

**AGRICULTURAL DEVELOPMENT AND FOOD SECURITY IN
POST-CONFLICT SOUTHERN SUDAN**

Michael Roberto Kenyi

July 2011

Submitted in partial fulfilment of the requirements for the degree of:

Master of Science in Agriculture (Food Security),

African Centre for Food Security,

School of Agricultural Sciences and Agribusiness,

Faculty of Science and Agriculture,

University of KwaZulu-Natal,

Pietermaritzburg

DECLARATION

I, Michael Roberto Kenyi declare that:

- The research reported in this mini-dissertation, except where otherwise indicated, is my original research
- This mini-dissertation has not been submitted for any degree or examination at any other university
- This mini-dissertation does not contain other persons' data, pictures, graphs or other information, unless specifically acknowledged as being sourced from those persons
- This mini-dissertation does not contain other authors' writing, unless specifically acknowledged as being sourced from other authors. Where other written sources have been quoted, then:
 - Their words have been rewritten but the general information attributed to them has been referenced. Where their exact words have been used, their writing has been placed inside quotation marks and referenced
- This mini-dissertation does not contain text, graphics or tables that have been copied and pasted from the Internet, unless specifically acknowledged, and the source being detailed in the thesis and in the references sections.

Signed:



Date: 8 July 2011

Michael Roberto Kenyi Legge

As supervisor, I agree to submission of this mini-dissertation for examination.

Signed:



Date: 8 July 2011

Prof Sheryl L Hendriks

As co-supervisor, I agree to submission of this mini-dissertation for examination.

Signed:Date: 8 July 2011

Prof H Shimelis

DEDICATION

This work is dedicated to my family who carved my dreams into the palm of my hands - my beloved mother Helena Kaku Swokiri whose untimely death occurred on 17 August 2009, my lovely daughter Viola Poni who left us on 6 January 1999 at age of six, my grandparents and my siblings. I hope the love I feel shine through for without their constant love and support, I could never have finished this work.

ACKNOWLEDGMENTS

It is my pleasure to acknowledge and appreciate the assistance of the following people and organizations, without whom, this project would not have been possible.

Professor Sheryl Hendriks, my supervisor, for her encouragement, intellectual guidance and enthusiasm that made the course work and dissertation possible, and for her patience in reading and commenting on both my stylistic and technical mistakes.

I am thankful to Professor Shimelis Hussein for guidance in the research methodology and Dr Joyce Chitja for her encouragement throughout the study.

Sincere thanks go to staff and colleagues in the School of Agricultural Sciences and Agribusiness and the African Centre for Food Security for excellent facilitation of workshops, lectures and fruitful discussions.

Special thanks are extended to Shane Opperman, Velda Charlton and Raheel Moosa for their kind help with an enormous number of administrative matters.

The Government of Southern Sudan for kindly releasing me for study.

The European Commission for generous support through the Food and Agriculture Organization of the United Nations' offices in Rome, Khartoum and Juba for a scholarship.

Sincere thanks to Yergalem Beraki for providing me with useful insights during the administration of the survey, Rajiv Agarwal for data entry and Laila Lokosang for cleaning the data.

I am thankful to communities and officials who helped with the research in the counties of Western Bahr El-Ghazal, Western Equatoria and Upper Nile states.

My sincere and heartiest thanks and appreciation go to my wife Diana Samuel Farajalla and lovely daughters Keji Nancy, Juan Racheal and Pita Emmanuella and the entire family of my late

grandfather Chief Kenyi lo Legge of Jobur village and late Farajalla Hussein of Garbu village (both in Mongalla Payam of Juba County in Central Equatoria State of Southern Sudan), for their untiring patience, unshakable love, and encouragement throughout my study at the University of KwaZulu-Natal.

I wish to thank Almighty God for assisting me throughout the course work and dissertation and guiding me in difficult times. With His help, I was able to turn challenges into opportunities and obstacles into stepping-stones.

ABSTRACT

This study was set out to examine household food security in post- conflict Southern Sudan. Over the past four years the Government of Southern Sudan and Development Partners have shown increased interest in accelerating agricultural development and food security in the country. This study provides insight into the key factors responsible for food insecurity, the challenges faced and household coping strategies employed to reduce and manage risk, assure food supply, improve dietary diversity and take advantage of economic opportunities for sustainable livelihoods.

The problem addressed by this study was whether cereal (sorghum, millet, maize and wheat) availability in three of the ten states of Southern Sudan improved in the five year post conflict period (2004-2008). The study explored if cereal grain production increased and how households coped with the unavailability of cereal grain. The researcher gathered data and information from multiple sources, including 542 household questionnaires and nine focus group discussion conducted between June and August 2009. Quantitative analysis supplemented the extensive qualitative data sources.

The major challenges experienced by households with regard to food security were limited access to extension services, production inputs, processing, credit/saving facilities, training, market information and physical infrastructure. Evidence showed that food insecurity occurred due to the lack or absence of feeder roads, communication and transport facilities, strategic value chain alliances and partnerships; and limited exposure to communities for learning in Southern Sudan.

The study concluded that the availability of cereals at the household level was generally low, although cereal production increased by small increments across the study areas after the conflict period. However, the increase in cereal production was inadequate to support the cereal needs of households, leading to food insecurity. The study identified the major factors responsible for food insecurity at the household level in the study areas as conflict, drought, floods and erratic rains. Poor infrastructure, weak policies and lack of access to services to

improve farm production were among the key constraints reported by households. These factors were perceived by all stakeholders as root causes of inadequate food production in the study area.

Household production provided 56.6 % of household food consumption, but this was inadequate to provide year-round. Other food sources included purchases, food aid and gifts. Households relied largely on consumption-based coping strategies when faced with food shortages including: relying on less preferred food, limiting meal portion sizes, mothers reducing their food to allow children to eat and reducing the number of meals eaten per day. These strategies are detrimental to the nutritional status of household members; considering that proper nutrition is critical for active and productive life. Therefore, food insecurity was high in the study areas and detrimental coping strategies were widely practiced, raising concerns of hunger and malnutrition.

Food insecurity in Southern Sudan needs to be addressed urgently. Direct interventions to support a significant scaling up of food production (beyond only cereal production) are needed to alleviate hunger, prevent malnutrition and provide for future food security especially among resettling refugees and demobilized soldiers. In many cases food aid and direct transfers of food is urgently needed to address the situation, but this should be short-term and part of an integrated plan to boost production of food at community level. Programmes should be developed to assist households should establish food gardens, diversify cropping and undertake non-farm activities in improving food production and productivity.

The local communities should participate in community-based food security needs assessment with strong support provided by the county agriculture department and state Ministries of Agriculture. This must lead to the identification of implementation measures and development of food security plans and budgets that include both increased production and market access.

An inter-sectoral Food Security Council (FSC) and a framework for action should be developed to include strategic management of cereal grain reserves, establishment of an effective and

efficient public distribution system, harmonisation of relevant sector policies and development of a well coordinated food security information system.

Longitudinal studies are recommended to monitor the food security situation in Southern Sudan and gain a deeper understanding of household coping strategies to inform policies and programmes. Further research is recommended to investigate how to increase the supply of food, promoting dietary diversification, improve access to economic opportunities and manage risk to help vulnerable households become more resilient to absorb shocks, stresses and threats.

TABLE OF CONTENTS

DECLARATION	II
DEDICATION	IV
ACKNOWLEDGMENTS	V
ABSTRACT	VII
TABLE OF CONTENTS	X
LIST OF FIGURES	XIII
LIST OF TABLES	XIV
CHAPTER ONE: THE PROBLEM AND ITS SETTING	1
1.1 IMPORTANCE OF THE STUDY	1
1.2 RESEARCH PROBLEM	2
1.3 SUB-PROBLEMS	2
1.4 STUDY LIMITS	2
1.5 OUTLINE OF THE MINI-DISSERTATION	3
CHAPTER TWO: REVIEW OF RELATED LITERATURE	4
2.1 INTRODUCTION TO CONFLICT AND FOOD SECURITY IN THE SUDAN	4
2.2 CAUSES AND EFFECTS OF CONFLICT	4
2.3 CONSUMPTION STRATEGIES AND COPING WITH HUNGER DURING WAR	7
2.4 AGRICULTURE AND FOOD SECURITY	10
2.5 THE STATE OF FOOD INSECURITY IN AFRICA WITH SPECIAL FOCUS ON EAST AFRICA AND SOUTHERN SUDAN	11
2.6 SUMMARY	16

CHAPTER THREE: INTRODUCTION TO THE GEOGRAPHY, CLIMATE AND DEMOGRAPHY OF SUDAN AND AGRICULTURAL DEVELOPMENT IN POST-CONFLICT SOUTHERN SUDAN	17
3.1 ECONOMY AND AGRICULTURE.....	20
CHAPTER 4: AGRICULTURAL DEVELOPMENT PROGRAMMES AND PROJECTS IN POST CONFLICT SOUTHERN SUDAN	29
4.1 REVITALISATION OF AGRICULTURE IN SOUTHERN SUDAN	29
CHAPTER FIVE: FOOD INSECURITY IN SOUTHERN SUDAN.....	36
CHAPTER SIX: RESEARCH METHODOLOGY.....	41
6.1 RESEARCH DESIGN.....	41
6.2 METHODOLOGY	42
6.3 SCOPE AND AREA OF STUDY	44
6.4 STUDY SAMPLE	45
6.5 SAMPLING TECHNIQUE	46
6.6 QUESTIONNAIRE DEVELOPMENT	46
6.7 TRAINING OF DATA COLLECTORS AND ENUMERATORS	47
6.8 DATA PROCESSING AND STATISTICAL ANALYSES.....	47
CHAPTER SEVEN: RESULTS AND DISCUSSIONS.....	51
7.1 HOUSEHOLD DEMOGRAPHIC INFORMATION AND PROFILE OF HOUSEHOLD RESPONDENTS	51
7.2 HOUSEHOLD CHARACTERISTICS	52

7.3 UNDERLYING CAUSES AFFECTING HOUSEHOLD FOOD INSECURITY IN STUDY AREAS	53
7.5 TRENDS IN CEREAL GRAIN PRODUCTION IN POST-CONFLICT PERIOD	57
7.6 FOOD SOURCES OF SURVEYED HOUSEHOLDS	60
7.7 COPING STRATEGIES OF SURVEYED HOUSEHOLDS	62
CHAPTER EIGHT: CONCLUSIONS AND RECOMMENDATIONS.....	66
8.1 CONCLUSIONS	66
8.2 RECOMMENDATIONS.....	67
8.3 RECOMMENDATIONS FOR FURTHER RESEARCH	68
APPENDICES.....	79
APPENDIX A: HOUSEHOLD QUESTIONNAIRE	79
APPENDIX B: CHECK LIST FOR FOCUS GROUP DISCUSSIONS	86
APPENDIX C: ESTIMATED CEREAL AREA, YIELD, PRODUCTION, CONSUMPTION AND BALANCE IN 2008/09-SOUTHERN SUDAN (FAO/WFO/CFSAM, 2009).....	89

LIST OF FIGURES

Figure 2.1	:	Proportion of the undernourished in the world	12
Figure 3.1	:	Map of Southern Sudan showing study areas in asterisk	17
Figure 3.2	:	Map showing the administrative organization of Sudan	18
Figure 3.3	:	Map showing the 10 states of Southern Sudan	19
Figure 3.4	:	Map showing the agricultural ecological zones of Southern Sudan	22
Figure 3.5	:	Pre-war Fisheries projection in Southern Sudan	25
Figure 6.1	:	The researcher in Focus Group Discussion with community members in Kato village, Raja County, Western Bahr-El Ghazal	44
Figure 7.1	:	Estimated cereal grain area and production in Southern Sudan	57
Figure 7.2	:	Trend in cereal grain availability in the 10 states in Southern Sudan	58
Figure 7.3	:	Comparison of cereal grain production in study areas during post conflict farming seasons	60
Figure 7.4	:	Proportion of food sources used by household heads in study areas	61

LIST OF TABLES

Table 2.1	The potential immediate and short-term effects of armed conflicts	6
Table 2.2	Southern Sudan prevalence of wasting, stunting and underweight	7
Table 2.3	Nutritional indicators in East Africa Region	15
Table 2.4	Basic economic indicators in Eastern Africa Region	15
Table 3.1	Average crop productivity in Sudan (tones per hectares)	21
Table 3.2	Major crops in Southern Sudan	23
Table 3.3	Livestock population in Southern Sudan	25
Table 5.1	Estimated food aid needs of IDPs, Refugees and Returnees in Southern Sudan	38
Table 5.2	Comparison of cereal area and production in the 10 states in Southern Sudan	39
Table 5.3	Estimated volume of food aid in Southern Sudan	40
Table 5.4	Cereal production in traditional rain-fed agriculture during and after the post conflict in Southern Sudan	45
Table 5.5	Estimated cereal availability 2004-2008	45
Table 6.1	Data collection analysis plan for each sub-problem	50
Table 7.1	Distribution of respondents by states and counties	51
Table 7.2	Household respondents' profile in study areas	52
Table 7.3	Characteristics of household heads	53
Table 7.4	Major causes of household food insecurity in study areas	54
Table 7.5	Proportion of households with farm holdings	56
Table 7.6	Proportion of households that responded to questions on policy changes	56
Table 7.7	Average cereal production in the 10 states of Southern Sudan 2004-2008	59
Table 7.8	Food served and ingredients by household heads	62
Table 7.9	Frequency of coping strategies employed by household heads	63
Table 7.10	Severity ranking of coping strategies (CS) obtained from the focus group discussion in study areas	63

CHAPTER ONE: THE PROBLEM AND ITS SETTING

1.1 IMPORTANCE OF THE STUDY

Although richly endowed with natural resources, Sudan remains comparatively underdeveloped, primarily as a result of protracted civil strife and poor economic management (Food and Agriculture Organisation (FAO), 2005). For the duration of its independent history, Sudan has been plagued by persistent, endemic internal conflict. The two decades of civil conflict in Southern Sudan created instability of access and impaired the availability of food at household level. This has resulted in displacement of more than three million people. More than 80% of donor resources go to relief and emergency operations, leaving less than 20 % for development objectives (World Food Programme (WFP), 2009).

The Comprehensive Peace Agreement (CPA) enabled state actors to refocus efforts towards sustained peace, economic growth and poverty eradication through integration of Southern Sudan into regional and global markets (Sudanese People's Liberation Movement (SPLM), 2004). Under this agreement, the country's efforts were focused towards reducing household vulnerability in terms of food availability.

The purpose of this study was to determine any improvement in household food security from 1998 to 2008 using cereal grain availability as a measure of food security in three of the ten states of South Sudan. The study explored the coping strategies employed by returnees, internally displaced persons (IDPs) and resident households when cereals were not available. The findings of this dissertation are of great importance to the Government of Southern Sudan (GOSS) to understand if food security has improved at the household level and to inform policy reflection four years after the signing and implementation of the CPA.

In addition, the Ministry of Agriculture and Forestry (MAF) in the Government of South Sudan (GoSS) intends developing an early warning system to guide mitigation of food insecurity across the ten states of South Sudan. This study will inform the design of this system. So too, the MAF could use the information from this study to explore options for providing social protection to

manage food insecurity and reduce poverty in the country. This study provides the first reference baseline for food security and will inform the drafting of agricultural development frameworks for sustaining food security through improved planning, managing, monitoring, evaluation and reporting, and policy formulation. The international partners - vis-à-vis donors- could benefit from this information and provide more appropriate intervention strategies, improving aid effectiveness and efficiency through improved program design, directly benefitting vulnerable communities.

1.2 RESEARCH PROBLEM

This study investigated whether household food security (measured as access to cereal grain) improved in the post conflict period in the three states of Southern Sudan and how households coped with grain shortages in this period.

1.3 SUB-PROBLEMS

To investigate the above problem, two sub problems were examined, namely:

Sub-problem 1: Has there been a significant increase in the production of cereal grain in the post-conflict period?

Sub-problem 2: How do the Internally Displaced Persons (IDPs), returnees and resident households cope with the non-availability of cereals?

1.4 STUDY LIMITS

The inaccessibility of some areas restricted the collection of qualitative and quantitative data. Inaccurate data reporting for some information arose due to errors in translation of questions in the questionnaires from English into the local languages of the respondents. This data could not be used in the study. Random sampling was constrained by imperfect information on the actual population of each Boma (group of villages). Site selection was constrained by the time available for field research, heterogeneity of the area under study, logistical concerns, vastness of study

area, the long distances between states and counties, limited access to transportation between counties and localised insecurity. Therefore, the researcher conducted the study in three of the ten states and in 9 out of 72 counties.

1.5 OUTLINE OF THE MINI-DISSERTATION

This mini-dissertation is organised into six chapters. Chapter one presents the introduction, which includes the background information significant to the study, statement of the study problem and sub-problems. Chapter two presents a review of literature with a brief review of continental, regional and national food security strategies and coping mechanisms and household food sources. This chapter also gives a detailed account of what is known and not known about the research question. Chapter three presents the general profile description of the country and sample communities in the study area. Chapter four describes the post-war agricultural development programmes and projects in Southern Sudan. Chapter five explains food insecurity in Southern Sudan. Chapter 6 describes the research methodology. Chapter seven discusses the results and discussion. Finally, Chapter eight presents the conclusions and recommendations.

CHAPTER TWO: REVIEW OF RELATED LITERATURE

2.1 INTRODUCTION TO CONFLICT AND FOOD SECURITY IN THE SUDAN

Conflict in Sudan over the last two decades has seriously impaired access to food at the household level and created instability of access. This affected both the quality and quantity of food availability and consumption (FAO, 1996). Over the past 20 years, conflict has adversely affected agricultural activities in many African countries (United Nations University Institute of Advanced Studies (UNU), 2004). In recent decades, most wide-spread conflict has taken place within rather than between states. Some conflicts have been country-wide (Rwanda), while others have been localized in specific part/parts of a country (south Sudan). The origins of conflict are often multifaceted and include ethnic and economic inequities, social exclusion of segments of the population, social injustices, competition for scarce resources, poverty, lack of democracy, ideological issues, religious differences (Nigeria and Sudan) and political tensions (UNU, 2004). Recent conflict has often occurred in areas of influence such as the locations of natural resources, important infrastructure and lines of communication or in pockets of socially marginalised or excluded populations.

2.2 CAUSES AND EFFECTS OF CONFLICT

Over the past decade, wars have engulfed the people of Somalia, Sudan, Rwanda, Congo, Liberia, Sierra Leone, Chechnya, Haiti, and Bosnia (FAO, 2004). Civil conflict results in large numbers of internally displaced people (IDPs), forcing people away from productive land. IDPs rarely find other productive land to cultivate, but more often than not, end up in a camp where subsistence cultivation or other income generation opportunities are extremely limited. Therefore, both the land and farmers are placed out of commission. Conflict can lead to further deterioration of already poor basic services, retarding development, displacement, increases in human diseases and destitution of populations (FAO, 2009). Conflict removes able bodied people from agriculture production and places an extra work burden on households (especially women). The long-term effects of conflict are loss of lives and livestock, destruction of food

crops, displacement, fighting, landlessness, hunger, malnutrition and delay of, or no, farming. Table 2.1 shows the potential immediate and short-term effects of armed conflict.

Conflict erodes the social fabric of ownership leading to disunity, looting, fear, trauma and loss of property. Territorial disputes may limit social mobility, affecting food supply, increasing risk, reducing economic opportunities and lead to poor dietary diversification (FAO, 2009). The physical insecurity affects food security by loss or destruction of means of livelihood of the people, reduced access to other options of food such as exchange, displacement, and inappropriate farming practices. Other critical effects of food insecurity include pressure on the land and localised tensions (FAO, 1999). Table 2.2 shows the prevalence of wasting, stunting and underweight among the children of African countries in conflict in 2004.

Armed conflict creates economic, political, social and environmental conditions that lead to war. Lack of power sharing, centralisation of political administration, coups d'états, corrupt rulers, lack of permanent constitutions and lack of respect for human rights and democratic rules are some political characteristics that spark conflict. Terr (2008) argued that conflict in Liberia and Sierra Leone was rooted in poor governance leading to neglect of certain areas (International Crisis Group for the International Federation of Red Cross and Red Crescent Societies, 2009). Von Braun (2009) argued that food insecurity can be caused by social conflict, but can also be a primary source of conflict. The civil war and its resultant insecurity are some of the underlying causes of food insecurity in Sub-Saharan Africa (Alinovi et. al., 2008).

Table 2.1: The potential immediate and short-term effects of armed conflict (WFP, 2007)

Type of armed Conflict	Potential effects			
	Nutritional status, health, health environment	Food availability	Household food access	Household food consumption
Armed conflict (sudden, with displacement)	<p>Difficult access to water (possible increase in diarrhoea)</p> <p>Loss of housing</p> <p>Loss of access to health services</p>	<p>Loss of land</p> <p>Loss of crops and access to pastures</p> <p>Looting of livestock</p> <p>Looting of food warehouses</p> <p>Loss of access to markets</p> <p>Reduced market supplies (movement of goods dangerous)</p>	<p>Loss of agricultural income from sale of crops, animals and/or labour</p> <p>Loss of food stocks</p> <p>Loss of access to other income sources (petty trade, remittances)</p> <p>Loss of productive Assets</p>	<p>Loss of cooking Utensils</p>
Armed conflict (protracted)	<p>Increased mortality</p> <p>Increased wasting</p> <p>Damaged or dangerous access to water</p> <p>Loss housing</p> <p>Damaged or reduced health services, and loss of access</p>	<p>Loss of land</p> <p>Loss of crops and access to pastures</p> <p>Loss of livestock</p> <p>Damage to food warehouses</p> <p>Damage to market infrastructures and/or dangerous access</p> <p>Reduced market supplies (movement of goods dangerous)</p>	<p>Loss of agricultural income from sale of crops, animals and/or labour</p> <p>Loss of food stocks</p> <p>Loss of mobility: - seasonal labour - remittances</p> <p>Loss of productive Assets</p>	<p>Loss of cooking utensils</p> <p>Dangerous access to Firewood</p>

Table 2.2: Prevalence of wasting, stunting, underweight among African countries in conflicts in 2004 (UNICEF 2004)

Country	Percent of Population			
	Weight/Height	Height/Age	Weight/Age	Weight/Age
	Global acute Malnutrition	Stunting	Underweight	Underweight, Severe
Southern Sudan	22	45	48	21
All Sudan	16	34	17	7
Uganda	4	39	23	5
Kenya	6	37	23	7
Ethiopia	11	52	47	16
Democratic Republic of Congo	13	38	31	9
Sub-Saharan Africa	10	42	29	Not Available

2.3 CONSUMPTION STRATEGIES AND COPING WITH HUNGER DURING WAR

In general, subsistence households are able to continue meet their basic nutritional requirements through subsistence farming where there is not too much disruption (FAO, 2004). In other countries, like Uganda in the 1970s, households continued to meet their needs through subsistence farming. However, during the war of the mid-1980s this was impossible because the territories were engulfed in conflict and so the people were not able to access traded commodities and market their crops (IFAD, 2003). In countries like Southern Sudan and Iraq, people depend on exchange or bartering for food, and are vulnerable to trade disruptions in times of conflict (FAO, 2003). The formal sector is vulnerable to shortages of foreign exchange, and where the latter is relatively large and inflexible, loss in output and employment maybe greatest, as in Nicaragua (IFAD, 2003).

Household coping strategies differ depending on the nature of the war and its locations. Specific coping mechanisms are adopted at particular moments. Coping strategies can become adaptive strategies over time or during recurring crises, with households carefully weighing up the economic and the social costs of each action (Curtis, 1993). The three levels of household coping response include minimizing risk, absorbing risk, and taking risks (von Braun et.al., 1993).

Initial responses to impending food shortage are to attempt to minimise risks. First, households attempt to maintain a minimum level of productivity through such activities as intercropping and the planting of risk-averse crops. The second level of coping strategy is the accumulation of assets. This includes increasing food storage, investing in valuable and disposable assets. Third, households attempt to expand their access to credit and barter, through setting up a social support network. Finally, households diversify their income base through non-farm activities: the selling of firewood and gathered foodstuffs, and providing loans etc.

When crisis occurs, these coping strategies are employed in more intensified way by household members (Beraki, 2009). The Cooperative Assistance for Rehabilitation Everywhere (CARE) reported that when households are faced with shocks and stresses, the first response is to maintain food intake levels (CARE, 2005). Initially, adults will eat smaller meals. As things worsen, adults may miss meals and children may have smaller meals (Devereux 1993).

Farming households may realise that cash will be necessary in order to maintain access to food in times of production failure. Households will first divest accumulated non-essential assets as part of their strategy to minimise risk (FAO, 2005). The impact of this strategy is likely to be negative, as the absolute price of assets drops as the market becomes flooded with many such commodities and drops relative to the rising cost of food (Sen, 1981; Devereux, 1993). If the household has the option to sell its large livestock, it will do so earlier rather than later, in order to sell easier and gain a higher price while the economy is still robust. While African households behave differently, peasant households may sell livestock in some African countries as their last recourse (Beraki, 2009). In Southern Sudan, small animals were sold first, while large livestock was sold only if the situation continued to worsen, or if the size of the household's herd was large (Kanisio et.al., 2010). Households will also attempt to increase their access to cash by

calling in outstanding loans, searching for more credit, and reducing or dismissing farm wage labourers in their hire (Seavoy, 1986; Arnold, 1988).

Finally, households go hungry and or able-bodied household members will migrate to areas where seasonal employment has been found in the past. Migration is an extreme method of reducing consumption (United Nations Commission for Human Rights, 2006). Two important factors affect the choice to migrate: the source and location of employment, and the number and age of able-bodied household members (United Nations Commission for Human Rights, 2006). Some households with able-bodied members may move to locations where there is availability of casual labour, reducing the food consumption of that certain household. Women and children may go to relief camps or urban centres, while men search for work in urban centres, either with their families or alone. Extremely vulnerable members may be left behind at residential homes.

When food insecurity reaches desperate levels, households will employ strategies with grave social and economic risks. Some evidence shows that in extreme cases, out of frustration and anguish, children maybe abandoned or suffocated by their mothers (or traditional midwives, as has happened in Malawi in the past) (FAO, 2004). Marriages may become fragile under stress, leading to higher incidences of divorce.

The International Fund for Agricultural Development (IFAD, 2005) reported that in urban areas of Angola in the early part of 2005, petty crimes escalated as a consequence of war. Petty theft and armed robbery increased, as did the active trading of firearms and explosive devices, while old crafts, notably blacksmithing, tinkering and ceramics were revived. The same report cited that in rural areas, people used accessible land more intensively, while farmers diversified to manage risks with wider crop varieties and other sources of food such as wild game, fishing, wild food and kinship support. Reliance on small grains, namely sorghum and millet was seen in the northern part of Southern Sudan during the war (IFAD, 2005). Consumption of cassava took place in Southern parts of Southern Sudan, sweet potatoes, groundnuts, bananas and other fruit gained ground, while storing food in secret caches emerged. Mutual sharing of labour increased, while displaced persons became a pool of cheap casual labour for local residents. Rural people intensified hunting of wild game and fishing. In peri-urban zones, tiny gardens developed to

grow vegetables. Many families started keeping small livestock (IFAD, 2005). During war-induced famine, peasant households attempt to make food resources last as long as possible. The food items normally consumed may change in variety and quality.

2.4 AGRICULTURE AND FOOD SECURITY

Globally, agricultural production offers considerable potential for ensuring food security, poverty reduction and overall economic development. The 1996 World Food Summit adopted the following definition of food security: “Food security, at the individual, household, national, regional and global levels [is achieved] when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life” (FAO, 1996).

“Agriculture and the rural economy are key sectors for supporting livelihoods in protracted crisis, however, they may not be reflected in aid flows” was one of the key messages of the recent food summit (FAO, 2010). But production levels in Africa are generally low (FAO, 2010). An African Union (AU, 2006) review of the importance of the agriculture sector, in terms of its contribution to Gross Domestic Product (GDP), export earnings and employment, shows the importance of the sector in African economies. For the continent as a whole, the agriculture sector accounts for approximately 60 % of total employment, 20 % of total exports and 15 % of GDP (AU, 2006). In sub-Saharan Africa, 75% of the population derives its livelihood from smallholder agriculture.

African governments face formidable challenges as they strive to achieve food security and reduce poverty. These challenges include, but are not necessarily limited to, high poverty rates, high income inequality, resurgent conflict, political upheavals, poor infrastructure, the HIV/AIDS pandemic, debilitating diseases such as malaria, high external debts, soil degradation, increasing water scarcity, poor water use management, desertification and climate change (AU, 2006). Bold policy measures and innovative interventions may resolve or alleviate some of these challenges.

2.5 THE STATE OF FOOD INSECURITY IN AFRICA WITH SPECIAL FOCUS ON EAST AFRICA AND SOUTHERN SUDAN

The 1996 World Food Summit in November 1996 (FAO, 1996) concluded that about 840 million people, or 15 % of population was undernourished and that, under current prospects, this would only reduce to 10% by 2010. This number represents 18% of the estimated world population of about 6.8 billion in 2010 (FAO, 1996). In 2009, the Organisation for Economic Co-operation and Development/Food and Agriculture Organisation (OECD/FAO, 2009), reported that 15 % of men, women and children globally were undernourished and chronically hungry due to extreme poverty. In 2003, FAO reported that up to 2 billion people lacked food security intermittently due to varying degrees of poverty (FAO, 2003).

“The number and the proportion of the undernourished people have declined, but they remain unacceptably high” (FAO, 2010). The World Food Summit noted that after the numbers had increased between 2006 to 2009 due to high food prices and the global economic crisis, both the number and the proportion of hungry people have declined in 2010 as the global economy recovers and food prices remain below peak levels (FAO, 2010). But, hunger remains higher than before the crisis, making it more difficult to achieve the hunger reduction targets of the Millennium Development Goal one (reducing hunger and poverty by half by 2015).

Figure 2.1 illustrates the global food security or hunger situation (FAO, 2004). On average, Africa’s statistics worsened relative to other parts of the developing world. However, Africa is not homogenous and one cannot generalise across the large and diverse African continent with its diversity of physical environments and socio-economic conditions.

Poor people account for about 1.2 billion, found mostly in Africa and South Asia (Mahdi, 2009). Sub-Saharan Africa is home to 204 million hungry people and is the only region of the world where prevalence of both general undernourishment and children’s underweight status are increasing (Taskforce on Hunger, 2005). Poverty in Sub-Saharan Africa manifests as food insecurity. Food insecurity is a critical development issue in the developing world. More than half the food insecure people in Africa are clustered in seven Sub-Saharan countries: Chad,

Zaire, Uganda, Mozambique, Zambia, Somalia, and Ethiopia where over 40 % of populations estimated as food insecure (Taskforce on Hunger, 2005).

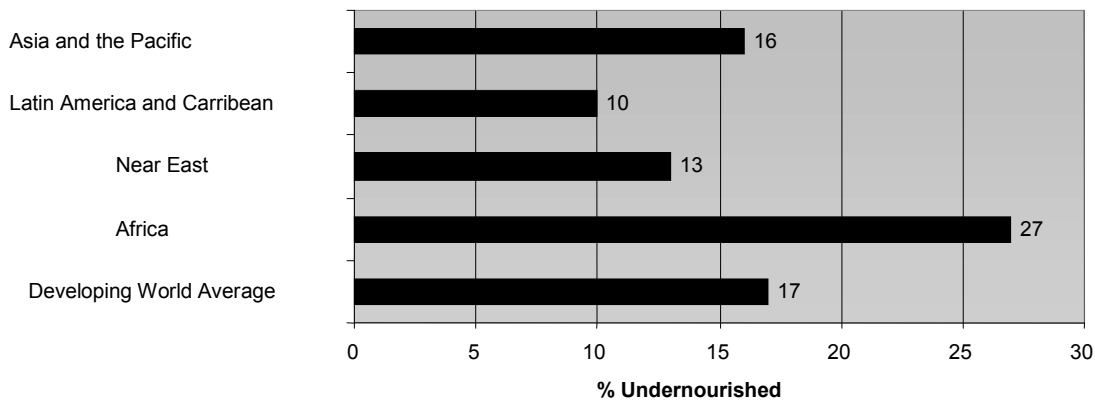


Figure 2.1 Proportion of the undernourished in the world (FAO, 2004).

Africa faces hunger and poverty due to lack of strategies to take advantage of the existing untapped opportunities. Despite improved social, economic and political economic improvements over the past 10 years, Africa remains a troubled continent, characterised by famine and disease. The African Union (AU, 2006) estimated that 27 % of Africans are undernourished, representing a two per cent decline since 1995. FAO (2004) reported that many sub-regions of Africa have made remarkable progress in reducing hunger. However, in the Central African region, the number of under-nourished people increased to 56% against 36% in the early 1990s (Mkandawire, 2009).

Over the past 30 years, the International Governmental Authority on Development (IGAD) countries has been threatened by famine at least once in each decade. The United Nations has categorised all IGAD countries as Least Developed Countries and Low Income and Food Deficit Countries (LIFDCs), except for Kenya, which is included only in the list of LIFDCs (UN General Assembly Resolution A/RES/43/178 of 20 December, 1988).

The IGAD region faces major challenges to food security, including (Mochonge and Zziwa, 2004):

- Small scale subsistence production
- A relatively high dependence on food aid
- Low agricultural production of specific commodities
- Lack of a policy orientation towards transformation of agriculture
- Severe natural resource degradation, and
- The need for capacity building, particularly in post-conflict countries.

More than 40 % of people in this region are undernourished. In Eritrea and Somalia, this proportion accounts for approximately 60 and 70% of the population respectively. The region is only 75% food self-sufficient and imports at least 1.5 million metric tons of cereals annually (IFAD, 2002). In normal years, IGAD countries do not have enough food to meet their peoples' needs. In four countries - Eritrea, Ethiopia, Kenya and Somalia - the average per capita dietary energy supply (DES) is substantially lower than the minimum requirement (Tables 2.3 and 2.4). This has a devastating effect on children, in particular, who face life-long physical and cognitive disabilities if not well nourished. With concerted efforts, the region could close this food gap and even become a net food exporter. The region is characterised by natural and man-made calamities such as floods, drought and conflict needs to urgently increase participation of member countries in harmonization of policies and programmes of common interest through a participatory, integrated and coordinated approach (Mochonge and Zziwa, 2004).

After more than two decades (since mid 1980s) of neglect, interest in agriculture is resurging, largely fuelled by a new understanding that growth in the agricultural sector plays a major role in overall growth and poverty reduction through linkages to manufacturing and services and international trading networks and connecting the poor into the agri-supply chain to growth (Wong, 2007). When African countries became independent in the 1960s, agriculture and rural development were seen as contributing to industrial development by providing fiscal and labour surpluses. Therefore, development funding for agriculture was a high priority, but this did not remain so. Over time, agricultural growth and development was neglected for investment in

other sectors. Only recently has attention returned to agricultural growth as the means of lifting African countries out of poverty. The agricultural sector is a primary opportunity for African countries to improve agricultural productivity for both food security and income generation (NEPAD, 2009). The New Partnership for Africa's Development's (NEPAD) Comprehensive Africa Agriculture Development Programme (CAADP) was adopted by African Heads of State and Governments in 2003 and provides a common framework for fostering broad-based agriculture-led economic growth in African countries (NEPAD, 2009). CAADP assists governments increase food supply, reduce hunger and improve responses to food emergency crises. The Programme has an operational structure developed in 2009 to help understand the different roles, responsibilities and relationships of various stakeholders and analyse the agriculture, food security and poverty in Africa (NEPAD, 2009). CAADP directs investment to four mutually reinforced and interlinked pillars. Pillar III focuses on the chronically food-insecure and the population who vulnerable and affected by various crises and emergencies.

The basic drivers of this renewed interest in agriculture are agro-biotechnology the rise in super markets, poverty reduction focus and environmental concerns. The new focus could reduce poverty, lead to innovation, cost reduction, productivity improvements, new processes and new products. Revitalisation of agriculture increases food security in several ways. First, increased production increases food availability and reduces the price of non-tradable or semi-tradable foods. Second, accelerating the rate of agricultural growth and development is the most powerful way to reduce hunger and rural poverty (World Bank, 2008). More specifically, agricultural development increases food availability for, and access to those able to produce it for themselves. It also improves the income generation potential for smallholders and agricultural workers through agro-processing. Third, through forward and backwards linkages with services and manufacturing sectors, agricultural growth increases non-farm economic activity in rural areas that require intensive labour, creates significant employment and generates incomes for the rural poor. Through similar linkages, it also increases urban employment in agricultural-related industries (World Bank, 2008). Therefore, it could be argued that no other sector offers the same possibilities that creates employment and generates income in the rural areas to pull people out of poverty as agriculture has the potential to do so.

The Common Market for Eastern and Southern Africa (COMESA) plays a key role in bringing the agricultural sector on track in the 21 countries in the region, some of which also belong to IGAD. The COMESA member countries are Angola, the Democratic Republic of Congo, Eritrea, Madagascar, Namibia, Sudan, Uganda, Burundi, Djibouti, Ethiopia, Malawi, Rwanda, Swaziland, Zambia, Comoros, Egypt, Kenya, Mauritius, Seychelles, Tanzania and Zimbabwe. COMESA's trade and agricultural reforms under CAADP will improve the mobility of people and goods, improving food security and optimizing social services in rural areas, where the majority of resource poor people live. However, most countries in the region have faced food security challenges since they attained their dependence from colonial administration.

Table 2.3: Nutritional indicators in Eastern Africa region (FAO, 2003)

County	Daily Dietary energy supply (DES) (1998-2000)*	Percent of infants with low birth weight (1998-2000)*	Percent of under-five (1995-2003*) suffering from:			Vitamin A Supplement: coverage rate (6-59 months) 2002	Percent of households consuming iodized salt 1997-2003*
			Under weight	Wasting	Stunting		
Djibouti	-	-	18	13	26	91	-
Eritrea	1710	21	40	13	38	51	68
Ethiopia	1880	15	47	11	52	16	28
Kenya	1960	11	20	6	31	91	91
Somalia	1600	-	26	17	23	60	-
Sudan	2360	31	17	-	-	93	1

Table 2.4: Basic economic indicators in the Eastern Africa region (UNICEF, 2005)

Country	Under-5 mortality Rate	Infant mortality Rate (under 1 year)	Annual number of births (thousands)	Annual number of under-5 deaths (thousands)	Gross National Income per capita (US\$)	Life expectancy at birth (years)	Life expectancy at birth (years)
Djibouti	138	97	27	4	910	46	65
Eritrea	85	45	163	14	190	53	56
Ethiopia	169	112	2992	506	90	46	39
Kenya	123	79	1032	127	390	44	82
Somalia	225	133	516	116	130	48	-
Sudan	93	63	1100	102	460	56	58

2.6 SUMMARY

This chapter has provided a review of food security at global, continental and regional levels. It has presented the importance of contribution of agriculture as a sector recognised lately as an engine of economic growth and for food security and poverty reduction in Africa. The literature review has also discussed the impact of food security and conflict in post-conflict situation in Africa.

Investigating food security from a post-conflict perspective is essential to understanding how various groups such as IDPs, returnees and the resident communities acquire food for household members in good and bad years. Coping strategies have implications for the households. Studying and anticipating these strategies is important to adequately provide for at-risk and affected households.

CHAPTER THREE: INTRODUCTION TO THE GEOGRAPHY, CLIMATE AND DEMOGRAPHY OF SUDAN AND AGRICULTURAL DEVELOPMENT IN POST-CONFLICT SOUTHERN SUDAN

Around independence in 1956, and for a few years thereafter, the Sudan was considered a potential “bread basket” for the Middle East as well as Africa because of its large areas of productive rain fed land and its access to irrigation from the Nile and its tributaries (O’Brien, 1981). The country has extensive grazing areas, valuable timber resources, and considerable fishery potential relative to the demands on these resources by the population.

The Sudan is the largest country in Africa (Figure 3.1), with a land mass of 2.5 million square kilometres extending between 4° and 22° North latitudes and 22° to 38° East longitudes. Its north-south extent is about 2 000 km, while its maximum east-west extent is about 1 500 km. The average annual rainfall is 416 mm, but ranges between 25 mm in the dry north and over 1 600 mm in the tropical rain forests in the south. In the most southern quarter of the country, where the annual rainfall exceeds 700 mm and can go up to 1 600 mm, the area is dominated by wetlands, some parts of which are infested by insects, which are hazardous to humans and livestock (FAO, 2005).



Figure 3.1: Map of Southern Sudan showing study areas in asterisk (Tombe, 2005).

The mean temperature ranges from 30 °C to 40 °C in summer and from 10 °C to 25°C in winter. Potential annual evaporation-transpiration ranges from 3 000 mm in the north to 1 700 mm in the extreme southern Sudan. Most agricultural activities are concentrated in the centre of the country, in the generally semi-arid dry savannah zone, through which the Blue Nile and the Atbara rivers flow. The growing season in the region is around four months. The major limiting factor is not the agricultural potential, but the short duration of the rainy season and the erratic distribution of rainfall during the growing period. The country has population of more than 14 million people recorded during the Sudan Population and Housing Census (SPHC) in 2008 (Southern Sudan Commission for Census, Statistics and Evaluation, 2008). Figure 3.2 shows the administrative map of the Sudan.

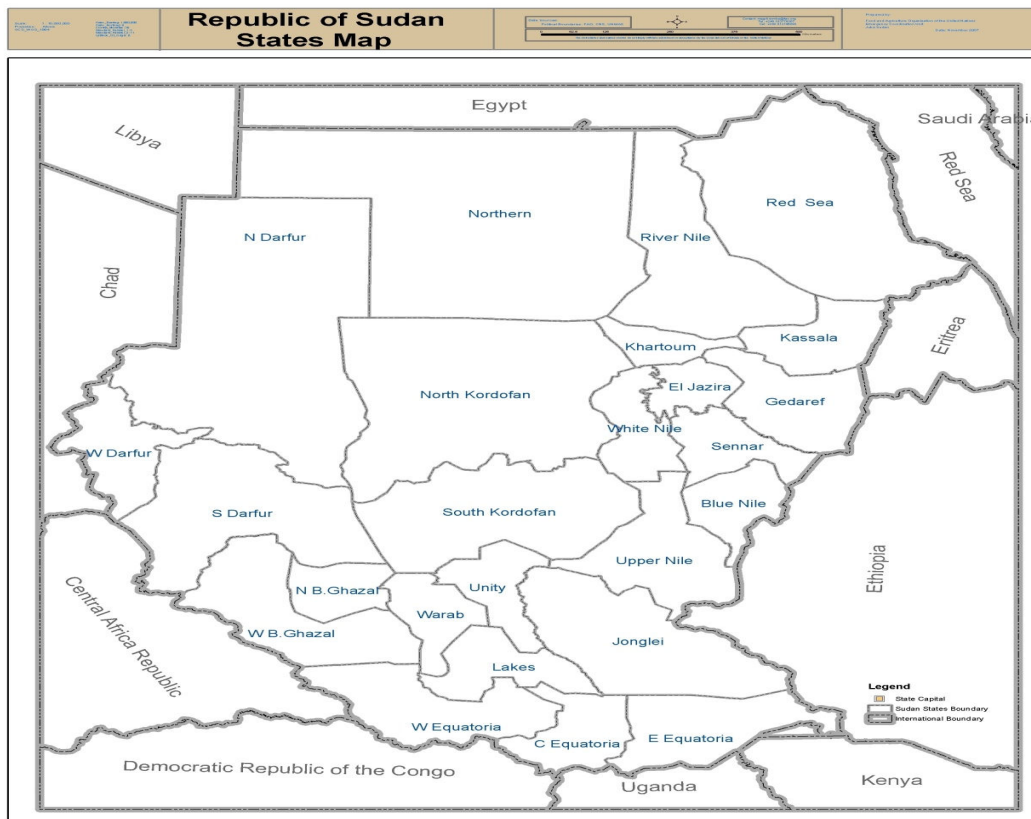


Figure 3.2: Map showing administrative organisation of the Sudan (Tombe, 2005)

Southern Sudan is composed of ten states (Figure 3.3) under the administration of the Government of Southern Sudan (GoSS). The latest population and housing census put the population of Southern Sudan at 8.26 million people (SSCCSE, 2008). There are no official statistics of GDP composition in the areas of Southern Sudan affected by conflict.

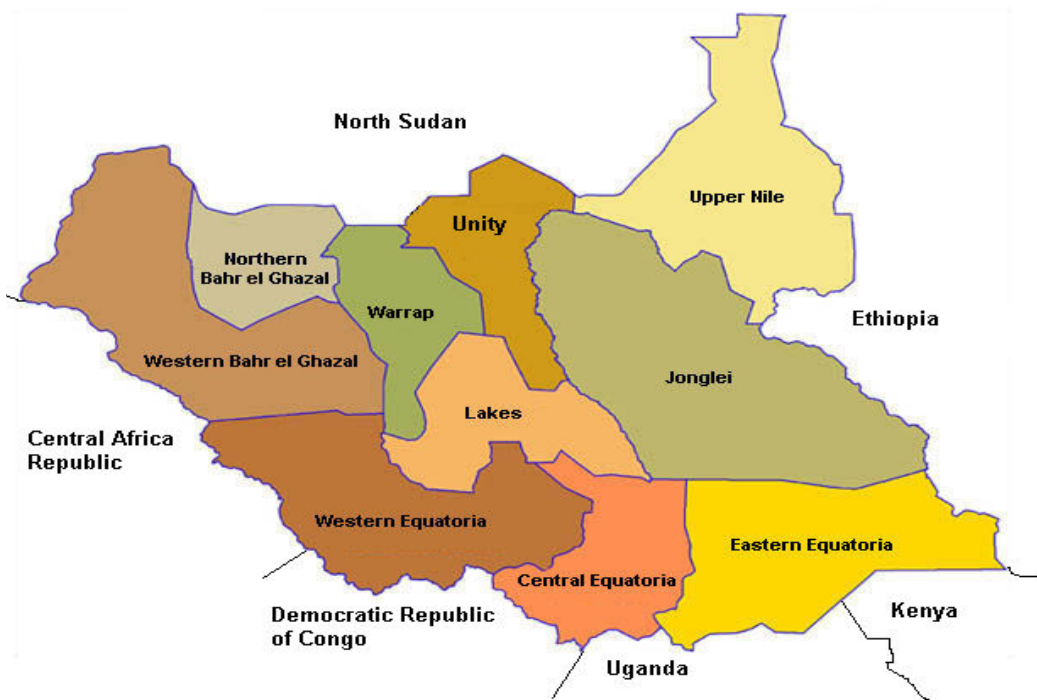


Figure 3.3: Map showing the 10 states of Southern Sudan (SSCCSE, 2008)

The population density of Sudan is 14 inhabitants per square kilometre. Some 80% of its population lives in rural areas, although recent urban growth rate has displaced more than three million people (UNDP, 2008). Most population lives along the Nile and its tributaries, and some live around water points scattered around the country. Poverty in the Sudan is deeply entrenched and predominantly a rural phenomenon. Over two-thirds of the population, and under the most favourable assumptions still around 50-70% of the population, are estimated to live on less than one United States dollar per person per day. Data limitations notwithstanding, proxy national

level data estimates tell more about conditions of endemic poverty and hunger. Decades of marginalisation, insecurity and lack of access to basic services in many parts of the country have undermined livelihoods, increased levels of poverty, and reduced agricultural growth, economic and education opportunities. These factors have led to high rates of malnutrition and food insecurity. Sudan is categorised by the United Nations as a low-income, food-deficit country and ranked 147 out of 177 countries on the 2007/8 Human Development Index (UNDP, 2008). Life expectancy at birth is 58.9 years for women and 56 for men. Of Sudan's 36.9 million people, 48 % of women are illiterate and 29 % of men (UNDP, 2008). Global Acute Malnutrition (GAM) rates are chronically above emergency thresholds. This manifestation of hunger, malnutrition and starvation among children leads to high mortality rates.

3.1 ECONOMY AND AGRICULTURE

The economy showed limited response to reform packages during the 1980s and early 1990s. Budget deficits have been common. The average annual rate of inflation peaked at 70% for the period 1991-1995, but gradually subsided to less than 5 % in 2001, then climbed to 8 % in 2002. Interest rates remained negative during the same period and resulted in the collapse of savings, which adversely affected the banking system and eroded public confidence. The Gross Domestic Product (GDP) of the Sudan was US\$17.8 billion (in current US\$ terms) in 2003.

Although agriculture is vulnerable to climatic and environmental changes, it remains a key source of employment and income for rural households. Agriculture is the mainstay of the Sudanese economy in terms of its contribution to GDP, even though its share has declined recently because of decreased agricultural production and the increased exploitation and export of mineral oil. In 2002, the sector contributed over 39 % to the GDP and employed 57 % of the total economically active population in 2004. Agriculture contributes about 90% of the Sudan's non-oil export earnings. It is the employer of more than two-thirds of the workforce and the main source of livelihood for the vast majority of the population. The performance of the agricultural sector in any given year determines the extent of food insecurity in the country.

Sudan has agro-climatic conditions ranging from tropical rainforests to the arid desert. Around 250 million hectares of land is arable. At least 84 million hectares are cultivable, of which only about 15 million hectares (20%) are currently utilised. Sudan’s agro-ecological zones support a variety of food, cash and industrial crops. The country has vast resource potential for agricultural production of a variety of food crops (Agriculture Research Council Sudan, 2003). Table 3.1 shows the major crops grown in Southern Sudan. Crop production accounts for 53% of agricultural output, livestock for 38% and forestry and fisheries for 9%. The main food crops grown are sorghum, millet, maize and wheat in addition to cassava, sweet potato and potato. The cash crops—grown mainly in the northern Sudan—include cotton, sesame, groundnut and gum Arabic. Sesame and groundnuts are also grown in the Southern Sudan, but mainly for consumption as opposed to income generation. The main exported crops are cotton, gum Arabic, sesame, groundnuts, fruits and vegetables, while livestock is important for export.

Table 3.1: Major crops grown in Southern Sudan (Sudan Institutional Food Security Information for Action, 2008)

Category	Crops
Cereals	Sorghum (short, medium and long term varieties), maize, millet (pearl and finger),rice, wheat
Pulses	Cowpeas, green gram, bambara nut, beans and soya bean
Oil crops	Groundnuts, sesame, hyptus, sunflower
Root crops	Cassava, sweet potatoes, yams
Vegetables	Jew’s mallow, okra, purslane, garden roquat (Local name: <i>girgir</i>), cucumber, watermelon, pumpkin, onion, tomato, eggplant, <i>amaranthus</i> , spider flower, carrots, fennel, cabbage, kale
Fruits	Citrus, pineapples, mango, banana, paw-paw, guava, <i>anona</i>
Others	Sugarcane, coffee, tea, tobacco, <i>roselle</i>

Food and cash crops in the Sudan are produced through three main farming systems: irrigated, mechanized rain-fed and traditional rain-fed agriculture (WFP, 2005). Southern Sudan has two distinct cropping systems: mechanised rain-fed production concentrated in Renk county of the Upper Nile state and traditional rain-fed in Western Equatoria and Western Bahr El-Ghazal states. Rainfed agriculture covers by far the largest area in Sudan. Vast natural pastures and forests support large herds of livestock including cattle, sheep and goats. In predominantly pastoralist communities, expansion of rain-fed agriculture has been extremely limited, though crop agriculture is possible during rainy season. For agro pastoralists, fodder production is as important as grain production.

The area actually cultivated and total yield can vary considerably from year to year, depending on variability of rainfall. The traditional rain-fed system supports people who practice subsistence agriculture and constitute 80% of the rural population, including some of the most vulnerable groups, such as internally displaced persons (IDPs) and returnees. Rainfed farming is characterised by small farms, labour-intensive cultivation techniques employing hand tools, low input levels and poor yields.

Even in years when total food production exceeded the annual requirements, significant sections of the community experienced serious food shortages because of lack of access to food. The main irrigated crops are sorghum, cotton, fodder, wheat, groundnuts and vegetables. Other crops under irrigation are sugar cane, maize, sunflower, potatoes, roots, tubers and rice. Irrigated agriculture has been Sudan's largest economic investment. Yet, returns have been far below potential. Crops grown in the rainfed sector include sorghum, millet, sesame, sunflower and groundnuts (GOSS MAF, 2006). According to the latest estimates, the traditional rainfed farming sector contributes all the production of millet, 11 percent of sorghum, 48% of groundnuts and 28% of sesame production of the country.

Irrigated and mechanised systems are predominantly found in northern Sudan, with a few exceptions found in Southern Sudan. Mechanised rainfed agriculture comprises about 10 000 large farmers with farm sizes of 400-850 ha and a few large companies with holdings of 8 400-84 000 ha (Dima, 2007). Prior to the conflict, farmers used ox-ploughing and limited numbers of

tractors. This was organised through tractor hire services rendered to interested farmers and on group farming systems as has been practiced among the Acholi and Madi tribes (Hassan, 1976). Both systems were supported by rural maintenance service units. The advantage of group farming is that a tractor can be collectively owned by a group of village farmers. For economies of scale these systems were based on five to six groups of 20-25 farmers sharing one or two tractors and cultivating a total of 2-2.4 hectares each or approximately 60 hectares collectively. Under Sudan conditions, a tractor can plough approximately 400 hectares per annum. During the pre-war period (1972-1982), the annual cereal production was high but declined between 1983 and 2004 (Dima, 2007).

The major constraints to higher farm productivity and incomes are high market margins on agricultural produce, inadequate budgetary allocation and scarce foreign exchange earnings. As a result, low input, low productivity production, and small farmers' incomes remain depressed. In the Gezira Scheme, a complex mix of financial, technical and institutional problems resulted in a serious fall in the productivity of the scheme and a corresponding drop in farm incomes in the late 1990s, resulting in a drop of cropping intensity from 80% in 1991/92 to 40% in 1998/99. In the wake of the food shortages experienced in the 1980s, a high priority has been given by the Government to producing food crops. Table 3.2 shows the average crop productivity in Sudan during 1971-1998.

Table 3.2: Average crop productivity in the Sudan (tons per hectare) 1971-1998 (IMF, 2002)

Crop	1971-1980 (Tons per ha)	1981-1990 (Tons per ha)	1991-1998 (Tons per ha)
Sorghum	0.6	0.61	0.59
Wheat	1.32	1.145	1.83
Millet	0.42	0.23	0.24
Sesame	0.30	0.22	0.19
Groundnut	0.91	0.69	0.71
Cotton	0.75	0.89	0.85

Bure-Yongo (2007) reported that over 80% of total area of Southern Sudan (about two million hectares) is suitable for agricultural production. Figure 3.3 shows the states of Southern Sudan and Figure 3.4 shows the main agro-ecological zones of Southern Sudan.

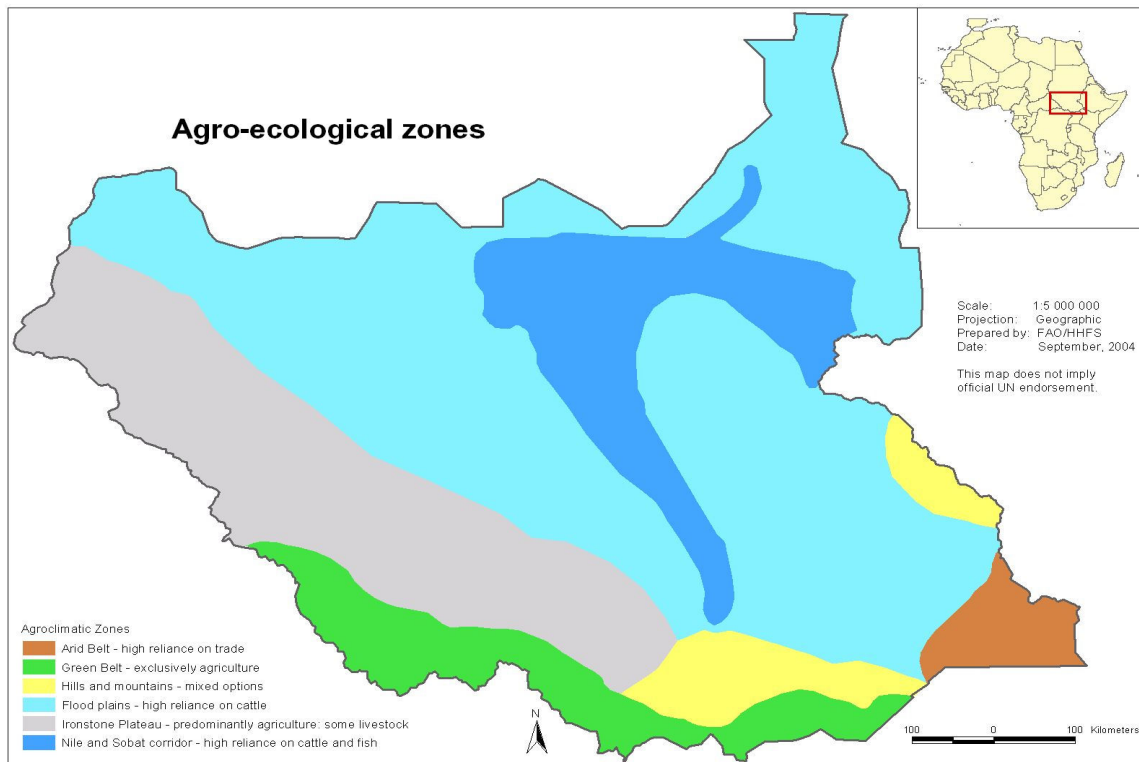


Figure 3.4: Map showing the main Agro-Ecological Zones of Southern Sudan (Ministry of Agriculture and Forestry, 2006).

Livestock plays a central role in livelihood of pastoral communities and contributes to nutrition, income generation, asset security and cultural function through milk, meat, hides and skins, manure and draught animal power (Hassan, 1976). Most households in rural areas rear small and large domestic animals for food, income, prestige and social rituals. In 1976, southern Sudan's livestock resources were estimated at 51 million head of cattle, 1.8 million sheep and 2.7 million goats, representing 40% and 30% respectively of Sudan's total herd (MARF, 1983). The

Regional Ministry of Finance and Ministry of Animal Resources (1983) reported that livestock population in Southern Sudan during the period 1979/80-1982/3 showed decline in population as indicated in Table 3.3.

Table 3.3: Livestock population 1979/80-1982/83 in Southern Sudan (Regional Ministry of Finance and Economic Affairs and Ministry of Animal Resources, 1983)

	1979/80 (000)			1982/83 (000)		
	Cattle	Sheep	Goats	Cattle	Sheep	Goats
Bahr El-Ghazal	2,316	791	123	2,624	1,267	1,140
Equatoria	1,226	1,131	73	1,086	1,1104	327
Upper Nile	3,370	1,219	955	3,854	1,472	1,050
Total	7,912	3,141	1,151	7,564	3,843	2,518

Fish production projections prior to the war showed a potential growth rate of 2,500 tons per year for a period of six years (1977-1982) as shown in Figure 3.5

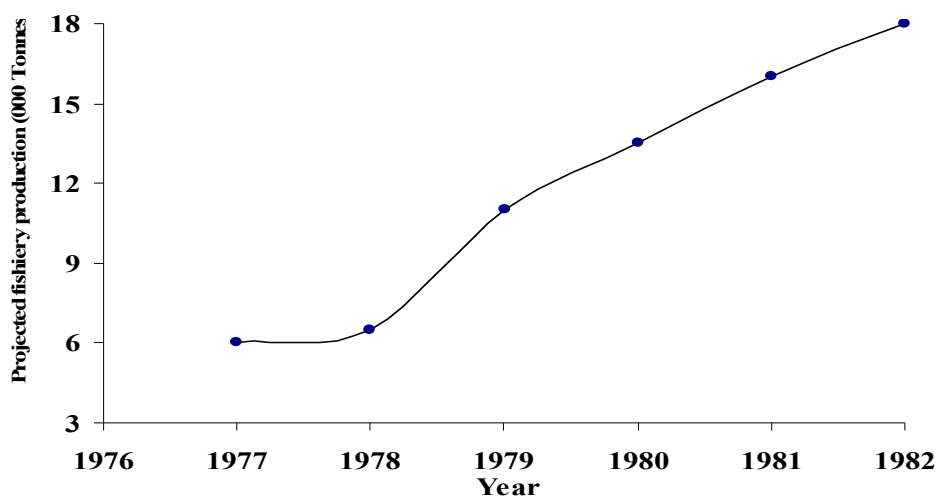


Figure 3.5 Pre-war fisheries projection trend (1977-1982) in Southern Sudan (Regional Ministry of Agriculture, 1976)

Despite its currently poor economic situation (mainly caused by the war), Southern Sudan, with its endowed vast natural resources and favourable agro-ecology conditions, has immense potential for agriculture and sustainable economic development (GoSS MAF, 2006). Yet, Southern Sudan faces both temporary and chronic food insecurity problems. Although it had achieved food self-sufficiency and succeeded in building a stock of food grains in the 1970s, a large proportion of the population still experienced extreme hunger and poverty (Dima, 2007). During the past few decades, Sudan frequently failed to produce or import enough food to feed its population and relied on international relief (ARC Sudan, 2003).

The 21-year civil conflict has had a significant impact on crop production through disruption of normal farming activities. Although cereal production has fluctuated and the area cropped reduced during 1999-2008, data shows that the area under cereal production was increasing prior to the war (FAO, 2008). A significant drop in cereal production is mainly attributed to lower sorghum and maize yields during the conflict period. The food production deficit was filled through commercial imports and food aid (WFP, 2006).

Von Braun (2009) pointed out that food insecurity can be primary a source of conflict as a result of competition over limited grazing land and natural hazards such as drought and floods. These nature-induced calamities are most pronounced in the semi-arid grassland zone of Eastern and Central Equatoria States and the flood plains in most areas of Greater Upper Nile and Bahr El-Ghazal Regions. The return of refugees, resettlement of displaced people or the demobilization and reintegration of the former combatants are highly sensitive food security issues, particularly in a context of extreme brutality, where ethnic cleansing or maiming were characteristic of the violence (Daniel and Knudsen, 1995; Terry, 2002).

IFAD trend surveys reported in 2002 reported that although respondents in all income groups reported long-term trends toward eating foods that were less preferred as a means of adapting to lower real incomes, in a squeeze, there is usually an even less preferred and less expensive food to eat that is roughly comparable, at least in terms of energy. Respondents stated that they must occasionally eat less preferred foods. Focus group respondents generally agreed that this was the least drastic measure to which they could resort (IFAD, 2002).

Surveys conducted by a WFP team in 2004 found that the majority of households practiced the limiting of food quantity served to an individual, although results indicate a significant seasonal variation (WFP, 2004). Cutting back the amount of food that each person in the household receives from the food distribution scheme provided by WFP was the second most common coping strategy, and in terms of severity. This is roughly equivalent to eating foods that are less preferred. In that same survey, if more than a modest reduction of food is involved, most respondents said they would skip meals, so that when they did eat, they would be satisfied. The manner in which limiting portion size is done varies widely, and understanding a sophisticated analysis to distinguish between uniform reductions and redistribution that favours some household members to the detriment of others.

Borrowing either food or money from relatives or friends was a commonly mentioned practice. Local merchants reported that they may also turn short-term credit. However, borrowing money for food can lead to permanent indebtedness, and is an example of how a short-term coping strategy can put a household in a more vulnerable position with regard to longer-term livelihood options. Maternal buffering is the practice of a mother deliberately limiting her own intake in order to ensure that children--usually recently weaned toddlers--get enough to eat. There is, of course, no reason why someone besides the mothers could not do the same thing, but no empirical evidence emerged to suggest that anyone other than mothers did this (IFAD, 2002).

During the war, as food stocks of households were exhausted, many families consumed diets of one or two simple and poorly processed items, often served only once a day (Save the Children United Kingdom (SC-UK), 2007). This means there was severe shortage of food. Poorer households tended to increase wild food and fish consumption where possible. During the 1998 famine in Bahr El-Ghazal region, hunger, starvation, malnutrition and famine were evident among children, pregnant and lactating women (UNICEF, 2004). From 1996 to 2000, wild foods contributed up to 40-50 % of household food needs of poor households. SC-UK (2007) reported that families with members depending on milk and milk products for their food (e.g. young children) were more reluctant to dispose of their milk-producing animals, unless as a last resort. In livestock-based livelihoods states, oxen and bulls may be offered for sale rather than

heifers that may be kept for breeding purposes. Goats and sheep sales are often cash sales, providing cash to purchase cereals and other non-food items.

CHAPTER 4: AGRICULTURAL DEVELOPMENT PROGRAMMES AND PROJECTS IN POST CONFLICT SOUTHERN SUDAN

4.1 REVITALISATION OF AGRICULTURE IN SOUTHERN SUDAN

Agricultural growth offers possibilities for reducing the risks of severe food shortages at farm household and other all levels of society, increasing supply of food, creating economic opportunities for the most vulnerable households and improving dietary diversity and the quality of food consumed by farm households (Hendriks and Lyne, 2009). Therefore, accelerating agricultural growth in African countries is crucial, for not only achieving food security and reducing hunger, but for generating employment and trade.

A poorly functioning agriculture sector heightens poverty, which in turn can spark conflict (Ngidi, 2008). During conflict, agriculture was characterised by lack of seeds and tools, poor crop varieties, fishing gear and veterinary vaccines and drugs and are available through emergency relief channels. In conflict and post-conflict zones, agricultural extension is non-existent and links between producers and markets by restricting movement of goods and access to markets, inputs and short-term financial credit destroyed (DDR, 2006).

In the process of agricultural revitalisation after conflict involves three strategies of great importance (UNHCR, 2008). The first, the process is demobilisation. Southern Sudan has had serious problems with these operations to recycle large number of people to agriculture activity to contribute to the stability of the rural areas, stability being crucial for the consolidation of peace and the reconstruction of the agricultural sector (DDR, 2006). Second, the substitution of relief crops with other high-value crops is of great importance to revitalise agriculture post conflict (FAO, 2006). This is because farming as a business would improve food security and increase income through production and marketing of high value crops. Third, the repatriation, reintegration, resettlement and rehabilitation of displaced persons, returnees and the restoration of agricultural infrastructure are central to reconstruction efforts. In the case of Southern Sudan, the instability in rural areas after war impeded repatriation and return of refugees and displaced people to their original villages, hindering agricultural reconstruction. Therefore, performance of

the agricultural sector as the key provider of food has been poor and its impact on other social services was not recognised. However, demonstration of political, social and economic development could result in realisation of sustainable food security in Southern Sudan (Guvele et. al., 2003).

During the protracted crisis, most of the official responses regarding policies, programmes and projects to the crisis were undertaken and directed by international agencies in Southern Sudan. This weakened the capacity of local institutions and limited the effectiveness of responses. Secondly, the responses were principally of a humanitarian nature with over 50 % of the Operation Lifeline Sudan of the United Nations resources allocated to food aid. Third, these policies were planned and conceived for short-term perspectives with a top-down approach to planning in order to produce quick and visible results on the ground (UNHCR, 2008).

The end of civil war has encouraged the return of a significant proportion of previously displaced people. Most return to areas of local population faced with humanitarian challenges and ill equipped to absorb returnees without substantial support from authorities and international community (Oyat, 2009). The situation has not yet improved to expected levels even with return of peace. This intrinsic setting of deprivation is exacerbated by weak capacity of communities to respond to the post-conflict situation in terms of ability to employ traditional coping mechanisms for food access. Moreover, several years of food aid have instigated a dependency syndrome, unlikely to change abruptly in post conflict situation (Oyat, 2009). Between 2006-2008 United Nations and partners had reported that Southern Sudan is now considered one of the poorest regions in the Sudan (UNDP, 2008). Poor access to basic social services undermines and reduces livelihoods opportunities further increasing levels of poverty.

With the progressive consolidation of the peace process, a new policy environment is emerging reflecting the changing situation and providing opportunities and related challenges in terms of capacity building for more conducive, long-term and locally owned food security policy frameworks and related programmes. In 2006, the main preoccupation of the Government of Southern Sudan has been the transformation of the lives of Southern Sudanese through sustainable agricultural development since 2006. In the food and agriculture policy presented to

Southern Sudan Legislative Assembly by H.E., the President of the Government of Southern Sudan stated that: "Improved agriculture and forestry services shall become the driving force for national socio-economic development without compromising the sustainability of the natural resources" (Kiir, 2006). As a mandate, the MAF is expected to ensure food security for the people of Southern Sudan, using the two developed policy frameworks – the Food and Agriculture and Forestry Policies of 2006 and 2007 GOSS, 2008. Both policy frameworks advocate for food security for all the people of Southern Sudan to enjoy and improved quality of life, and environment and economic prosperity for the country.

The agriculture sector has not been given much attention it deserves since 2005. However, the Government of Southern Sudan (GOSS) has planned and formulated a number of programmes to improve delivery of agricultural and forestry services for food security (Kiir, 2006). The Government of Southern Sudan Ministry of Finance and Economic Planning (GOSS MFEP) ranked the livelihoods sector number five where agriculture falls in the top government expenditures (GOSS MFEP, 2008). Furthermore, while the GOSS budget consistently increased between 2006 and 2008, conversely, the Ministry of Agriculture and Forestry budget declined between 2006 and 2008 with an average budget allocated to Ministry of Agriculture and Forestry during 2006-2008 was only 1.6 % of the GOSS budget (GOSS MAF, 2008)

To accelerate agricultural productivity and growth, the government has started to provide tractors to farmers' organisations in order to promote productivity by encouraging states and counties to concentrate on few potential food crops. However, the institutional support for agricultural production, in the form of agricultural extension, is non-existent and often remains so even after the Southern Sudan has returned to relative security. If support is provided at all, it is generally through the temporary agency of an NGO or international organisation. Infrastructural breakdown and a lack of institutional support are also evident in areas that are not directly affected by conflict, thus demonstrating the indirect effects of the conflict on such areas.

MAF's mission is to transform agriculture from a traditional/subsistence system to achieve food security through science-based, market oriented, competitive and profitable agricultural system, without compromising the sustainability of the natural resources for generations to come. These

policies have adopted a smallholder centred approach in partnership with the private and civil sectors. The key guiding principles outlined in these frameworks include; ownership of, equitable distribution of, efficiency and effectiveness, access to information and services, sustainability, environmental concerns, gender equality, and coordination (GOSS MAF, 2006-2007). The overall objectives include the development of a strategy to provide sustainable food security, generate income from surplus agricultural production, develop human resources, identify and use appropriate technology through research and capacity building and training are identified as the first short-term priority (GOSS MAF, 2006-2007).

Numerous support programmes have been developed to support agriculture and food security in Southern Sudan. The key programmes are discussed below..

a) Support to Agriculture and Forestry Development Programme

The Government of Southern Sudan first drafted the Support to Agriculture and Forestry Development Programme (SAFDP) as an initial project proposal in October 2005 (SAFDP, 2005). The government has been budgeting annually for Support to Agriculture and Forestry Development Programme and other related programmes in the natural resource and rural development sector to promote delivery of agricultural services to five states: Central Equatoria, Eastern Equatoria, Jonglei, Upper Nile and Unity of Southern Sudan.

Donors contribute funds for implementation of SAFDP through the World Bank Multi-Donor Trust Fund (MDTF). The overall objective of SAFDP is building the physical, human and organisational capacity of the state and county institutional and technical capacity in delivery of agricultural and forestry services to organized farmers. SAFDP is being implemented in phases- the first two-phase started in 2008. Norwegian People's Aid (NPA) has been contracted to implement the programme.

b) Southern Sudan Emergency Food Crisis Response Project

Following the Comprehensive Peace Agreement in 2005, a donor conference was organised in April 2005 in Oslo, Norway to solicit financial resources for reconstruction of affected areas in

Northern Sudan and Southern Sudan. The World Bank managed the funds under the Multi-donor Trust Fund (MDTF) Mechanism. In 2008, World Bank supported, the agricultural development that was provided through the Southern Sudan Emergency Food Crisis Response Project (SSEFCRP) with a budget of US\$ 5 million. The selected NGOs execute the project in one county in six states. Action Africa Help-International (AAH-I) in Yambio and Morobo, Agency for Technical Cooperation and Development (ACTED) in Raja county, World Vision International in Tonj North County, Norwegian People's Aid in Renk and Panyikango counties in Greater Equatoria, Bahr Le-Ghazal and Upper Nile Regions (World Bank, 2008).

c) Southern Sudan Livelihood Development Programme (SSLDP)

The International Fund for Agricultural Development (IFAD) has been involved in Southern Sudan since 1986. IFAD has pledged to support a Programme targeting the rural poor and this is closely aligned to IFAD policy. IFAD is currently supporting one project in Southern Sudan: the Livelihood Development programme in selected three counties in three states of Southern Sudan from 2007-2010 (IFAD, 2008).

d) Sudan Productive Capacity Recovery Programme (SPCRP)

The European Commission support to the agriculture sector is provided through the Sudan productive Recovery Programme (SPCRP). The main purpose is to build the capacity of State and county agriculture ministries and departments in terms of physical infrastructure, organisational and human capacity building in the five states not covered by Support to Agriculture and Forestry Development Programme. German technical co-operation agency (GTZ) was contracted to implement the model projects under Sudan Productive Capacity Recovery Programme (SPCRP) through Food and Agriculture Organisation (FAO, 2007).

e) Sudan Institutional Capacity Programme: Food Security Information for Action (SIFSIA)

The main aim of the Sudan Institutional Capacity Food Security Information for Action (SIFSIA) Programme is to enhance the capacity of the government to planning, policy development and decision making in food security 2006-2010. This programme is being

implemented by Government of Southern Sudan by international staff from Food and Agriculture Organisation.

f) Sudan Food Security and Livelihood Programme (SFLDP)

Food and Agriculture Organisation and World Food Programme of the United Nations are the co-leaders of Food Security and Livelihood programme. The focus of the programme is to support the IDPs, returnees and affected resident population. This emergency and rehabilitation programme is being implemented by a range of International and National NGOs with funding from various donors. United States Agency for International Development (USAID) provided a significant contribution to the agricultural sector through its support to the UN and NGOs implementing emergency food aid in Southern Sudan.

g) Southern Sudan Agriculture Revitalisation Programme and Food Aid (SSARP)

United States Agency for International Development (USAID) supported establishment of six training centres through Southern Sudan Agricultural Revitalization Programme (SSARP) from 2002-2006. As a major donor, USAID has been supporting emergency food aid programming throughout Southern Sudan's long years of conflict-induced displacement and malnutrition through food for peace project.

“Food assistance helps build the basis of long term food security, and is particularly important in countries with protracted crisis. The current system uses humanitarian assistance to support short term efforts to address the immediate effects of a crisis, and development assistance for long term interventions to address underlying causes. Areas of intervention that are important in protracted crisis are underfunded and are weak in governance structure” (FAO, 2010). Humanitarian assistance not only saves lives, but also an investment to the country's future because it preserves the human assets and livelihoods that are the foundation of future stability and development (FAO, 2009).

Food aid is often crucial in addressing war-related hunger to save lives. The literature on the distribution of food aid in war-affected zones illustrations suggest that humanitarian agencies

have still not found a good way to reach those most disadvantaged. It is estimated that the share of food aid that effectively reaches the targeted groups ranges from 10 to 12 % of the total. Teodosijevic (2003) reported that this failure is largely due to the strategies of belligerents, who consider hunger as a weapon to weaken each other, and target food aid.

The use of food aid during reconstruction phases is more controversial than its use during war. Food aid is suspected to undermine the incentives for food production. However, in countries where food aid is used to finance “food for work” operations aimed to the reconstruction of collective agricultural infrastructure, it contributes significantly to post-conflict restoration and production.

h) Food Security and Livelihood Programme

FAO has been active in supporting the IDPs, returnees and the affected resident population with seeds and tools. The pilot phase of the project became operational in 1997. The objective of the programme was to contribute to the improvement of household food security through the distribution of seeds and tools and training of targeted population in crop husbandry and ox ploughing.

The above discussions focused on the Pre and Post war agricultural development programmes and projects in Southern Sudan. The discussions led to the preconditions of food insecurity in Southern Sudan as detailed in the next chapter.

CHAPTER FIVE: FOOD INSECURITY IN SOUTHERN SUDAN

In the Sudan, food insecurity is a key development challenge. The FAO/WFP/Crop and Food Supply Assessment Mission (CFSAM) estimated that in 2009, 574 405 people in the Sudan were in need of food aid, while 755,000 people in the rural areas of Southern Sudan needed food assistance (FAO, 2009). Guvele et al. (2003) reported that more than 95% of Southern Sudan's population depends on subsistence agriculture. Around 80 to 90% of South Sudanese households earned less than US\$1 per person per day in 2004 (SPLM, 2004). Despite the current situation, Southern Sudan, with its endowment of natural resources and favourable agro-ecology conditions, has potential for sustainable economic development (GOSS MAF, 2006). Still, Southern Sudan faces both temporary and chronic food insecurity, mainly caused by war.

A CFSAM report (FAO, 2009) stated that Southern Sudan faces multifaceted problems including high rates of poverty, economic stagnation and low agricultural productivity. Adverse climate changes (drought and flood), dismal road infrastructure, weak market systems, inter-tribal conflict, new arrivals of returnees combined with environmental, technological and institutional factors that have led to a decline in land holding size per-household, low labour and land productivity.

The Northern Bahr El-Ghazal, Upper Nile, Unity, Jonglei and Eastern Equatoria states are food deficit states in Southern Sudan. Many households in these states are only able to produce sufficient food for half of the year (FAO, 2009). The vulnerable groups include those without assets such as returnees, IDPs, female headed households, victims of family conflict, and households affected by drought and floods. According to FAO (2009), conflict, weather irregularities and agricultural activities are not uniform across states. The situation in Malakal and Yambio counties needs close monitoring due to physical insecurity caused by inter-tribal conflict and the presence of the Ugandan Lord Resistance Army respectively. The volume of food aid and the number of beneficiaries in Western Equatoria has increased over time, with chronic dependence on food aid in some areas like Yambio. At the household level, IDPs, and refugees are particularly food insecure due to loss of crops and assets.

Most households rely on a combination of crops, gathering wild food and hunting, fishing, livestock keeping and barter/exchange as sources of food and livelihoods (SSCCSE, 2007). With reference to World Food Programme with its Comprehensive Food Security and Vulnerability Analysis (WFP, 2007), three quarters of households engage in a mixture of agriculture and livestock rearing for their livelihood. Most people identify themselves as crop producers, and claim no livestock ownership. Access to food is seasonal and location-dependent. In the face of natural hazards, such as floods and drought, the households balance food needs with strategic movements to seasonal areas of supply to increase resilience.

In Southern Sudan, most agricultural activities performed by women are done with hand tools, yet women's contribution to agricultural labour is estimated at 90% (FAO/WFP, 2008). Currently, the irrigated and mechanized rain-fed systems are found in northern Sudan with a few exceptions in the Southern Sudan predominantly. The traditional rain-fed system supports people who practice subsistence agriculture who constitute 80% of the rural population, including some of the most vulnerable groups, such as IDPs and returnees. A WFP (2005) Annual Needs Assessment Report categorised food aid for returning IDPs and refugees into three categories:

- Transit packages containing 15 days full ration for IDPs
- Return packages at destination, comprising 3 months full ration and
- Community-based reintegration support in the form of full monthly food rations until the end of the year.

Kidane et al. (2006) reported that cereals, which represent approximately 90% of the total volume, constituted the bulk of food aid to Sub-Saharan Africa countries. Food aid considerably increased since the 1970s, when it was generally below one million tonnes per year, or 2-3% of total food consumption. The 1980s saw first a doubling and then a tripling of food aid delivery, which made up to 10 % of total food consumption. This was exceptionally high in 1992 when it reached 6 million tonnes - almost equivalent to commercial imports. From a national food security perspective, a country's capacity to import sufficient food to meet the requirements of its population is determined by its ability to generate sufficient foreign exchange from exports or

by other means (FAO, 2006). Reliance on food imports or aid is not a sustainable option for food security in Sub-Saharan Africa countries, given the region's limited capacity to generate sufficient foreign exchange and given the region's comparative advantage in agriculture, particularly food production.

Table 5.1 shows the total food needs estimated at 105,000 MT for the expected 0.7 % (755,000) returnees in 2005.

Table 5.1: Estimated food aid needs of IDPs and refugee returnees in Southern Sudan (WFP, 2005)

Type of beneficiaries	Number of beneficiaries	Type of assistance	Modality of Assistance	Time Period	Average number of days	Ration Size (%)	Food Needs(MT)
Internally Displaced Persons (IDPs)	645,000	Travel package	Grain distribution	Jan – Dec	15	100	5,314
Returnees		Return and reintegration	Grain distribution	Jan – Dec	214	100	84,730
Refugee Returnees	110,000	Return and reintegration	Grain distribution	Jan – Dec	214	100	14,450
Total	755,000						104,494

NGOs and other agencies provide food interventions support that complements non-food inputs such as agriculture support, education and protection. However, as implementation of the Comprehensive Peace Agreement progresses, and more refugees return to their homes and their livelihoods there has been a relative increase in the commercial and production activity in whole of Southern Sudan. Table 5.2 presents the cereal area and level of production of all states during the farming season 2008/2009 for comparison purpose using the Crop and Food Supply Assessment Mission Report (FAO, 2009).

Table 5.2: Comparison of cereal area and production in the ten states of Southern Sudan (FAO, 2009)

Region/State	Area 000t* ha	Prod. 000 t	Area 000 ha	Prod. 000 t	Area 000 ha	Prod. 000 t	Area 000 ha	Prod. 000 t	Area 000 ha	Prod. 000 t
Upper Nile	138	82	204	167	226	189	142	123	197	196
Upper Nile	89	48	59	48	67	61	40	35	58	49
Unity	31	22	41	35	48	39	30	27	47	46
Jonglei	18	12	104	84	111	89	72	61	92	101
B El-Ghazal	451	306	432	374	438	359	450	422	487	561
Northern	295	195	95	56	104	72	94	70	111	83
Western	37	26	41	38	45	41	41	50	44	68
Lakes	119	85	111	103	111	95	104	107	113	136
Warrap	0	0	185	177	178	151	211	195	219	274
Equatoria	218	199	233	259	242	258	257	314	314	491
Central	79	66	75	77	71	78	70	74	86	132
East	32	20	37	26	45	29	61	51	79	87
West	107	113	121	156	126	151	126	189	149	272
TOTAL	807	587	869	800	906	806	849	859	998	1 248

000* (in thousands)

Households with severe food insecurity would be in need of food assistance. Households that are moderately food insecure need to be carefully monitored, as they could easily fall into a worse state if they are hit by new shocks. Livelihood support programmes from FAO and other UN/NGO agencies assist households through non-food humanitarian assistance (FAO, 2009).

As implementation of the Comprehensive Peace Agreement (CPA) progresses, and more refugees return to their homes and their livelihoods there has been a relative upswing in the commercial and production activity in whole of Southern Sudan. The CFSAM (2008) reported that the level and amount of production in 2008 has increased compared to 2007 due to better weather conditions, relative peace and stability that have allowed returnees to settle and take up household farming. Table 5.3 illustrates cereal area and production estimates during and post conflict situation in Southern Sudan. The Annual Needs and Livelihoods Assessment (ANLA), a United Nations World Food Programme tool estimated that 0.11% (1.3 million) vulnerable people were in need of food assistance. Of this number, 1.06 million residents and IDPs and 239 000 expected returnees in 2009 would require about 96 000 tonnes of food (73 500 tonnes and 22 500 tonnes respectively).

Table 5.3: Cereal production estimates in traditional rain fed agriculture during and after the conflict in Southern Sudan (CFSAM, 2009)

Regions/ State	2004		2005		2006		2007		2008	
	Area 000 Ha	Prod. 000 MT	Area 000 Ha	Prod. 000 MT	Area 000 Ha	Prod. 000 MT	Area 000 Ha	Prod. 000 MT	Area 000 Ha	Prod. 000 MT
Upper Nile	138	82	204	167	226	189	142	123	197	196
Upper Nile	89	48	59	48	67	61	40	35	58	49
Unity	31	22	41	35	48	39	30	27	47	46
Jungle	18	12	104	84	111	89	72	61	92	101
Bahr El- Ghazal	451	306	432	374	438	359	450	422	487	561
North	295	195	95	56	104	72	94	70	111	83
West	37	26	41	38	45	41	41	50	44	68
Lakes	119	85	111	103	111	95	104	107	113	136
War rap	0	0	185	177	178	151	211	195	219	274
Equatoria	218	199	233	259	242	258	257	314	314	491
Central	79	66	75	77	71	78	70	74	86	132
East	32	20	37	26	45	29	61	51	79	87
West	107	113	121	156	126	151	126	189	149	272
TOTAL	807	587	869	800	906	806	849	859	998	1 248

*000 in thousands

Table 5.4 provides an overview of the estimated cereal availability for 2008/2009 in Southern Sudan. There was an estimate of an overall cereal surplus of 47,236 tons across Southern Sudan until the next harvest. Though this bodes well at the macro-level, it is important to analyse whether there is sufficient localised food availability and if not it is important to gauge whether markets may make up for this lack of availability through functioning marketing channels.

Table 5.4: Estimated cereal availability for 2008/2009 (WFP, 2009)

Cereal Deficit States		Cereal Surplus States	
State	Amount in tonnes	State	Amount in tonnes
Upper Nile	-25356	Warrap	30027
Jonglei	-22847	Western Bahr El- Ghazal	390
Unity	-22813	Lakes	17149
Northern Bahr El- Ghazal	-51551	Central Equatoria	23492
Eastern Equatoria	-22152	Western Equatoria	120909
Total	-144729	Total	191965

The next chapter presents a discussion of the research design and methodology to address the inquiry on whether there was a significant increase in the cereal or grain production during the post conflict period in the three selected states of Southern Sudan.

CHAPTER SIX: RESEARCH METHODOLOGY

This section describes the research design and methodologies used in this study and provides justification for their use in data analysis. This study investigated whether household food security (measured as access to grain) improved in the post conflict period in three of the 10 states of Southern Sudan. The study used both quantitative and qualitative methods to gather information about concerned communities and stakeholders. The participatory approaches emphasise the importance of involving the communities in the study, as they have clear ideas about the real situation as well as the crucial problems, concerns and issues in their areas.

6.1 RESEARCH DESIGN

A quantitative-qualitative design was adopted for this study. The quantitative measures were directly available from the Sudan Institutional Food Security Information for Action (SIFSIA) database (SIFSIA, 2009) serving in Southern Sudan for the food and agriculture sectors. SIFSIA has been the national information source for market, rainfall, cereal production, among others. The secondary data were obtained from reports and records of the pertinent the state ministries of agriculture and county agriculture departments' offices including agriculture, forestry, fisheries, livestock, county administration and NGOs. Additional secondary data were also obtained from United Nations agencies. The secondary data used for this survey strongly complemented with what was gathered during the household survey.

The qualitative measures for the study were sourced from the household interviews, Focus Group Discussions (FGDs) and Key Informant Interviews (KIIs). The responses were recorded appropriately such that factors focusing on the constructs of coping strategies during food gaps were carefully analyzed. It covered information on households' demographic data obtained from the Southern Sudan Commission Census Statistics and Evaluation Supplementary data included the area under crops and production of cereal crops were gathered from the Crop and Food Supply Mission reports from 1999-2008 (FAO, 2008).

The discussions with governmental and non-governmental institutions involved in food security and related topics in the study areas provided additional information. Other information collected were on population, climate, farming systems, sources of food, policies, programmes and projects implemented by NGOs was collected from state Ministries and County Agriculture Departments. Such documents included reports, journals, books, and papers on agricultural and natural resources development issues supplemented household survey results.

Sources of data on physical resource bases, agro-ecology, vegetation cover and soil of Southern Sudan and their implications for agricultural production were existing topographic and thematic maps. Also included were the satellite imagery products, mainly developed for supporting food security early warning information needs for this survey. These maps were of great value in identification of agro-ecological situation in study areas. The researcher also captured food security-related situations in form of notes while travelling by air, land, water or walking around study areas. The imagery captured included physical characteristics of study areas and on-going socio-economic activities.

6.2 METHODOLOGY

This study adopted four methodologies responding to research design centered on the main research questions and the sub-problems. First, the secondary data used in this study were the main source of quantitative information from the most recent SIFSIA database records available in Southern Sudan (SIFSIA, 2008). The database stored the records from 1998 up to the time the study was conducted with records of cereal production, availability, market availability as well as price, and access based on the parameters that the Government of southern Sudan's needs (SIFSIA, 2008). This data were used to ensure that the quantitative references of this research are within the confines of its area of study that matched with the household interviews gathered by the researcher. All the secondary data gathered were converted in EXCEL 2007 and later migrated to SPSS V15. Higher or advanced technical data analyses were completed using the SPSS output generated reports.

Second, a household survey was the primary source of quantitative information obtained from the household survey using a questionnaire developed for this study. The researcher retrieved 542 survey questionnaires from households in three states and nine counties. The questionnaire is attached as Appendix A.

The researcher conducted 542 household interviews using random sampling. The survey elicited household demographics information including age, gender and level of education of the household head, socio-economic aspects such as household demographic data, household characteristic, and type; sources of Agricultural services like government, NGO, farmers organisation and others; and household access to resources such as ownership of land, arable land, land use for agriculture, production inputs, and market information. It also covered government policies that are perceived to have positive and negative changes by household respondents; sources of food including proportion of own production, purchases, aid/gift; and coping strategies specifically, household's response in case of food shortages.

Third, Focus Group Discussions were designed to cross-validate the quantitative data. The researcher conducted a participatory discussion (Figure 6.1) through the Focus Group Discussions with eight or more members with at least three women participating in each group from each county focusing on the questions regarding household coping mechanism and strategies when food gaps occur in the household. The Focus Group Discussions facilitated the open discussions and the spontaneity of opinions while discussing crucial issues like agricultural services, dietary diversification, marketing constraints, conflict or disaster and gender issues in relation to food security. In addition, other issues related to institutional development, human resource capacity and infrastructure were discussed. The Focus Group Discussions sessions included husbands, wives and children during the discussion. The Focus Group Discussions questions are attached as Appendix B.



Figure 6.1: The researcher in group discussion with community members at Kata village, Raja County, Western Bahr El-Ghazal State, 6 August 2009.

Fourth, the researcher conducted direct interviews on specific issues from the government, United Nations, NGOs implementing food security programmes and projects in counties and Payams who worked at the state or county levels in the Ministry of Agriculture and Forestry. Their viewpoints were focused on the policy and implementation issues on cereal production and availability as well as policy implementations in their respective states.

6.3 SCOPE AND AREA OF STUDY

The Sudan Housing and Population Census in 2008 conducted a study between July and August, 2009 in the three states and nine counties, namely, Upper Nile State (Renk, Malakal, and Panyikango), Western Bahr El-Ghazal State (Wau, Jur River and Raja) and Western Equatoria State (Yambio, Maridi and Mundri East). The study area has a total population of 926,128 people (SSCSSE, 2008). The criteria for selecting the 3 states and 9 counties were based on the Agri-

ecological zone locations and their classification as High Potential State and High Potential Counties for cereal production with reference to CAFSM Report in 2008. Table 6.1 shows the area imagery, number of selected counties, states and number of interviewed households.

Table 6.1 Selected states, counties and households interviewed during the study period July-August, 2009

State	Western Bahr El-Ghazal (Wau, Jur River, Raja)	Western Equatoria (Yambio, Maridi, Mundri East)	Upper Nile (Renk, Malakal, Panyikang)	Total
Number of counties	3	3	3	9
Number of households interviewed	153	238	151	542

6.4 STUDY SAMPLE

The state ministries of agriculture and county agriculture departments provided the list of all households in the study areas. The researcher purposively selected three states, three counties, three payams, and three bomas or three villages in each boma while considering the criteria to be of high agricultural potential in Southern Sudan (GOSS MAF, 2006). Taking into account the high degree of heterogeneity in livelihood systems, three households from each village/Boma were selected randomly as a starting selection process for the household surveys.

The participants of the study were the farming household residents in the selected counties and states. The participants were then classified as IDPs, Returnees, and or resident households. All the participants of this study were involved in agriculture off/on farming activities. They have stayed on the same area for at least six months and longer. Resident households were categorized as permanent residents for they have stayed 3 or more years in the same area at the time of the interview or survey was conducted.

6.5 SAMPLING TECHNIQUE

The researcher used criteria in selecting the three states, three counties for each state and three bomas per county purposively. However, the Simple Random Sampling selection was utilised in choosing the households for interviews with a class interval of eight.

As a result, there were 17 households per Payam were randomly selected in Western Bahr El-Ghazal and Upper Nile states each, enumerator selected 27 households in Western Equatoria State. Therefore, the data collectors fielded 81 questionnaires instead of 51 per county in the Western Equatoria state. The actual number of questionnaires returned was 542 (Upper Nile 151, 153 Western Bahr El-Ghazal and 238 Western Equatoria states, respectively) from surveyed households.

The selection of households for interview in each village started from the where the centre of activity was observed. This place could be a market, a church or a house of a village chief. At least 65 to 70 households per village or boma were determined by the researcher. In cases, the household chosen for interview may not be available for reasons of tribal differences, or other reasons- the researcher opted for a replacement sampling in which the next interval would then be determined for the next household interview be chosen.

The sampling error was computed using the Levene's Formula with 95% level of confidence, using the criterion $\alpha = 0.05$.

6.6 QUESTIONNAIRE DEVELOPMENT

The researcher developed a household survey questionnaire as a tool design to collect the information needed for this study. The questionnaire covered essential issues in six core issues such as respondent profile including socio-economic aspects, agriculture and extension services, farm holdings, food security as well as coping mechanism, market information and gender issues. The developed questionnaire underwent three stages of tool development, namely, developing the constructs of the questionnaire, content review by experts and pilot-testing of the tool.

The validity and reliability of the questionnaire was done through experts' review as well as peer review from the staff of the Ministry of Agriculture and Forestry at GOSS level as well as from the State level. Thus, the questionnaire was then declared valid and reliable.

6.7 TRAINING OF DATA COLLECTORS AND ENUMERATORS

The researcher recruited a total of three data collectors from local areas responsible for gathering, and cleaning the collected data from the sample households. The data collectors were taken from the identified state to avoid the problems associated with language, travelling time and cost. The data collectors were from state ministry of agriculture and county agriculture department and had an intensive one-day training/orientation session on qualitative and quantitative survey techniques.

6.8 DATA PROCESSING AND STATISTICAL ANALYSES

The questionnaire designed for the household survey was coded for ease of electronic data analysis. The collected data were carefully reviewed for possible errors in enumeration including missing data. Following cleaning and editing of the responses, the data were entered into a computer using the Statistical Package for the Social Scientists (SPSS), Version 15.0.

Table 6.2 shows the data collection and analysis plan for each sub-problem. Available quantitative data for cereal production (1999-2008) in Southern Sudan were analysed using Excel version 2003 migrated into SPSS version 15. The unit of data analysis was at the household level.

The food availability at the household level quantified the household food balance model. Data on cereal production obtained from the recent CFSAM 2008 and assumed a consumption requirement of 85 kg of mixed cereals/person/year. An average daily per capita requirement of 236 grams of mix cereals multiplied by number of household members was used to calculate household's daily cereal requirement. Total cereal production was then divided by daily cereal requirement to determine the number of days or months a household was food in/secure based on own household production. The measures of household food sources in determining proportion

of various sources of food for household utilized the proportional piling. This study employed the Coping Strategy Index (CSI) in determining the most important coping mechanisms of farming households when facing serious food shortages.

Thus, in this survey, several statistical tests were processed to ensure that variables analyzed met the criterion indices as required for validity and reliability measures. These processes involved percentage during the data cleaning and in the determination of appropriate variables for analysis.

Analysis of Variance was employed to determine the variation effects in-between and among the groups when disaggregated in 3 or more groups. However for disaggregation in two or less groupings, One-Way ANOVA was used or t-Test. This differential tests provided which state and counties the variable differed significantly in conflict and post conflict period i.e. cereal production or production index, availability, landholding size, among others.

Multiple Correlations ensured that variables used to predict the food security, cereal production, and availability, among others have indicated significant relationships using Pearson r or Spearman ρ when conditions are met for the specific analysis.

Factor Analysis optimized the responses gathered from the Focus Group Discussions and Key Informant Interviews. An Eigene loading effect was used to assess whether the weight of each factor contributing to food security and cereal production would specify a good measure of its effects within and in-between other identified factors.

Multiple Regressions determined what would best predict the food security in the post conflict areas in Southern Sudan at the same time the best-fit model for predicting cereal production. It also provided the estimated contribution effect in relation to food insecurity and cereal production using the coping strategy index.

The Coping Strategy Index (CSI) provided the quantitative conversion of factors from qualitative response using an agreed coding technique and where responses could be used to calculate the index using Maxwell's formula (Maxwell et al., 2003). The CSI is an indicator of household

food security, and is relatively quick and simple to use, straight forward to understand, and correlates well with more complex measures of food security (Mzibule, 2004; Maxwell et al., 2003). The coping strategy index (CSI) is a measurement of behaviour, namely, things people do when they cannot access enough food. There are several regular behavioural responses to food insecurity – “coping strategies” for short – that people use to manage household food insecurity. CSI revolves around answers to a question: “What do you do when you don’t have enough food, and don’t have enough money to buy food?” The answers to this simple question comprise basis of CSI tool (Maxwell et al., 2003). The CSI measures the frequency and severity of a household’s coping strategies for dealing with shortfalls in food supply. Information on the frequency and severity of the CSI gives a quantitative score for each household and is a cumulative measure of level of coping — and measure of food insecurity. The higher the numeric score of CSI, the more coping a household has reported — and therefore the more food insecure it is. A lower score means fewer coping strategies were employed, and so, more food secure a household is. Comparing scores and averages gives a good comparison of overall household food security, establishes baseline for monitoring trends in emergencies and for measuring impact of interventions (Maxwell et al. 2003). A list questions developed by WFP/CARE through focus group work and field-testing CSI were used for this exercise comprising:

- Rely on less preferred and less expensive foods
- Limiting portion size
- Borrowing food or money to buy food
- Maternal buffering (mother limits her intake to ensure child has food)
- Skipping meals
- Skipping days (whole days without food).

This list of strategies was included in survey questionnaire with four relative frequency categories ranging between never (0 times/week), rarely (1-2 times/week), often (3-5) times/week and daily. To analyse data, relative frequency score recorded during household surveys was multiplied by severity score (following Maxwell et al. 2003). These individual scores

were summed to give an overall score or quantitative indicator for a household. In order to rank severity level, coping strategies listed above were grouped into four categories, where one = least severe category, and four most severe.

Table 6.2 Data collection and analysis plan for each sub problem

State	Tool of data collection	Data used
Number of counties	1. Household interviews 2. Focus group discussions 3. Trend series analysis	1. Cereal production estimates 2. Type of household 3. Government budget allocation 4. Services to farmers
How do the households cope with decline in cereal production?	Coping strategies score	Coping strategies frequency

This chapter has provided the highlights of the research methodology with overviews on research design with descriptions of four research methodologies. This chapter, too, provides discussions on subjects of the study, scope and area of the study, sampling techniques and questionnaire development. This section also provided data processing and statistical tools used in response to the main and sub-problems of this study.

The next chapter provides the basic findings of the study. The data is presented using tables and figures and the results were interpreted accordingly.

CHAPTER SEVEN: RESULTS AND DISCUSSIONS

7.1 HOUSEHOLD DEMOGRAPHIC INFORMATION AND PROFILE OF HOUSEHOLD RESPONDENTS

The study included 542 respondents from three states and nine counties. The distribution of respondents by state and counties showed that majority of the respondents were from Western Equatoria State (WES) as shown in Table 7.1.

Table 7.1 Distribution of household respondents by state and counties in Southern Sudan, 2009

Name of State	Name of County	Number of Households	Percentage of sample
Upper Nile	Renk	49	27.8
	Malakal	54	
	Panyikang	48	
	Total	151	
Western Bahr-El Ghazal	Jur River	61	28.2
	Wau	67	
	Raja	25	
	Total	153	
Western Equatoria	Yambio	57	44.0
	Maridi	90	
	Mundri East	69	
	Total	236	
Grand Total (3 states)	9 counties	542	100%

The study showed that the majority of respondents (407) were male (75.1%) household heads of between 25 and 55 years (32%). Residents represented 28.6% of the sample, while 55.3% of the sample respondents were IDPs and 16.1% were returnees. Most household heads (65.7 %) were between the ages of 25 and 55 years, while 32% were above 55 years. Only two per cent of respondents were younger than 25 years. Table 7.2 presents the household respondents' profile showing the distribution of respondents by gender, respondent types, education level, age groups and household size.

Table 7.2: Household respondents' profile in study areas (N=542)

Household Profile	Categories	N	Percentage of sample
Gender of households heads	Male	407	75.1
	Female	135	24.9
Respondent types	Resident	153	28.6
	IDPs	296	55.3
	Returnees	86	16.1
Education level	No formal education	197	36.3
	Some primary education	178	33.3
	Completed primary	82	15.3
	Post secondary	78	14.6
	No response	7	1.3
Age	Below 25 years	12	2.2
	Between 25-55	351	65.7
	Above 55 years	171	32.1
Household size	Resident	7.9	
	IDP	7.5	
	Returnees	8.4	
	Others	7.0	
	Over-all	7.7	

7.2 HOUSEHOLD CHARACTERISTICS

The majority of respondents and their spouses had either no or some primary education 70 and 77% respectively (Table 7.2). The average household size was 7.7 members and ranged from one to 15 persons with three males and five females per household (Table 7.3). Almost a third of households (33.5%) reported having one male, compared to 31.2% of respondent households with one female member. Only 2.8% of the respondent households had no females. During food shortages, households with both males and females would be more resilient because they perform different roles in coping with food shortages, labour, kinship support, and exchange/trade and food aid.

In terms of the number of household members below 16 years, 18% of surveyed households reported three members below 16 years, while 8.2% reported no members below 16 years.

Table 7.3: Characteristics of surveyed households in study areas (N=542)

Household characteristics	Household composition	Sample number
Gender of household head	Male	407
	Female	135
Age of household head	Up to 25 years	12
	25 to 55 years	351
	Above 55 years	171
Household size		8
Number of males per household		3
Number of females per household		5
Number of household members below 16 years		3

7.3 UNDERLYING CAUSES AFFECTING HOUSEHOLD FOOD INSECURITY IN STUDY AREAS

Table 7.4 presents major causes of food insecurity mentioned by surveyed households and focus group discussions. The underlying causes of household food insecurity could be generalised from the diversity of responses and discussions with surveyed households and key informants.

Access to food was clearly dependent on power relations within the household. Access to land was influenced by inequality and insecurity related to land tenure and border issues. At the time of the survey, household respondents did not foresee land availability as a problem. Yet, surprisingly, most surveyed households farmed less than 1.2 hectares, constraining food production. Other major constraints to increasing local food production were lack of access to credit, loans and appropriate technologies.

Physical insecurity issues had a direct impact on the quality of community life. Focus group discussion participants explained that security issues, ranging from armed inter-ethnic conflict to cattle raiding, adversely affect household food security. The study established that changing eating habits, food aid and imported food suggested a change in preferences that affected rural

culture. The disinterest of youth in agricultural activities and a lack of entrepreneurial spirit were evident. Table 7.4 presents the causes of food insecurity reported by the respondents.

Table 7.4: Major causes of household food insecurity in the study areas

Major causes of household food insecurity in study areas. Note: √=Indicates that cause(s) reported by the surveyed households and mentioned during focus group discussions.	Western Equatoria			Western Bahr El-Ghazal			Upper Nile		
	Yambio	Maridi	Mundri East	Wau	Raja	Jur River	Malakal	Panyikango	Renk
A changing culture (multiculturalism)									
Access to natural resources									
Basic lack of food			√					√	√
Changes in eating habits	√	√	√	√	√	√		√	
Changing balance between cash and food crop									√
Climate									
Commercialization									√
Community Life			√	√	√		√	√	
Contested access to land	√	√	√	√	√	√	√	√	√
Disinterest of the youth for agriculture									√
Fluctuating prices	√	√	√	√	√	√			
Gender									
Lack of appropriate production technology	√				√				√
Lack of entrepreneurial spirit, dependency									√
Lack of storage capacity		√							
Lack of traditional safety nets	√	√	√	√	√	√	√	√	√
No power in the market place: middleman system	√	√	√	√	√	√		√	√
Poor organization of the community	√	√					√		
Poor road networks							√	√	√
Remoteness					√				
Soil erosion			√						√
Technology	√	√	√	√	√	√	√	√	
Unequal distribution of food in the household			√				√		
Use of ecologically unsustainable technology		√							√
Violence, conflicts, robbery, cattle raiding, abduction of children	√			√			√		
Wasteful celebrations	√	√	√	√	√	√	√	√	√
Women work overload		√	√		√	√	√	√	

Furthermore, across study areas, respondent types, and gender, the survey respondents cited three most common causes of food insecurity were contested access to lands, lack of traditional safety nets and the wasteful celebrations. Both men and women were involved in the areas cited as causes of food insecurity, irrespective whether the households are classified as IDPs, residents, or returnees. Also, the households surveyed reported that some factors may not cause food insecurity such as climate, gender (female or male-headed households), and access to natural resources. These findings agreed were in agreement to the reported cases obtained from community interviews during the 1st ever Joint Baseline Survey on Agriculture and Animal Resources (Kanisio et.al, 2010).

The surveyed households reported that main sources of agricultural services were Non-Governmental Organizations (61.8% of respondents), Government (3.6%), farmers' organisations (2.8%) and others (31.8%) like faith-based organisations or the private sector.

Land is an indispensable natural resource and an essential factor for agricultural production. Table 7.5 shows that most surveyed households (46.9%) reported owning between 1.4-2.4 hectares, 28% of households owned more than 2.4 hectares, and 25.1% owned below 1.4 hectares. The study established that 41% of households reported access to arable land, while only 28.8% of available land was used for agriculture. This suggests that land was available, but households were not using it. During the focus group discussions, participants reported that soil erosion, compounded by inequality and insecurity of land tenure; and the pressure for land generated by urbanisation and development projects affected land access. Surveyed households reported access to the following agricultural development services: production inputs, agricultural skill training, savings/credit facilities, advisory services and processing facilities and market information.

Table 7.5: Proportion of households with farm holdings (N=542)

Farm holding	Below 1.2 hectares	1.2-2.4 hectares	Above 2.4 hectares
Total land owned	25.1	46.9	28.0
Total arable land	35.6	41.0	23.4
Land use-agriculture	63.2	28.8	8.0

Households were asked to give their opinion on existing government policies, whether the policies made positive or negative changes on their household food security. All surveyed households (Table 7.6) responded that most government policies negatively affected household food security. Only a few households (0.4-14%) reported that government policies and programmes had contributed to improved household food security through the increased access to extension services.

Table 7.6 Proportion of households that responded to questions on policy change across study areas (N=407)

Policies	Negative effects	Positive effects
Good road network	99.6	0.4
More market information	98.0	1.5
Increased access to extension services	86.0	14.0
Low transport cost to market points	90.0	10.0

7.4 CEREAL GRAIN PRODUCTION IN THE POST CONFLICT PERIOD

This study investigated whether household food security improved in the post conflict period in three states of Southern Sudan. In addition, the access to grain or cereal referred to as household food security. In the context of this study, food availability referred to consistent and continuous adequate supply of food in terms of quantity and quality for all household members accessing food either through household own production, purchases or food aid/gift. This research used

two sets of secondary data in analysing food availability. According to FAO/WFP/CFSAM missions, the estimated cereal area and production were constant over 10 years period in Southern Sudan (Figure 7.1).

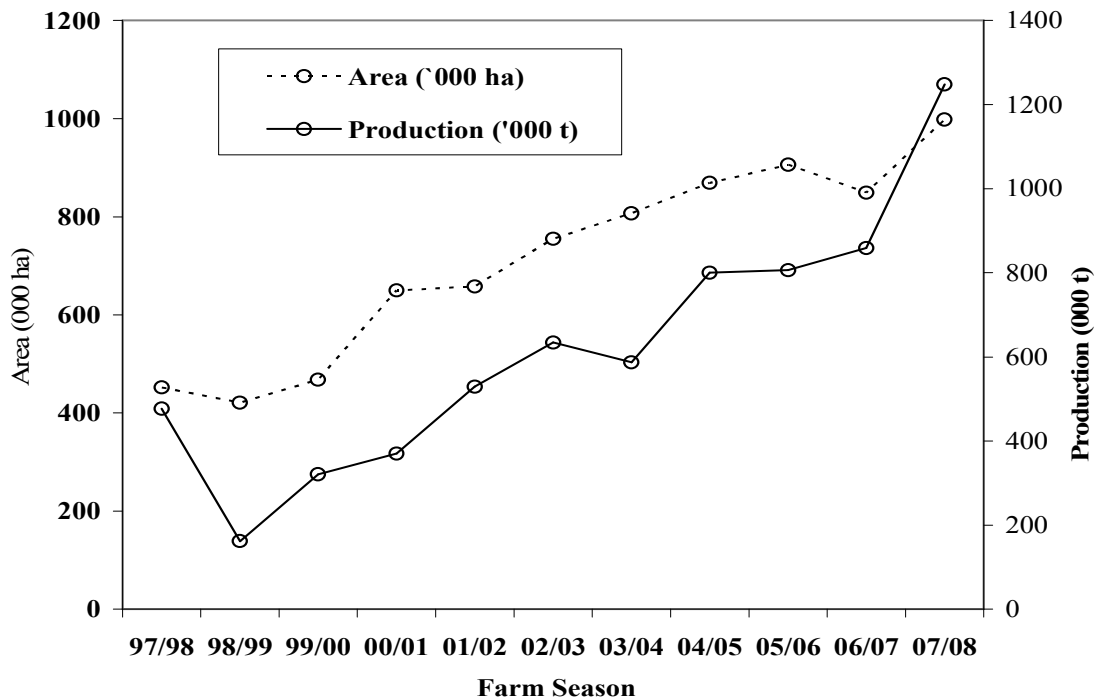


Figure 7.1: Estimated cereal grain area and production in Southern Sudan (FAO/WFP/CFSAM, 1998-2008).

However, a sharp decline in production was seen in 1998/9 farming season. Erratic rainfall compounded by conflict explained the drop in production during conflict to the 10 states in Southern Sudan. The cultivated area and cereal availability consistently increased from 2005 to 2008, with a relatively small drop in area under cultivation and production in 2006/7 due to a shortage of input supplies, but increased in the 2007/2008 farming season.

7.5 TRENDS IN CEREAL GRAIN PRODUCTION IN POST-CONFLICT PERIOD

In Western Equatoria, cereal production was relatively low in 2004. However, this consistently increased from 2005 to 2008 in the surveyed counties. In Western-Bahr-El Ghazal, cereal

availability indicated a marked increase from 2004-2008. In Upper Nile, unstable trends in cereal production were evident. However, production started picking up slowly between 2006 and 2008. Figure 7.2 shows the comparative trends in cereal production across the 10 states of Southern Sudan.

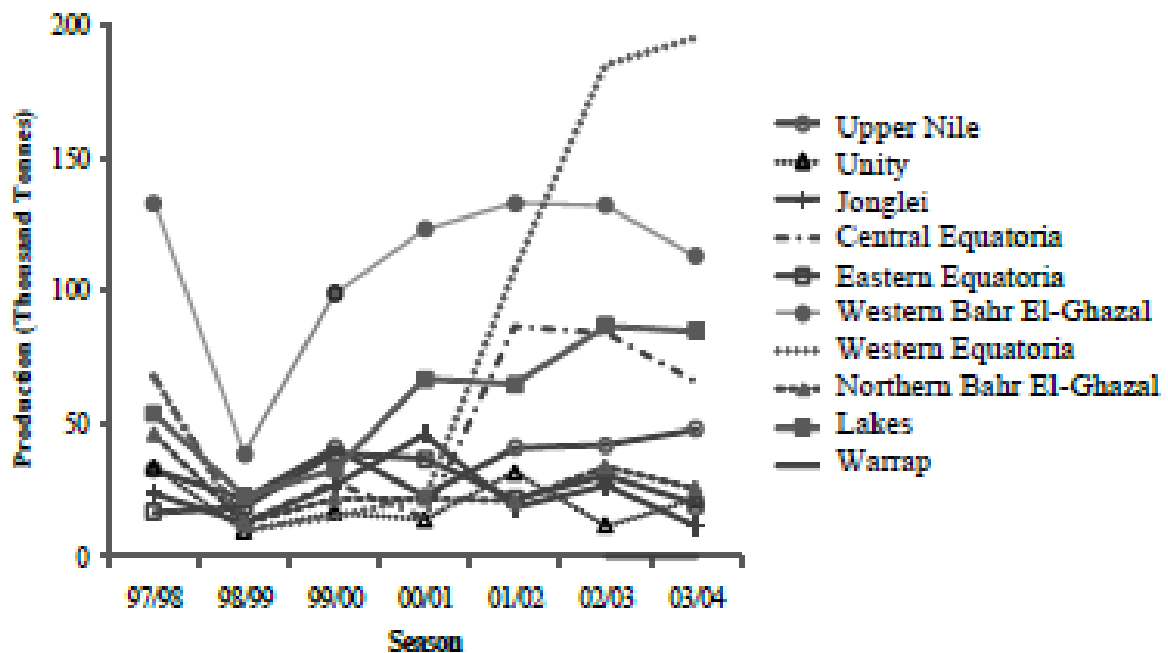


Figure 7.2: The trend in cereal grain availability in the ten states from 1997/1998 to 2003/2004 in Southern Sudan (SIFSIA, 2008).

The analysis of variance (ANOVA) showed that there was no significant difference in cereal production from 2004 to 2008 in the study areas of Western Bahr El-Ghazal and Upper Nile (Table 7.7), but there was a significant difference in the cereal production in the Western Equatoria States ($p= 0.05$).

Furthermore, during farming season, only in Western Equatoria State (WES) that the cereal production showed significant increases from 2004 to 2008 Table 7.7. This is because the ecological conditions of WES have been classified as the greenbelt zone where wheat, maize and

sorghum are produced. However, the increases of cereal production in WES have been inadequate to supply the cereal need of households.

In Upper Nile and Western Bahr El-Ghazal states, the cereal production from 2004-2008, also showed small increments of increases (Figure 7.4) in cereal production. Again the ecological conditions of these two states were not able to support the needed production to supply the cereal need of the households.

Table 7.7: Average cereal production in the ten states of Southern Sudan, 2004-2008

State	Cereal Production (Thousand Metric Tonnes)	
Unity	33.8 a	
Eastern Equatoria	42.6ab	
Western Bahr El-Ghazal	44.0 ab	Study Area
Upper Nile	48.2 ab	Study Area
Jonglei	69.4 ab	
Central Equatoria	85.4 ab	
Northern Bahr El-Ghazal	95.2 ab	
Lakes	105.2 bc	
Warrap	159.0 cd	
Western Equatoria	176.0 d	Study Area

The two letters mean: have no significant difference at $p=0.05$

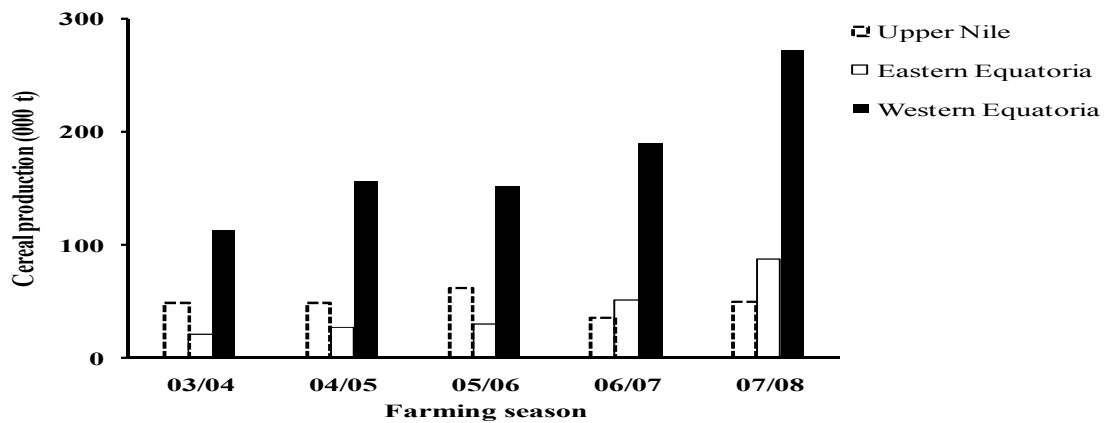


Figure 7.3: Comparison of cereal grain production among the study areas during and post conflict farming seasons (data from FAO/WFP/CFSAM, 2009).

7.6 FOOD SOURCES OF SURVEYED HOUSEHOLDS

The second set of data came from food sources acquired by surveyed households themselves. Figure 7.3 presents the proportion of food obtained by households by food sources. Overall, 39.3% of surveyed households reported that 50-75% of their food came from their own food production in a good year. However, 17.3% of households responded that 75-100% of their food proportion came from their own food production. Only 42.9% of households obtained a quarter to half of their food for purchased, while 20.9% purchased half to all their food in a normal year. Food aid provided three quarters to all food for 46.2% of the respondent households. Most households (93.1%) purchased at least some of their food.

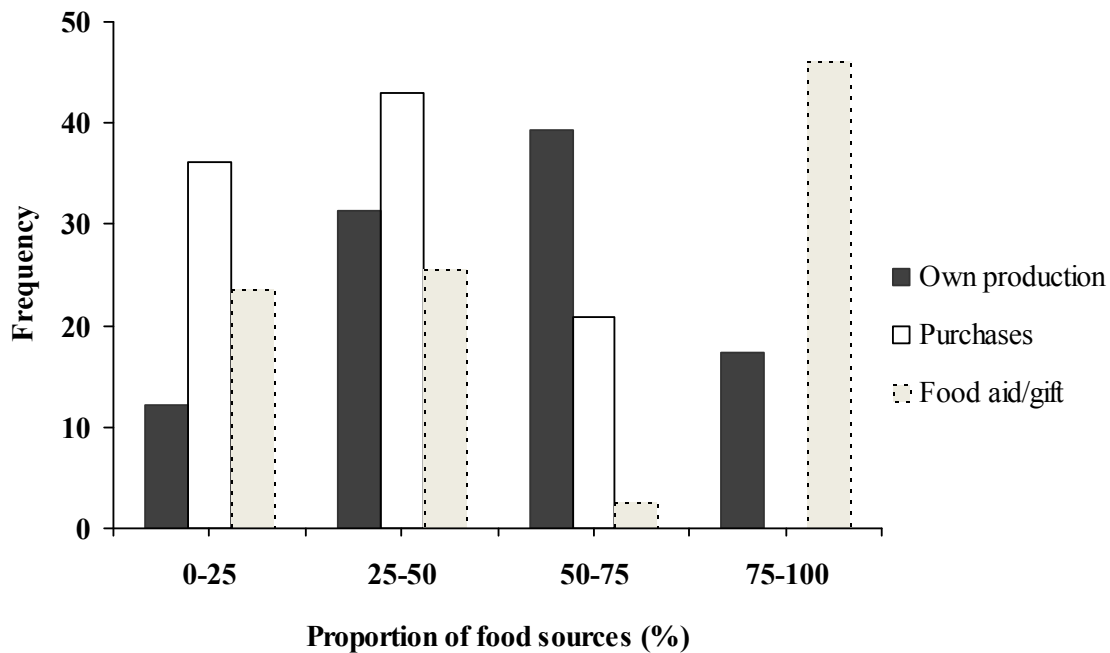


Figure 7.4 Proportions of food sources used by households in the study areas (N=534).

In general, food insecurity adversely affected the growth and development of young children. Most surveyed households (65.7% or N=356) claimed that their children ate two meals a day in the week prior to the survey. This was consistent with the 2004 Multiple Indicator Cluster Survey (MICS) conducted during the conflict period in Southern Sudan (UNICEF, 2004), which stated that older children often ate only two meals a day. However, in the current study, only eight (1.5% of the sample) households reported that their children ate more than four meals a day, while 15.7% reported that their children ate three meals per day. Interestingly, 13.2% of households claimed that their children ate one meal a day. Harvey & Rogers-Witte (2007) reported that malnutrition rates were not only high throughout Southern Sudan, but are extremely persistent. Despite the relative return of peace and increased access to markets, food aid and improved crop production, nutritional status has not improved (New Sudan Commission for Census, Statistics and Evaluation, 2004).

Table 7.8: Food and ingredient in households served in study areas (N=542)

How foods are served in households	Frequency	Percentage of households
Communally* for staple and sauce separately	121	22.3
Communally for both sauce and staple	118	21.8
Separately for all	72	13.3
Adults communally	62	11.4
Children communally	27	5.0
Separately for children	131	24.2
Others (children with adults, etc)	3	.6
Total	534	98.5
Missing System (No Responses)	8	1.5
Total	542	100.0
<i>*Communally means together</i>		

Foods, when available in households, are served in different ways. In 24.2% of households, children were served separately with both the sauce and staple served on the same plate. In some households (22.3%) food was served communally (form a common serving dish) with the staple and sauce served separately; and in 21.8% of the households, food are served communally with the staple and sauce served in the same serving dish. Serving children separately ensures that they are receiving a fair portion of the food rather than competing with adults – if this is a break with tradition it provides an indicator that mothers were protecting children. However, in this case the practice indicates rationing in times of food scarcity.

In summary, there was a significant increase in cereal production in the study areas of Western Equatoria but not in Upper Nile and Western Bahr-El Ghazal in the post conflict period (2005-2008). The major food sources were from own production, purchases and food aid or gifts. The households served food separately for children with the staple and sauce and staple in the same dish.

7.7 COPING STRATEGIES OF SURVEYED HOUSEHOLDS

The Coping Strategies Index (CSI) provides a quantitative score for each household, which is a cumulative measure of the level of coping and a measure of food insecurity (Senefeld and

Polsky, 2005). Surveyed households responded to a set of questions based on the principle “What do you do when you don’t have enough food, and don’t have enough money to buy food?” A reference period of 30 days prior to survey, the frequency of use was measured in a sliding scale (daily, 3-5 times per week, 1-2 times per week, never used). The survey considered only coping strategies relevant to local context in selected counties in Western Equatoria, Western Bahr El-Ghazal and Upper Nile.

Irrespective of respondent types, the patterns of employing coping strategy mechanisms were similar. The surveyed households employed a range of coping strategies in response to food insecurity during the 30-day period prior to the survey. Many (61%) surveyed households reported eating cheaper or less preferred foods in the 30-day period prior to the survey. Many (60%) households reported reducing their meal portion sizes, while 55.5% skipped meals. A high proportion of interviewed households (62.6%) heads claimed that mothers limited their food intakes to ensure could children eat. Borrowing food or money to buy food was reported by 55.5% of respondents and 36.9% reported rationing the days that food was eaten to avoid starvation. Table 7.9 presents the frequencies that coping strategies were employed by households in the study area.

Coping strategies are progressive and households may shift from one to another strategy. It can be projected that as the proportion of households with limited food increased, the range of reversible strategies available to households would be exhausted. Households may turn to detrimental strategies, negatively affecting their health and nutrition status, and possibly damaging future food security, increasing vulnerability. Table 7.9 presents the responses to the questions on coping strategies and showed that 44.9 % of the households have employed skipping meals. Table 7.10 showed the severity ranking of coping strategies on a focus group discussions conducted for this study.

Table 7.9: Frequency of coping strategies employed by households in the study areas

Frequency of coping strategy	Households using the coping strategies (%)						
	Reliance on less preferred/ expensive foods	Limiting portion sizes	Borrowing food or money to buy food	Maternal buffering	Skipping meals	Skipping days	
Daily	10.9	8.5	2.3	3.6	1.1	1.1	
Often	22.4	18.1	13.2	13.4	16.2	6.9	
Rarely	61.0	66.0	55.5	62.6	64.5	36.9	
Never	5.6	7.4	29.1	20.4	18.2	55.1	

Table 7.10 Severity ranking of coping strategies (CS) as per focus group discussion in the study area, July-August 2009

Coping Strategy	Eating less preferred foods	Limiting portions	Borrowing food money to buy foo	Maternal buffering	Skipping meals	Skipping days
Yambio	2.0	2.0	2.0	2.0	3.0	3.0
Maridi	2.0	2.0	3.0	2.0	2.0	4.0
Mundri East	1.0	3.0	3.0	2.0	2.0	4.0
Wau	1.0	2.0	2.0	3.0	2.0	3.0
Raja	1.0	3.0	3.0	4.0	3.0	4.0
Jur River	2.0	3.0	3.0	4.0	3.0	4.0
Malakal	1.0	2.0	2.0	2.0	2.0	3.0
Panyikango	2.0	3.0	3.0	2.0	4.0	4.0
Renk	1.0	2.0	2.0	2.0	3.0	3.0
Total CSI	13	22.0	22.0	23.0	23.0	23.0
Average	1.3	2.2	2.4	2.5	2.5	3.5
Consensus Severity Ranking of CS	1.0	2.0	2.0	3.0	3.0	4.0

Tables 7.9 and 7.10 showed that across study areas, the coping strategies employed during food insecurity were similar and started with eating less preferred foods, limiting food portions, borrowing money to buy food, maternal buffering, and skipping meals. Skipping eating for certain days was employed by households when food insecurity reached more severe stages. Skipping days for eating was employed (44.9% of households) when high food insecurity occurred in the areas of Maridi, Mundri East, Raja, Jur River and Panyikango. Eating less preferred foods was the most common coping strategy.

The CSI values in all the study areas showed that there was severe food insecurity at the time of the survey. Increasing cereal production from 2004 to 2008 was indicated in study areas. However, the increments were small, and the volume of production inadequate. This was further supported by the fact that 44.9% of the households (44.9%) were not eating every day (skipping days) at the time of the survey.

CHAPTER EIGHT: CONCLUSIONS AND RECOMMENDATIONS

The purpose of this study was to examine whether the household food security situation improved in post-conflict period (1998-2008) in Southern Sudan. The two sub problems explored were:

Sub problem 1: Has physical cereal production increased after the conflict?

Sub problem 2: How do the households cope with the decline in cereal availability?

8.1 CONCLUSIONS

The availability of cereals at the household level was generally low, although cereal production increased by small increments across the study areas after the conflict period. However, the increase in cereal production was inadequate to support the cereal needs of households, leading to food insecurity. The study identified the major factors responsible for food insecurity at the household level in the study areas as conflict, drought, flood and erratic rains. Poor infrastructure, weak policies and lack of access to services to improve farm production were among the key constraints reported by households. These factors were perceived by all stakeholders as root causes of inadequate food production in the study area.

Household production provided 56.6 % of household food consumption, but this was inadequate to provide year-round. Other food sources included purchases, food aid and gifts. Households relied largely on consumption-based coping strategies when faced with food shortages including: relying on less preferred food, limiting meal portion sizes, mothers reducing their food to allow children to eat and reducing the number of meals eaten per day. These strategies are detrimental to nutritional status of household members; considering that proper nutrition is critical for active and productive life.

Food insecurity was high in the study areas. While production of cereals was increasing very slightly, production was insufficient to sustain households throughout the year. Detrimental coping strategies were widely practiced, raising concerns of hunger and malnutrition.

8.2 RECOMMENDATIONS

Food insecurity in Southern Sudan needs to be addressed urgently. Direct interventions to support a significant scaling up of food production (beyond only cereal production) is needed to alleviate hunger, prevent malnutrition and provide for future food security especially among resettling refugees and demobilized soldiers. In many cases food aid and direct transfers of food is urgently needed to address the situation but should be short-term and part of an integrated plan to boost production of food at community level. Programmes to assist households should establish food gardens, diversify cropping and undertake non-farm activities in improving food production and productivity. Such programmes need to provide support for accessing neighbouring markets, particularly in the more drought-prone areas where food shortages are more acute. These activities should lead to production of more food in the table, generate income and strengthen coping strategies. Future programmes need to focus on supporting the natural resilience of households and monitor changes in coping behaviour over time and their impact on household food security.

The local communities should participate in community-based food security needs assessment with strong support provided by the county agriculture department and state Ministries of Agriculture. This must lead to the identification of implementation measures and development of food security plans and budgets. In drought prone areas, diversified interventions that support crop and animal husbandry activities should be encouraged. Food production and marketing to ensure food availability and increase income generation are urgently needed by establishing agro-forestry, communal gardens, and fish and poultry production. It is important to ensure sufficient food availability during seasonal shortages to reduce hunger periods. Priority should be placed on the rehabilitation and construction of rural infrastructure and the establishment of effective basic rural services such as: access to extension services, market information and linkages, road networks, transportation, production input supplies, processing facilities, and training, saving/credit facilities, production inputs supply and advisory services. Civil Society Organisation and NGOs need to support government in provision of information, advisory services and capacity building in particular.

At the political level, the establishment of inter-sectoral Food Security Council representing key ministries related to food security issues is encouraged. Such an institution could improve the general understanding of food security and improve stakeholders' ability to respond on food security interventions affecting rural communities. A Government framework should be developed to include strategic management of grain/cereal reserve and effective and efficient public food grain/cereal distribution system. This would protect consumption and reduce the need for households to employ damaging coping strategies. Government bodies at all levels should adopt good governance addressing directly in support of food security for all in Southern Sudan. Overall coordination of policies and programmes is needed for the development of an early warning system focusing on the food security status on the 10 states of Southern Sudan. This should include creating conditions for the smooth implementation of food security interventions by harmonising relevant sector policies related to market efficiency, trade, access to credit and build institutional capacity for implementation and monitoring of policy effectiveness.

The Ministry of Agriculture and Forestry and relevant government institutions; national, regional, continental and international development partners, should work in partnership to support establishing and strengthening food security information systems.

8.3 RECOMMENDATIONS FOR FURTHER RESEARCH

Longitudinal studies are recommended to monitor the food security situation in Southern Sudan and gain a deeper understanding of household coping strategies to inform policies and programmes. This is especially important for the moment in history that Southern Sudan is, where secession is likely to bring about considerable change and challenges and new policies and programmes will be needed.

Further research could investigate how to increase the supply of food, promoting dietary diversification, improve access to economic opportunities and manage risk to help vulnerable households become more resilient to absorb shocks, stresses and threats. This could include an

in-depth analysis of the contribution of a range of crops, livestock, forestry, apiculture, fisheries and market opportunities.

REFERENCES

AGRICULTURAL RESEARCH CORPORATION (ARC) SUDAN, 2003. *Food Security and Agricultural Productivity in the Sudan*. A paper to be presented in the Consultative Workshop for Eastern and Central Africa Organized by IAC and ASARECA. February 24-27, 2003. Nairobi, Kenya.

ALINOVI, L., HERMRICH, G, & RUSSO, L., 2008. *Beyond relief: Food security in protracted Crises*. FAO, Rome.

AMALRIC, F., 2001. *From aid to community empowerment on food security as a political project*. A report from SID (Society for International Development) initiative: Food security and sustainable livelihoods pp 5-20. Society for International Development, Rome.

AFRICAN UNION (AU), 2006. *Status of Food Security and Prospects for Agricultural Development in Africa, 2005*. AU Ministerial Conference of Ministers of Agriculture. January 31-February 1, 2006. Bamako, Mali.

BERAKI, Y., 2009. *Do household coping strategies mitigate perceived food insecurity among sample households in Dasse Administrative Area, Gash-Barka Zone, Eritrea?. Unpublished paper for Masters Degree, Faculty of Science and Agriculture, University of KwaZulu-Natal, Pietermaritzburg, South Africa. Unpublished paper. 2009.*

BURE-YONGO, B., 2007. *Economic Development of Southern Sudan*. University Press of America, Inc. Maryland.

Cooperative Assistance Rehabilitation Everywhere (CARE), 2005. *Report on the sustainability of food intake levels among households in conflict areas*. CARE Atlanta.

CURTIS, P. 1993. *Famine Household coping strategies: Their usefulness for understanding household response to armed conflict*. RSP documentation centre.

DANIEL, E, and KNUDSEN J, 1996. *Mistrusting refugees*. Los Angeles: University of California Press.

DIMA S, 2007. *Agricultural development in Southern Sudan*. A paper presented to strategic planning workshop, 27-30 May, 2007, Crop Training Centre, Yei: Government of Southern Sudan Ministry of Agriculture and Forestry.

Disarmament, Demobilization and Reintegration (DDR), 2006. Report on *the status of the demobilization and reintegration in Southern Sudan for peace and reconstruction*. UNDP New York.

FOOD AND AGRICULTURE ORGANIZATION (FAO) OF THE UNITED NATIONS AQUASTAT, 2005. *FAO's information on water and agriculture in Sudan. FAO-Land and water*. FAO, Rome.

FAO/WFP, 2004. *Crop and food security assessment mission to Southern Sudan report*. FAO, GIEWS, Rome.

FAO, 2006. *FAO's aquastat information on water and agriculture in Sudan. FAO Land and Water*. FAO, Rome. <http://www.fao.org/nr/water/aquastat/countries/sudan/index.stm> 26/11/2009. Accessed (01/10/2009)

FAO, 1996. *FAO/WFP Crop and food security assessment mission in Southern Sudan report*. Geographical Information Early Warning System (GIEWS), FAO, Rome.

FAO, 2003. *FAO/WFP Crop and food security assessment mission in Southern Sudan report*. GIEWS, FAO, Rome.

FAO, 2004. *FAO/WFP Crop and food security assessment mission in Southern Sudan report*. GIEWS, FAO, Rome.

FAO, 2005. *FAO/WFP Crop and food security assessment mission in Southern Sudan report*. GIEWS, FAO, Rome.

FAO, 2006. *FAO/WFP Crop and food security assessment mission in Southern Sudan report*. GIEWS, FAO, Rome

FAO, 2007. *FAO/WFP Crop and food security assessment mission in Southern Sudan report*. GIEWS, FAO, Rome.

FAO, 2008. *FAO/WFP Crop and food security assessment mission in Southern Sudan report*. GIEWS, FAO, Rome.

FAO, 2009. *FAO/WFP Crop and food security assessment mission in Southern Sudan report*. GIEWS, FAO, Rome.

FAO, 2010. *FAO/WFP Crop and food security assessment mission in Southern Sudan report*. GIEWS, FAO, Rome, 2010.

FAO, 2010. *The state of food insecurity report: addressing food insecurity in protracted crisis*. FAO, Rome.

FRANKENBERGER.T.R, 2007. *Sudan Food Assistance Transition Study*. Food and Nutrition Technical Assistance Project. Washington, DC.

GUVELE, C, DENG, L, B, ITTO, A, D'SILVA, B, 2003 *.Food security analysis*. USAID-Interim Strategic Plan. Publisher, Washington DC. http://www.usaid.gov/locations/sub-saharan_africa/sudan/sudan_isp_a3.pdf. (Accessed on 01/4/2009).

GOVERNMENT OF SOUTHERN SUDAN MINISTRY OF AGRICULTURE AND FORESTRY (GOSS MAF). (2006). *Food and Agriculture Policy Framework*. Government of Southern Sudan Ministry of Agriculture and Forestry, Juba.

GOVERNMENT OF SOUTHERN SUDAN MINISTRY OF FINANCE AND ECONOMIC PLANNING, 2008. Paper on *basic service delivery in Sudan*. Sudan Consortium, Oslo.

GOVERNMENT OF SOUTHERN SUDAN MINISTRY OF HEALTH, 2006. *Sudan Health Household Survey Report*, 2006. Government of southern Sudan, Juba.

HASSAN, G, 1976. *Policy statement agriculture and forestry presented to Southern Sudan Regional Assembly* Ministry of Agriculture, Animal Resources, Forestry and Irrigation, Juba.

HENDRIKS, S, L AND LYNNE, M, C, 2009. *Does food security improve when smallholders access a niche market? Lessons from the Embo Community in South Africa*. The African Centre for Food Security, University of KwaZulu-Natal. Intrepid Printers, Pietermaritzburg.

INTERNATIONAL FUND FOR AGRICULTURE DEVELOPMENT (IFAD), 2002. *Coping strategies commonly employed by vulnerable households in Southern Sudan*. IFAD, Rome.

IFAD, 2003. Rural Poverty Report 2003 *on the access to traded commodities during conflicts and war in Southern Sudan*. IFAD, Rome.

IFAD, 2005. *Managing risks while in conflict: Angola*. IFAD Report. IFAD, Rome.

IFAD, 2008. Rural Poverty Report *on the economic effects of war in households*. IFAD, Rome.

INTERNATIONAL COMMITTEE OR RED CROSS, ICRC, 1996. *World Food Summit: Security in armed conflicts-The ICRC's approach and experience* .

INTERNATIONAL FEDERATION OF RED CROSS AND RED CRESCENT SOCIETIES, IFRCC, 2009. *World Disaster Report*, 2009. ICRC Press, Geneva
http://www.ifrc.org/publicat/wdr2009/index.asp?navid=09_03(Accessed on 28/11/2009)

<http://ideas.repec.org/e/c/pvo93.html> (Accessed on 28/9/2009).

KANISIO, J.O, ROBERTO, M.K., POLESTICO, R.V., 2010. *Joint Baseline Survey for Agriculture and Animal Resources in Southern Sudan* pp 25-50. Unpublished Report, Juba.

KIDANE, W., MALETZ, M. and DARDEL,P., 2006. *Food security and agricultural development in Sub-Saharan Africa*. Building a case for more public support. Sub-regional office for Southern and Eastern Africa (Harare). FAO, Harare.

KIIR,S, 2006. *Policy Statement to Southern Sudan Legislative Assembly*. 10 April, 2006, Juba, Southern Sudan, Sudan.

MAHDI, S, T, 2009. *Trade and Liberalisation and Poverty reduction in developing countries; the case of Africa*. World Trade, World Poverty: Third conference of Institute of Human Rights, Indiana University-Purdue University, Fort Wayne, Indiana, September 10-20,2009.

MSAKI, MM, 2006. *Coping strategies index: A convenient indicator to assess household food security*. Unpublished PhD. African Centre for Food Security. University of KwaZulu-Natal, Pietermaritzburg.

MAXWELL, D, G.1996. *Measuring food insecurity: the frequency and severity of" coping strategies"*. Food Policy, 21, 291-303.

MKANDAWIRE, R, M. 2009. *Agriculture as pathway to hunger and poverty reduction in Africa*. A paper presented as an inaugural address at the University of KwaZulu-Natal, Pietermaritzburg on the award of an Honorary Doctorate (Honoris Causa) of Science in Agriculture, April 2009. .

MOCHONGE, B and ZZIWA, S.2004. *Agricultural and food security challenges of IGAD Region*. A paper presented at the NEPAD/IGAD Regional Conference" Agricultural successes in the Greater Horn of Africa". 22-24 November 2004. Nairobi, Kenya.

MZIBULE, C, 2004. *Community and Households Surveillance Systems (CHS) in Malawi. Food Security and Livelihood In-depth Trend Report*. Consortium for Southern Africa Food Emergency and World Food Program, Lilongwe.

NGIDI, M., 2008. *Measuring the impact of crop production on household food security in KwaZulu-Natal using the coping strategies index (CSI)*. Unpublished Masters of Science dissertation, Faculty of Science and Agriculture, University of KwaZulu-Natal, Pietermaritzburg, South Africa.

NEW SUDAN COMMISSION FOR CENSUS, STATISTICS AND EVALUATION (NSCCSE), 2004. *A report on the national survey on nutritional status of Southern Sudan*. New Sudan Commission for Census, Evaluation and Statistics, Juba.

O'BRIEN, J, 1981. *Sudan: An Arab Breadbasket. Middle East Research and Information Project*. JSTOR: MRIP Report No.99, pp.20-26. Cairo.

ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT, OECD-FAO, 2009. *OECD-FAO, Agricultural outlook highlights 2009-2018 Report*, 2009. <http://www.agri-outlook.org/dataoecd/2/31/43040036.pdf> (Accessed on 16/11/2009).

OYAT, M, 2009. *Report on the impact of agriculture, fisheries and vegetable production interventions and technology transfer on household food and livelihood security in four Southern Sudan States*. FAO Rome.

REGIONAL MINISTRY OF FINANCE AND ECONOMIC AFFAIRS, 1983. *Proceedings of the conference on Development in the Southern Region of Sudan, 5-8th April, Juba*. Annual Bulletin of Animal Resources Statistics, Issue No.7, (Khartoum, 1987). Something is wrong here.

SEN, A., 1981. *Poverty and famines: An essay on entitlement and deprivation*. Clarendon Press. Oxford.

SENEFELD, S, AND POLSKY, K, 2005. *Chronically ill households, food security, and coping strategies in rural Zimbabwe*. Christian Relief Services, Lilongwe.

SAVE THE CHILDREN UNITED KINGDOM (SC-UK), 20017. *Report on the effects of war in vulnerable households in Southern Sudan 1996-2000*. SC-UK, Khartoum.

SUDAN INSTITUTIONAL FOOD SECURITY INFORMATION FOR ACTION (SIFSIA), 2008. *Report on the cereal availability in southern Sudan from 1998- 2004*. FAO, Juba.

SOUTHERN SUDAN COMMISSION FOR CENSUS, STATISTICS AND EVALUATION, 2008. *Sudan population and housing census report*. Government of Southern Sudan, Juba.

SUDAN PEOPLES' LIBERATION MOVEMENT, SPLM, 2003. *The agriculture and GDPs in Southern Sudan*. SPLM Economic Commission, Juba

SUDAN PEOPLES' LIBERATION MOVEMENT, SPLM, 2004. *The SPLM Strategic Framework from War-to-Peace Transition*. SPLM Economic Commission, Juba

TASKFORCE ON HUNGER, (2005). *Millennium project. Halving hunger: It can be done*. FAO Rome.

TERR, B., 2008. *Orientations and challenges of economic and social reconstruction in Sierra Leone and Liberia*. Regional workshop on post-conflict and development (for the Development of a Regional Post-conflict Reconstruction Policy), Golf Hôtel Abidjan, Côte d'Ivoire 3 - 5 June 2008 (Accessed on 28/11/2008).

TERRY, F, 2002. *Condemned to repeat? The paradox of humanity action*. Ithaca: Cornell University Press. California

UNITED NATIONS DEVELOPMENT PROGRAMME (UNDP), 2008. *UNDP Human Development Report on the poverty indices across African region*. UNDP, New York.

UNICEF, 2004. *A report on the status of children in conflict areas: prevalence of wasting, stunting and underweight among African countries in conflict*. UNICEF, Geneva.

UNICEF, 2005. *A report on the basic economic indicators in Africa region*. UNICEF, Geneva.

UNHCR, 2006. *A Global Report on the Status of Refugees: the human development index- a comparative analysis among post conflict regions*. UNHCR, Geneva.

UNHCR, 2008. *A report on the Institutional response on the relief operations in Southern Sudan*. GoSS, Juba

UNITED NATIONS UNIVERSITY (UNU) INSTITUTE OR ADVANCED STUDIES (IAS), 2004. *Agriculture for peace*. UNU Press, Tokyo.

VON BRAUN, J., 2008. Rising food prices: What should be done? Policy brief. International Food Policy Research Institute (IFPRI). Pp 10-25. IFPRI, Washington DC.

World Food Programme WFP, 2007. *Comprehensive Food Security and Vulnerability Analysis Report in Southern Sudan*, GoSS Juba.

WFP, 2008. *The potential immediate and short-term effects of armed conflict*. Emergency food security training guide sheet. Government of the National Unity Khartoum.

WFP, 2009. *Southern Sudan Annual Needs and Livelihoods Assessment Report*, Juba, Southern Sudan. GoSS, Juba.

WFP, 2005. *Sudan Annual needs Assessment 2004/2005 food security report. Regional outlines and recommendations*. A collaborative report of WFP and FAO, NGOs, Government of Sudan (Khartoum), and Southern Sector Counterparts, Operation Lifeline Sudan (OLS), Nairobi.

WORLD BANK, 2008. *Agriculture for Development. World Development Report*. World Bank, Washington, D.C.

WORLD BANK, 1986. *Poverty and hunger: Issues and options for food security in developing countries*. Washington, D.C.

APPENDICES

Appendix A: Household Questionnaire

Date			
County		Payam	
Boma		Village	
Name of the respondent			
Sex	01 = Male 02= Female		
Relationship to household head		1=spouse, 2=father, 3=mother, 4=son, 5=daughter, 6=other (specify)	
Name of interviewer			
Name and Signature of Supervisor:			

A. Social economic aspects

Household background information

Demographic data			
1.1 Age of Household head	1. Below 16, 2. Above 25, 3. Above 55		
1.2a Education level of household head		01=no formal education, 02=some primary education, 03=completed primary education, 04=secondary,05=Post-secondary	
1.3b Education level of Spouse of head			
1.4a Household size		(see definition of household)	
1.4b Number of adult males aged		1.4c Number of adult females	

16 years & above		aged 16 years & above	
1.4d Number of household members below 16 years old			
Household characteristics			
1.7 Type		1=Resident 2=IDP 3=Returnee	

2. Source of agric. services: If Government, NGO, and Farmers' Organisation. Give details below (Tick one or more):

SOURCE OF AGRIC. SERVICES	
(01) Government	
(02) NGO	
(03) Farmers' organization	
(04) Other(specify)	

(* 01 – government, 2 NGO and 3 farmers organization)

3. Mention at least one government policy you know in agriculture

.....
.....
.....

3. a. has the government policies made any change (+ or -) in your household food security?
(Yes or No)

Policy	
GOSS	
State	

County	
--------	--

3. b. If yes or, elaborate more on the change(s) brought about by the policies

Positive effect/Contribution	Negative/Contribution
a. Increased access to extension services	a. Inadequate access to extension services
b. More market information	b. No market information
c. Good road network within the County	c. High transport cost to market points

4. What other services do you wish to access to improve your food security? (Indicate all that apply in order of importance)	
Production inputs	
Advisory services	
Processing facilities	

Market linkage	
Market information	
Savings and/or Credit facilities	
Agriculture skills training	
* 1 for the most important and 10 for the least important. The range of values is between 1 to 10)	

B. Farm holding

5. What is the size of land holding for this household?

Description	Feddans
Total land owned	
Total arable land owned	
Land under use – Agriculture	

C. Food Security

7. What are the three sources of food in your HH (Tick one or more)?

Source of food	
Own Production	
Purchases	
Food aid/gift	

8. What are the proportions of food source in your household in normal (good) year (Use proportional piling)?

Food source	
-------------	--

Own production	
Purchases	
Food aid/gift	
9. How many meals are eaten in a day by children in your household last week?	
1 meal	3 meals
2 meals	4 meals
	More than 4
10. How is food usually served in your home (circle appropriately)?	
Communally for staple and sauce separately	adults communally
Communally for both sauce and staple	Children communally
Separately for all	Separately for children
	Others (specify)

11. When there is shortage of food how does your household cope? (Multiple answers accepted as you explore extent and duration)

Indicator	Relative frequency score (for HH; result from survey questionnaire)
-----------	---

Relying on less preferred and less expensive foods	4=Never (0 times/week) 3=Rarely (1-2 times/week) 2=Often (3-5 times/week) 1=Daily
Limiting portion size	4=Never (0 times/week) 3=Rarely (1-2 times/week) 2=Often (3-5 times/week) 1=Daily
Borrowing food or money to buy food	4=Never (0 times/week) 3=Rarely (1-2 times/week) 2=Often (3-5 times/week) 1=Daily
Maternal buffering (mother limits her intake to ensure child has food)	4=Never (0 times/week) 3=Rarely (1-2 times/week) 2=Often (3-5 times/week) 1=Daily
Skipping meals	4=Never (0 times/week) 3=Rarely (1-2 times/week) 2=Often (3-5 times/week) 1=Daily

Skipping days (whole days without food)	4=Never (0 times/week)
	3=Rarely (1-2 times/week)
	2=Often (3-5 times/week)
	1=Daily

D. Market information

12. What market information do you usually look for when you want to purchase food? (Multiple answers allowed)

1. Unit price
2. Quantity of commodities demanded
3. Quality of commodities demanded
4. Presentation/packaging of products
5. Timing of supply
6. Market dues/levies
7. Transport costs/availability

13. Where do you usually get market information from?

1. Print media
2. Electronic media

3. Extension workers

4. Neighbours /friends

5. Physical visits to markets

6. From traders/middle men who come to buy/sell

E. Gender issues

14. Who is usually involved in food production, purchase, receiving food aid or gift in your household? (Fill in the codes)

Enterprise	Who mainly is involved (codes): 1=man; 2=woman; 3=both; 4=children; 5=both women and children 6=..... 7=.....
Food production	
Food Purchases	
Food aid/gift	
4.....	
5.....	

Appendix B: Check list for Focus Group Discussions

1. Sources of agricultural services

1.1 Cereal Crops grown for food and cash at household level;

1.2 Food availability and food provisioning at household level;

1.4 Major constraints at farm level;

1.5 Access and availability of agricultural extension/advisory services

2. Conflict

2.1 What are the types of shock which areas are most vulnerable to the identified shock?

2.2 How does conflict affect agricultural production and food security in your area?

3. Food Security

3.1 No of meals per household;

3.2 Access to food from markets;

3.3. Balance diet of foods;

3.4 Dependency on food aid;

3.5 Nutrition status of children;

3.6 Coping strategies to the food insecurity at the household level;

4. Market information

4.1. Major external sources of food supplies;

4.2. Market-Exchange and key tradable crops

4.3. Marketing constraints encountered by farmers;

5. Gender issues

5.1 Who is involved in crop production, purchase and receiving food aid (relief food?)

5.2 How have the government interventions changed the gender equality in the household, community and county organs?

Appendix C: Estimated cereal area, yield, production, consumption and balance in 2008/09-Southern Sudan (FAO/WFO/CFSAM, 2009)

State/County	Area-harvested (ha)	Yield (t/ha)	2008 cereal production (tonnes)	2008 net cereal Production (tonnes)	Population mid-2009	Consumption (t/year) ^{1/}	Surplus (+)/deficit (-) (tonnes)
Upper Nile	58 113		49 278	39 422	723 691	64 788	-25 366
Returnee (07/08)*	793	1.1	872	697	16 264	1 626	-929
Renk	2 679	1.2	3 215	2 572	21 701	2 170	402
Fashoda	6 671	0.9	6 004	4 803	54 324	5 432	-629
Panyikango	4 362	0.9	3 926	3 141	35 519	3 552	-411
Sobat	3 751	0.9	3 375	2 700	45 810	3 665	-964
Latjor/Nasir	36 158	0.8	28 927	23 141	441 648	35 332	-12 191
Malakal	3 699	0.8	2 959	2 367	108 426	13 011	-10 644
Jonglei	92 934		101 596	81 276	1 116 999	104 123	-22 847
Returnee (07/08)*	973	1	973	779	15 361	1 536	-758
Old Fangak	18 249	0.9	16 424	13 139	198 132	17 832	-4 693
Atar	4 345	0.9	3 910	3 128	47 173	4 246	-1 117
Nyirrol	1 862	1.1	2 048	1 639	20 216	1 819	-181
Ayod	18 597	1.2	22 316	17 853	201 906	18 171	-319
Waat	8 193	1.1	9 012	7 210	88 954	8 006	-796
Wuror	5 214	1.1	5 735	4 588	56 610	5 095	-507
Diror	4 606	1.1	5 066	4 053	50 005	4 000	-447
N.Bor	10 721	1.2	12 865	10 292	116 395	10 476	-184
S.Bor	1 142	1.2	1 370	1 096	13 944	1 255	-159
Bor Town	841	1.1	925	740	21 580	1 942	-1 202
Pibor	8 805	1.1	9 685	7 748	172 068	15 486	-7 738
Akobo	6 599	1.2	7 919	6 335	80 599	9 672	-3 337
Pochalla	2 788	1.2	3 346	2 677	34 055	4 087	-1 410

State/County	Area-harvested	Yield (t/ha)	2008 cereal production	2008 net cereal	Population mid-2009	Consumption	Surplus (+)/deficit (-)
--------------	----------------	--------------	------------------------	-----------------	---------------------	-------------	-------------------------

	(ha)		(tonnes)	Production (tonnes)		(t/year)1/	(tonnes)
Unity	47 196		46 251	37 001	661 351	59 814	-22 813
Returnee (07/08)*	2 090	1.2	2 508	2 006	39 580	3 958	-1 952
Ruweng	3 925	0.8	3 140	2 512	54 785	4 383	-1 871
Bentiu	2 208	1.2	2 650	2 120	64 740	8 416	-6 296
Rubkoana	1 963	1.4	2 749	2 199	57 552	7 482	-5 283
Mayom	3 662	0.9	3 296	2 637	67 096	5 368	-2 731
Guit	4 608	0.9	4 147	3 318	56 282	4 503	-1 185
Koch	12 123	1	12 123	9 698	131 619	10 530	-831
Leer	6 843	1	6 843	5 474	83 579	6 686	-1 212
Panyijar/Myandit	9 774	0.9	8 797	7 037	106 117	8 489	-1 452
Warrap	219 355		274 417	219 533	1 890 744	189 506	30 027
Returnee (07/08)*	2 588	1	2 588	2 071	38 395	3 839	-1 769
Twic	48 579	1.1	53 437	42 750	449 704	44 970	-2 221
Gogrial	62 298	1.3	80 987	64 790	570 694	57 069	7 721
Gogrial Town	841	1	841	673	21 580	2 590	-1 917
Tonj	105 048	1.3	136 562	109 250	810 371	81 037	28 213
Northern Bahr El-Ghazal	111 506		83 604	66 883	1 395 461	118 435	-51 551
Returnee (07/08)*	8 339	0.9	7 505	6 004	177 008	19 471	-13 467
Aweil W	26 131	0.7	18 292	14 633	307 870	24 630	-9 996
Aweil N	17 634	0.8	14 107	11 286	207 757	16 621	-5 335
Aweil E +Aw ak	36 765	0.7	25 736	20 589	433 161	34 653	-14 064
Aweil S	22 275	0.8	17 820	14 256	244 870	19 590	-5 333
Aweil Town	363	0.4	145	116	24 795	3 471	-3 355
Western Bahr El- Ghazal	43 920		68 409	54 727	414 665	54 337	390
Returnee (07/08)*	2 151	1.7	3 657	2 926	38 951	3 895	-969
Raja	4 809	1.7	8 175	6 540	39 156	3 916	2 624
Raja Town	3 528	1.3	4 586	3 669	60 373	7 848	-4 179

Wau	29 682	1.6	47 491	37 993	228 974	27 477	10 516
Wau Town	3 750	1.2	4 500	3 600	86 161	11 201	-7 601
Lakes	113 352		136 216	108 972	967 640	91 824	17 149
Returnee (07/08)*	5 448	1	5 448	4 358	81 801	8 180	-3 822
Cueibet	12 828	1.3	16 676	13 341	103 906	9 352	3 989
Rumbek	50 915	1.2	61 099	48 879	391 795	39 179	9 699
Yirol	33 873	1.2	40 647	32 518	289 611	26 065	6 453
Awerial	10 288	1.2	12 345	9876	100 527	9 047	829
Western Equatoria	149 621		272 163	217 730	877 042	96 821	120 909
Returnee (07/08)*	703	1.5	1 055	844	17 321	2 252	-1 408
Tambura	17 512	1.7	29 771	23 817	108 896	11 979	11 838
Yambio	49 985	2	99 970	79 976	262 998	28 930	51 046
Ezo	14 026	1.3	18 234	14 587	95 938	10 553	4 034
Maridi	32 062	2	64 124	51 299	182 752	20 103	31 196
Mundri	35 332	1.7	60 064	48 051	209 138	23 005	25 046
Central Equatoria	86 246		132 364	105 891	744 669	82 399	23 492
Returnee (07/08)*	841	1.2	1 009	807	20 707	2 692	-1 885
Juba	11 298	1.4	15 817	12 653	72 446	7 245	5 409
Juba Town	2 206	0.8	1 765	1 412	107 794	11 857	-10 445
Yei	29 361	1.5	44 041	35 233	301 243	33 137	2 096
Kajo-Keji	28 587	2	57 173	45 738	162 943	17 924	27 815
Terekeka	13 954	0.9	12 558	10 047	79 537	9 544	502

State/ County	Area-harvested (ha)	Yield (t/ha)	2008 cereal production (tonnes)	2008 net cereal Production (tonnes)	Population mid-2009	Consumption (t/year)	Surplus (+)/ deficit (-) (tonnes)
Eastern Equatoria	79 397		86 880	69 504	862 349	91 656	-22 152
Returnee (07/08)*	1 426	0.9	1 284	1 027	22 806	2 965	-1 938

Torit	17 395	1.1	19 134	15 307	199 965	19 997	-4 689
Budi	14 815	0.9	13 333	10 667	160 845	16 084	-5 418
Magwi	13 442	1.5	20 163	16 131	131 350	13 135	2 996
Ikotos	19 391	1.1	21 331	17 064	157 901	20 527	-3 463
Kapoeta	12 928	0.9	11 635	9 308	189 482	18 948	-9 640
TOTAL	1 001 638		1 251 176	1 000 941	9 654 611	953 703	47 238