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Sudan: Greater Darfur

Comprehensive Food
Security and Vulnerability
Analysis (CFSVA)

Data collected in May 2006

Strengthening Emergency Needs
Assessment Capacity (SENAC)

Sudan: Greater Darfur, Comprehensive Food Security and Vulnerability Analysis (CFSVA)

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Geographic designations:

South Sudan refers to the following States: Northern Bahr El Ghazal, Western Bahr El Ghazal, Warrup, Lakes, Unity, Upper Nile, Jonglei, Western Equatoria, Central Equatoria and Eastern Equatoria.

Darfur/Greater Darfur refers to the three States in Darfur: North Darfur, South Darfur and West Darfur.

Rest of Sudan refers to the following States: Northern, River Nile, Red Sea, North Kordofan, South Kordofan, Abyei, Khartoum, White Nile, Al Gezira, Kassala, Gedaref, Sennar and Blue Nile.

“The Three Areas” (also known as the Protocol Areas or Transition Areas) refers to South Kordofan, Abyei and Blue Nile States. Their administration and final status will be determined according to specific protocols established under the 2005 Comprehensive Peace Agreement (CPA).

Table of contents

Acknowledgement	3
Geographic designations:	4
Greater Darfur	8
1.1 SITUATIONAL ANALYSIS	8
1.1.1 <i>Overview</i>	8
1.1.2 <i>Current Security Situation</i>	10
1.1.3 <i>Economic Situation and household livelihoods</i>	10
1.1.4 <i>Agricultural Sector</i>	10
1.1.5 <i>Obstacles and hurdles</i>	11
1.2 LIVELIHOOD STRATEGIES OF HOUSEHOLDS	11
1.2.1 <i>Traditional Livelihoods and income sources</i>	11
1.2.2 <i>Impact of war on livelihoods</i>	12
1.2.3 <i>Current livelihood activities/ profiles (from the SHHS)</i>	12
1.3 AGRICULTURAL PRODUCTION	14
1.3.1 <i>Cropping Season</i>	14
1.3.2 <i>Current land use and main crops cultivated</i>	14
1.4 CURRENT HOUSEHOLD FOOD SECURITY STATUS	15
1.4.1 <i>Food consumption patterns and sources of food</i>	16
1.4.2 <i>Food security status of households in Darfur</i>	17
1.4.3 <i>Targeting of food aid</i>	17
1.4.4 <i>Underlying causes of food insecurity</i>	19
1.5 MOST COMMON SHOCKS	21
1.6 HOUSEHOLD VULNERABILITY TO SHOCKS	21
1.6.1 <i>Household vulnerability to conflict in Darfur</i>	21
1.6.2 <i>Vulnerability to becoming food insecure from drought in relation to pre-shock food security</i>	22
1.6.3 <i>Household vulnerability to floods</i>	23
1.7 GENERAL HEALTH AND NUTRITION SITUATION	23
1.7.1 <i>Child health</i>	23
1.7.2 <i>Child feeding practices</i>	24
1.7.3 <i>Children's nutritional status</i>	25
1.7.4 <i>Role of food aid in addressing malnutrition</i>	26
1.7.5 <i>Micronutrient deficiencies</i>	27
1.8 CONCLUSIONS AND RECOMMENDATIONS	28
1.8.1 <i>Livelihood food security and vulnerability profiles</i>	28
1.8.2 <i>Geographic Food security and vulnerability profiles</i>	29
1.8.3 <i>Priority areas and causes of food insecurity and vulnerability</i>	29
1.8.4 <i>Targeting and timing of food aid assistance</i>	29
1.8.5 <i>Food interventions by priority area and priority group</i>	30
1.8.6 <i>Recommended non-food interventions by priority area and priority group</i>	31

LIST OF TABLES

TABLE 1. THE TOP 5 MOST COMMONLY REPORTED LIVELIHOODS ACTIVITIES BY STATE IN GREATER DARFUR (PERCENT)	13
TABLE 2. FREQUENCY AND DISTRIBUTION OF LIVELIHOOD PROFILES IN GREATER DARFUR.....	14
TABLE 3. CROPPING SEASON BY TYPE OF CROP AND STATE IN GREATER DARFUR	14
TABLE 4. LAND USE, HARVEST MONTHS, LENGTH OF HUNGER SEASON AND MAINTENANCE OF VEGETABLE PLOTS BY STATE IN GREATER DARFUR	15
TABLE 5. PERCENTAGE OF CROP PRODUCING HOUSEHOLDS AND PROPORTION OF HARVEST CONSUMED, SOLD OR EXCHANGED BY STATE IN GREATER DARFUR	15
TABLE 6. PERCENTAGE OF FOOD INSECURE HOUSEHOLDS BY STATE IN GREATER DARFUR	17
TABLE 7. FOOD SECURITY STATUS, SHARE OF FOOD INSECURE AND SHARE OF FOOD AID BENEFICIARIES BY STATE IN GREATER DARFUR	18
TABLE 8. TOP THREE MOST COMMON SHOCKS BY STATE IN GREATER DARFUR.....	21
TABLE 9. PERCENTAGE OF HOUSEHOLD VULNERABLE TO DROUGHT BY STATE IN GREATER DARFUR	23
TABLE 10. PREVALENCE OF DIARRHEA AND TYPES OF TREATMENTS BY STATE IN GREATER DARFUR (PERCENT).....	24
TABLE 11. PREVALENCE OF FEVER AND TYPES OF TREATMENTS BY STATE IN GREATER DARFUR (PERCENT).....	24
TABLE 12. PREVALENCE OF ARI AND TYPES OF TREATMENTS BY STATE IN GREATER DARFUR (PERCENT).....	24
TABLE 13. CHILD FEEDING PRACTICES BY STATE IN GREATER DARFUR.....	25
TABLE 14. PERCENTAGE OF HOUSEHOLDS WITH PROPERLY IODIZED SALT BY STATE IN GREATER DARFUR (PERCENT)	28
TABLE 15. SOURCE OF HOUSEHOLDS SALT BY STATE IN GREATER DARFUR (PERCENT).....	28
TABLE 16. PERCENTAGE OF CHILDREN RECEIVING VITAMIN A SUPPLEMENTS AND SOURCE OF LAST SUPPLEMENT.....	28

LIST OF FIGURES

FIGURE 1. DISTRIBUTION OF IDP AND REFUGEE CAMPS IN GREATER DARFUR	9
FIGURE 2. LIVELIHOOD ZONES IN GREATER DARFUR	11
FIGURE 3. NUMBER OF LIVELIHOODS HOUSEHOLDS ENGAGE IN 5 MAIN ACTIVITIES BY STATE, GREATER DARFUR	13
FIGURE 4. NUMBER OF TIMES FOOD GROUPS WERE CONSUMED PER WEEK BY STATE IN GREATER DARFUR.....	16
FIGURE 5. SOURCE OF FOOD BY STATE IN GREATER DARFUR.....	16
FIGURE 6. SOURCES OF FOOD (ONLY FOOD FROM FOOD AID BASKET) BY STATE IN GREATER DARFUR.....	17
FIGURE 7. SHARE OF FOOD INSECURE HOUSEHOLDS EXAMINED IN RELATION TO SHARE OF BENEFICIARIES BY STATE IN GREATER DARFUR	18
FIGURE 8. NUMBER OF INDIVIDUALS WITH POOR FOOD CONSUMPTION EXAMINED IN RELATION TO NUMBER OF BENEFICIARIES BY STATE IN GREATER DARFUR	18
FIGURE 9. SIGNIFICANT PREDICTORS OF HOUSEHOLD FOOD SECURITY STATUS, TAKING ACCOUNT OF POTENTIAL CONFOUNDERS	20
FIGURE 10. INSTANCES OF VIOLENCE BY AREA AND TYPE OF INCIDENT IN GREATER DARFUR...	22
FIGURE 11. HIGH RISK FLOOD AREAS IN GREATER DARFUR	23
FIGURE 12. ANNUAL FLUCTUATIONS IN GAM, SAM AND U5 MORTALITY RATES IN GREATER DARFUR.....	26

FIGURE 13. ANNUAL FLUCTUATIONS IN GAM, SAM, U5 MORTALITY RATES AND NUMBERS OF
FOOD AID BENEFICIARIES IN GREATER DARFUR..... 27

Greater Darfur

1.1 Situational analysis

1.1.1 Overview

Situated between the Sahelian and desert zones, Greater Darfur is comprised of 3 states and covers an area approximately 511,412 square kilometres. Northern Sudan is typically more arid, receiving less than 100 mm of rain, while South Darfur is part of the Sudanic zone and enjoys a much longer rainy season, receiving 500 to 900 mm of rain.

Culturally, Darfur is comprised of both sedentary (non arab) and nomadic (arab) agro-pastoralists. Tribal and ethnic conflicts over natural resources have historically been common, though in recent years they became both more frequent and more severe, ultimately culminating in the current crisis that began in 2003. The roots causes of this crisis have been summarized as follows¹:

- General marginalisation and neglect of Darfur;
- Marginalisation of Arab nomad tribes within Darfur;
- National and international strategies of arabisation;
- Drought and competition over limited natural resources within Darfur;
- Land tenure rights;

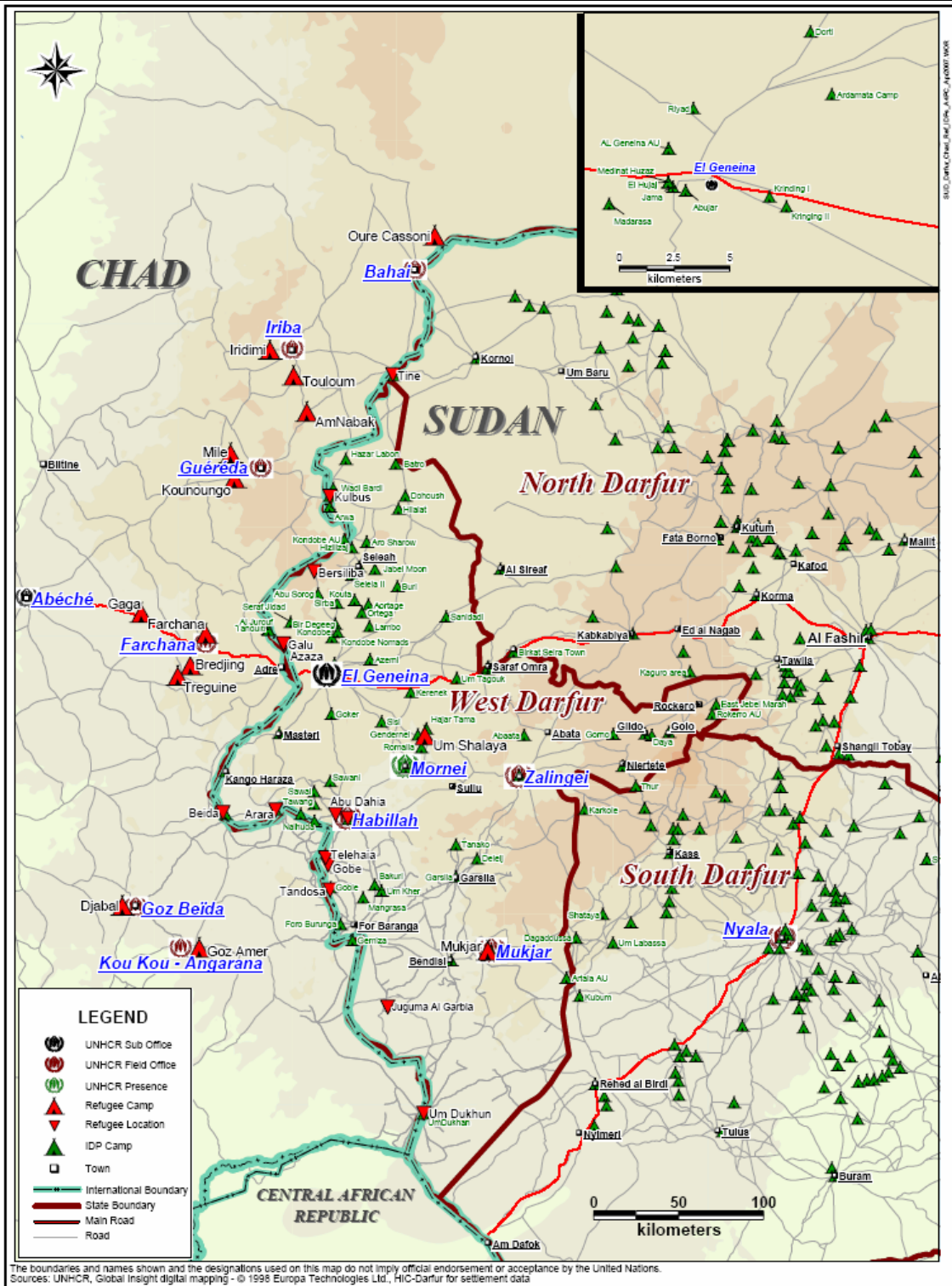
While sporadic conflict was relatively common in the years before the war, large scale fighting began in earnest in late 2003, with rebel forces launching an insurgent campaign against strategically important GOS targets. The response from GOS and allied militia forces was swift and violent, particularly in North and West Darfur. In these areas, villages were completely destroyed and livelihoods (crops, livestock, etc) were systematically targeted for destruction. The violence was so widespread that most of the rural populations in these states were displaced, with many moving to scattered IDP camps throughout the region.

Rebel forces have also been implicated in attacks on pastoral communities, particularly in North Darfur, which has resulted in killings and looting of livestock.

The net effect of this crisis has been widespread displacement, and livelihood destruction. As of 2006, it is estimated that 3.7 million people have been affected by the conflict and close to 2 million people have been displaced. To illustrate the depth of the displacement, figure 1 shows the geographic distribution of IDP and refugee camps as of April 2007.

¹ V. Tanner. *'Rules of lawlessness. Roots and repercussions of the Darfur crisis'*. Inter-agency paper of the Sudan Advocacy Coalition, January 2005

Figure 1. Distribution of IDP and refugee camps in Greater Darfur



*Source: UNHCR

Livelihoods have been affected by: 1) loss of manpower (with boys and men being killed and migrating out of Darfur), 2) loss of assets (livestock, farming implements, etc), and 3) limited mobility. Specifically, insecurity has limited access to former livestock trade routes, farmland, and markets. Destruction of homes, livestock, farming implements, schools, health centres, etc by the GOS and Janjaweed forces has made it even more difficult for displaced households to return home and restart their livelihoods. It is estimated that the

non arab population in Darfur has lost 50-90 percent of their cattle². Movement by IDPs and residents in search of water, food or in pursuit of various livelihood activities (like collection of wild grass and firewood) is also restricted, as venturing too far from camps or towns leaves people exposed to attacks by Janjaweed. Rape, in particular, remains a constant threat to women.

1.1.2 Current Security Situation

While the same dynamics have largely persisted in Darfur (GOS/ Janjaweed vs SLA/ JEM), the specific nature of the conflict has changed somewhat since 2003. First, new engagements and resulting displacements are decidedly smaller in scale. This is due to the fact that both sides have consolidated their power and new fighting is over areas of specific strategic importance to one side or the other. Secondly, fighting has metastasized from something approaching a civil war (GOS/ Janjaweed vs SLA/ JEM) in the beginning to the general state of lawlessness that now exists. This can largely be attributed to the splintering of existing rebel factions (like the SLA and JEM), resurgent tribal tensions (and subsequent shifting of alliances) and activities of third party participants (ie. the Chadian rebels). The decentralization of the conflict has resulted in violence that is increasingly revenge oriented, with certain groups attacking particular households to settle old scores. This, combined with the proliferation of arms has also led to a spike in general banditry and other kinds of criminal activities. Unfortunately this is increasingly affecting aid workers, as car jackings and assaults have become more common. Another important emerging source of insecurity is the threat of terrorism that has been directed against UN facilities. While this threat is specifically targeted towards the UN, a successful attack could alter how WFP operates, affecting millions of people reliant on food aid.

Recent developments provide renewed hope for an end to violence. In April, the Government in Khartoum finally came to an agreement with the UN Security Council, in regards to the deployment of a 26,000 hybrid UN-AU peacekeeping force. While this appears to be a step in the right direction, only time will indicate whether this deployment will proceed as planned and whether it will be effective.

1.1.3 Economic Situation and household livelihoods

Before the conflict, the main livelihood sources for households in Darfur consisted of subsistence farming and trade in livestock. Agricultural production and yields have historically been highly erratic due to unpredictable patterns of rainfall, pest infestations and the lack of appropriate agricultural implements. The livestock trade has been a crucial livelihood component with tens of thousands of livestock (pre-conflict) exported annually to surrounding countries. A shortage of grazing land and water, however, has placed added pressure on livestock populations over the past decades.

Regional food security is dependent on a combination of food production, formal and informal inter-state and cross border trade. A breakdown at any of these levels due to production shocks or to disruptions to physical and economic access to markets could have severe food security repercussions. Despite unpredictable yields, cereal production in Greater Darfur was usually sufficient to satisfy demand in each state. Regional cereal self-sufficiency is important, as cereals produced in other parts of Sudan are not routinely brought into the region because of substantial transportation costs.

1.1.4 Agricultural Sector

Most households in Darfur, even generally nomadic households, engage in some food crop production, with sorghum and millet as the primary crops. Aside from cereals, households throughout the region also rely on water melon, tobacco, and groundnut production. South and West Darfur, given generally more favorable agricultural conditions, tend to be surplus food producing areas, while North Darfur is typically food deficient. The arid climate limits crop diversity as conditions only permit millet (and groundnut) production, leaving households reliant on foods produced in South and West Darfur.

² Young, H, Osman AM, Akillu, Y, Badri, B and Fuddle, AJ. Darfur- Livelihoods under Siege. Feinstein International Famine Centre. June 2005.

Livestock is a crucial part of the agricultural sector here, as virtually all households own livestock and at least pre-conflict there was a thriving international trade. The importance of livestock as a livelihood has diminished in importance since the start of the conflict, as typical trade routes are largely inaccessible and livestock populations have been placed under increasing pressure. Also many households have had their livestock plundered, forcing them to turn to other livelihoods.

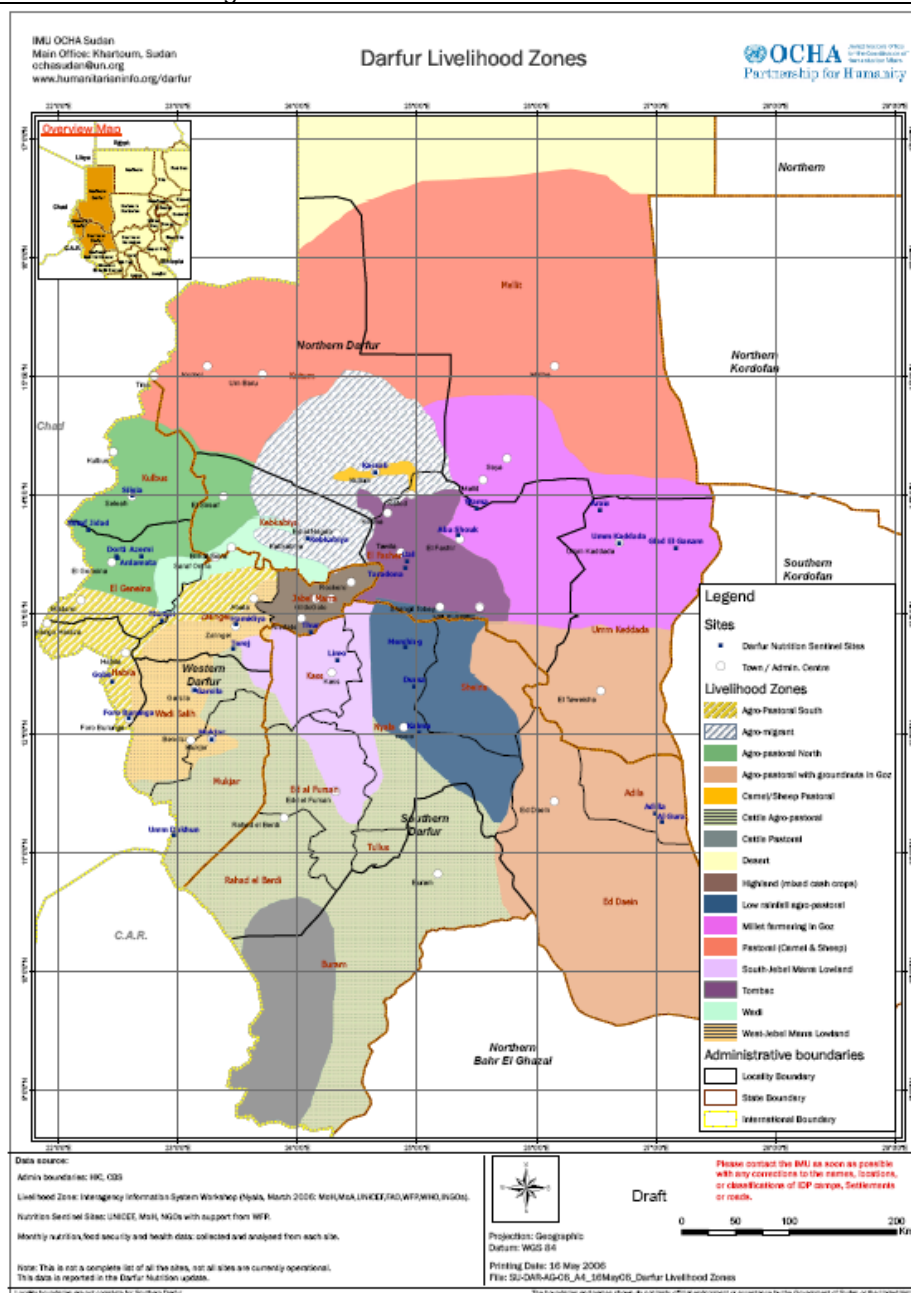
1.1.5 Obstacles and hurdles

In Darfur, the most pressing obstacles and hurdles now all revolve around a resolution of the conflict. The establishment of the UN peacekeeping force is a potential first step in this process, but a cessation of the violence is only the beginning, as many issues like resettlement of displaced households and reconstitution of lost assets remain outstanding.

1.2 Livelihood strategies of households

1.2.1 Traditional Livelihoods and income sources

Figure 2. Livelihood zones in Greater Darfur



Prior to the start of the conflict in 2003, traditional livelihoods in Darfur consisted of 4 main income generating activities. These included: 1) agriculture, 2) livestock/ herding, 3) trade, 4) labour migration (Khartoum, Libya, etc). As discussed above, Darfur has historically been able to provide for its food needs with the most productive areas also being a crucial source of labour. South Darfur (with a longer rainy season) traditionally has some of the most productive land and consequently has always been wealthier and more food secure than either West or North Darfur. North Darfur, given its arid climate (especially in the northern regions) has consistently been the most food insecure state in Darfur. Trade in livestock has also been an important source of livelihoods with tens of thousands of camels exported annually (pre-conflict) to Libya and Egypt. Figure 2 above provides a concise break down of primary livelihood activities by geographic area in Greater Darfur.

1.2.2 Impact of war on livelihoods

The outbreak of the war in late 2003/ early 2004 resulted in the systematic destruction of livelihoods throughout the region. The early stages of the war were particularly damaging, as household assets (including productive and non productive assets, livestock, etc) and entire communities were systematically destroyed. Livestock losses were particularly severe not only because of violence but also because of distress selling by households. Agricultural production and livestock trade also suffered, as access to farmland was severely limited and typical trade routes were largely cut off.

Since that time, the amount of large scale violence has declined, though significant ongoing fighting in certain areas, theft, looting, rape and criminal activity are still heavily affecting livelihoods. Women are fearful to leave their villages, IDP camps or garrison towns for any reason, lest they be raped or murdered. Displaced farmers are being forced off of productive land and onto less productive, hard clay soils. Farmers that remain on their land are usually able to access only a fraction of it, as they are unwilling to venture far from home for fear of violence. A livelihood assessment conducted in 2006 indicated that Janjaweed sometimes graze their cattle on crops before they can be harvested.

The practical effect of the ongoing violence and traditional livelihood destruction has been less reliance on traditional livelihoods and an emerging reliance on daily labour and petty trade activities. According to the livelihoods assessments conducted in 2006, IDPs, especially those with access to capital from relatives or loans, are increasingly engaging in petty trade activities. One specific activity that has become increasingly common is brick-making. This activity by and large allows the participant to stay in the relative safety of their town or village, thus not exposing them to violence. Another common activity is the collection of wild grass and firewood. This activity involves more risk as collection of these resources requires that participants leave the town or village.

1.2.3 Current livelihood activities/ profiles (from the SHHS)

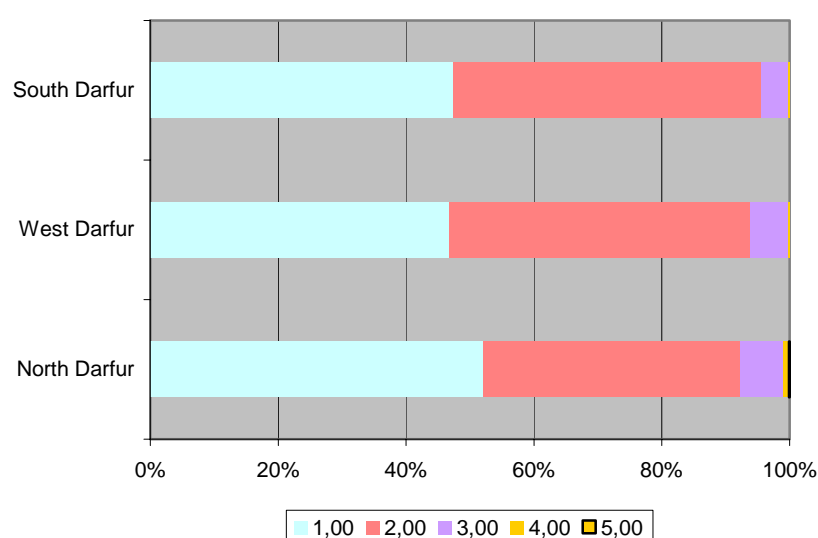
The war's impact on livelihoods is reflected in the current SHHS data. While agricultural activities remain the most common livelihood activity, "food aid", "petty trade", and "unskilled labour" are the next most common income generating activities in Greater Darfur. Examined by state, food aid assistance was the most commonly reported livelihood activity in West Darfur, which was experiencing most of the violence at the time of data collection. Overall, 36 percent of households reported this. In both North and South Darfur, the impact of the war was noticeable. While "agriculture" was the most common livelihood activity, "food aid assistance" and "unskilled labour" were the second and third most common activities in North Darfur and "petty trade" and "unskilled labour" were the second and fifth most common activities in South Darfur. Complete results by state are shown in table 1. It should be noted that "food aid assistance" was not a prominent source of livelihoods in South Darfur as it was in both North and West Darfur. This discrepancy can only be explained by households in South Darfur having greater income generating opportunities (whether it be agriculture, employed work etc) and thus, despite receiving a similar share of food aid, are less likely to consider food aid a stand alone source of livelihood rather than a supplement to their existing livelihoods. This explanation is bolstered by the fact that households in South Darfur have been historically better off (in terms of food security and child nutrition) than households in North and West Darfur.

When assessed by number rather than type, approximately 50 percent of households, regardless of state, relied on one livelihood activity primarily while 30-40 percent relied on 2. Fewer than 10 percent of households relied on more than 2 activities (Figure 3).

Table 1. The top 5 most commonly reported livelihoods activities by state in Greater Darfur (percent)

	Most reported activity	2nd most reported activity	3rd most reported activity	4th most reported activity	5th most reported activity
Greater Darfur-Overall	Agriculture (42.1)	Food aid (21.8)	Petty trade (18.5)	Unskilled labour (16.7)	Employed work (14.6)
State					
North Darfur	Agriculture (33.2)	Food aid assistance (27.5)	Unskilled labour (18.8)	Employed work (17.4)	Petty trade (13.5)
West Darfur	Food aid assistance (35.8)	Agriculture (21.6)	Unskilled labour (20.5)	Petty trade (18.3)	Collecting natural resources (14.2)
South Darfur	Agriculture (58.4)	Petty trade (19.9)	Employed work (14.0)	Livestock (12.9)	Unskilled labour (12.2)

Figure 3. Number of livelihoods households engage in 5 main activities by state, Greater Darfur



In terms of livelihood profiles, “agriculture” was the most prominent livelihood activity with almost one-third of households engaging in it. The percentage of households depending upon this livelihood activity differed dramatically by state, with 45 percent of households in South Darfur versus only 15 percent of households in West Darfur. While South Darfur is considerably more fertile than other regions in Greater Darfur, this difference is likely not due to productivity differentials alone. Instead, this is likely at least partially explained by the dynamics of the surrounding conflict, which has intensified over the past year or two in West Darfur.

As table 2 indicates, “Unskilled labour”, “employed work”, and “food aid assistance” were the next most commonly reported livelihoods with 11 percent, 12 percent and 10 percent of household reporting them respectively. Each of these activities was more common in North and West Sudan than in South Sudan. This difference was most evident in terms of the households reporting “food aid assistance”. In this case, 20 percent of households in West Darfur relied exclusively on “food aid assistance” while only 5 percent of household in South Darfur did likewise. “Petty trade” was the next most common activity with 9 percent of household engaging in it. This was more common in South Darfur than in North or West Darfur but differences were small.

Table 2. Frequency and distribution of livelihood profiles in Greater Darfur

Livelihood Profile	N Sample	percent in Population (weighted)	Geographic Distribution
Agriculture	880	32.1	45% of HHs in South, Almost 30% of HHs in North, and only 15% of HHs in West
Agriculture, fishing & hunting	13	0.4	Fewer than 5%
Agro-pastoralist	48	1.7	Fewer than 5%
Pastoralist	88	2.7	Fewer than 5%
Unskilled	356	11.0	15% of North and West; slightly over 5% in South
Skilled labour	89	3.1	Fewer than 5%
Employee	358	11.7	15% in North and approx. 10% in West and South
Petty trade	283	9.9	Slightly more than 10% of HHs in South and between 5-10% in North and West
Handicraft	158	5.5	5-10% in West; 5% or fewer in North and South
Collection	168	5.5	5-10% in West; 5% or fewer in North and South
Food aid assistance	332	10.0	20% of HHs in West Darfur; 10% in North; and fewer than 5% in South
Other	115	3.2	5-10% of HHs in Northern; fewer than 5% in West and South

1.3 Agricultural production

1.3.1 Cropping Season

The cropping season is largely uniform throughout Greater Darfur but it does vary slightly depending largely on the arrival of the rains. Table 3 details the planting and harvest periods by state.

Table 3. Cropping season by type of crop and state in Greater Darfur

	Jan	Feb	March	April	May	June	July	Aug	Sep	Oct	Nov	Dec
North Darfur												
Sorghum	█						█	█	█			
Millet							█	█	█			
West Darfur												
Sorghum	█						█	█				
Millet							█	█				
South Darfur												
Sorghum	█						█	█				
Millet							█	█				

1.3.2 Current land use and main crops cultivated

As discussed in Chapter 4, households in the Darfur have greater access to the farmland (60 percent) than households in the rest of northern Sudan (40 percent) but not as much access as households in southern Sudan. This is to be expected, as rainfall patterns are more favourable to crop production in Darfur (and particularly in South Darfur) than in the rest of northern Sudan. Likewise, conditions here are not quite as favourable for farming as in southern Sudan, which along with the ongoing conflict, explains that differential.

Examined by state, there is considerable variation in access to farmland which likely can be explained by the ongoing conflict (Table 4). In the traditional agricultural hub of South Darfur, access to farmland is highest with almost three-quarters of households reporting usually utilizing land for farming. Slightly fewer households (57 percent) reported accessing farmland in the more arid areas in North Darfur. Interestingly, fewer than 50 percent of households reported accessing farmland in West Darfur, which is generally

better suited for crop production than North Darfur. Intensifying conflict in West Darfur over the past two years, likely explains this.

A similar percentage of households that reported usually using land for farming reported having planted crops in 2005, at least in North and West Darfur. In South Darfur, the percentage of households planting in 2005 was a quite a bit below (12 percent below) the percentage that reportedly usually accesses farmland. While the data does not indicate a reason for this discrepancy, it could be conflict-related.

As indicated by the cropping seasons, households throughout Darfur consistently reported having only one harvest per year and reported that the harvest lasted for 5 (South Darfur) to 7 (West Darfur) months. In South Darfur, the hunger season lasted one month longer than other states (4 versus 3 months). Fewer than 10 percent of households, regardless of state, reported maintaining a vegetable garden.

Table 4. Land use, harvest months, length of hunger season and maintenance of vegetable plots by state in Greater Darfur

	HH uses land for farming	Land planted in past year	Harvests in year	How many months food lasts	Hunger season harvest	HH has vegetable plot/garden
North Darfur	57%	51%	1	6	3	9%
West Darfur	44%	38%	1	7	3	7%
South Darfur	73%	61%	1	5	4	8%

Table 5 shows the percentage of households in each state producing crops and the percentage of the harvest that is consumed or sold/ exchanged. The crops produced most often in the last year (regardless of state) were sorghum, millet and groundnuts. These crops were produced by households in South and West Darfur, though the percentage of crop producing households was much higher in South Darfur. Here, slightly over one-third of all households reportedly cultivated all three crops. In West Darfur, by comparison, fewer than one-third of households produced sorghum, fewer than one-fifth of households produced millet and fewer than one-tenth of households produced groundnuts. Production patterns differed in North Darfur, as arid the climate is only suitable for millet and groundnut production. Here, almost one-half of all households produced millet and 9 percent of households produced groundnuts. Examining the percentage of production consumed vs sold/ exchanged, over 90 percent of sorghum produced in Greater Darfur was consumed, as was over 80 percent of all millet. The pattern differed for groundnuts. Households in South and North Darfur produced groundnuts primarily to sell or exchange them. In West Darfur, while a larger percent of groundnuts (than millet or sorghum) were sold vs consumed, the overwhelming majority (three-quarters) was consumed. This might reflect poorer access to markets or concerns over food shortages.

Table 5. Percentage of crop producing households and proportion of harvest consumed, sold or exchanged by state in Greater Darfur

State		Percent of Cases	Proportion consumed*	Proportion sold or exchanged*
North Darfur	Millet	46%	83%	11%
	Groundnuts	9%	18%	81%
West Darfur	Sorghum	29%	92%	0%
	Millet	19%	93%	0%
	Groundnuts	6%	75%	25%
South Darfur	Sorghum	37%	92%	0%
	Millet	35%	92%	0%
	Groundnuts	38%	47%	52%

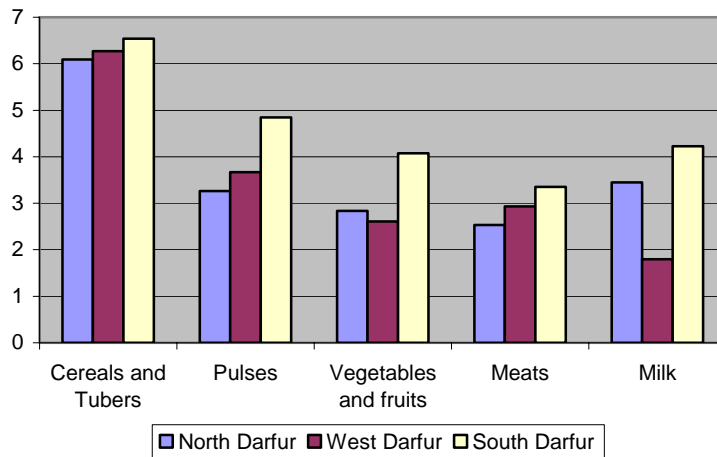
1.4 Current Household Food Security Status

Households in Darfur, like the rest of northern Sudan, generally have a cereal-based diet, with little diversity. Below is a discussion of food consumption patterns and how these patterns differ by state.

1.4.1 Food consumption patterns and sources of food

Figure 4 shows the number of times per week foods from main food group were consumed by state. Cereals and tubers (sorghum and millet) are eaten 6-7 times per week regardless of state, while pulses (beans, groundnuts, sesame and cowpeas) are generally consumed between 3 and 5 times per week. Fruits and vegetables (pumpkin, watermelon, etc), meats and milk are all eaten 2-4 times per week, depending on the state. Households in South Darfur consume each food group more often than households in other states, especially in regards to pulses, fruits and vegetables and milk.

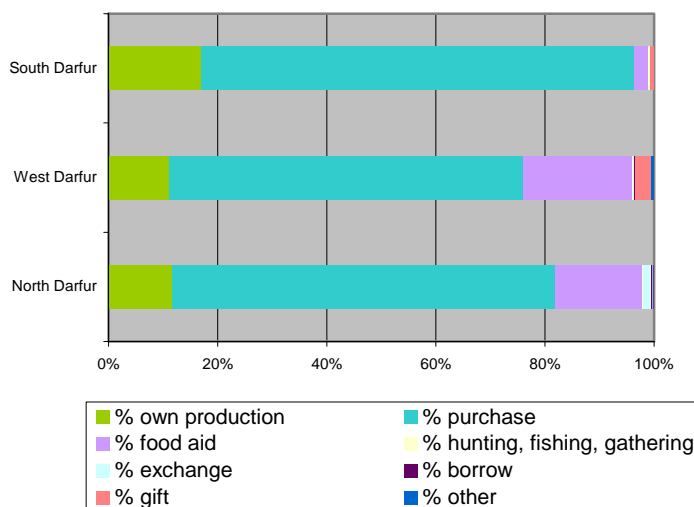
Figure 4. Number of times food groups were consumed per week by state in Greater Darfur



Households in North Darfur appear to have the worst food consumption, with consumption of cereals, pulses and meats less frequent than households in either South or West Darfur. As households in North Darfur are typically pastoral, milk consumption is quite heavy with households reportedly consuming milk 3.5 times per week (versus less than 2 times per week in West Darfur).

As figure 5 shows, the majority of households access food (at least two-thirds) through purchase. Overall, 65 percent, 74 percent, and 80 percent of households in West, North and South Darfur respectively reported purchasing the food they consumed. The remainder of households report accessing food through a combination of own production and food aid, with the importance of both differing by state. Households in South Darfur rely more heavily on agricultural production (than households in North and West Darfur) as a livelihood and thus as a source of food.

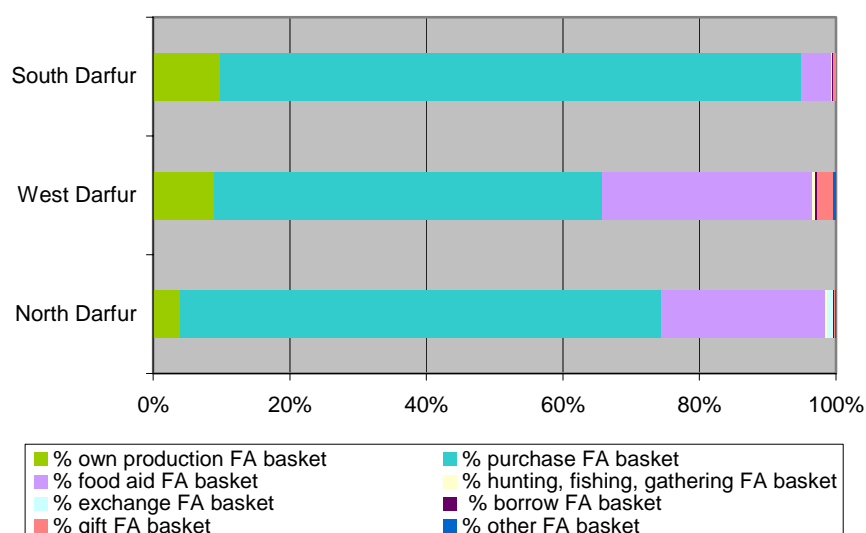
Figure 5. Source of food by state in Greater Darfur



Conversely, food aid is one of the top livelihoods in North and West Darfur and consequently one of the major sources of food. Findings on the differing importance of food aid were at first peculiar, given that a similar amount of food aid is delivered to each state. The likely explanation for this, as discussed before (see section 10.2.3), is that households in South Darfur appear to have access to more income generating activities than households elsewhere in Darfur and thus rely more on food purchases and less on food aid.

When examining sources of sorghum, oils and sugars only (the foods included in the food aid basket), the same general patterns were seen with own production and purchase remaining the most important sources of food (Figure 6). However, the overall contribution of food aid was more noticeable. In North and West Darfur, the percentage of households reporting food aid their food sources, jumped from 15-20 percent to 24 percent and 31 percent respectively. By contrast, in South Darfur, the percentage of households reporting food aid as their source of food jumped from slightly under 3 percent to about 5 percent.

Figure 6. Sources of food (only food from food aid basket) by state in Greater Darfur



1.4.2 Food security status of households in Darfur

As discussed previously, Darfur has a higher prevalence of food insecurity than the rest of northern Sudan but (even with the ongoing conflict) a lower prevalence than southern Sudan. Overall 25.9 percent of households in Greater Darfur are food insecure.

As table 6 illustrates, however, the prevalence of food insecurity within Darfur varied dramatically by state. West Darfur had the highest prevalence with approximately 40 percent of households food insecure. Surprisingly, North Darfur, historically considered the most food insecure state in Darfur, had a slightly lower prevalence at 33 percent. South Darfur, typically considered the best off of the Darfur states, had the lowest prevalence at 13 percent.

Table 6. Percentage of food insecure households by state in Greater Darfur

	Food insecure	Number of people food insecure
North Darfur	33.0	563645
West Darfur	40.2	713357
South Darfur	13.0	427796

1.4.3 Targeting of food aid

Large amounts of food aid have been flowing into Darfur since the start of the war, feeding 2.5-3 million beneficiaries per month, according to 2006 data. Darfur is receiving more than double the amount of food aid per month than ROS and southern Sudan combined (700,000 and 300,000 respectively).

In order to gain a better idea as to whether this food aid is properly targeted toward the most vulnerable, the percent of food insecure households (and the number of people with clearly deficient dietary patterns, ie. those falling into the poor consumption category only) were examined in relation to the share and number of beneficiaries per state.

While it is not possible to assess how well food aid was targeted at the household level (given that food aid data was only available at the state level), this analysis did indicate that the share of food aid deliveries per state in 2006 appeared appropriate considering the share of food insecure households per state, especially when security constraints are

taken into account. As table 7 and Figure 7 indicate, North Darfur comprised 33 percent of the total food insecure (in Greater Darfur) and received approximately 32 percent of the food aid. Likewise, South and West Darfur comprised 25 and 42 percent of the total food insecure respectively and each received 34 percent of the food aid. The slight under targeting of West Darfur is likely a result of the precarious security situation that has existed there for much of the past year. This analysis suggests that shifting of certain resources from South Darfur toward West Darfur might be appropriate.

Comparisons of the number of beneficiaries per state to the number of individuals estimated to have poor food consumption patterns revealed that the number of beneficiaries in 2006 far exceeded the number of people with poor food consumption, regardless of state. This leads to one of two possible conclusions: 1) all three states are over-targeted and thus there is a need to substantially scale back the amount of food aid given or 2) food aid is having its intended effect, ensuring that vulnerable households have adequate food to stay out of the poor food consumption category. While the data does not indicate which explanation is most likely, a critical assessment of the situation— taking into account the number of people displaced, systematic loss of livelihoods, etc— suggests that the first explanation is simply not plausible. The second explanation— that food aid is protective against poor food consumption— appears most reasonable. If true, then food aid programmes are having a substantial impact and any attempt to scale back may result in a corresponding increase in food insecurity.

Table 7. Food security status, share of food insecure and share of food aid beneficiaries by state in Greater Darfur

	Food insecure	Number of people food insecure	Number of beneficiaries	Share of food insecure/ Share of beneficiaries
North Darfur	33.0	563645	873986	33.1/ 32.1
West Darfur	40.2	713357	913120	41.8/ 33.6
South Darfur	13.0	427796	932298	25.1/ 34.3

Figure 7. Share of food insecure households examined in relation to share of beneficiaries by state in Greater Darfur

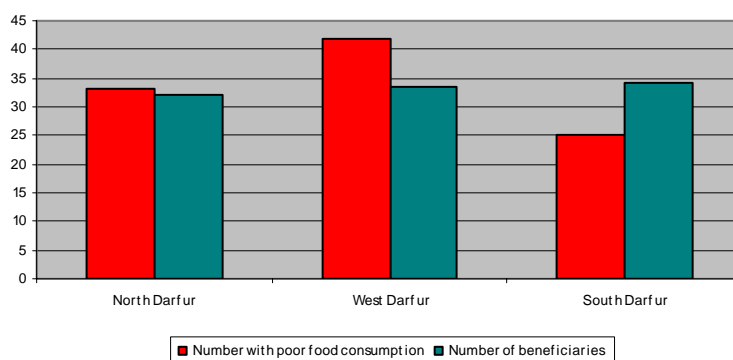
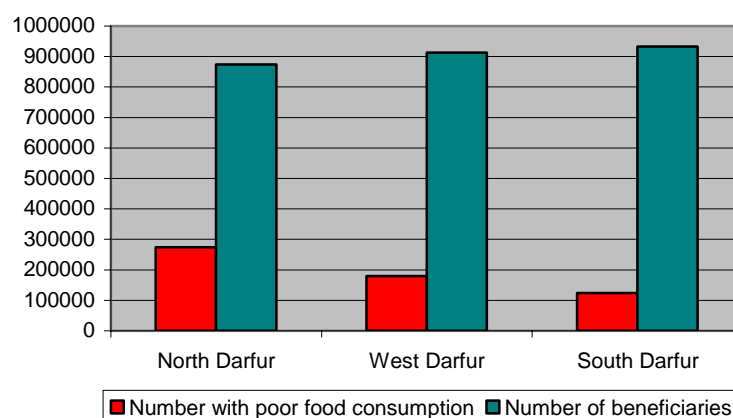


Figure 8. Number of individuals with poor food consumption examined in relation to number of beneficiaries by state in Greater Darfur



1.4.4 Underlying causes of food insecurity

This section explores the immediate and underlying causes of food insecurity in Greater Darfur. To assess these causes, probit models were developed using the dichotomous food secure (yes/no) variable as the dependent variable and various demographic, household and socio-economic characteristics (previously determined to be associated with food insecurity in bivariate comparisons) as the independent variables. Stata 9.2 was used for the analysis and the “robust cluster” function was used to ensure correct estimation of standard errors.

Darfur, unlike the rest of Sudan, is currently experiencing large-scale fighting and population displacement. Thus, the largest predictors of food security status are likely to be factors associated with conflict, including level of conflict-affectedness, household displacement status and loss of livelihoods. SHHS data indicates that the level of displacement and livelihood abandonment is significant with at least 10 percent of households reporting food aid as their primary source of food and income and almost one-third of households reportedly rely on less risky, closer to home livelihoods like petty trade, collection (likely collection of grass and firewood for sale), unskilled labour (likely brick-making) or handicrafts. Not surprisingly, many of these livelihoods are commonly reported in West Darfur which at the time of data collection was experiencing a disproportionate share of the violence.

While conflict-related factors are likely the most important determinants of food security status, other factors should not be overlooked. Wealth status is likely one of the most important determinants as wealth may provide a household not only with consistent food access but also with a greater degree of security, both of which is crucial to maintaining proper food security. Agricultural shocks, such as drought and floods also pose a significant risk, as crop cultivation does continue despite the violence, especially in the traditionally agricultural areas of South Darfur. Other important factors may include food price shocks, death of household members, etc.

Taking into account the unique situation in Greater Darfur, the independent variables examined included in the analysis were sex of head of household, dependency ratio, household displacement status, wealth index, livelihood strategies, and exposure to shocks (by number and type of shock). Again, there was particular focus on conflict related factors, but the same general iterative model progression (seen in the causal analysis in the rest of northern Sudan) was followed. First, characteristics of typically vulnerable households (female headed hhs, hhs with a high dependency ratio, and displaced—idp or refugee—hhs, households experiencing shocks) were examined in relation to food insecurity. Next, asset wealth was examined (taking account of these basic hh characteristics) in relation to food security status, assessing whether any of these basic household characteristics modified wealth’s effect on food security status. Finally, household’s livelihoods were examined in relation to food security status, again taking account of and examining interactions with basic hh vulnerability characteristics. The models assessed are shown below:

Probit= $b_0 + b_1(\text{female hhh}) + b_2(\text{high dependency ratio}) + b_3(\text{IDP hhs}) + b_4(\text{refugee hhs}) + b_5(\text{returned IDPs}) + b_6(\text{returned refugees}) + b_7(\text{hh experience one shock}) + b_8(\text{hh experienced two shocks}) + b_9(\text{household experienced three shocks})$

Probit= $b_0 + b_1(\text{female hhh}) + b_2(\text{high dependency ratio}) + b_3(\text{IDP hhs}) + b_4(\text{refugee hhs}) + b_5(\text{returned IDPs}) + b_6(\text{returned refugees}) + b_7(\text{hh experienced sickness/death}) + b_8(\text{hh experienced agricultural shock}) + b_9(\text{household experienced insecurity shock}) + b_{10}(\text{household experienced price shock})$

Probit= $b_0 + b_1(\text{female hhh}) + b_2(\text{high dependency ratio}) + b_3(\text{IDP hhs}) + b_4(\text{refugee hhs}) + b_5(\text{returned IDPs}) + b_6(\text{returned refugees}) + b_7(\text{hh experience one shock}) + b_8(\text{hh experienced two shocks}) + b_9(\text{household experienced three shocks}) + b_{10}(\text{hh wealth index})$

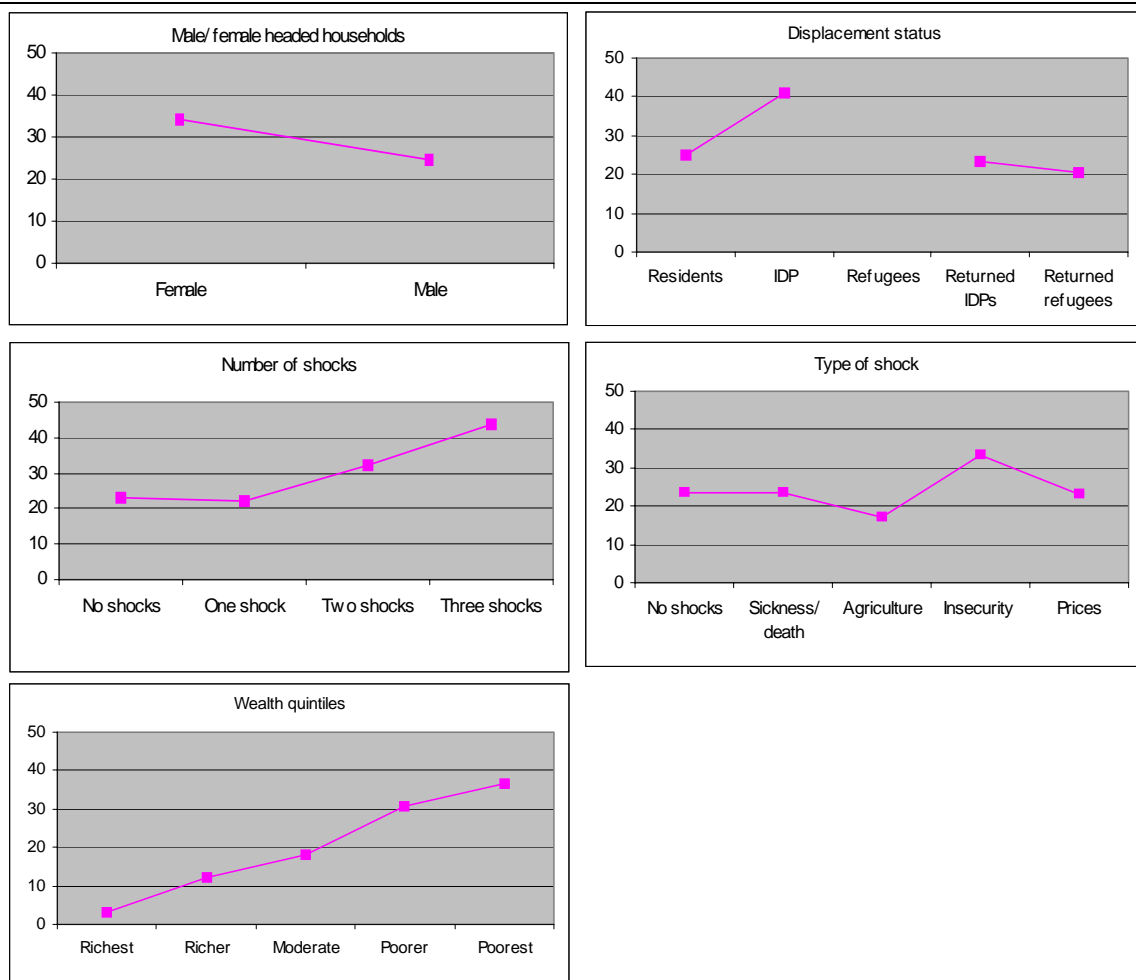
Probit= $b_0 + b_1(\text{female hhh}) + b_2(\text{high dependency ratio}) + b_3(\text{IDP hhs}) + b_4(\text{refugee hhs}) + b_5(\text{returned IDPs}) + b_6(\text{returned refugees}) + b_7(\text{hh experience one shock}) + b_8(\text{hh experienced two shocks}) + b_9(\text{household experienced three shocks}) + b_{10}(\text{agricultural, fishing and hunting hhs}) + b_{11}(\text{agropastoralist hhs}) + b_{12}(\text{pastoralist}) + b_{13}(\text{unskilled labour hhs}) + b_{14}(\text{skilled labour hhs}) + b_{15}(\text{employee hhs}) + b_{16}(\text{petty trade hhs}) + b_{17}(\text{handicraft}) + b_{18}(\text{collection}) + b_{19}(\text{food aid assistance hhs}) + b_{20}(\text{other activity hhs})$

1.4.5.1 Basic predictors of food insecurity

As figure 9 shows, female headed households, IDP households, and households experiencing shocks were significantly more likely to be food insecure. Specifically, female headed households, IDP households, and households experiencing two or three shocks were more food insecure (than households without these characteristics) by 10, 16, 9 and 21 percentage points respectively.

When examined by type of shock, households affected by insecurity/ violence were the most affected, with 34 percent of households reportedly food insecure (versus only 23 percent of households not experiencing shocks). Even in the heavily-conflict affected areas of Darfur, wealth remains the strongest predictor of food security status. Overall, 37 percent of households in the poorest quintile were food insecure versus only 3 percent of households in the wealthiest quintile. Generally speaking, wealth's effects on food security status are distinct from the effects that shocks have on food security status, meaning that the effect of poverty on food security status is not modified by whether the households has been affected by a shock (regardless of the number or type).

Figure 9. Significant predictors of household food security status, taking account of potential confounders



Disaggregated by urban and rural status, the same general pattern was observed though urban households appeared more vulnerable to shocks. In urban areas, households were affected in a dose response relationship according to the number of shocks experienced. Likewise, urban households were vulnerable to a wider range of shocks, with households experiencing sickness/ death, agricultural shocks, or insecurity or violence worse off than household not experiencing shocks. In rural areas, the patterns were a bit different with households only affected by insecurity or violence. This is not surprising considering that violence is the most significant threat to many of these communities. Following the overall pattern, wealth remained the most important predictor in both urban and rural areas.

1.4.5.3 Role of livelihoods

Somewhat surprisingly, choice of livelihoods did not appear to increase vulnerability to food insecurity when compared to households engaging in agricultural activities (the most common livelihood activity in Greater Darfur). The only exception to this was households engaged in unskilled labour who were more likely to be food insecure by approximately 17 percent than households not engaging in this activity. While it is not clear exactly what unskilled labour refers to, it is likely that households relying on unskilled labour are partially relying on brick-making and wild grass/ firewood collection. Finally, as was the case with wealth, livelihoods activities did not interact with shocks, indicating that the effect of both, on food security status, were independent of each other.

1.5 Most common shocks

Table 8 details the top three shocks by state in Darfur. Not surprisingly, given the level of ongoing conflict, the most common shock reported by households in each state was insecurity and violence. Reportedly, 12 percent, 18 percent, 13 percent of households in North, West and South Darfur respectively were directly affected by some violent episode (or displacement) within the last year.

In North and West Darfur, the second most common shock reported was higher prices. Vulnerability to higher prices reflects a reliance on food purchases rather than production in both states. While this is typical given climate factors in North Darfur (even in pre-conflict years), it is unusual in West Darfur, which in pre-conflict years was a food surplus state. This suggests a high level of disruption to the agricultural sector in this area.

In South Darfur, sickness in the household was reported as the second most common shock experienced (and was the third most common shock reported in North and West Darfur). While this is due in part to the conflict (as households are exposed to poorer quality food and water), illness has historically been a problem throughout Darfur.

Table 8. Top three most common shocks by state in Greater Darfur

State		Percentage of households reporting this shock
North Darfur	Insecurity, violence	12
	Higher prices	3
	Sickness in HH	3
	Loss/lack of employment	3
	Drought	3
West Darfur	Insecurity, violence	18
	Higher prices	6
	Sickness in HH	3
	Death in HH	3
South Darfur	Insecurity, violence	11
	Sickness in HH	6
	Drought	5

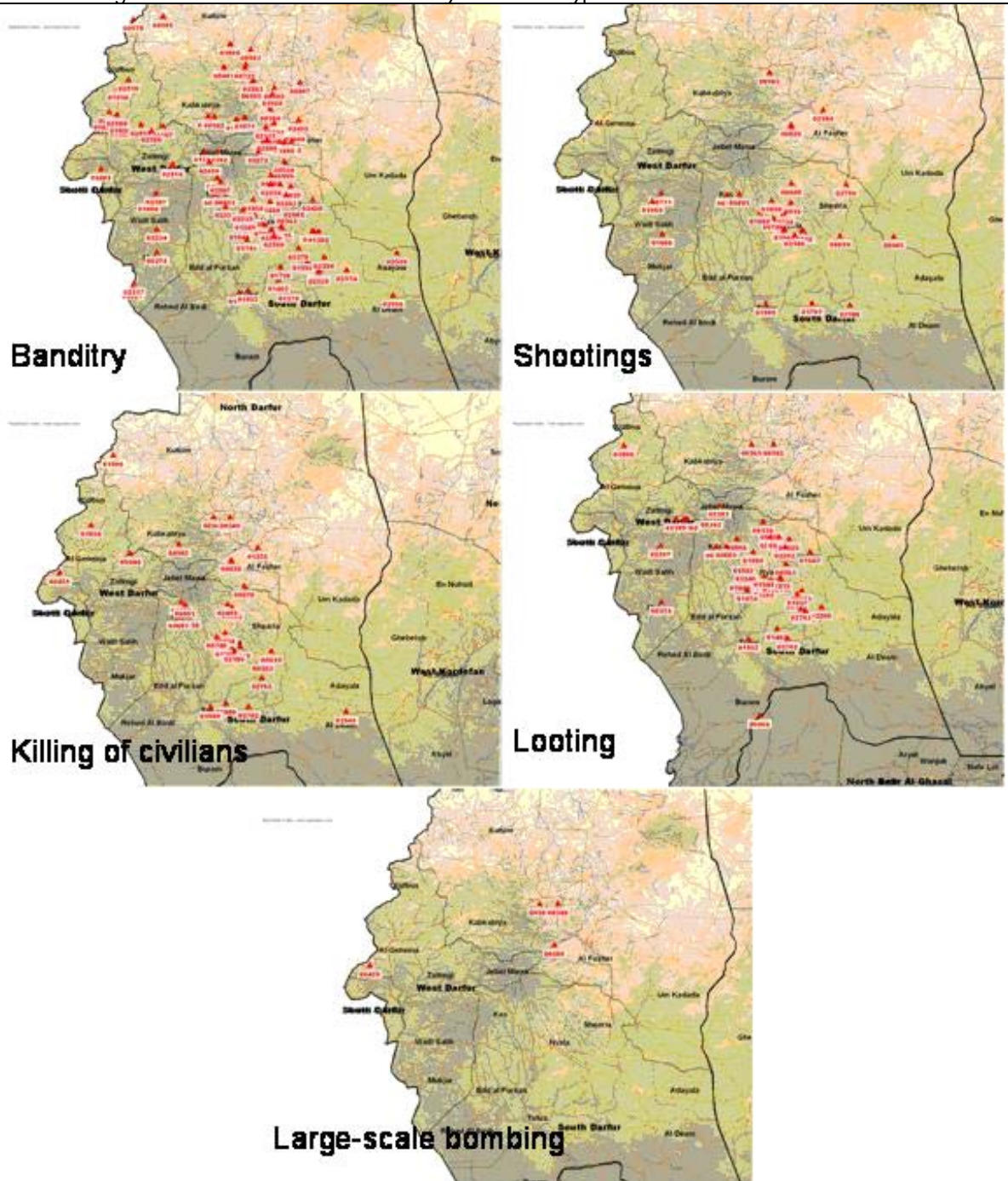
1.6 Household vulnerability to shocks

As stated in Chapter 8, vulnerability to becoming food insecure because of a particular shock depends on the exposure of households to that shock and their capacity to cope with the effects of the shock.

1.6.1 Household vulnerability to conflict in Darfur

Conflict and violence have been constants in various parts of Darfur since the start of the war in 2003. High levels of conflict have persisted in the post DPA period, though the nature of the conflict has changed. Post DPA fighting is now generally more localized and splinters among warring factions have led to more criminality, banditry and revenge oriented killings. To illustrate the nature of the conflict and the areas most affected, Figure 10 maps instances of insecurity by incident type over the past 15 months.

Figure 10. Instances of violence by area and type of incident in Greater Darfur



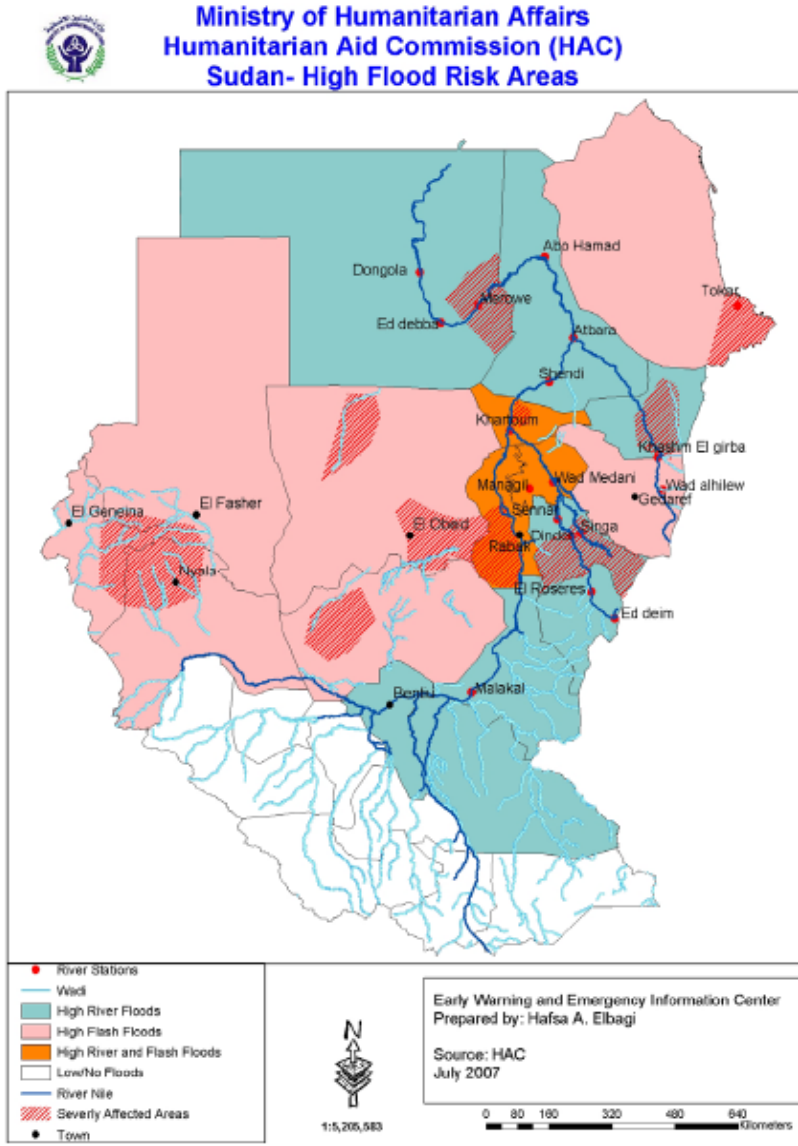
1.6.2 Vulnerability to becoming food insecure from drought in relation to pre-shock food security

Using the methodology described in Chapter 8, poor households in states heavily reliant on agriculture like South Darfur were the most susceptible to drought while households in heavily conflict affected areas (where food production was difficult) like West Darfur were less vulnerable. Overall, in South Darfur, 44 percent of households were considered drought susceptible while in West Darfur only 25 percent were.

Table 9. Percentage of household vulnerable to drought by state in Greater Darfur	
Percentage of households susceptible to drought	
North Darfur	31.6
West Darfur	25.3
South Darfur	44.1

1.6.3 Household vulnerability to floods

Figure 11. High risk flood areas in Greater Darfur



As explained in Chapter 8, vulnerability to floods is less easily mitigated by wealth status or choice of livelihoods. Instead, all households located in flood plains are considered to be “at risk”.

As Figure 11 illustrates, much of Greater Darfur is prone to flash flooding, which leaves almost all households in the region vulnerable to flooding during particularly wet periods.

The central portion of Greater Darfur is classified as a severely flood affected area. This area spans from south and east of Nyala, west almost to El Geneina and north almost to El Fasher. Households should be considered to be at particular risk.

Source: Ministry of Humanitarian Affairs, Humanitarian Aid Commission (HAC). Early Warning and Emergency Information Centre. Vol II (1). February 2007

1.7 General health and nutrition situation

The main findings from the child health and nutrition section of the household questionnaire for Darfur are reported below.

1.7.1 Child health

1.7.1.1 Diarrhea

In Greater Darfur, 27 percent of children overall experienced an episode of diarrhea in the two weeks preceding the survey. As table 10 shows, frequency of diarrheal disease was

similar regardless of state, but children in South Darfur reported the highest prevalence at 29 percent. The percentage of sick children that used ORS was generally highest in West Darfur (at 40 percent), likely provided at the various IDP camps scattered throughout the state. Homemade fluids recommended by the government were most often used in South Darfur at 39 percent.

Table 10. Prevalence of diarrhea and types of treatments by state in Greater Darfur (percent)

	Child had diarrhea in last 2 weeks	Drank fluid made from special packet (ORS)	Govt. recommended homemade fluid
North Darfur	24.1	28.6	37.6
West Darfur	26.9	39.5	25.5
South Darfur	29.2	20.4	39.4
Greater Darfur-- Overall	27.3	27.4	35.2

1.7.1.2 Fever

Overall, as shown in Table 11, 11 percent of children had a fever in the two weeks preceding the survey, but prevalence differed significantly by state following rainfall patterns. In South and West Darfur, which both generally receive more rain than North Darfur, 15 and 12 percent of children reported fever in the 2 weeks preceding the survey. Conversely, in North Darfur, the driest region, only 4 percent of children reported fever.

In response to fever, 58 percent of children in Greater Darfur reported being seen at a health centre and 93 percent reported taking the medicine prescribed by the health worker. Access to health centres was most common in North Darfur, with close to 86 percent seen at clinics. Access was much more limited in both West and South Darfur, with only 52 and 56 percent visiting clinics respectively. Adherence to the medicinal regimen prescribed was high in all three states with at least 90 percent of children taking their medicine.

Table 11. Prevalence of fever and types of treatments by state in Greater Darfur (percent)

	Child ill with fever in last 2 weeks	Child seen at health facility during illness	Child took medicine prescribed at health facility
North Darfur	4.1	86.5	93.8
West Darfur	11.7	52.2	89.6
South Darfur	15.0	56.4	94.7
Greater Darfur-- Overall	11.3	57.9	93.2

1.7.1.3 Acute respiratory infections

Forty-one percent of children in Greater Darfur had a cough in the two weeks preceding the survey, and slightly over one-quarter of these children had difficulty breathing during these episodes. Prevalence varied by state, with children in South Darfur by far the most affected. Here 55 percent of children reported having a cough and 40 percent reportedly had difficulty breathing. In West Darfur, almost one-third of children reported a cough while in North Darfur less than one-quarter did. One-fifth or less of these children reported difficulty breathing during these episodes.

Again, caregivers in North Darfur were more likely to take their child to a health centre than caregivers in either West or South Darfur. Overall, 70 percent sought treatment in North Darfur while only slightly over half did so in either West or South Darfur.

Table 12. Prevalence of ARI and types of treatments by state in Greater Darfur (percent)

	Child ill with cough in last 2 weeks	Difficulty breathing during illness with cough	Sought advice or treatment for illness
North Darfur	22.2	16.2	70.1
West Darfur	32.2	20.3	57.4
South Darfur	55.2	40.1	53.0
Greater Darfur-- Overall	40.6	28.7	56.3

1.7.2 Child feeding practices

Summary statistics on child feeding by state, examined 1) what percentage of children received complementary foods in the first 6 months of life (contrary to WHO

recommendations), 2) average age complimentary foods were introduced, and 3) average age breastfeeding stopped. These are shown in Table 13.

Over half (57 percent) of all mothers reportedly introduced food other than breastmilk in the first 6 months of life. Examined by state, 61 percent in North and South Darfur did so, while in West Darfur, only 42 percent did. Reasons for this discrepancy were not explored, but given that food insecurity was highest in West Darfur, one explanation might be general household food scarcity. Further analysis revealed that additional foods were added to children's diets in West Darfur one to two months after they were added to diets in North and South Darfur. Caregivers reportedly stopped breastfeeding at 14 months of age on average, with the mean age being 15 months in North and South Darfur and 12 in West Darfur.

Table 13. Child feeding practices by state in Greater Darfur

	Other foods in first 6 months	Age at which breastfeeding stopped	Age at which additional foods started
North Darfur	60.9%	15	5
West Darfur	41.6%	12	7
South Darfur	60.9%	15	6
Greater Darfur-- Overall	55.7%	14	6

1.7.3 Children's nutritional status

While the anthropometric data collected as a part of the SHHS was not included in this analysis, it was possible to examine general wasting patterns in parts of Darfur using secondary data sources. To do so, Global Acute Malnutrition (GAM), Severe Acute Malnutrition (SAM) and Under-5 mortality (U5 MR) rates gathered in many localized surveys from 2003 to the present were compiled by month of survey and averaged to attain a mean monthly GAM, SAM or U5 MR rate. Figure 12 shows these fluctuations by month of survey. While this figure should be interpreted carefully (given the inherent limitations—see footnote), they do, given the large number of surveys conducted, provide a rough estimate of fluctuations in nutrition and mortality indicators by month³. Importantly, this can provide insights into causes of child malnutrition, the role of conflict and disease in child malnutrition and whether increases in food aid appear correlated with declines in child malnutrition and/or mortality.

Figure 12 below reveals several important findings. Firstly, U5 MR fluctuate between 1 and 4 per 10,000 per day depending on the month. Peaks (at 4 per 10,000 per day) are seen during the rainy season (April, June and August). These rates are roughly comparable to the rates seen in southern Sudan. Secondly, GAM rates have two annual peaks, following the same pattern seen in southern Sudan. The first peak is at the beginning of the rainy season (May and June) and the second is at the end of the hunger gap/ peak Malarial season (October). As with southern Sudan, the first peak (at 25-30 percent) tends to be more dramatic than the second peak (at 20 percent).

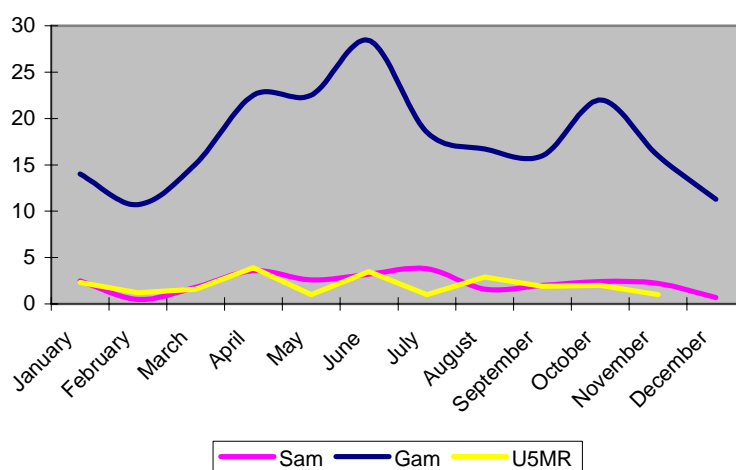
Reasons for this are similar to those in southern Sudan. The end of the dry season/ the beginning of the rainy season is typically a time when: 1) food supplies are becoming strained (with households beginning to rely on less preferred food), 2) meningitis outbreaks are common 3) households being forced to rely on the less safe sources of drinking water, and 5) vector borne and infectious diseases (esp diarrhea) are more prevalent.

³ Limitations include: 1) surveys within and across months are not necessarily from the same year and likely do not cover the same areas; 2) sample sizes in most cases are quite small (representative of only a small geographic or administrative area) resulting in very large confidence intervals for GAM, SAM, and U5CMR; 3) surveys are conducted by different organizations which likely means that methods and generally quality differ (and for purposes of this analysis differences in methods and quality were not taken into account); 4) GAM, SAM and U5 MR shown are likely the rates for the most vulnerable populations (as ngo's are likely to focus on typically more vulnerable areas); and 5) some of these surveys were conducted during the ongoing crisis and may therefore the nutritional situation may have been due to nearby insecurity or fighting vs what would be considered typical fluctuations in nutritional status).

Each of these factors tend to work synergistically to affect child malnutrition. As the dry season progresses, meningitis outbreaks are common. The lack of humidity in the air leaves mucous membranes very dry and more prone to tears which facilitates transmission person-person. Simultaneously, water sources (wells or surface water) tend to dry up forcing households to rely on less desired water sources that are more easily contaminated by animal or human faeces. Consumption of contaminated water leads to higher prevalence of diarrheal disease. Increased incidence of infectious diseases, such as meningitis and diarrhea, initiate the malnutrition infection cycle, with illness begetting malnutrition and malnutrition leaving a child more vulnerable, eventually (in cases of particularly vulnerable children) leading to death. The start of the rains does not alleviate this problem but rather exacerbates it, as heavy rains and resulting floods further facilitate contamination of available water sources. Also, the arrival of the intertropical convergence zone (ITCZ) which initiates the rains is likely associated with a bloom in vector borne and infectious diseases. In southern Sudan, there was a heavy focus on milk consumption as another contributing factor to this deterioration (given that milk alone comprised 25 percent of children's diets under two years of age).

In Darfur, however, milk does not play such a prominent role in children's diets. Conflict is likely an important component. Assessing its impact is difficult as the high level of violence in Darfur is relatively constant. The second peak in malnutrition that occurs around October is, as in southern Sudan, more likely to be food and malaria related. Any successful intervention– defined in terms of reduced mortality/improved nutritional status– would need to address both factors.

Figure 12. Annual fluctuations in GAM, SAM and U5 mortality rates in Greater Darfur



1.7.4 Role of food aid in addressing malnutrition

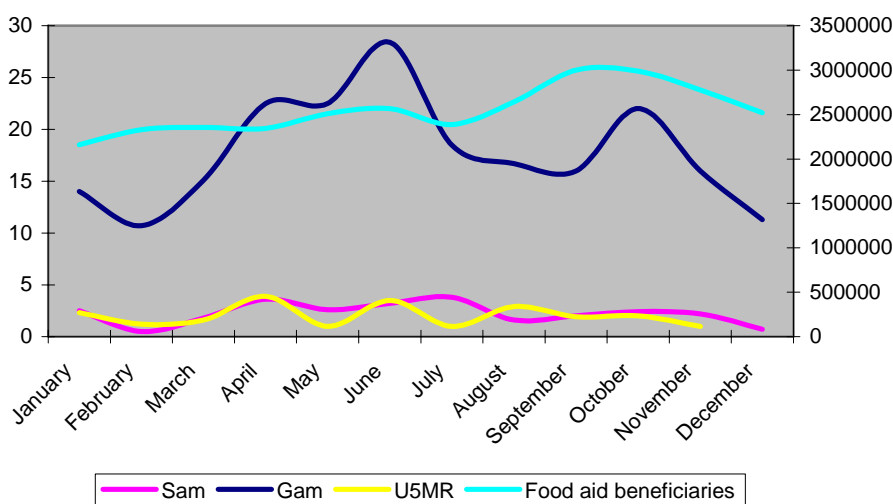
Examining fluctuations in GAM and SAM rates by the number of WFP food aid beneficiaries by month, it is possible to assess both the timeliness of food aid deliveries (ie. whether peaks in food aid deliveries correspond with peaks in malnutrition rates/ hunger seasons) and whether food aid may be having an impact. It is important to acknowledge up front that this analysis has some serious limitations. First, this assessment only examines food aid deliveries in one year (2006) while annual nutritional patterns are compiled from data from 2003 to 2006. A more complete assessment would examine food aid patterns for the same time period. Secondly, the number of nutrition surveys per state was not adequate for a state level analysis. Thus, the number of food aid beneficiaries was aggregated to the Greater Darfur level. This overlooks variations in amounts and timing of food aid deliveries and any fluctuations in malnutrition rates by state. Finally and most importantly, drawing conclusions on the nutritional impact of food aid from aggregate data is problematic as there are countless other determinants of malnutrition that this analysis cannot take into account. Therefore, discussions of observed correlations should not be mistaken for claims of causality (or as evidence that food aid is not having an impact). Instead, the intent here is to simply describe the patterns seen, in the hope that it might shed some new insights on the associations being examined.

As figure 13 indicates, food aid deliveries in Greater Darfur remained high throughout the year, feeding between 2 and 3 million people per month. Given this, the timeliness of food aid delivery is less of an issue than in other parts of the country. It is noteworthy that food aid deliveries peaked in September and October, while malnutrition rates peaked in June. This might suggest a need to re-evaluate the timing of food aid deliveries, though causes of the increase in malnutrition rates during this period have not been examined analytically and many may not be food related.

In terms of the relationship between food aid and malnutrition, figure 13 shows that the number of beneficiaries served per month did not appear to correlate with increases or decreases in GAM or SAM rates. The number of food aid beneficiaries in 2006 increased from 2.1 million in January to 2.6 million in August, while malnutrition rates more than doubled from March to June and then nearly halved from June to August.

The number of beneficiaries peaked in September at 3 million and then declined steadily back down to about 2.5 million by the year's end, but malnutrition rates increased 5+ percentage point from September to October (immediately following the peak in food aid) only to decline thereafter (as the number of beneficiaries was also declining).

Figure 13. Annual fluctuations in GAM, SAM, U5 mortality rates and numbers of food aid beneficiaries in Greater Darfur



1.7.5 Micronutrient deficiencies

1.7.5.1 IDD

Previous reports indicate that the mountainous regions of Darfur might have the highest prevalence of IDD, with prevalence ranging anywhere from 75 to 90 percent⁴. Despite government policy which states all salt must be properly iodized, people in Darfur still do not have access to locally produced, iodized salt. In fact in Greater Darfur, slightly over one-quarter of households had properly iodized salt, and households in North and West Darfur were much more likely than households in South Darfur to have it (36 and 40 percent vs 16 percent). Households in North and West Darfur were more likely to have received their salt through food aid, while over 80 percent of households in South Darfur reported purchasing their salt at the local market (where only a small percent is properly iodized). Overall, slightly more than one-third of the salt in North and West Darfur was from food aid versus only 11 percent in South Darfur.

⁴ Bani, I. (2006). Accelerating progress towards universal salt iodization in Sudan: Time for action. New Research, Submitted to the Khartoum Food Aid forum, June.

Table 14. Percentage of households with properly iodized salt by state in Greater Darfur (percent)

	Not iodized 0 PPM (no colour)	Less than 15 PPM (weak colour)	15 PPM or more (strong colour)
North Darfur	56.0	8.2	35.8
West Darfur	55.9	5.1	39.0
South Darfur	77.0	7.2	15.8
Greater Darfur-- Overall	65.6	6.8	27.6

Table 15. Source of households salt by state in Greater Darfur (percent)

	Local market	Food aid	Indigenous, other
North Darfur	63.6	35.6	.7
West Darfur	60.6	39.0	.4
South Darfur	88.4	11.6	.0
Greater Darfur-- Overall	74.1	25.6	.3

1.7.5.2 Vitamin A deficiency

Vitamin A supplementation was highest in North and West Darfur. Here, 82 percent and 79 percent of children reportedly had received a vitamin A supplementation capsule within the last 6 months. It was over 10 percent lower in South Darfur (at 68 percent). Approximately three-quarters of Vitamin A supplements were reportedly received during the last national immunization day campaign, though the percent receiving it at that time was much higher in West Darfur (at 97 percent). Eleven to seventeen percent of children in North and South Darfur received their supplements during routine visits to a health centre.

Table 16. Percentage of children receiving vitamin A supplements and source of last supplement

	Child ever received vitamin A	Place child got last Vitamin A dose			
		Yes	On routine visit to health centre	Sick child visit to health centre	National immunization day campaign
North Darfur	81.5	17.4	4.7	76.9	1.0
West Darfur	79.3	1.7	2.6	95.7	.0
South Darfur	67.5	10.6	5.0	84.4	.0
Greater Darfur-- Overall	74.3	9.9	4.2	85.6	.3

1.8 Conclusions and recommendations

Examined regionally, Greater Darfur has the second highest percent of food insecure households in Sudan at 25.9 percent. Current reasons for food insecurity are largely conflict related. This is evidenced by measurable changes in the traditional patterns of food insecurity in the region. In pre-conflict years, given climate and productivity factors, households in the more arid zones of North Darfur have historically been most vulnerable food shortages, while households in South and West Darfur were typically surplus food producers. Now, data from the SHHS indicates that households in West Darfur, where the bulk of violence was centred in 2006, experienced the most food stress.

1.8.1 Livelihood food security and vulnerability profiles

Traditional livelihoods (agriculture, livestock, etc) have been one of the primary casualties of the war. Insecurity and violence have forced historically agro-pastoral communities to migrate to cities or camps. In the process, livestock and other assets (including their homes) have been destroyed, sold or looted. The net effect of this has been to undermine livelihoods and to cripple coping capacity. Many of the caretakers in these households, as discussed in previous livelihood assessments, have been forced to engage in "unskilled labour activities" such as wild grass or firewood collection and brickmaking in order to provide for the household. Not surprisingly, therefore, data from the SHHS, indicated that

households engaged in “unskilled” labour were the most vulnerable to food insecurity and were the most affected livelihood group.

1.8.2 Geographic Food security and vulnerability profiles

Traditional geographic patterns of food insecurity in Greater Darfur were largely driven by climate and food productivity factors. Generally speaking, households in North Darfur have historically been worst off while households in West and South Darfur, both food surplus states, have been better off. Data from the SHHS, however, now indicates that households in West Darfur that suffered a disproportionate share of the violence during the time of the survey, were most vulnerable to food insecurity, with a prevalence of food insecurity 7 percent higher than in North Darfur (40 percent VS 33 percent). On the other hand, households in South Darfur remain the least vulnerable with only 13 percent of households reportedly food insecure.

1.8.3 Priority areas and causes of food insecurity and vulnerability

The causes of food insecurity in Darfur, according to data from the SHHS, are all conflict-related. These included:

1. Sex of head of household
2. Displacement status--IDP households
3. Households experiencing 2 or 3 shocks
4. Households experiencing insecurity
5. Wealth status

The strongest predictor of food security status was asset wealth. Specifically, 37 percent of households in the poorest quintile were food insecure versus only 3 percent of households in the wealthiest quintile. One of the effects of the conflict has been to systematically strip assets from households, meaning that households most affected by conflict are likely to have the fewest number of assets. Conversely, households with significant wealth are more able to insulate themselves from the effects of the war (by paying protection fees to Janjaweed, migration, etc) while also being able to recover from shocks more easily.

Not surprisingly, female headed households were more vulnerable to food insecurity than male headed households. Female headed households are also households that are most likely to be affected by conflict, as it is likely that the men of the household have either fled (to other parts of Sudan, to rebel movements, etc.) or were killed. On average, female headed households were 10 percent more likely than male headed households to be food insecure.

Finally, families who had been driven their homes and were displaced at the time of survey were also significantly more likely than residents to be food insecure. On average, 41 percent of displaced households were food insecure vs only 25 percent of resident households.

Households experiencing shocks, particularly those households experiencing two or three shocks, were more vulnerable, on average, than households not experiencing shocks by 9 percent and 21 percent respectively. When examined by type of shock, households experiencing insecurity or violence were the most vulnerable. Overall, 34 percent of households experiencing violence or insecurity were food insecure vs 23 percent of households not experiencing shocks. Households throughout Darfur were vulnerable to conflict and flooding, though in both cases households in the areas north and west of Nyala were are particular risk.

1.8.4 Targeting and timing of food aid assistance

In Greater Darfur the targeting of food aid assistance appeared adequate, though West Darfur did appear to be slightly under-targeted while South Darfur was slightly over targeted. Given the security situation in 2006, this was hypothesized, however, to be a result of inaccessibility rather than poor targeting. One other important finding was that the number of beneficiaries greatly outnumbered the number of food insecure people in all three states. While at first glance this suggests that each state is over-targeted, a critical evaluation of the situation suggests that this is more likely an indication that food aid

assistance is having its intended effect, by keeping households out of the poor food consumption group. This also suggests that any reduction in food aid may result in noticeable increases in the number of households in the most vulnerable food insecurity category.

The timing of food aid was less of an issue in Darfur than in the rest of Sudan as the levels of food aid were very high year round. However, the CFSVA did indicate that the peak in food aid assistance in 2006 (in September) did not coincide with the annual peaks in child malnutrition rates (in June). While it is recognized that the levels of food aid assistance-particularly in conflict affected areas- are driven by a variety of factors (including perceived need, seasonality, accessibility, etc), this data may suggest a need to slightly recalibrate the timing of food aid deliveries to better take into account seasonal fluctuations in child malnutrition rates.

1.8.5 Food interventions by priority area and priority group

Synthesizing the main findings above, a three pronged approach in terms of food interventions is recommended in southern Sudan.

1. Refine the targeting of food aid

The CFSVA indicates that food insecurity in Darfur is largely the result of ongoing conflict. Household characteristics associated with food insecurity are listed below. As discussed previously, conflict affected households are the most likely to display these characteristics.

- Asset poverty (conflict affectedness is associated with asset loss);
- Households reliant on “unskilled labour” (IDP/ conflict affected households engage in brickmaking, grass and firewood collection, etc.);
- IDP households (displaced by violence or insecurity);
- Household frequently affected by/ vulnerable to shocks (multiple shocks or insecurity shocks).

In terms of the location of food insecure households, the CFSVA indicates that these households are likely to be in the most conflict affected areas. In 2006, the majority of food insecure households were located in West Darfur. As the conflict evolves and other areas become more affected, the geographic distribution of food insecure is likely to change correspondingly. This is a significant departure from traditional patterns of food insecurity in Darfur, which were largely driven by climate and crop productivity levels. In pre-conflict times, this meant that households in the low productivity, arid environment of North Darfur were the most vulnerable to food insecurity, while households in the wetter and more productive states of West and South Darfur were better off.

The CFSVA recommends that programmers continue current activities, targeting the most conflict affected areas and areas where there are large numbers of IDPs. To facilitate this, the CFSVA recommends that programmers take full advantage of the data collected by security personnel.

2. Examine timing of food aid deliveries

While the timing of food aid deliveries is less of an issue in Darfur than in the rest of Sudan, given the amount of food delivered, the CFSVA recommends that the timing of food aid be examined to determine if there are benefits for ensuring that food aid peaks in June (instead of September) and continues at peak levels until October.

3. Couple food aid and malarial programmes

The CFSVA recommends that WFP consider coupling food interventions with anti-malarial programmes in September and October to try and reduce the deterioration in child nutrition that occurs annually at the end of the hunger season and peak malarial season. Research also indicates that being malnourished leaves children more vulnerable to mortality from malaria⁵.

⁵ Caulfield, L, Richard, S, and Black, R. Undernutrition as an underlying cause of malaria morbidity and mortality. DCPD working paper No. 16. John's Hopkins University Bloomberg School of Public Health.

1.8.6 Recommended non-food interventions by priority area and priority group

Findings from the CFSVA provide guidance on what non food interventions or activities should be prioritized. These are discussed below.

Child health and nutrition priorities/ interventions

1. Institute programmes encouraging improved child caring practices and particularly child feeding practices

The CFSVA recommends incorporating programmes encouraging proper child caring practices, and particularly child feeding patterns into existing nutritional support programmes. This appears to be especially important in the context of North and South Darfur. Here over 60 percent of women report providing foods other than breastmilk in the first 6 months of life.

2. Increase vitamin A supplementation programmes in South Darfur

The CFSVA recommends that vitamin A supplementation programmes be instituted in South Darfur to improve supplementation rates. CFSVA data indicates that supplementation rates are generally 10-15 percent lower in South Darfur than in North and West Darfur. While reasons for this are unclear, fewer children are reached by the national immunization day campaign in South Darfur than in West Darfur and fewer children receive supplements during routine visits than in North Darfur. This would suggest a need to expand the reach of supplementation efforts during the national immunization day and a need to encourage health centres to provide supplements to children who may not have been supplemented during this campaign.

3. Encourage salt fortification programmes

While the prevalence of IDD varies (by region, soil content, altitude etc), recent studies indicate that IDD prevalence is highest in the mountainous parts of Darfur, with prevalence ranging from 75 percent to 90 percent⁶. While the Universal Salt Iodization (USI) policy was officially adopted in 1994 as the foundation for the national IDD prevention strategy, this policy has not been properly enforced, leaving people in Greater Darfur as in the rest of Sudan, without access to properly iodized salt. Given the level of food aid flowing into Darfur, it is obviously the primary source of iodized salt. Substantial declines in food aid (given either improvement or substantial deterioration in the security situation) would leave many people at much greater risk of IDD. The long term solution to IDD is to encourage the government to enforce the USI and ensure that all domestically produced salt is iodized. The CFSVA recommends that WFP encourage such efforts.

Agricultural interventions

1. Facilitate crop production in agricultural households, specifically targeting displaced households

WFP should collaborate with other agencies, like FAO, to facilitate crop production. One of the consequences of the ongoing conflict has been significant asset loss by households, specifically in terms of agriculture and livestock losses. The CFSVA recommends that displaced, agricultural households be targeted for distribution of seeds, tools and other farming implements, enabling these households to maximize crop outputs.

⁶ Bani, I. (2006). Accelerating progress towards universal salt iodization in Sudan: Time for action. New Research, Submitted to the Khartoum Food Aid forum, June.