from November to April the following year.

The flood recess cropping of maize starts with land preparation in mid-September to end of October, followed by sowing in November, and then weeding in January. The maize crop harvest starts with green consumption towards the end of February and dry grain harvest in March the following year.

Lambing, kidding and calving take place in dry season from October to February. Peak milk production is during the rainy season.

Seasonal livestock movement in search of water and pasture takes place within the zone.

CONSUMPTION CALENDAR FOR POOR HOUSEHOLDS, ZONE 10

	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sept	Oct	Nov	Dec
Staple foods												
maize												
vegetables												
wild food consumption												
Income												
sale of firewood												
sale of elephant grass												
domestic work												
Expenditures												
health care												
education												
Legend												
		own production		market purchase				in-kind				gathering

The maize harvest of the poor group normally lasts for six and a half months from mid-August to February the following year starting with green consumption in the month of August. Market purchases of maize and vegetables start in March and ends in early August. The main sources of income available during the lean season are sale of firewood, elephant grass and sometimes domestic work. The main expenditures include purchase of staple foods, health care services during the rainy season due to malaria. Secondly the school fees payment in three installments in the months of April, July and October.

NORTHERN SORGHUM AND LIVESTOCK (Livelihood zone 11)

Food security risk	
High risk food insecurity zone, due to semi-arid conditions and natural hazards.	
Main productive assets	
Poor	Better-off
Land cultivated- fewer hectares Goats Sheep	Land cultivated- more hectares Cattle Goats Sheep
Main foods consumed and sources	
Poor	Better-off
Sorghum (OP/MP) Cow peas(OP) Pumpkins (OP) Fish (OP/MP) Vegetables (OP) Wild foods (C) Milk (OP/MP)	Sorghum (OP) Cow peas (OP) Pumpkins (OP) Fish (OP/MP) Meat (OP/MP) Vegetables (OP/MP) Milk (OP/MP)
Main income sources	
Poor	Better-off
Sale of natural products, including thatching grass and rope. Sale of goats Sale of labor Sale of local brew Sale of wild foods	Sale of goats. Sale of sheep. Sale of cattle. Retail trade Formal employment.
Main markets	
The main markets for selling and buying of commodities are Malakal, Renk, Juba, Parieng cattle market. There is also access to external markets across the border in Sudan.	
Main hazards and approximate frequency	
Inter communal conflicts including annual cattle raiding leading to insecurity in the dry season. Floods occur annually during the wet season. Livestock diseases occur on annual basis throughout the year. Crop pests and diseases occur on an annual basis during the rainy season. Dry spells generally occur every two years	
Main coping strategies	
Increased migration in search of labor Increased consumption of wild foods Increased sale of natural products such as grass	Increased sale of livestock. Increased reliance on formal employment. Increased reliance on cash remittances.

This livelihood zone is located along the border with Sudan in Upper Nile and Unity States. It is dominated by flat plains with low lying areas, which aid the flow of rivers Namm and Nang towards the south into the Sobat River. The zone is covered with grasslands, scanty shrubs, thorns, Balanites, bushes and other hardy plants and patches of forest.

The rainfall pattern is unimodal, with average precipitation of approximately 500mm per annum. Temperatures range from a minimum of 30 to 32° Celsius from June to December to a maximum of 35 to 37° Celsius from February to May. There are two agricultural seasons a rainy season, from May to October and a dry season from November to April.

The zone has relatively fertile sandy and loamy soils with rocky surfaces in some areas. These are somewhat less fertile than neighboring zones in Upper Nile and Unity States and are distinguished from these by relatively low rainfall, which restricts crops mainly to drought resistant sorghum and some gum arabic production.

The population density is moderate, with around 400 people per square kilometer. Average land cultivation is about 1 hectare per household. Hand tilling is the main means of ploughing, although mechanized and irrigated crop production is also carried out in some areas by a few commercial farmers and the Government of the Republic of South Sudan.

The inhabitants of this zone are agro-pastoralists. The main rain fed food crops grown include sorghum, cowpeas, pumpkins and okra and other vegetables. The main livestock reared are goats and to lesser extent sheep and cattle. There are seasonal livestock movements to Greater Bahr El Ghazal, with frequent inter marriages and other exchanges between communities in these areas.

These seasonal movements are the source of frequent conflict over pastures, waters and cattle raiding.

The poor and better-off group in this zone subsist on their own crops, fish, wild foods and some milk both from own stock. The poor group depend on market purchase for about half of their food needs.

Better-off households obtain income from the sale of livestock, supplemented by retail trade and for some household's formal employment. Income opportunities for the poor group are very limited and include chiefly the, agricultural and other casual labor, brewing and the sale of goats, thatching grass, wild foods and other natural products. Most of the labor employment is within the zone, except during periods of crisis, when poor group migrate to neighboring zones in search of employment.

In years of poor rainfall, the poor maximize food access through migratory labor and increased consumption of wild foods. They also sometimes receive external food assistance.

Compared to other areas, this zone has exceptional access to markets within South Sudan and with Sudan. The main goods traded include cattle, goats and grain. During the dry season, cattle are generally taken from Leer to Rupnyagai, where they command higher prices. Commodities such as household items (soap, salt and tea among others) are brought in to Rupnyagai from Southern Kordofan. The local traders use cash from livestock sales to purchase these items for sale in Leer market.

Floods and crop pests and diseases normally compound the problem of low crop harvests in this zone and increasing reliance particularly by the poor group on the market for food.

SEASONAL CALENDAR, ZONE 11

	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sept	Oct	Nov	Dec	
Seasons													
Rainy season					[Rainy Season]								
Dry season	[Dry Season]											[Dry Season]	
Lean season						[Lean Season]							
Cropping													
sorghum	[Sowing]	[Sowing]	[Sowing]	[Sowing]	[Sowing]	[Weeding]	[Weeding]	[Weeding]	[Weeding]	[Weeding]	[Harvest]	[Harvest]	
vegetables	[Sowing]	[Sowing]	[Sowing]	[Sowing]	[Sowing]	[Sowing]	[Sowing]	[Sowing]	[Sowing]	[Sowing]	[Sowing]	[Sowing]	
Livestock													
lambing/kidding/calving	[Lambing]	[Lambing]	[Lambing]	[Lambing]	[Lambing]	[Lambing]	[Lambing]	[Lambing]	[Lambing]	[Lambing]	[Lambing]	[Lambing]	
milking	[Milking]	[Milking]	[Milking]	[Milking]	[Milking]	[Milking]	[Milking]	[Milking]	[Milking]	[Milking]	[Milking]	[Milking]	
Other													
employment by oil companies	[Employment]	[Employment]	[Employment]	[Employment]	[Employment]	[Employment]	[Employment]	[Employment]	[Employment]	[Employment]	[Employment]	[Employment]	
Hazards													
livestock diseases	[Disease]	[Disease]	[Disease]	[Disease]	[Disease]	[Disease]	[Disease]	[Disease]	[Disease]	[Disease]	[Disease]	[Disease]	
conflict/cattle raiding	[Conflict]	[Conflict]	[Conflict]	[Conflict]	[Conflict]	[Conflict]	[Conflict]	[Conflict]	[Conflict]	[Conflict]	[Conflict]	[Conflict]	
Legend	land preparation				sowing		weeding			harvest			

The rainy season starts in May and ends in October. The lean season is normally from June to July, before green crops are ready for consumption. Sorghum is the staple cereal. Agricultural work starts with land preparation from February to April, followed by sowing or planting in the months of May to mid-June. The season picks up with weeding from mid-June to

August. Harvesting of staple food crops, including green consumption takes place from September to December. Vegetable production is mainly carried out during the dry season, from November to April.

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

Lambing, calving and kidding are mainly during the dry season from November to February.

CONSUMPTION CALENDAR FOR POOR HOUSEHOLDS, ZONE 11

	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sept	Oct	Nov	Dec
Staple foods												
sorghum												
market purchase												
wild food collection												
Income												
sale of firewood												
sale of elephant grass												
domestic work												
Expenditures												
health care												
education												
Legend												

As in neighboring zones, the sorghum harvest of the poor group normally lasts for six and a half months from mid-August to February the following year, starting with green consumption in August. Market purchases of sorghum start in March until mid-August and include the lean months of June to July. The main sources of income available during the lean season include the sale of firewood, elephant grass and some domestic work. The main expenditures include the purchase of staple foods, health care services during the rainy season due to the high prevalence of malaria. Secondly school fees payment in three installments in the months of April, July and October.

ADMINISTRATIVE AREAS AND DEMOGRAPHICS

Livelihood zone name	States	Counties	2008 population estimates	
EQUATORIAL MAIZE AND CASSAVA (SSD 1)	Western Equatoria	Tambura	41,447	
		Nzara	65,712	
		Ezo	80,861	
		Yambio	148,099	
		Ibba	41,869	
		Maridi	82,461	
		Mundri West	33,975	
	Central Equatoria	Lainya	89,315	
		Yei	201,443	
		Morobo	103,603	
		Kajo Keji	196,422	
		Torit	99,740	
	Eastern Equatoria	Ikotos	27,415	
Magwi		169,826		
IRONSTONE PLATEAU AGROPASTORAL (SSD 2)	Lakes	Cuebit	64,869	
		Rumbek North	43,410	
		Rumbek Centre	153,550	
		Wulu	40,550	
		Rumbek East	122,832	
		Yirol West	103,190	
		Yirol East	67,402	
		Awerial	26,621	
	Western Equatoria	Mundri East	43,318	
		Mvolo	48,134	
	Central Equatoria	Terekeka	111,830	
HIGHLAND FOREST AND SORGHUM (SSD 3)	Central Equatoria	Juba	365,891	
	Eastern Equatoria	Lopa/Lafon	106,161	
		Budi	99,199	
		Ikotos	57,234	
	Jonglei	Akobo	4,146	
		Pochala	66,201	
		Pibor	6,151	
	WESTERN GROUNDNUTS, SIMSIM AND SORGHUM (SSD 4)	Warrap	Tonj South	86,592
		Western Bahr-el- Ghazal	Raga	54,340
Jur River			12,382	
Wau			151,320	
Northern Bahr-el-Ghazal		Awiel Centre	41,827	
Lakes		Cuebit		
Western Equatoria		Tambura	13,918	
		Nagero	10,077	
EASTERN SEMI ARID PASTORAL (SSD 5)	Eastern Equatoria	Kapoeta North	103,084	
		Kapoeta East	163,997	
		Kapoeta South	79,470	
	Jonglei	Pibor	143,324	

EASTERN PLAIN CATTLE AND SORGHUM (SSD 6)	Jonglei	Old Pangak	14,529
		Khorflus	92,460
		Ayod	21,001
		Duk	45,387
		Uror	178,519
		Nyirol	108,674
		Akobo	132,054
		Bor South	136,884
GREATER BAHR EL GHAZAL SORGHUM AND CATTLE (SSD 7)	Northern Bahr-el-Ghazal	Awiel North	129,127
		Awiel East	309,921
		Awiel South	73,806
		Awiel West	166,217
	Western Bahr-el-Ghazal	Jur River	115,389
	Warrap	Abyei	52,883
		Twic	204,905
		Gogrial West	243,921
		Gogrial East	103,283
		Tonj North	165,222
		Tonj East	116,122
	Lakes	Cueibet	52,886
NILE RIVER FISHING AND AGROPASTORAL (SSD 8)	Jonglei	Old Pangak	95,601
		Khorflus	6,608
		Ayod	117,553
		Duk	20,201
		Twic East	85,349
		Bor South	73,222
	Unity	Guit	33,004
		Leer	55,022
		Paynijar	50,723
	Lakes	Awerial	20,420
	Central Equatoria	Terekeka	20,770
		Juba	6,522
OIL RESOURCES, CATTLE AND MAIZE (SSD 9)	Unity	Rubkona	100,236
		Koch	74,863
		Mayendit	53,783
NORTHEASTERN CATTLE AND MAIZE (SSD 10)	Upper Nile	Maban	33,829
		Maiwut	79,462
		Nasir	210,002
		Longochuk	63,166
		Ulang	85,044
		Baliet	48,010
		Malakal	126,483
		Panykang	89,385
NORTHERN SORGHUM AND	Upper Nile	Renk	137,751

LIVESTOCK (SSD 11)		Manyo	38,010
		Fashoda	36,518
		Melut	49,242
		Maban	11,409
	Unity	Pariang	82,443
		Abiemnhom	17,012
		Mayom	120,715

2008 National Population Census, South Sudan.

LIST OF PARTICIPANTS

National Core Facilitators Workshop, Juba			
	Names	Function/Post	Institution
1.	John Vuga	National Technical Manager	Famine Early Warning Systems Net Work
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6.	Evans Kenyi	Coordinator- IPC	Food Agricultural Organization
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8.	Buzz Sharp	Senior Livelihood Consultant	Evidence for Development/FEWS NET
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Malakal Regional Workshop (Upper Nile and Unity States)			
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4.	Jilo Gilu Nasir	Deputy Director Agriculture	MLF/JSB
5.	Adol Apollo	Director- Taxation	MLF/JSB
6.	Alith Apeec Alith	Deputy Director Commerce	Ministry of Finance
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Wau Regional Workshop (Western Bahr-El Ghazal, Northern Bahr- El Ghazal, Warrap and Lake States)

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