

**DETERMINANTS OF CURRENT FOOD PRICE HIKES
AND THEIR IMPLICATIONS IN THE NORTHERN
STATES OF SUDAN**

**A National Consultancy Report
Submitted to
SIFSIA-N/FAO**

October 2008

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1. INTRODUCTION

1.1 Overview of recent global price changes

Over the past few years there has been a world-wide concern about sharp increases in food prices due to their negative impacts on food and nutritional status for wide sectors of the population, especially the poor in developing countries, and their repercussions in terms of potential food riots (IFPRI 2008, World Bank 2008). In 2007 the international food price index rose by nearly 40%, compared with 9% the year before, and in the first three months of 2008 prices increased further, by about 50% (von Braun 2008). Between January 2007 and January 2008 wheat nominal prices rose by 240% and real prices by 172%. Wheat export prices from USA climbed from \$375/ton in January to \$425/ton in February 2008, and Thai rice export prices increased from \$365/ton to \$475/ton. This comes on top of a 63% increase in global wheat prices over the past three years and a 33% increase in overall global food prices (World Bank 2008). Food price inflation (January 2007-January 2008) went up significantly across a range of countries e.g. China (18%), Sri Lanka (34%), Moldova (15.5%) and Armenia (10.6%). The price rise in international markets has been transmitted to many developing countries as reflected by soaring maize prices in Kenya, Uganda and Ethiopia and wheat prices in Ethiopia, although transmission has been lower in China and India (von Braun 2008).

The FAO Food Price Index (FAO Website 2008) has been steadily rising on monthly basis since 2006 to reach a record of 219 points in June 2008. Although the Index has been on a sharp decrease since then – falling in September to a nine-month low of 188 points – it was still much higher in 2008 than in 2007. The decline was a result of a rapid decrease in international prices of all major food and feed commodities, but the Index was still up 11 points from its value in September 2007 and as much as 51% above that of September 2006. Further, the FAO Food Commodity Price Index has been steadily declining for cereals, dairy products and oils and fats since March 2008, but the indices for meats and sugar have been rising. The Cereal Price Index fell from its peak of 278 in April to 228 points in September 2008 when the international cereal prices were subjected to a downward pressure in anticipation of a strong rebound in world supplies. Yet the Index was still up 10% from its corresponding period in the previous year. The Dairy Price Index fell to 218 points in September, down almost 12% from its August level and by about 28% from its peak in November 2007. Meat prices rose steadily since the beginning of 2008, although rising slaughtering rates combined with a slowdown in demand have begun to put a downward price pressure in September 2008. In Arab countries many food commodities have shown a rising trend of their price over the past few years (AOAD 2008).

Food price hikes have been attributed by IFPRI to various factors. Among these factors is the high demand for food driven by high economic growth, also accompanied by agricultural diversification toward high-value agricultural products that are on rising demand. Further, global food production has been declining over the past years, being partly affected by global climate change. This has induced steep depletion of global cereal stocks, particularly wheat. Rural-urban population shifts have also influenced spending and consumer preferences. Rising petrol prices, besides impacting food prices, have increased competitiveness of biofuel production, which draws highly of feed stocks, especially maize leading to its higher prices that in turn led to increasing prices of other grains (Rosegrant 2008). IFPRI's scenario analysis (von Braun 2008) suggests that structural forces will keep food prices high compared to the past decade for years to come, but the rise may not necessarily continue to be that steep.

1.2 Objectives

The international price situation is expected to reflect on the price situation in Sudan where signs for dramatic rise in food prices are already evident. This study, initiated by SIFSIA/FAO – Sudan (see the TOR in Appendix 1), aims to evaluate recent changes in the prices of important food commodities in the 15 Northern States of Sudan in terms of magnitudes, impacts, response measures taken so far, and relevant needed future policy and other interventions by various actors to mitigate the negative impacts of food price hikes. This initial information is meant to provide a basis for better understanding of the currently driving food inflation and the causalities of its driving force in Sudan. The specific objectives of the assignment are to:

- Examine the magnitude of food prices increase in Sudan,
- Identify the determinants of food price increases and assess the marketed supply and demand and their interactions,
- Examine the impacts of current soaring prices on the poor (urban and rural),
- Analyze the short term policy and program response options useful in containing, reversing and mitigating the impacts of the escalating prices.

1.3 Methodology

As presented under Section 1.1 a brief overview of global food price rises is first presented from literature sources, highlighting their quantifiable magnitude and providing an account of their underlying causes. The study then undertakes thorough analysis of the magnitude of price changes in Sudan at wholesale and retail levels using graphical presentations along with time and geographical market dimensions, supported by trend analyses, measures of central tendency, growth rates, inflation rates, and correlations of prices at various markets as well as those of internal and world market prices. The time horizon of annual price analyses mostly focused on the period 2000-2008 but longer time periods are considered in some cases. Based on the annual price patterns, the period January 2007 to June 2008 is selected as the monthly dimension for selected food markets since food prices in Sudan were predominantly soared during this period. In identifying the determinants of current food price hikes relevant macroeconomic and sectoral policy environments that intermingle with external factors to shape price patterns is illustrated with times-series and growth quantification of their causal factors. Internal factors that influence the prices of food commodity groups and individual food items as

well as their demand and supply attributes are again subjected to time-series trend analyses while quantified information is solicited from the results of an informal field survey conducted in nine major state markets in the country (see data sources below). Impact of price rises on various stakeholders, namely producers, traders, processors and consumers is derived mainly depending on the field survey. While it was not possible to provide a thorough quantification of the poverty dimension in relation to food price hikes within the scope of this study, implications of soaring food prices on the poor are well illustrated. The survey also provided information on interventions already undertaken by various players in the food market that could have mitigated the effect of soaring prices as well as their views on possible interventions that would lead to the same objective.

1.4 Data sources

A range of standard approaches and procedures for information gathering are used. Various relevant local and international literature sources were consulted for a better conceptualization of the issue and tapping of information and data related to price hikes. Statistics on food prices, supply and consumption was tapped from various sources including the Planning and Agricultural Economics Administration of the Ministry of Agriculture and Forests, the Central Bureau of Statistics (CBS), annual reports of the Central bank of Sudan (CBoS), Ministry of Finance and National Economy, Customs Administration and the Agricultural Bank of Sudan (ABS). Data were screened and treated for outliers and entry errors, but since all of this data is from official sources its reliability is considered as satisfactory.

An informal field survey was conducted in nine capital states' markets where various people engaged in or concerned with food price changes were interviewed. The markets covered were Khartoum, Kosti, Damazin, El Obeid, El Fashir, El Gedarif, Port Sudan, Eddamer and Dongola. Interviewees included government officials, traders, processors, consumers, and some NGOs. Depending on guidelines for interviews, questions asked targeted four basic issues, namely the interviewees' perceptions of the magnitude of price rises, impacts of price rise on their situation, interventions so far made to alleviate the situation, and possible further required interventions from various players that would lead to reduction in price hikes. Various types of statistics emerged from the field survey that were used to support the findings and results. Such data include different types of taxes and charges, food prices, production expansions, consumption and traded food quantities. Some of these data types are estimates by respondents and accordingly their reliability is variable, but many other data taken from records at the state institutions or grain market records data have satisfactory reliability. An account of the categories of interviewees covered in different states, interview guidelines, and a crude summary of the survey results are provided in Appendix 2 while the data used in the analysis are presented in Appendix 3.

1.3 Scope of coverage of food items

At the start of the study five food commodity groups were considered, namely cereals and their products, oil seeds and their oils, livestock and their products, vegetables and food legumes. However after preliminary analysis, it was found that there were no noticeable rises in the prices of vegetables and their fluctuations follow the normal seasonal patterns.

Consideration of food legumes, on the other hand, was confronted with scarcity of data on prices, production, consumption and the like, and when data is available, its reliability is questionable. Accordingly, vegetables and food legumes were dropped from the analysis. The three groups of commodities addressed in the study are the predominantly main agricultural commodities in the country, forming about 93% of the agricultural GDP in 2004 measured at farm gate prices (recalculated from Faki and Taha 2007). They are also major consumed products in Sudanese diets. The individual food items of the three food groups were:

- 1) Cereals:
 - Sorghum grain, sorghum flour and sorghum bread “*kisra*”.
 - Wheat grain, wheat flour and wheat bread.
 - Millet grain.
- 2) Oil Seeds:
 - Groundnuts (unshelled) and groundnuts oil.
 - Sesame seed and sesame oil.
- 3) Livestock:
 - Sheep and mutton.
 - Cattle and beef.
 - Poultry meat
 - Fresh milk and imported powder milk

1.5 Organization of the study

The study is organized in six Chapters. Following this introductory part, Chapter 2 addresses the magnitude of price changes in Sudan covering the price patterns of the food items under consideration. Chapter 3 deals with the determinant of price changes in Sudan where various policy and other causal factors are discussed. This is followed by Chapter 4, which displays the impacts of food price rises on different players in the food market, followed by Chapter 5 in which the types of undertaken and required interventions as thought by stakeholders to address price rises are portrayed. Finally, Chapter 6 gives conclusions and recommendations on relevant short-term policy actions on the food price issue. Appendices are given at the end of the documents.

2. MAGNITUDE OF PRICE CHANGES IN SUDAN

2.1 CEREALS

Sorghum, millet and wheat are the major staple foods in Sudan. The three cereals are produced in the country and their production is primarily consumed domestically. Rice, mostly imported is not a major essential food item in Sudan and represents a secondary dish in common Sudanese diet, but it might be used in social occasions such as marriage. Sorghum forms the major food among the three grain types. Although it forms one of the traditionally exported products, its exports have been quite variable in amount and are often subject to restrictions in response to policies that have always had a priority target of ensuring its domestic availability. Sorghum exports, which reached about 613,000 tons in 1993, were only 2,336 in 2005 and 43,000 in 2007 (Bank of Sudan, various Annual reports). Millet is predominantly produced and consumed locally, while Sudan is a net importer for wheat. Due to low and variable domestic production of wheat, imports of wheat and wheat flour in terms of wheat equivalent have been escalating, reaching about 1.35 million tons in 2006 compared to about 0.6 million tons in 1999. Total cereal production in the country has ranged over the last five years between 4 and 6 million tones. It accounts for about 65% to total annual grain requirements (El-Dukheri 2007), the balance being mainly imported wheat. Due to the high importance of these food grains in the population diets, their price levels are crucial for people's access to food. This is especially critical given the already high and increasing poverty, especially in rural areas. The incidence of rural food poverty increased in the period 1990-1996 from a range of 55-77% to a range of 91-97% in the Regions of Khartoum, Northern, Eastern, Central, Kordofan, and Darfur, while its depth witnessed similar increases (Faki and Nur 2008).

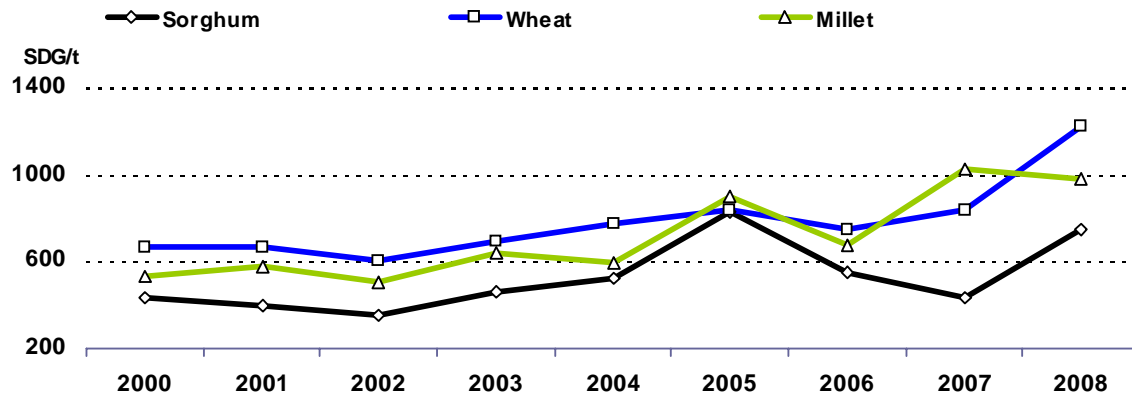
Statistical records of the Ministry of Agriculture and Forests reveal that, on average, sorghum accounts for 78% of total cereals produced in the country, wheat 9% and millet 13%. Out of the total area grown with cereals, sorghum occupies about 71%, wheat 3% and millet 26%. Over the last five years sorghum's total production ranged between 2.8 and close to 5 million tones. Wheat total production ranged between 0.332 and 0.669 million tones, while that of millet varied from 0.581 and 0.796 million tons.

Price changes, especially of sorghum and millet, are usually governed by the level of the marketable surplus, which forms an important component of the household economy in rural areas (El-Dukheri 2007). Since the marketable surplus is very much a function of the level of domestic production, prices change in response to the locally produced amounts, although international prices might play an important role. For wheat, most local supply is from imports and the world prices would therefore be expected to form the most important determinant of domestic prices.

Average wholesale price movements of the three cereals in different markets in the period 2000-2008, shown by Fig. 1, indicate fairly normal increasing price trends up to 2006, despite the 2005 peak that was obviously due to low production in season 2004-2005. Price hikes were witnessed in 2007 for millet and wheat and further in 2008 for sorghum and wheat. It can be calculated that price changes between 2006 and 2008 were 35%,

45% and 63% for sorghum, millet and wheat, respectively. Compared with a general estimated inflation rate of 16% during the same period¹, price of the three cereals can be considered to soar enormously with most of the price rises for sorghum and wheat occurring in the 2007-2008 period.

Figure 1. Development of average wholesale prices of main cereals in Sudan 2000-2008*



* Prices in 2008 are averages of the January-June period.

Sources: Price data from the Ministry of Agriculture and inflation from the Central Bureau of Statistics.

While the above analysis gives an overall picture of the general wholesale cereal price changes, it is useful to trace monthly changes for individual cereals at different markets focusing on the 2007-2008 when price hikes are witnessed.

2.1.1 Sorghum

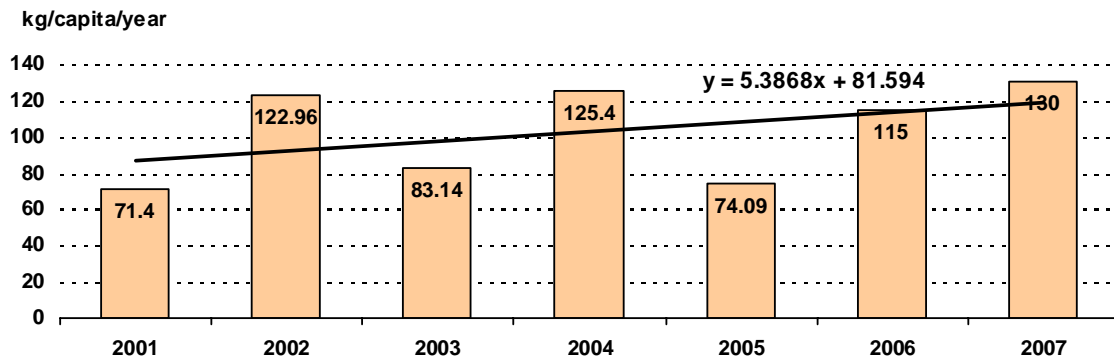
Sorghum, the main staple food grain in the Sudan, is produced in all production systems and occupies the largest cultivated area. Its major demand is for food but its demand for feed is increasing. Amounts ranging from 200 to 530 thousand tons were reported to be utilized for livestock feed in the period 1995/96 – 2002/03 (El-Dukheri 2007). This forms 3-7% of total grain utilization, but would make 5-18% of total sorghum production in the same period. With continual expansions in fattening, dairy and poultry production in urban areas, the demand for sorghum grain as feed is expected to have increased in recent years.

Sorghum per capita consumption trend has been increasing in spite of its variability, which seems to be affected by the level of prices that are in turn influenced by domestic production. This is clear in the low per capita consumption in 2005 (Fig. 2) when prices were escalating. The linear-trend equation in Fig 5 shows that per capita consumption increased on average by approximately 5.4 kg per year in the period 2001-2007. At high prices, people are expected to shift to other substitutes, reduce own consumption as well as the part of grain used as livestock feed. In areas of severe deficits food aid is provided that covers part of the consumption requirements but food shortages and sometimes famines occur resulting in the observed rural-urban migration. Variability in sorghum consumption

¹ Inflation for 2008 was for the January-July period. Since an overall general inflation record was not available for 2008, an average consumer price index was estimated from the available consumer indices of the high, medium and low income groups for the January-July period, according to which the 16% inflation rate was estimated.

extends to include total grain utilization in the country amounting to as high as 8.206 million tons in 1998/99 and as low as 4.835 million tons in 2001/02 (El-Dukheri 2007).

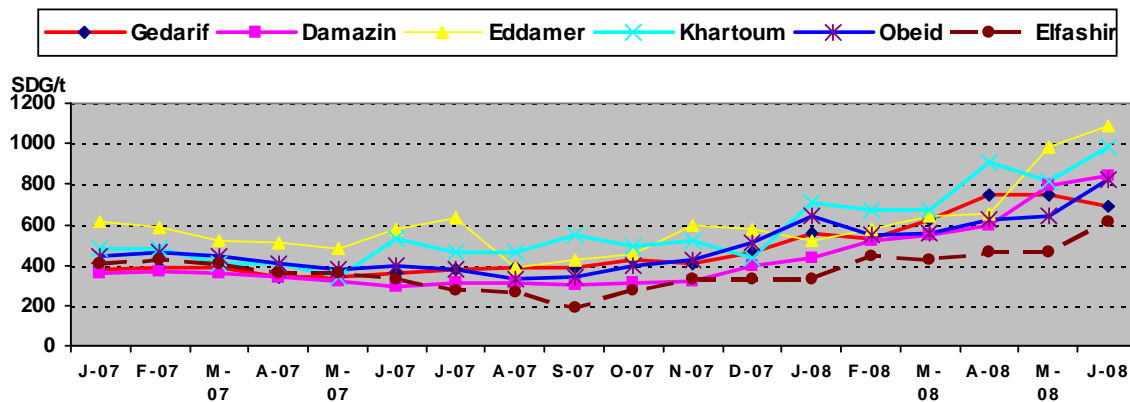
Figure 2. Average annual per capita consumption of sorghum during 2001-2007



Source: Data compiled by the Planning and Agricultural Economics Administration, MoAF

Monthly wholesale grain prices during 2007 and the first half of 2008 in different markets reflect the price development over the recent period that coincides with world-wide price hikes. This is shown in Fig. 3 for selected markets where prices largely move together indicating high integration of sorghum markets in the country. Higher prices are however recorded for Eddamer and Khartoum, which are net consuming areas, and the lowest at El Fashir, most probably due to food aid deliveries. Most of the price rise was from September 2007 after which prices increased steadily by about 130% on average by June 2008.

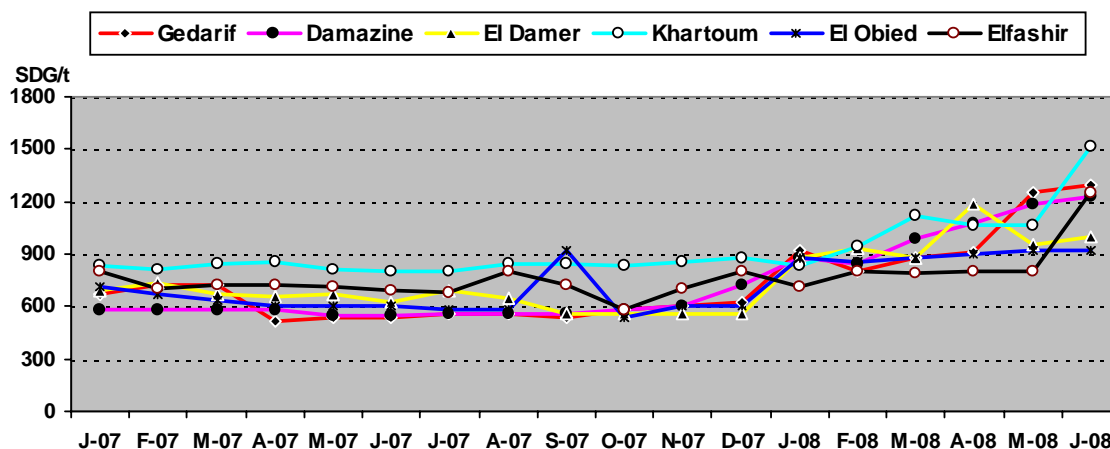
Figure 3. Sorghum grain wholesale prices in selected regions Jan 2007-Jun 2008



Source: Data of the Planning and Agricultural Economics Administration, MoAF

Sorghum's monthly consumer prices (average of *Feterita* and *Dabar* varieties) in selected markets, depicted in Fig. 4, show irregular increasing trends as from January 2007 following a largely stable pattern in the earlier months. Prices at Khartoum were the highest over most months while those at El Fashir were generally lower as from January 2008. The irregular price pattern seems to be related to adjustment lags to wholesale prices. The steepest price rise is witnessed in El Gedarif where prices have more than doubled between December and June 2007. This seems to go more in line with the June inflation rate of around 24.5% for the lower-income group in El Gedarif, which was then one of the highest in the country.

Figure 4. Sorghum* monthly consumer prices in selected markets Jan 2007-June 2008



* Average of *Feterita* and *Dabar* varieties.

Source: Statistics of the Central Bureau of Statistics (CBS)

In other markets, the price increase ranged between 52% and 78% when in June 2008 consumer prices at Khartoum were about 18% higher than those of El Gedarif; one of the major producing areas. Compared with an average overall inflation rate of 13.7% during the first half of 2008, the hike in sorghum prices has been enormous. The relatively low price at Eddamer was most probably of a localized nature due to domestic harvests of irrigated sorghum in the River Nile State that usually comes late in the season, while the higher wholesale prices there was likely influenced by the general sorghum price level in the country that is in turn governed by price differential of sorghum varieties. Consumer prices are available for only *Feterita* and *Dabar* varieties, which are not largely consumed in the River Nile area. It is therefore important to address in future analyses price movements of sorghum with respect to their variety differential. Overall, average grain retail prices were 33% higher than wholesale prices and there is no clear trend of the price markup.

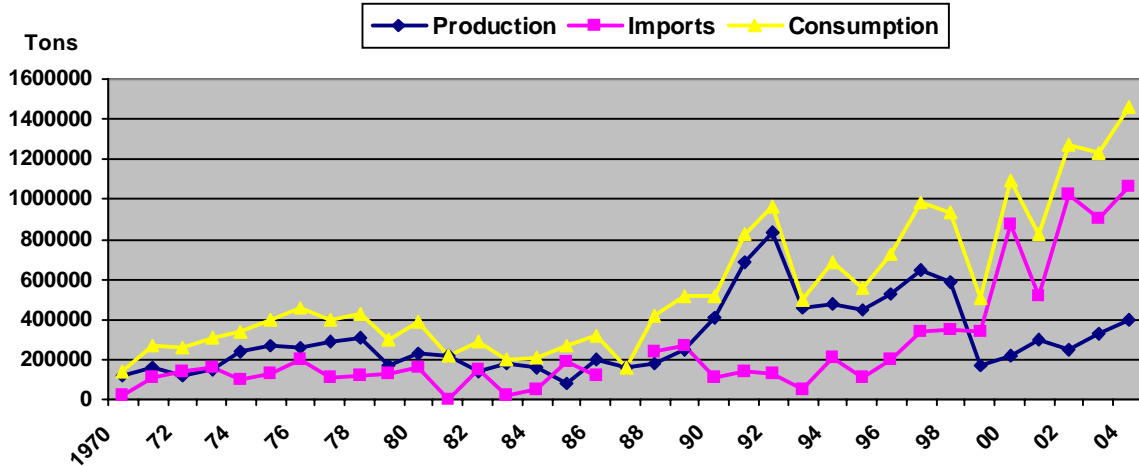
Prices of sorghum flour followed those of grain, naturally at a higher level. However, taking Khartoum as an example, the gap between the two prices generally widened as from December 2007, reaching 58% in January and 41% in May. In June the two prices converged due to the highly shooting grain prices. Records of consumer prices of sorghum bread '*kisra*' (pancake) reveal high stability at SDG 0.5 per two pieces '*sheets*' during the same period but no data is available about the size/weight per sheet and it is also difficult to relate the number of sheets to grain weight. But it is worthwhile to note that, at Khartoum, average grain retail prices during the stated period were SDG 920 per ton compared to SDG 573 per ton for wholesale prices; an increase of 60%. Further, average sorghum flour prices were SDG 1195 per ton, which were 31% higher than retail grain prices. This might reflect high marketing and processing costs but would also indicate heavy burden on consumers; not to talk about the price wedge between flour and sorghum bread.

2.1.2 Wheat

Wheat is considered as one of the main food grains and its demand for consumption is increasing in urban areas due to changes in consumption patterns. Aggregate and per capita consumption are showing increasing trends. Yield and aggregate production are

increasing but at lower rates than that of consumption. As a result, the wedge between consumption demand and domestic production and consumption is widening, leading to increasing imports (Fig. 5). This exposes the wheat sub-sector and its prices to the direct effect of the world market forces and their effect on prices.

Figure 5. Development of wheat production, imports and consumption* 1970-2004



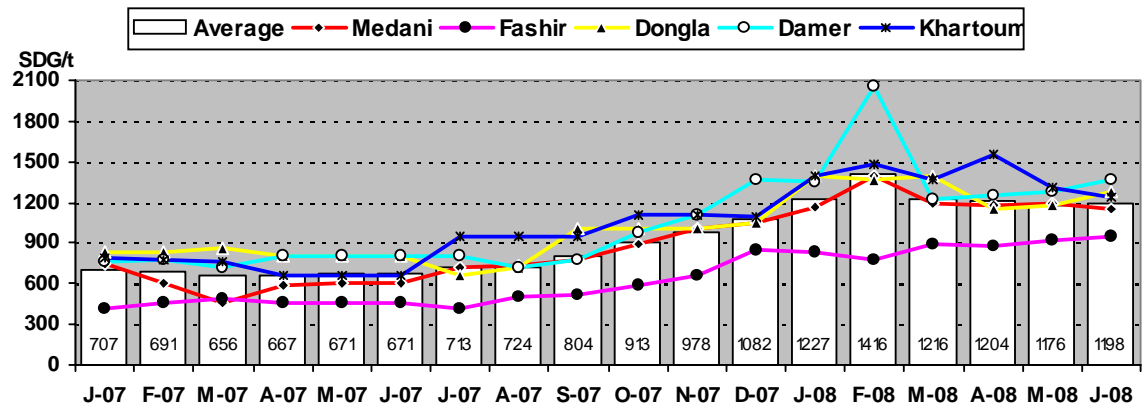
* Total utilization

Source: Data taken from Faki and Taha (2007)

International wheat prices started to increase since June 2007 when the world price for hard wheat was 201\$ /ton, increasing to 246\$ at the end of June (45\$ increase in one month). The price reached 389\$/ton by the end of 2007 and 507\$/ton in March 2008.

In Sudan the surge in wheat prices occurred as of January 2007 (Fig. 6). Prices continued to rise in all five markets till February 2008, when a slight drop occurred in March after which prices started to stabilize or decline in trend. Kartoum and Eddamer experienced the highest price rise and El Fashir the lowest. Excluding El Fashir, the peaks of February 2008 depicted a range of SDG 1367 to SDG 2056 per ton, and in June 2008 prices ranged from SDG 994 to 1367 per ton for all markets. Price increases ranged between 53% and 130%, highly exceeding the general inflation rate. The rise is largely a transmission of world-market prices. The correlation calculated for monthly world and local wheat prices for the period January 2006 to and June 2008 reflects a high correlation coefficient of 0.89. However, domestic factors intermingled with external prices to determine domestic prices. Some of the domestic factors which could contribute to the price rise include high cost of production, low productivity levels and the structure of taxes and levies that affect the final consumer prices. There are also some controls on bread prices while in 2008 the Ministry of Finance exempted 11 agricultural commodities from the VAT, including that on local wheat flour, and made a 15% exemption on the VAT value of all other processed commodities (Ministry of Finance, personal communications). These interventions have played a counteracting effect of the price rise.

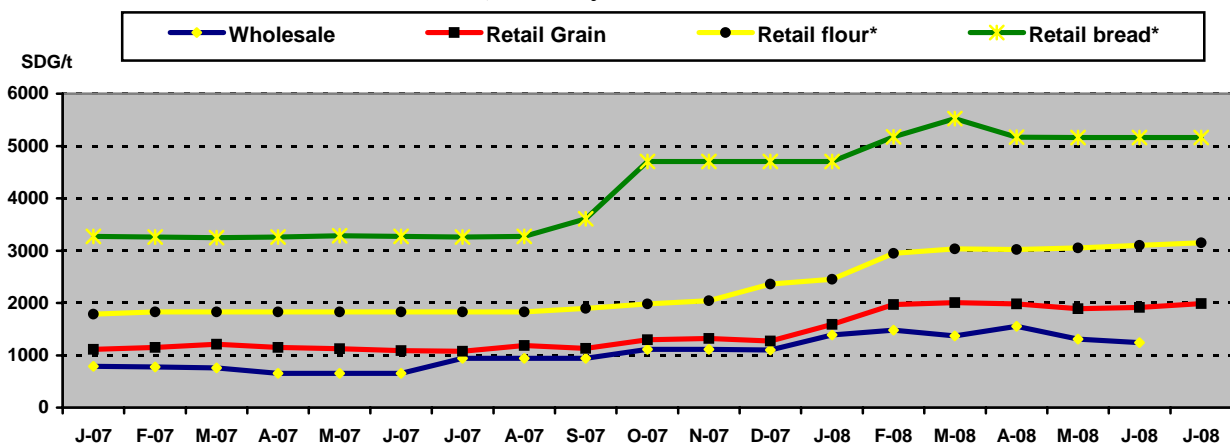
Figure 6. Wheat wholesale prices in selected markets, Jan 2007-Jun 2008



Source: Data of the Planning and Agricultural Economics Administration, MoAF

Retail prices of different wheat products are traced for Khartoum, being the biggest consumption area. This is shown by Fig. 7 in which the monthly consumer prices for wheat grain wholesale, grain retail, flour and bread prices are shown for the period January 2007 to July 2008. The gap between wholesale and retail prices widened and as was that between flour and grain retail prices but at a lower extent. The biggest gap was that between bread and flour prices, but it shows a slight decreasing tendency. Bread prices hiked in November over-proportional to those of flour, retail grain or wholesale prices. This implies that wheat bread consumers began to endure high prices earlier than the rise in grain or flour prices, exerting high pressure on poor sectors of the population especially in urban areas. Marketing margins to both millers and bakers were relatively high while those to grain traders were generally lower. Obviously, millers and bakers are expected to face higher marketing costs than traders, but their high marketing margins are indicative of substantial profit gains. On the other hand, producers seem to be the least beneficiaries in the price hikes.

Figure 7. Development of prices of wheat wholesale, retail, flour retail and bread prices at Khartoum, January 2007 to June 2008



* Retail and flour and bread prices are derived in terms of grain equivalent using a milling factor of 0.82 for flour and conversion factor of 0.67 for baking.

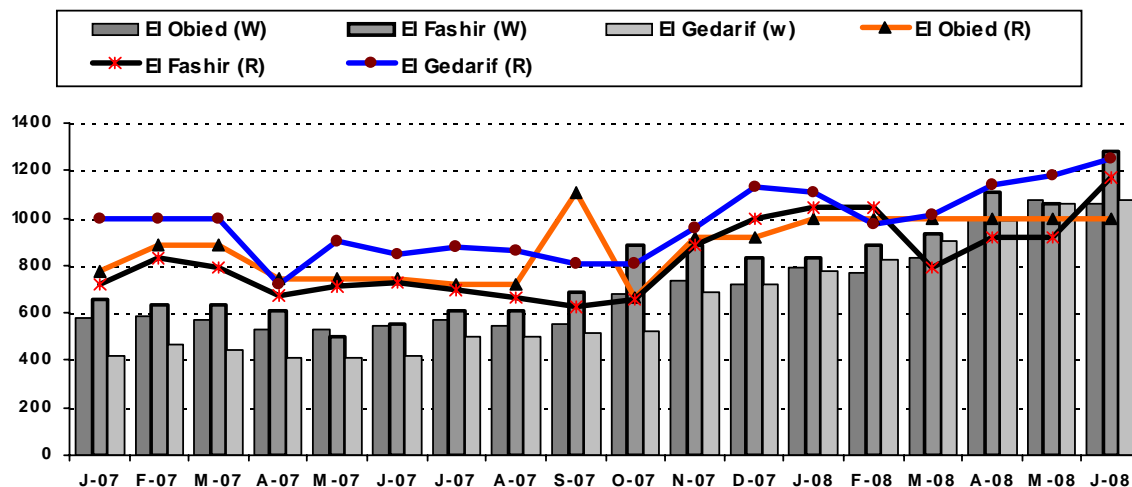
Source: Data of the Planning and Agricultural Economics Administration, MoAF and the CBS

2.1.3 Millet

Millet is also an important staple food and its production and consumption are confined to western Sudan and some other areas in the east. Millet local prices have shown increasing trends in recent years. However, since the commodity is locally produced and traded, it is less likely that there would be a direct effect of international prices on domestic ones. Instead, domestic factors like low productivity, high cost of production and cross-price substitution effects with other cereals are usually the main factors that derive the price increase.

Both wholesale and retail prices of millet experience a rising trend as from October 2007 in main millet production and consumption areas (Fig. 8). Wholesale prices hiked in June by 56%, 44% and 106% of their October level at El Obeid, El Fashir and El Gedarif, respectively. Consumer prices assumed high stability at El Obeid while there was a slight drop in February 2008 at El Gedarif and a higher one in March at El Fashir. Thereafter, prices at both markets continued their rise. Retail prices in June 2008 were 50%, 79% and 55% of their October level at the three markets, respectively. Highest consumer-wholesale price differences occurred during December 2007 and January and February 2008 while consumer prices were notably lower than wholeslae pieces at El Fashir during March-June 2008 and slightly lower at El Obeid during May-June, most likely due to food aid interventions.

Figure 8. Millet average monthly wholesale and retail prices in selected markets during the period 2006-2008*



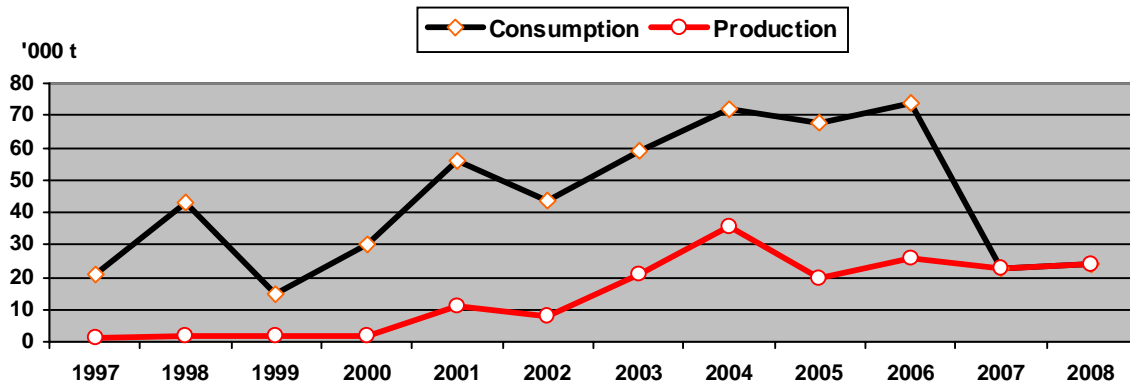
* Figures for 2008 are for January-June

Source: Data of the Planning and Agricultural Economics Administration, MoAF and the CBS

2.1.4 Rice

Rice is a commodity of lower importance in the Sudanese diet compared to other cereal grains as mentioned before. Aggregate consumption is much higher than domestic production though the latter is also increasing. Yet, the wedge between the two variables is very big (Fig. 9) and is satisfied through imports. Same domestic factors (limited areas, low productivity and high cost of production) applies to rice as well, but because of the high imports, the effect of the international price increase is the main driver of the consumer price increases.

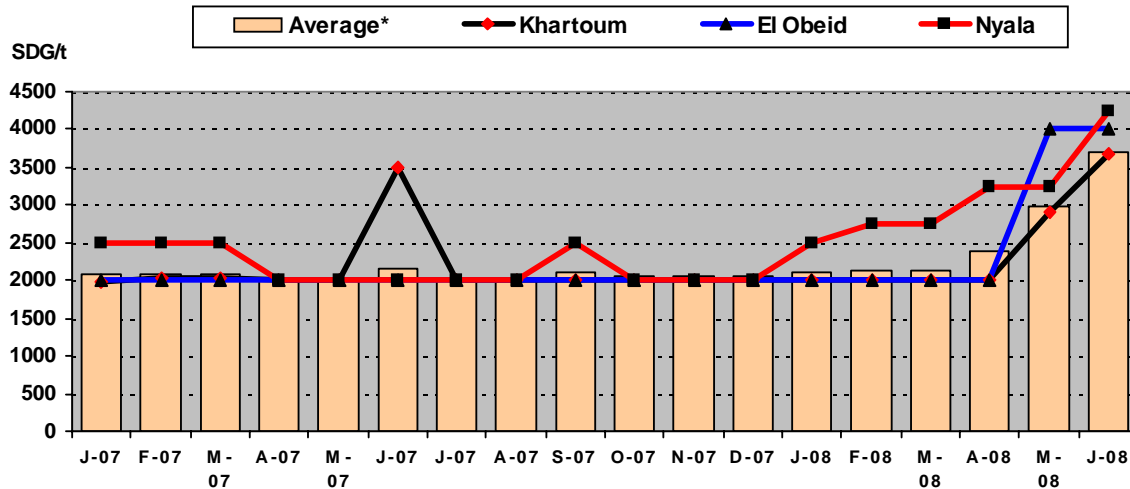
Figure 9. Rice consumption and production in Sudan 1997-2008



Source: Data compiled by the Planning and Agricultural Economics Administration, MoAF

Domestic consumer prices of rice, shown by Fig. 10 for three markets, have been highly stable on average till March 2008 after which they hiked steeply to rise by 73% in July of the same year. However, at El Fashir, the rise started as early as January and the increase was steady till June, reflecting the almost consistently higher price pattern there. At both El Fashir and El Obeid prices were higher in the April-June period than either Khartoum or the Sudan's average. The difference is likely to be over-proportional to the marketing costs, but more importantly the two markets are in food deficit and poverty-stricken areas. Although rice is not an essential part of the diet in Sudan, its price rise is expected to reduce its substitutability to other food that witnessed a sharp rise like wheat and sorghum. This would obviously be more problematic for areas like El Fasir and El Obeid.

Figure 10. Rice consumer prices in selected markets and Sudan average, Jan 2007-Jun 2008



* Average over 12 markets in the country (Khartoum, Sennar, Kosti, Damazi, Port Sudan, Atbara, Dongola, El Obeid, Kadugli, El Fashir, Nyala, El Gedarif)

Source: Data of the CBS

2.1.5 Note on cereal prices after June 2008

At the time of preparation of the study price analysis was done till June 2008. Recent data that are available for cereals till November 2008 indicate largely similar patterns of price

rise to the past period, yet with some differences. Prices continued their rising trend for sorghum till September in most markets; decreasing or stabilizing thereafter till November when the new harvest started to enter the markets. Further price rises in November over June 2008 were highest in El Gedarif (32%) and El Obeid (27%) and lowest in Damazin and Khartoum (7%), while prices decreased by 3.6% at El Fashir.

Similarly, wheat prices increased in July and August 2008 but at a milder level than those of sorghum and then dropped steadily to November 2008. The drop was so significant that the price levels in Khartoum, Medani, Dongola and Eddamer were very close to their June 2008 level and have almost kept their February 2008 level. The high drop is most likely an influence of the drop in sorghum prices, but world-market prices have also sharply decreased (FAO 2008a).

Millet prices continued their increase over July and August but substantially decreased during the September-November period. This is about the time of the new crop harvest. Their November level was higher by about 34% in El Obeid but lower by 13% and 3% in El Fashir and El Gedarif, respectively.

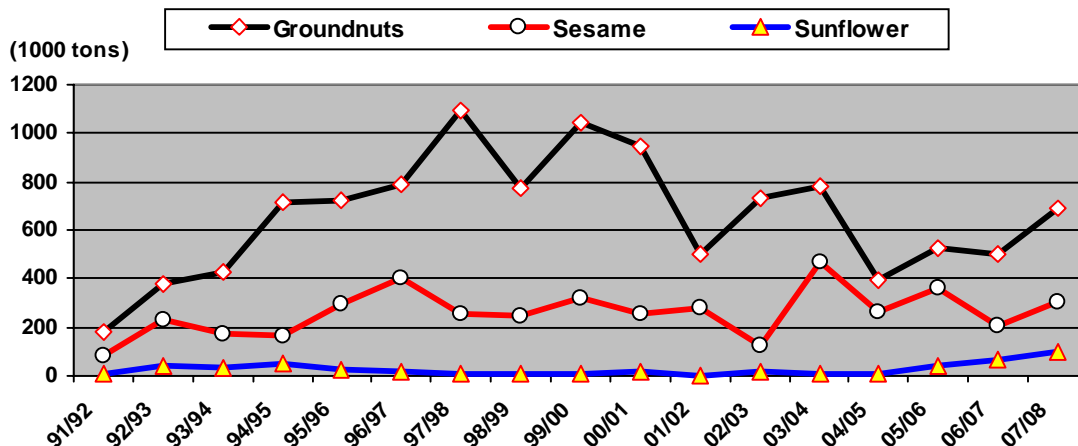
In all, domestic price levels of cereals remained high, a situation implying that the food price crises is still continuing in spite of world price decreases over the past months.

2.2 OIL SEEDS AND VEGETABLE OILS

2.2.1 Production

Groundnuts and sesame and, to a lesser extent, sunflower are the major oil seeds produced in Sudan, mostly under rain-fed conditions. Total production of the three crops depicts considerable annual fluctuations (Figure 11) mainly due to weather variability, especially rainfall.

Figure 11. Production of major oilseeds crops in Sudan, 1991/92-2007/08



Source: Data of the Planning and Agricultural Economics Administration, MoAF

However, groundnuts production that peaked during the late 1990s has consistently declined thereafter due to constraints related to marketing and processing. It nevertheless started to pick up again over the last four seasons, increasing by 75% between 2004/05 and 2007/08. Bar seasonal fluctuations, sesame production assumed a declining trend

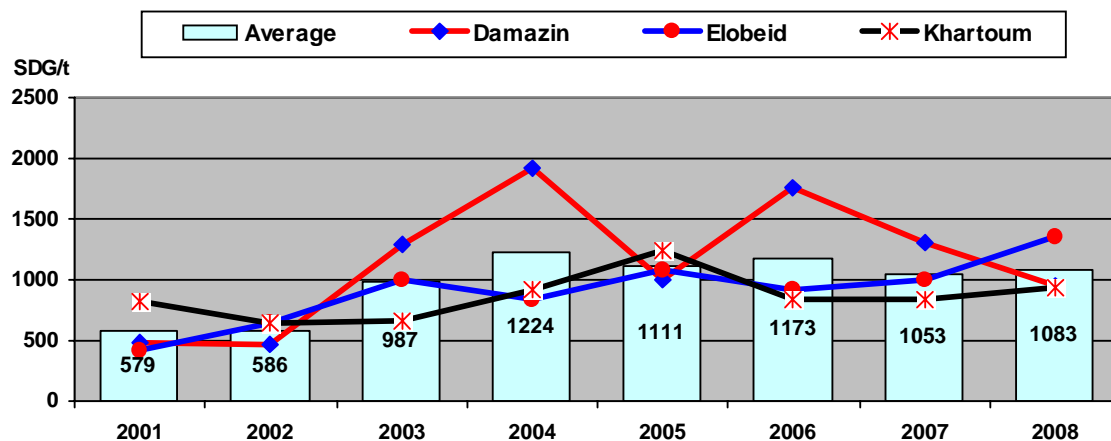
after the peak of 2003/04. Sunflower production has been much lower than the other main oilseeds but showed a steady increase over the past four years, reaching in 2007/08 many folds of its 2004/05 production level.

The period 2006-2008, which coincides with the world-wide soaring prices witnessed rising production of both groundnuts and sunflower, while that of sesame increased over the past two years. Such developments might have relation to price movements, but internal market and production conditions are likely to have hindered full response to price changes.

2.2.2 Oil seeds prices

Wholesale prices of unshelled groundnuts are presented in Fig.12 for three regional markets in the period 2001-2008. The average price of the three regions depicts a steady rise from 2001 to 2004 after which prices have had considerable stability with a decrease of 10% in 2007 and an increase of 3% in 2008 with an overall drop of 8% between 2006 and 2008. Both El Obeid and Khartoum assumed a rising price trend as from 2006 but with different magnitudes. In the former an increase of 9% was realized in 2007 and another 36% in the first half of 2008. The price rise at Khartoum was more gentle, having increased by 11% over the two years. Damazin prices were highly variable across the whole period with extreme ups and downs and there were relatively high consecutive price decreases there by 25% and 27% in 2007 and 2008. But Damazin has only a marginal importance in groundnuts production and the small production there is most likely behind the unusual price movement.

Figure 12. Wholesale prices of unshelled groundnuts in selected markets

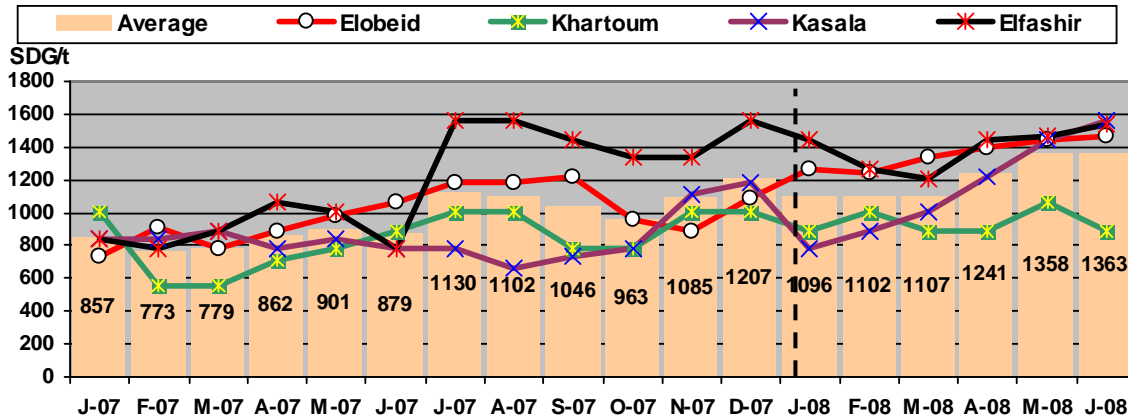


Source: Data of the Planning and Agricultural Economics Administration, MoAF

The overall situation does not indicate drastic price changes at the wholesale level over the last three years. This reflects the erratic condition of groundnuts markets where signs of monopsony are apparent. Nevertheless, annual averages might have masked price changes that might have occurred over shorter time periods during 2007 and 2008 as experienced with cereals.

Analysis of monthly wholesale prices of unshelled groundnuts showed sharp price increases at El Obeid (73%) and El Fashir (71%) between January 2007 and January 2008 (Fig.13).

Figure 13. Monthly wholesale price changes of unshelled groundnuts



Source: Data of the Planning and Agricultural Economics Administration, MoAF

Although, prices decreased in Khartoum (11%) and Kassala (8%) in the same period, they rose by 20% between January and May 2008 in Khartoum and doubled in Kassala between January and June 2008. In general it seems that price movements started to take shape as from June 2007. Price changes since then and up to June 2008 were around 100% at each of Kassala and El Fashir and close to 40% at Elobeid, while changes were negligible at Khartoum. The average at these markets reflects an overall rise of 59% from January 2007 to June 2008 and 55% between June 2007 and June 2008.

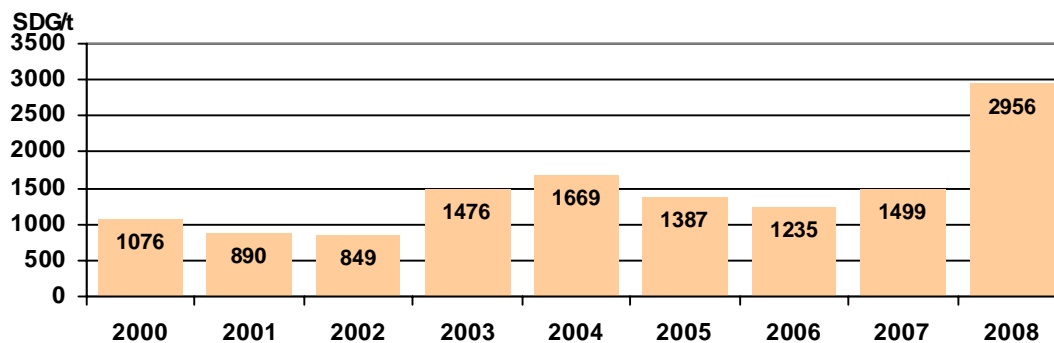
Over the stipulated period and despite variations, El Fashir and El Obeid average prices were respectively 44% and 28% higher than in Khartoum, and were respectively higher than those at Kassala by 31% and 17%. However, prices at Kassala have picked up quickly over the last four months. Price differences are influenced by the low amounts of groundnuts production in later seasons and the location-specific production and processing demand. The lower prices at Khartoum and Kassala are probably due to their proximity to groundnuts produced in the major irrigated schemes of Gezira, Rahad and New Halfa, while the high prices in the western states of El Fashir and El Obeid might have been influenced by the Sudan.

On the other hand, prices in 2008 were substantially higher than their 2007 levels in all three markets and almost in all months. Percentage increases are calculated to range between 37% and 73% at El Obeid, between 35% and 97% at El Fashir, and between 5% and 100% at Kassala. At Kassala, prices were escalating over individual pairs of months in spite of the small drop of 8% during January. The situation is suggestive of high price spikes in wholesale groundnuts markets that reflect on producer prices, but producer-prices records show that the margin was not adequate enough to raise incentives.

2.2.3 Sesame

Sudan sesame exports in 2005-2006 accounted for about 56% of production, but only small quantities of sesame oil is usually exported; about 110 tons in 2006 for example. Average annual price increases over the period 2000-2008 depict rather a gentle rise up to 2007, followed by a sharp price rise in the first half of 2008 (Fig. 14). The overall price increase over seven years, from 2000 to 2007, was 39% while prices soared in 2008 by 97% (close to double) compared to their 2007 average level.

Figure 14. Annual average changes in sesame prices 2000-2008*

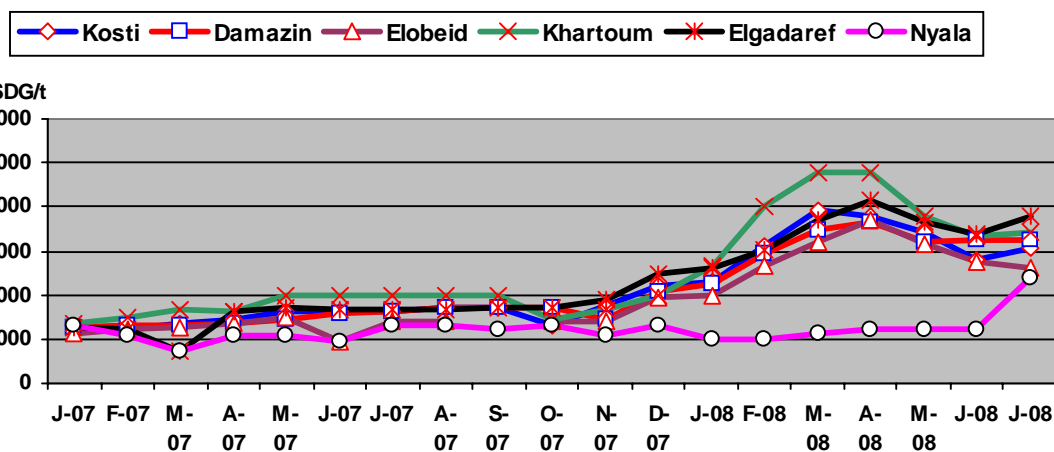


* Average prices at six markets (Damazin, El Obeid, Khartoum, Nyala, Kosti and El Gedarif). Prices for 2008 were for the period January-June

Source: Data of the Planning and Agricultural Economics Administration, MoAF

Monthly wholesale sesame prices during 2007 were also less volatile and increased gently during most months in different markets of the country (Fig. 15). They however assumed an upward trend since November 2007, with highly a similar pattern in all markets except for Nyala. However the sharp price rise started to reverse after reaching a peak in April, but slightly rose again in most markets between July and August 2008. At Nyala prices continued their stability till June 2008 when they rose sharply to reach comparable levels to other markets by the following month.

Figure 15. Monthly wholesale prices of sesame in selected markets



Source: Data of the Planning and Agricultural Economics Administration, MoAF

The whole price movement seems to have a seasonality influencing pattern when prices were low following the harvest time at the winter months and rose during the summer months till the time on sowing in the following season. With respect to location and ignoring the odd case of Nyala, peak prices were highest at Khartoum and lowest at El Obeid. On the other hand, and excluding Nyala, markets are highly integrated with high correlation coefficients calculated to range between 0.92 and 0.98 within the correlation matrix. Obviously, Nyala market for sesame is poorly integrated with other markets, where the situation there is most probably affected by the conflict in Darfur.

Monthly comparisons between the first seven months of 2007 and 2008 reveal high increases in all months of 2008. For example, price increases in 2008 at El Obeid (with the highest prices) were 76%-193%, and at Khartoum (with the lowest price) were 67%-199%. The average of the five regional markets reveals higher prices during the 2008 months that exceeded corresponding ones of 2007 by 88%-200%. This represents a maximum spike of three times.

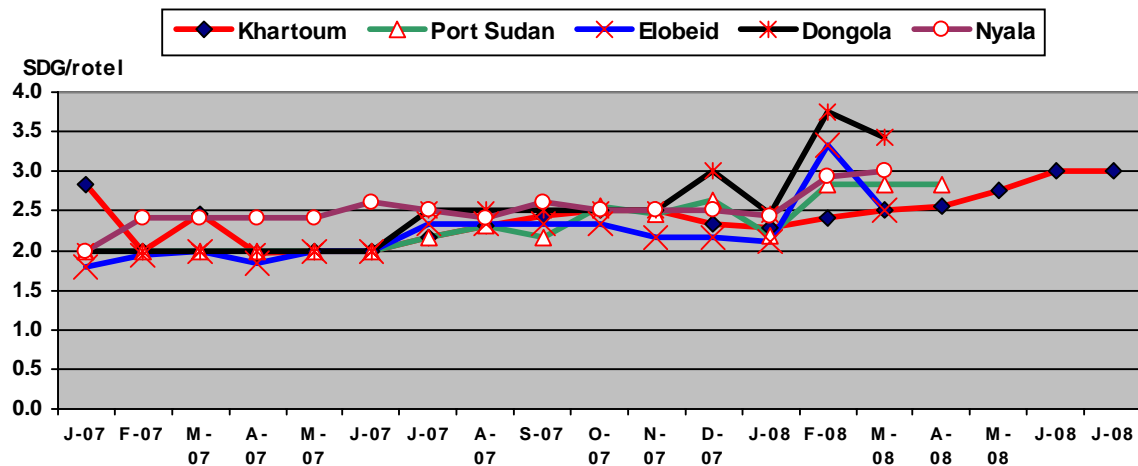
Global sesame price (Nigeria natural 98% - FOB Lagos) increased by 94% between 2007 and 2008, while average domestic price of sesame increased by 87% for the same period. The substantial increase in sesame seeds price in domestic market suggests high degree of transmission of global price to domestic market, because more than half the quantity of sesame seeds produced in Sudan is internationally traded.

2.2.3 Vegetable oil prices

a) Groundnuts oil

Monthly changes in groundnuts retail oil prices since January 2007 are presented in Fig. 16 for five regional markets. Prices were much more volatile at Nyala with a high coefficient of variations of 53% during the period January 2007 to March 2008. They were less so at El Obeid, Khartoum and Portsudan, with coefficients of variation of 8%, 11% and 14%, respectively. In all markets prices peaked in February 2008, increasing at each of Khartoum and Nyala by about 22% compared to their February levels. Dongola recorded a very high increase of about 88% for the same period. Price increase was also high at Port Sudan (42%) and El Obeid in the same period. Following the 2008 February peak, prices continued to increase steadily at Khartoum, rising by 24% in June 2008, but remained stable at Port Sudan. In contrast, prices dropped sharply at El Obeid, and Nyala following February 2008.

Figure 16 : Retail prices of groundnuts oil in selected markets



Source: Data of the Planning and Agricultural Economics Administration, MoAF

Despite staggered price peaks in different markets and high substantial volatility, most of the markets under consideration have substantial integration, detected by calculation of correlation coefficients that ranged from 0.72 to 0.93 for Port Sudan, El Obeid and Kassala. Khartoum is an exception with its relatively low prices that might be a result of a wide array of vegetable oil choices at different prices.

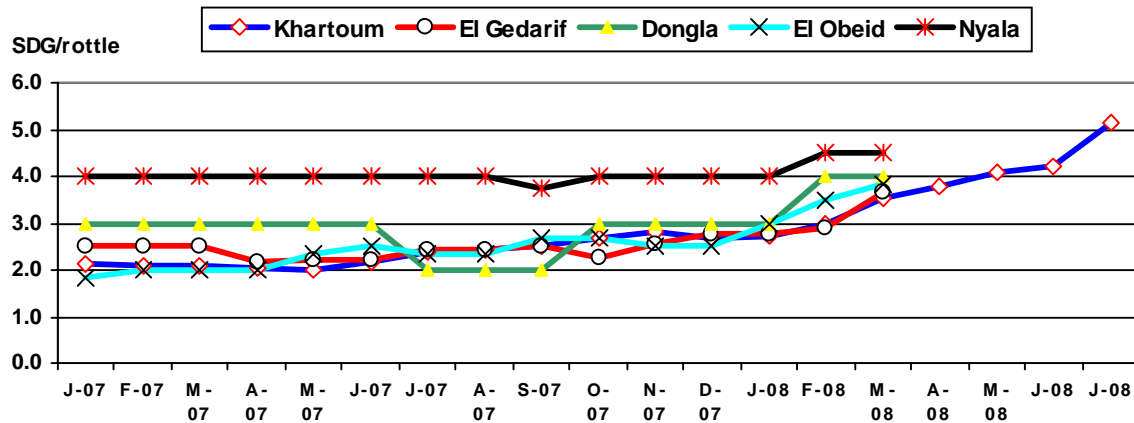
Groundnuts domestic consumption (kernels and oil) accounts for the largest share of local production with most of it milled to produce cooking oil widely used in Sudan. However, due to variable local supply of groundnuts and other oilseeds and problems encountered by oilseeds industry, importation of vegetable oils especially palm oil has significantly increased in recent years. Palm oil is widely used for cooking in Sudan and it has lower price compared to groundnuts oil.

In spite of non-tradability (or very low tradability) of groundnuts seed and its oil, connection of oil domestic to international prices exists via the importation of substitutes such as palm oil and to a lesser extent sunflower and maize oils. Time-series groundnuts oil consumer prices at Khartoum correlates well with international prices with a significant positive correlation coefficient of 0.64 indicating highly possible effect of world market vegetable prices in spite of differences in price levels. The average international price of groundnuts for the period January 2007 to June 2008 (SDG 2.48/kg) was higher by about 33% compared to Khartoum market (SDG 1.87/kg). In contrast to that average price of groundnuts oil in Khartoum market (SDG 5.33/kg) was higher by about 59% compared to the average international market price of (SDG 3.36/kg) for the period January 2007 to July 2008.

b) Sesame oil

Like the case with groundnuts oil, retail prices of sesame oil have been on an upward trend since around February 2008 in all of the states shown by Fig. 17, except for Nyala. However, the most important surge occurred from January 2008, which is more clear at Khartoum when prices surged by 90% by July 2008. The rise between February 2007 and March 2008 was 92% at El Obeid, 69% at Khartoum, 47% at El Gedarif, and 33% at Dongola. At Nyala prices were generally stable, but were remarkably higher than those in all other states over the stipulated period; even assuming a jump by 53% between December 2007 and March 2008. The odd case for Nyala might be explained within the complex situation of production and security problems.

Figure 17: Retail prices of sesame oil in selected markets

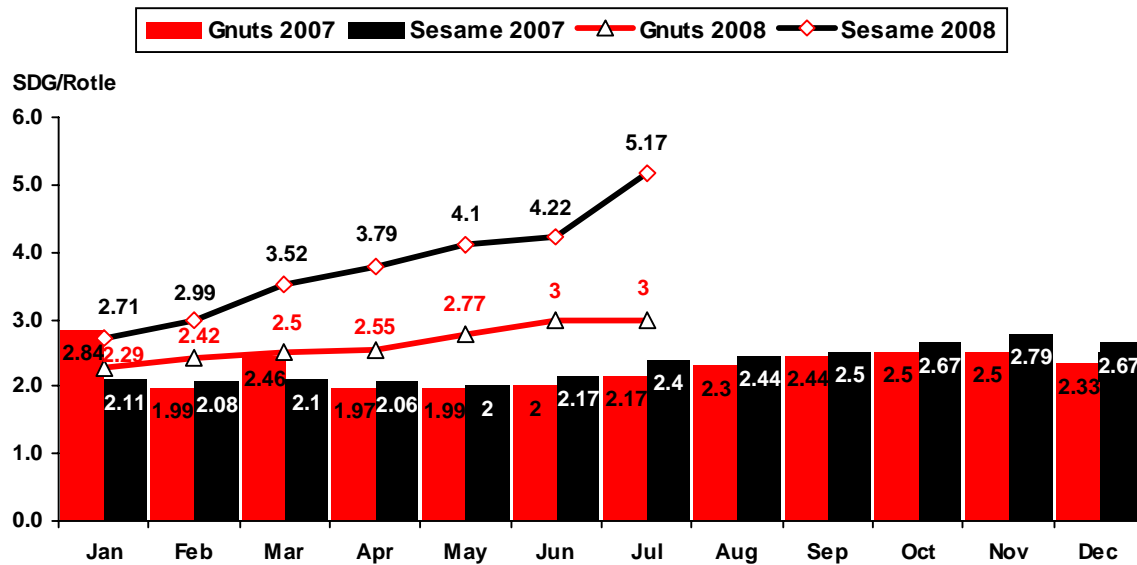


Source: Data of the CBS

While price patterns differ among states, they are substantially correlated, as evident from computed correlation coefficients that fall from 0.67 to 0.91 among El Obeid, El Gedarif and Khartoum markets, with relatively lower integration for Dongola.

Monthly price rises for both groundnuts and sesame oil and their relative patterns can be shown for Khartoum State for 2007 and the first seven months of 2008 (Fig. 18). While sesame oil prices have been generally but slightly higher than those of groundnuts oil in 2007, differences have been widened during the first seven months of 2008. Prices of both products increased but the increase in sesame oil price was remarkably steeper resulting in 72% higher sesame than groundnuts oil price in July 2008 as compared with a difference of only 2% between the 2007 prices averaged over all months.

Figure 18. Monthly price changes of groundnuts and sesame oil at Khartoum State 2007 and 2008



Source: Data of the CBS

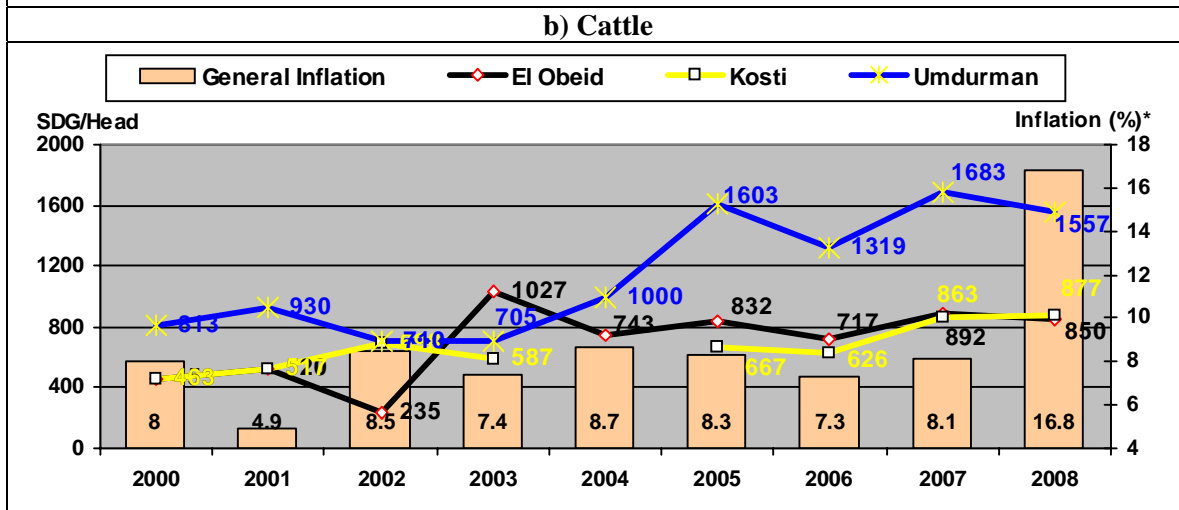
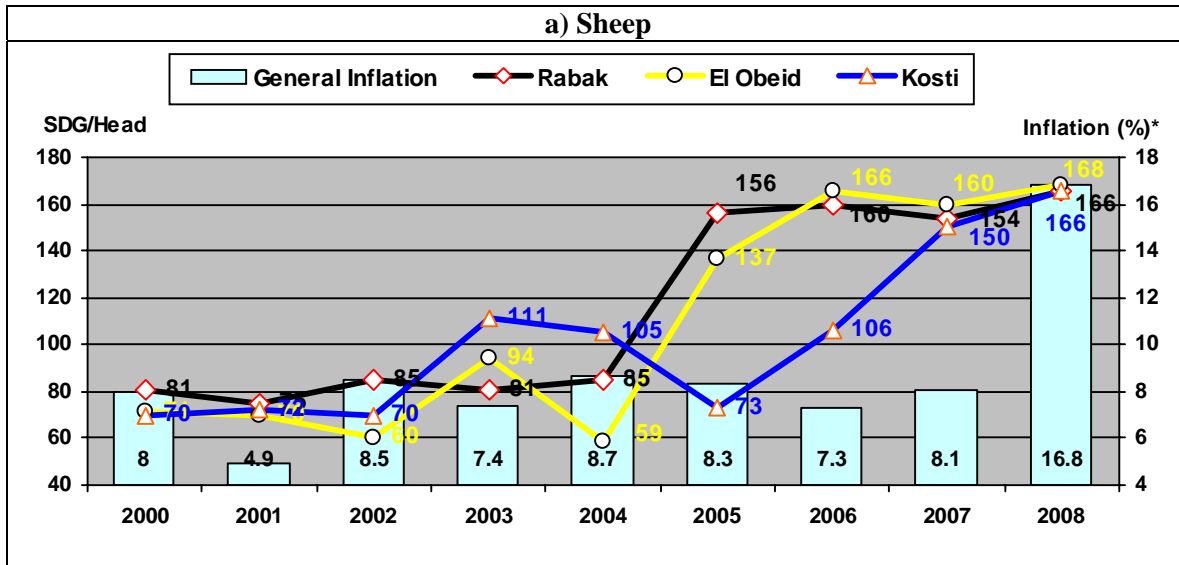
It is interesting to note that correlation between prices of the two oil types was weak during 2007 ($r=0.41$) when prices were lower, but highly increased during 2008 ($r=0.93$). The two oils are not strict substitutes since sesame oil is usually used for purposes other than cooking. Yet the escalating prices of sesame oil might have resulted in consumers shifting to groundnuts oil with its relatively lower prices, as well as to other oils. This has implications that policy might need to treat the rise in their prices differently.

2.3 LIVESTOCK

2.3.1 Price changes for live animals

Sheep and cattle as well as their products represent the most important livestock commodities for which price levels substantially affect domestic production and consumption. Changes in sheep and cattle wholesale prices in selected markets during 2000-2008 are shown by Fig. 19. Except for Kosti where sheep prices depicted a steady surge from 2005 to 2007 by more than double (although still substantially lower than those of the other two markets), price changes in the other two markets were highly stable from 2006 up to 2008. Simple average annual increases were 1.3% in Rabak and 0.4% in El Obeid.

Figure 19. Average sheep and cattle prices in selected markets, 2000-2008



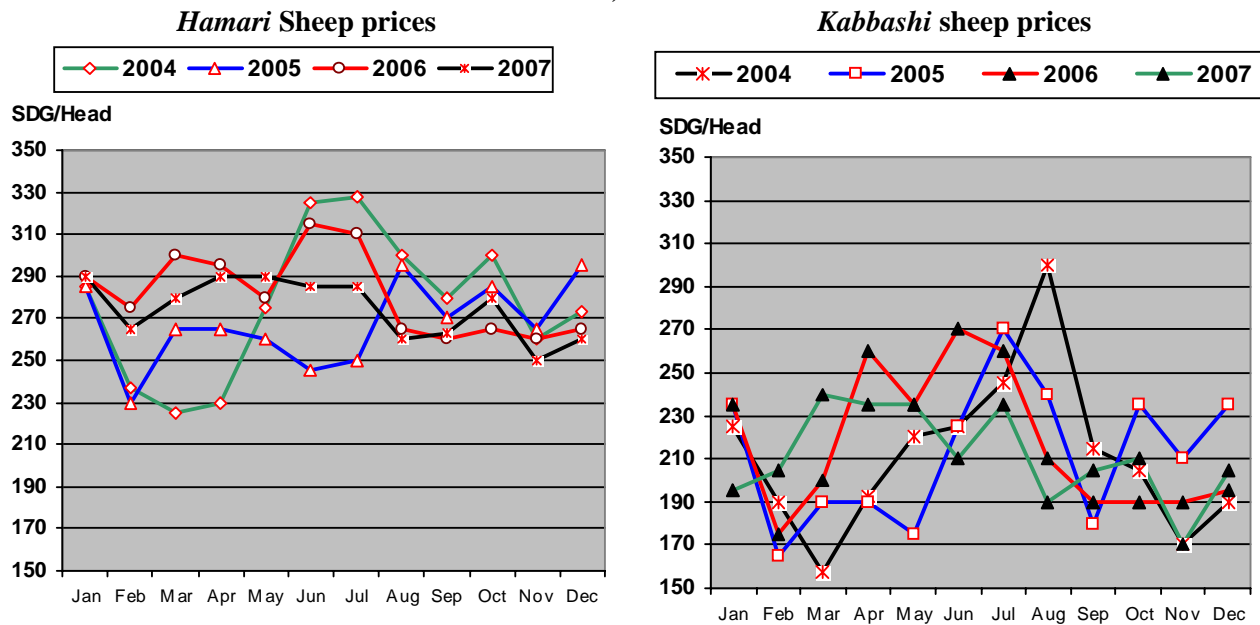
* Inflation in 2008 is the average for Jan-July period
 Source: Data of the Ministry of Animal Resources and Fisheries

For cattle, prices increased in the three markets under consideration from 2006 to 2007 but dropped in 2008. The corresponding simple average changes between 2006 and 2008 were 6% in each of El Obeid and Umdurman and 13% for Kosti. Again in Kosti, which is in the vicinity of Rabak, prices increased abnormally by 38% between 2006 and 2007 before dropping again by 2% in 2008.

In general for the two livestock types, there is no evidence of soaring prices over the past three years. Price developments of live sheep and cattle seem to move within the general pattern of inflation shown in the Figure, but with variations that use to characterize most sectors of the economy. The absence of unusual (or externally driven) price rise can be verified by considering price changes of live sheep in El Salam Market, which is one of the biggest terminal livestock markets in the country. Average monthly price changes in the period 2004 to 2007 for two sheep breeds (*Hamari and Kabbashi*) shown by Fig. 20 do not reflect any clear trend of dramatic price rises.

The figure depicts a noticeable general price increase of Hamari over Kabbashi ranging from 28% to 33% over the four years, which means the price premium due to quality difference has been maintained. However, for both breeds, there is no indication of an unusual price rise over time. The rise in average price from 2004 to 2005 was mainly the influence of price rises in March and April. There was otherwise a decrease in prices over the four-year period, which is more apparent for 2007 in all months. During the period September to January, prices were rather close in all four years. As from 2006 sheep exports were declining, a situation that might have contributed to price stabilization in spite of the rising general inflation from 7.3 to 8.1 percent in 2007.

Figure 20. Changes in monthly prices of two sheep breeds at El Salam Market (Um Durman) 2004-2007

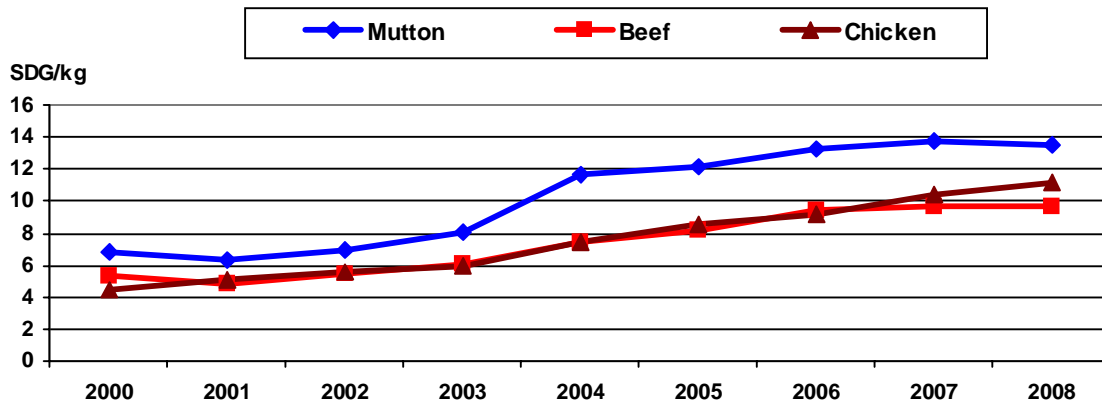


Source: Data of the Livestock Marketing Services Company

2.3.2 Meat consumer prices

Average annual retail prices of three types of meat (mutton, beef and chicken) at the national level are presented in Fig. 21 for the period 200-2008. Although they have all been increasing, the highest magnitude of increase was experienced between 2003 and 2004, which was preceded and followed by fairly gentle sloping prices. In fact, both mutton and beef prices were almost stable as from 2006, and even assumed a slight decrease between 2007 and 2008. It can be calculated that, while mutton price increased by 98% in 2008 over its level in 2006, it increased by only 7% between 2006 and 2007 and decreased by 3% between 2007 and the first half of 2008. Comparable figures for beef were respectively 6% and 2%. Chicken meat is the type that has the steadiest rise since 2003. It assumed a price upsurge of 28% between 2006 and 2007 with another 16 percentage points in 2008. In all, meat price developments do not seem to have a strong relation to the lately soaring food prices worldwide. This is evident for mutton and beef on account of their low price rises over the past three years, while the high price spike for chicken meat can be argued to emanate from its observed limited domestic supply and highly rising domestic demand.

Figure 21. Annual average meat consumer prices in Northern States, 2000-2008 (SDG/kg)



Source: Data of the CBS

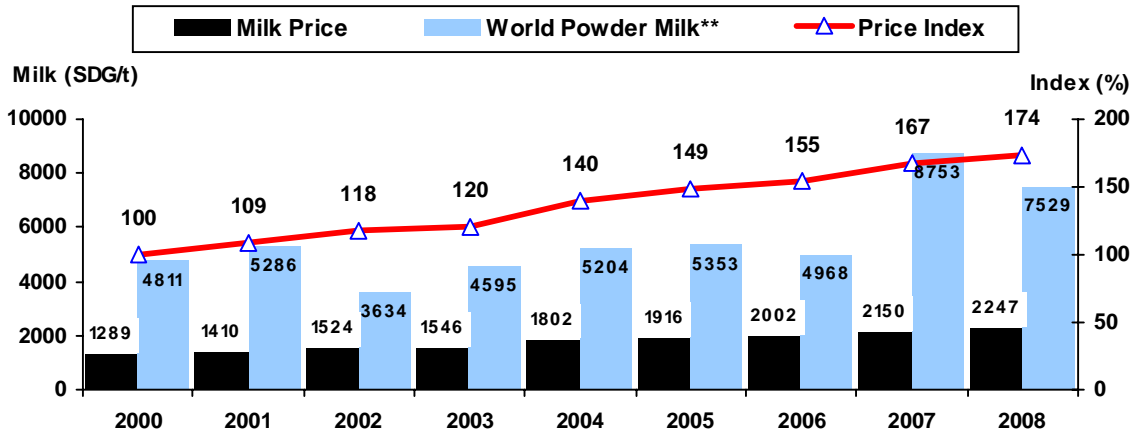
Analysis of monthly mutton and beef price movements in eight states from January 2006 to June 2008 showed differences in prices among states, which are mostly attributed to local conditions including the incidence of the Rift Valley Fever and conflict in Darfur. However state-level prices showed high stability almost during the whole stipulated time period, bar very slight seasonal differences. This indicates that there have been no noticeable mutton or beef price rises within individual markets and in some markets such as Khartoum there was even a drop after September 2007.

On the other hand, consumer price differences among ten regional markets largely indicate poor meat market integration for the three types of meats as reflected by computation of a correlation matrix. This implies that meat markets are generally location-specific, most likely due to differences in the magnitude of animal wealth, meat quality attributes and local policy effects.

2.3.5 Milk consumer prices

Development of domestic national-average milk consumer prices over the period 2000-2008 as depicted in Fig. 22 indicates a gentle price rise over the whole period with no distinct surge in any year. The index reflects an increase in the first half of 2008 of 74% over the 2006 price level. The rise in 2007 was 12% over the 2006 level while in 2008 another rise of 7 percentage points was recorded. The increases over these two years look higher than most of the increases in individual pair of years, which might indicate an unusual price hike. The changes in world market price of powder milk, although more fluctuating than domestic prices are also depicting a rising trend and they seem to influence domestic prices. In spite of the obvious difference between the two price levels, they are substantially correlated where a correlation coefficient of 0.73 can be calculated over the period under consideration. Due to Sudan's high level of imports of powder milk, reaching about \$63 million in 2006 up from about \$30 million in 2003 Sudan's high-level price transmission from the world market looks plausible.

Figure 22. National-average fresh milk price and world-market powder milk* price changes over the period 2000-2008*



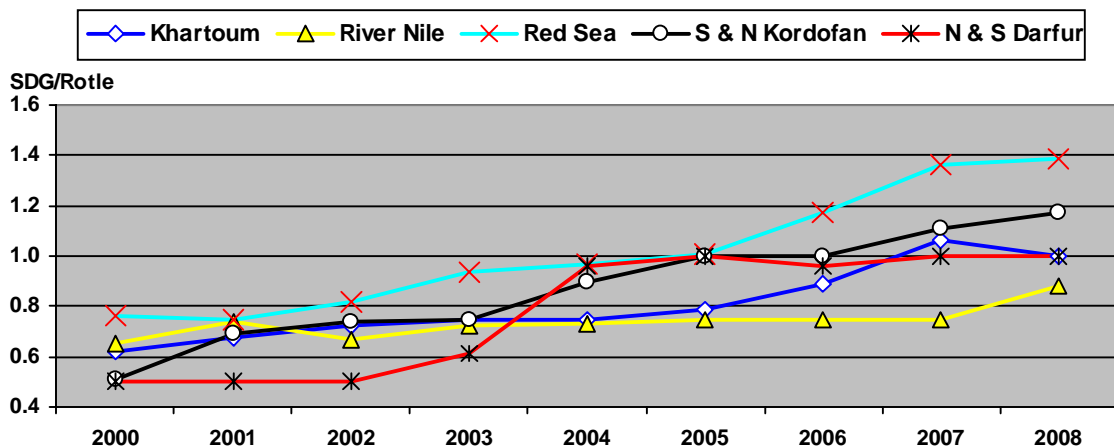
*Dairy whole-milk powder (Oceania, indicative export prices, f.o.b.)

**For 2008 prices are for January-July period.

Sources: World powder milk price based on data obtained from USDA 2008; Domestic prices from data of Sudan's Livestock Marketing Services Company.

Milk price changes by state over the same period (Fig. 23) display a trend similar to the national average in the sense of continual price rise, but with obvious expected differences among states induced by local milk supply. Highest price records are depicted for the Red sea across all years while the lowest in most of the period were for the River Nile. The steepest price increases, especially after 2004, were recorded for the Red Sea followed by Khartoum and North and South Kordofan. Those at the River Nile and North and South Darfur were gently sloping upwards and were even highly stable as from 2005. The highest price difference was in 2007 when the price at the Red Sea of SDG 1.36/rotle exceeded that of SDG 0.75/rotle in the River Nile by 81%. The high prices at the former have important implications on account of the high poverty levels there, being the highest in the Northern States of the country (Faki and Nur 2008). A fairly similar situation applies to South and North Kordofan, also with high poverty levels.

Figure 23. Domestic fresh-milk prices in selected states 2000-2008*



For 2008, prices are for January-July period.

Source: Data of the CBS.

Despite yearly price differences, milk prices are highly correlated among states as revealed by high correlation coefficients computed for eight states (Khartoum, Gezira, River Nile, Red Sea, Blue/White Nile and South/North Kordofan). Correlation coefficients fell mostly between 0.73 and 0.94. Such high milk-market integration is most likely induced by the common factor of prices of imported powder milk.

3. DETERMINANTS OF FOOD PRICE CHANGES AND FOOD SUPPLY AND DEMAND

3.1 Macroeconomic policy

Price changes over 2007 and 2008 are obviously influenced by intermingling factors of the internal macroeconomic and sectoral policies and external factors, which are difficult to isolate. However, many of the macroeconomic factors have been in favor of price stability. Monthly exchange rates over the two years as reported by the Central Bank of Sudan (CBoS) have been fairly stable ranging between 2.005 to 2.213 SDG to the USD, conforming to the CBoS mid-term exchange rate stabilizing policy around the rate that fulfills the realization of internal and external balances (CBoS 2007; 2008). Exchange rates were highly stable till May 2008 when they started to increase reaching their peak in October before dropping through November and December. This limited rise by about 9% to October and 7.6% to December 2008 would have been expected to influence domestic prices of imported wheat, but such prices were largely stable after their earlier spikes.

On the other hand, general inflation increased from 7.2 in 2006 to 8.1 in 2007 and rose further during 2008, reaching 20.6 in March but slowed to 16.9 in June (CBoS 2008a). This is commensurate with the general rise in prices, especially those of cereals and, naturally, price rises and inflation are confounded variables.

Sudan's foreign trade policy is associated with generally high import tariffs. Tariff rates that average 20.2% are among the highest in the world and considerably higher than most countries in Africa and the Middle East (DTIS 2008). They are especially high for some food items such as milk and milk products (25%) and vegetable oils (40%) (Sudan General Customs Administration, personal communication). Further, custom duties include value added tax (VAT) which was set for all imported food commodities at 10% in 2003 till 2006, increased to 12% in 2007 and to 15% in 2008. Such peak tariffs and VAT have certainly not assisted in reducing price hikes in these products. But on the other hand, sorghum tariff rates are relatively low (10%) and for wheat they have been set since 2003 at only 3%, while both rice and lentils are exempted from customs duties.

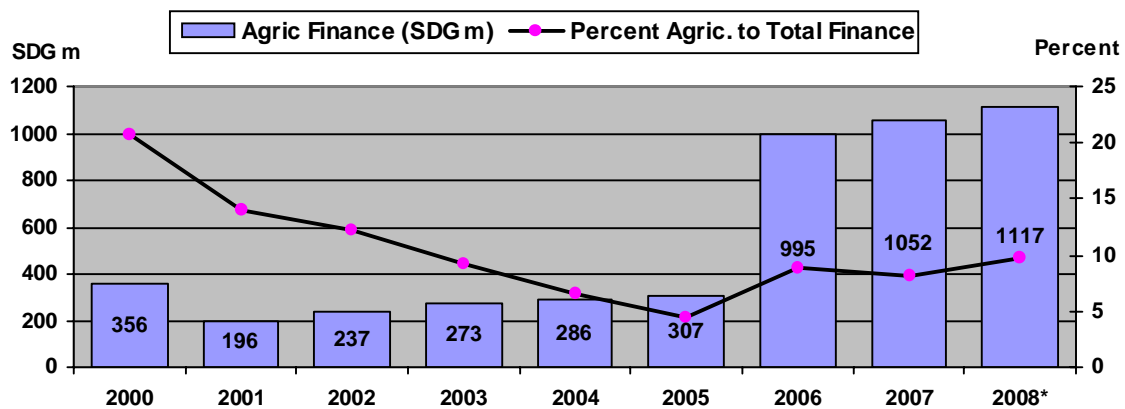
Of other relevant trade policy issues is the existence of 11 Commodity Export-Organization Councils under the Ministry of Foreign Trade (MFT) among which are Sorghum, Oil Seeds and Livestock & Meats councils. Councils aim, among other objectives at export promotion, setting regulations and procedures that regulate commodity export, and supervision of price movement in internal markets with the view of price stabilization. However, these councils are faced by many constraints to their functioning (Ministry of Foreign Trade 2008) and it is not clear whether they have any effective role on either exports or domestic prices. It however seems that MFT plays an important role in export licensing for sorghum, livestock and oil seeds and sorghum internal prices in liaison with other relevant institutions like the Ministry of Finance and National Economy (MoFNE) and its affiliate the Strategic Reserve Corporation (SRC) as well as the Agricultural bank of Sudan (ABS) (see also DTIS forthcoming). Confounded with the generally high domestic prices of agricultural products (see DTIS forthcoming) interventions in commodity export would be expected to influence internal prices, reducing them when there are some sort of export restrictions and raising them when

there is relaxation on controls as observed in the case of sorghum and sesame and live sheep through indicative price announcement. Price influences also exist due to restrictions of importers based on quality requirements as evident for live sheep (rift valley fever), groundnuts (aflatoxin) and sesame (seed infestation).

3.2 Sectoral policies

One of the main sectoral policies that influence domestic supply and eventually domestic prices is agricultural finance. Over the past three years the financial sector spending on agriculture has increased tremendously in nominal terms, rising by 3.6 times in the first half of 2008 of its 2005 level (Fig. 24). However, its share in total finance to various economic sectors remained humble; ranging from 8.1% to 9.7% during 2006-2008 compared with 20.7% in 2000, yet much higher than its 2005 level of only 4.4%. The relatively lower share reflects a lower priority given to the agricultural sector, but the substantial allocations in later years should have formed a decent boost to production and accordingly higher domestic supply.

Figure 24. Agricultural finance from the financial sector, 2000-2008



* First half of 2008

Source: Compiled from data of Bank of Sudan Annual Reports

On the other hand, the Agricultural Bank of Sudan (ABS, personal communication) has boosted its credit portfolio to agriculture from SDG 203 million in 2005 to SDG 572 million in 2008; an increase of 2.8 times. Its finance in 2008 was 42% more than its 2007 level. The Bank also provides commercial lending services but such lending was small forming only about 9% of its total agricultural lending services.

Further, the Agricultural Revival Program 2007-2011 that gives high promise for a big drive to the performance of the agricultural sector, and in spite of a rocky start, has provided modest support. Out of a budgeted support of SDG 127.5 million for 2007, actual support allocation by the Ministry of Finance was only SDG 22.2 million (17%), but Support would have expected to be higher in 2008. Such efforts will give a needed push to the agricultural sector and address the food price rises positively.

Among other encouraging actions is the microfinance agenda adopted by the CBoS when in 2008 the Bank established a Microfinance Unit as a mechanism of reducing poverty (CBoS 2008). Enabling policies declared by the Bank include encouraging all commercial banks to allocate at least 12% of their finance portfolio to microfinance and they should establish units

at their headquarters that provide their plans in this respect according to directives set by the CBoS. They should also activate their role by creating arms to expand microfinance and improve human and institutional capacities in this area, take actions to reduce finance cost and create microfinance awareness among poor sectors of the population, while they may also establish branches and/or companies specialized in microfinance.

All of the above mentioned macroeconomic and sectoral policies, however suboptimal they might be in their support to the agricultural sector, would be expected to form a driving force for agricultural production. In fact, records of the Ministry of Agriculture and Forests show that high domestic production of cereals was achieved in 2007 amounting to close to 5 million tons of sorghum, 0.8 million tons of millet and 0.67 million tons of wheat. These levels exceeded those of 2006 by 15%, 18% and 61% for the three crops, respectively and were certainly higher than the population growth of about 2.2%. They were also higher than production peaks recorded for 2004. Further and according to the FAO (2008) prospects for the 2008 food crops are favorable in Sudan's major producing areas owing to improved rainfall. Despite this, and as shown earlier, cereal prices escalated by the end of 2007 and through 2008, indicating that price movements were not attributed to decreasing production. For sorghum however, exports in 2007 and 2008 might have induced an increase in prices.

Accordingly and in general terms, policies should have been in favor of price reduction or at least price stability. This indicates that the external dimension should be thought as being responsible for the food price hikes. Nevertheless, there are crop-specific factors that might have caused and/or exacerbated the rise in food prices. This will be discussed within the context of individual food products.

3.3 Determinants of price changes of individual food commodities

A salient feature of Sudan's agricultural commodities is their high domestic prices that have created a chronic decreasing international competitiveness and impediment to exports, resulting in declining value of exports (DTIS 2008; DTIS forthcoming). The ratios of border to export price at the costs and prices of 2006 and an exchange rate of SDG 2.0 to the USD were 0.79 for irrigated sorghum, 0.94 for sesame and 0.93 for rain-fed groundnuts. These ratios indicate that internal prices at the point of export were higher than the export price. For irrigated hand-picked shelled groundnuts and rain-fed sorghum the ratios were respectively 1.08 and 1.07, which means that the incentives to traders were rather marginal. At the centre of high domestic prices is low and variable yields the related high production cost. But other factors include low spending on agricultural development, high trade costs amplified by high taxation, appreciation of the exchange rate and rising average per capita income. Yet, the price rises over the past two years have surpassed the normal high domestic prices. Circumstances of price changes of individual commodity groups are discussed in the following for cereals and oil seeds, which are the food commodities most subjected to price rises.

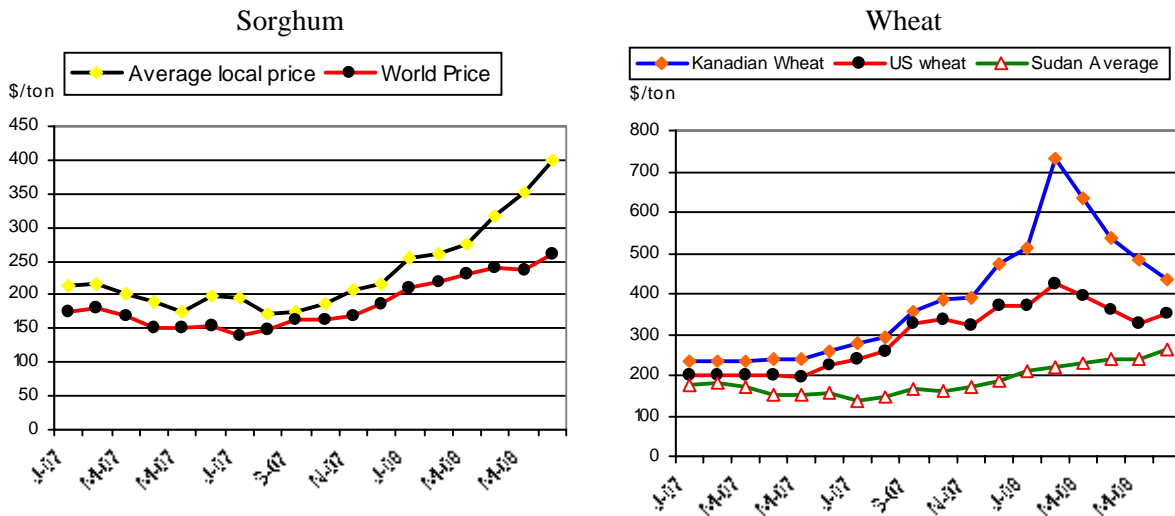
3.3.1 Cereals

An important feature of the three cereal foods; sorghum, wheat and millet is their high integration in the Sudanese markets. This is evident from the associated movement of their prices in Fig. 1, Section 2.1. It can be calculated from the data that correlation

coefficients were 0.72 between sorghum and wheat, 0.62 between sorghum and millet and 0.78 between wheat and millet. The relatively lower coefficient between sorghum and millet is most probably the location-specific consumption of the latter in western Sudan where sorghum is not as popular. The high correlation between wheat and millet on the other hand might be related to a substantial part of food aid in the form of wheat that flows to western Sudan where millet consumption dominates. Rice, as mentioned earlier has low consumption and may form a minor substitute to cereals in cases of soaring cereal prices.

Domestic sorghum and wheat prices were largely affected by the world market trends during 2007 and 2008. Figure 25 shows that domestic wholesale prices, averaged over various markets, go together with world market prices as traced for the period July 2007 and June 2008. Correlation coefficients calculated from the graph's data were 0.94 in the case of sorghum and 0.96 and 0.93 for local wheat with Canadian and US wheat, respectively.

Figure 25. World market and wholesale domestic price patterns of sorghum and wheat, Jan 2007-June 2008



Source: El-Dukheri (2007) and data of the Planning and Agricultural Economics Administration, MoAF

As Sudan's millet is largely a non-traded commodity in the world market, its prices would be expected to be largely determined locally. Accordingly its price rise obviously stems from its substitutability effect with other cereals. The rice price pattern was mentioned earlier to be influenced by world market prices due to the high volume of imports (CBoS figures reflect that Sudan produced only about 33% of its consumption needs in 2007).

It seems that the international food price hikes were triggered by the rise in wheat prices and this is likely to be the case for Sudan. As shown earlier, Sudan has for many years depended in a large part of its wheat consumption requirements on imports. Over the past three years (2005-2007), and according to figures of the CBoS and Ministry of Agriculture, Sudan imported on average 1.345 million tons of wheat equivalent of grain and flour and produced 0.483 million tons of wheat grain. This means its domestic coverage of its consumption was only about 26%. The world market price transmission of

wheat has induced by soaring sorghum and millet prices since, as mentioned earlier; production of both types of grains was high.

Some other internal factors might have however intermingled with the international dimension to influence prices of individual commodities. These factors include:

- a) Sorghum exports could have accentuated price increases. Sorghum forms one of Sudan's traditional exports, but mostly confined to seasons of bumper harvests. Trade figures of the CBoS show that sorghum exports amounted to 149,142 tons in 2007 and 222,315 tons in the first half of 2008. Although usually sorghum export policy is pursued in a way as not to jeopardize domestic availability of the crop, it seems that these sorghum exports had taken place simultaneously with the general price rises and before price hikes had been fully comprehended.
- b) In spite of the overall country-level availability of sorghum and other cereals, supply shortages highly related to limitation in domestic production had been felt by many respondents in the field survey in nine out of the 11 states (except for El Gedarif and Blue Nile, which are consumption surplus areas). This must have exacerbated the price rise situation in these states. While emphasizing the effect of world market prices, some of the responses of interviewed people revealed supply problems as causes of price rises (Box 1).

Box 1: Supply shortages in many states have added to the price rises of cereals:

- A trader in the Um Durman grain market mentioned low productivity in previous seasons as a factor that led to limited market supply.
- At the White Nile State (Kosti), the General Director, Ministry of Agriculture attributed supply shortages to low production in the State due to excessive rainfall and water logging. Officials at the Ministry of Finance stated reasons of low production, decreased strategic reserve of grains, and lack of statistics on consumption levels of different types of food. The Agricultural Bank of Sudan referred to low local productivity and production due to heavy rains and excessive flooding in the previous season. The Zakat Chamber also made reference to the excessive rains and flooding, but added failure of the Strategic Reserve Corporation (SRC) to pay traders for sorghum purchases that hindered SRC from releasing stocks. Traders on the other hand attributed supply limitation to low production in the State, high costs of transport from main production areas (SDG 4 per sack of sorghum), unstable government policies and government failure to remove transport-related taxes. But they conversely stated that neither their sales nor sorghum consumption have decreased. The Agricultural Chamber related the issue to disincentives to farmers who incurred losses that resulted in limited supply.
- At El Gedarif State, which is a known sorghum surplus area, while the Farmers Union indicated that there is a shift by farmers towards production of oil crops, the Director of the Grain Market Administration said that the grain amounts coming to the market have not been affected by the price rise. Traders have good storage capacities and have the advantage of ability to wait for longer period than farmers to follow price movements. There is accordingly monopsony among traders although it is difficult to differentiate between traders and big farmers there since the latter also engage in trade based on their high amounts of production.
- At Kordofan State, which is a deficit area, low production was stated by most respondents as a supply-limiting factor in addition to limited supplies from other areas due to rising transport costs. There is also limited market finance by banks during harvest time (December) when banks wind-up their accounts. An interesting phenomenon there is the rising demand in the

summer months when water availability decreases in rural areas and migration to El Obeid increases.

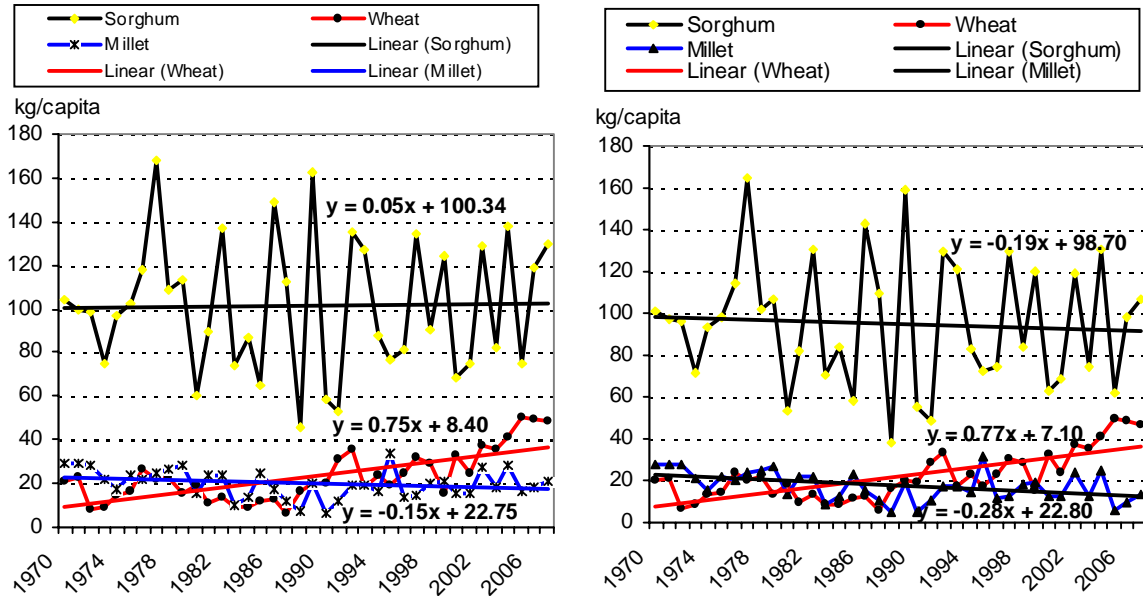
It appears from the above that there are location-specific supply and demand problems along with other factors that might have also contributed to the price difference among various markets. For example, the relatively high prices at El Gedarif and Khartoum would be partly due to high demand from traders in the former and high consumption demand in the latter. At El Obeid, food aid would be expected to reduce prices in the face of high demand. In all cases weak infrastructure and high trade costs have certainly contributed to problems in smoothing supply in different markets.

- c) Smuggling into neighboring countries was reported by respondents in the field survey as a supply constraining factor in states bordering other countries, especially for sorghum from El Gedarif and Red Sea States. Furthermore, policies related to cross-border trade have had a negative effect on local supply such as reduced supply of faba bean coming from Ethiopia due to a ban based on quarantine measures. In the Northern State, low benefits accrue from border trade with Egypt in the Northern State which is largely treated as a transit location of commodities to other parts of the country.
- d) Limitations in storage facilities were mentioned to impair regular commodity supply in the Northern, White Nile and Blue Nile States. In El Gedarif, sorghum stocks of the SRC was reported to stand at 20,000 tons in September 2008, down from 200,000 tons in 2006/07, being depleted due to weak and irregular government finance.
- e) The ever-rising consumption of cereals would have also been expected to influence domestic prices of cereals. Rising consumption due to population growth and increasing awareness of consumers about nutritional issues was reported by survey respondents to have contributed to the rise in prices in the Northern, White Nile, Red Sea and Blue Nile States. Cereals consumption for both human food and livestock feed has been on the rise for the three main cereals, yet with differences among these cereals and at different levels with respect to total utilization and human consumption.

Fig. 26 illustrates long-term development of total utilization (including the use as seeds and livestock feed) and human consumption alone for the three cereals; sorghum, wheat and millet (1970-2007). While total utilization of sorghum is rising at 0.05 kg/capita/year, its human consumption is decreasing by 0.19 kg/capita/year as shown by the straight-line trend equations. A similar pattern is depicted for millet where, although both its utilization and human consumption are decreasing, the decrease in the latter (0.28 kg/capita/year) is faster than the former (0.15 kg/capita/year). On the other hand, wheat utilization and human consumption are both rising at a relatively high rate (0.75 and 0.77/capita/year, respectively). It is to be noticed that while the wheat human consumption trend line is lower than that of utilization the trend coefficient is higher. The difference between the two is the amount of seeds since the grain is not used as feed, which varies with the wheat area and results in different trend equations. These results are indicative of: first, a clear shift from both sorghum and millet to wheat and second, rising consumption of livestock feed.

Figures for livestock feed are unreliable. Those used in the graph are from FAOSTAT where they varied from about 1% to 9.7% of the amount produced during the period under consideration with an average of 3.8%. Such high variation is plausible, given the variation in rainfall and pasture availability that influences the amount of required grain for feed. Records for millet show that no millet grain was used till 1988 after which feed use seems to be rising with 1 - 11% variation and average of 4.1% of production.

Figure 26. development of utilization and human consumption of main cereals, 1970-2007
Total utilization *Human Consumption*



Source: Faki and Taha (2007); figures for 2005-2007 are from CBoS data with authors estimates of seed and feed requirements.

Irrespective of the feed portion out of the amounts produced, livestock feed from both sorghum and millet grain has been clearly and considerably rising in quantity. Other sources provide other estimates. El-Dukheri (2007) confirms the considerable expansion in the use of grains for livestock production including that provided for both poultry and other livestock species. Referring to FAO estimates, he stated that the portion of total grain production that goes for livestock feed ranges from 7 to 10%. The best guess of the quantity of feed grain by the Ministry of Agriculture (MOA) was stated to be about 32% of sorghum long-term average production (3,403,000 tons) and 56% of millet long-term average production. Consumption of millet as feed is basically in western Sudan and is justified by the frequent shortage of feed stuff from range and crop residues as well as the prime need for giving concentrates to animals as a required husbandry practice. A sizable increase in grain needs as feed is due to expansions in commercial poultry production and in feedlots activities around Greater Khartoum to support export of live animals and also for dairy farming. El-Dukheri made note to the real challenge of balancing the need for grains as animal feeds and as human food. This is also an opportunity for enhancing the demand for local grains as part of the

overall management of production systems of the country in the face of a comparatively declining demand for local grains as human food.

- f) Monopsony/Monopoly behavior of traders and big farmers has widely emerged as a major cause of price rise of many food commodities from the interviews. Monopolies, speculative behavior and harmful storage in the grain market were also evident in the Northern, River Nile, White Nile and Blue Nile States (see Box 2). Such monopsony behavior has also been mentioned in El Gedarif to affect sorghum supply and prices. According to El_Dukheri (2007), the high sorghum prices make local sorghum trade difficult and require huge investment by traders in order to buy at harvest time and store for gradual release. This often creates some kind of monopoly not in favor of consumers and grain trade in the end.

Box 2: Many claims of monopoly/monopsony by respondents

- “According to the Trade Administration at the Ministry of Finance in Dongola trade monopolies are practiced by traders at varying levels among localities within the State but are more apparent in Dongola Locality.”
- According to the Ministry of Agriculture and the ABS at Eddamer monopoly forms one of the reasons of food price rises, especially for sorghum and wheat.
- At Damazin it was reported that 15-20 traders control the market to a monopoly level, while the Grain Market Administration mentioned that most of monopolizing traders in the State are big farmers.

- g) Wheat seems to have two markets; one dominated by three big milling companies namely, “SEAGA”, “WEATA” and “Seen” who predominantly depend on wheat importation from abroad. They import huge volumes of medium and hard high-gluten wheat from Canada and Australia through forward contracts and partnership agreements (El-Dukheri 2007). Soft wheat only constitutes about 10% of the volume as indicated by SEAGA, who import annually about 1,000,000 metric tons. SEAGA for example have partnership with the Australian Wheat Board and have consistently been relying on Australia for their supply and have a total storage capacity of 100,000 metric tons (70,000 in Port Sudan and 30,000 in Khartoum). The recent drought that hit Australia has cut back the supply from Australia and SEAGA had to rely on other sources, namely Canada and Germany.

The second market is wheat produced locally by small farmers in the irrigated sector. In the past locally produced wheat, particularly from big irrigation schemes such as Gezira and New Halfa, used to be delivered to medium size mills that have been crowded out by the above mentioned big mills and they do not seem to function now. Such wheat flows into the retail market although dialogue is going on with the big milling companies mentioned above, especially “Seen” to mill local wheat but there are disputes on its quality.

The market of the wheat flour is a monopoly of the big millers who control a big share of the market and have setup commission brokers across the country for its distribution (El-Dukheri 2007). SEAGA, for example, has a milling capacity of 3400 tons per day (the actual capacity is 85% of the design) and the two others have more or less similar capacities.

The rival behavior of the two big milling factories "SEAGA" and "WEATA" and the homogeneity of wheat flour produced by each limits very much the ability of any of them to influence the price of wheat flour without providing additional services as the market is seemingly divided between the two before the entrance of "SEEN" (El-Dukheri 2007). So the wheat flour price is largely influenced by the behavior of these big companies, but there are interventions by the State to influence its price to bakers in order to reduce bread prices.

- h) With regard to millet, reasons mentioned for its price rise in one of its important producing areas – El Fashir – is the reduction of food aid by 50% and exclusion of millet from the food aid box of food commodities. This in addition to the internal displacement of people where about 50% of the farmers had moved to refugee camps on account of security problems.

3.3.2 Oil seeds and vegetable oils

Underlying causes of price surges for oilseeds could include global and national factors. Oil seeds are not widely traded in the usual markets where other crops such as cereals prevail. They largely go for export or to the milling industry. Accordingly few responses were obtained from official sources and various players in the market (see Box 3).

Box 3: Some responses to the price rise of oil seeds and vegetable oils:

- According to an oil miller in Um Durman the rise in vegetable oil prices was attributed to speculative behavior of commercial banks, providing large credit amounts to traders who store large quantities of sesame and groundnuts after making large purchases at low prices from producers through the Oil Seeds Auction Market. This triggers a monopolistic speculative situation that prevails in the oil seeds auction markets.
- At El Gedarif, respondents at the Ministry of Finance and Working Forces referred to the primitive industry in the State where there is lack of agricultural industry and large oil milling factories are defected due to shortages in water, spare parts and skilled labor in addition to high electricity prices and inability to compete with imported oils. There are only about 30 small oil mills in El Gedarif town, most (96%) of them are electrically driven and the remainder are traditional mills. Respondents from the Academia at the University of El Gedarif alluded to the high cost of drinking water that hampers industrial growth where the price of a barrel of water increases to SDG 10 in the summer months up from SDG 6 on average.

Nevertheless, variable supplies and climate effects characterize production of oilseeds. Disruption of supply in western Sudan because of conflict has aggravated the problem. Prevalence of small and fragmented markets that are poorly connected and stagnant, or declining productivity and poor organization of oilseeds market are key factors. Marketing of oilseeds crops is mainly handled by the private sector and a large portion of oilseeds marketing is controlled by commercial banks. On the seed oil side, high costs of processing were said to adversely affect the oilseeds industry.

3.3.3 Price-influencing factors common to all food commodities

- a) *Levies and high production costs*

Fees and charges, especially those levied on roads, were an important cause of price rises of commodities in many states as reported by survey respondents (see Box 4). In addition, high transportation costs were a price rising factor, especially in South Darfur on account of high fuel prices. It was however reported in the survey that such fees and charges have been abandoned in the River Nile and Blue Nile States and strictly fixed at a low level in North Kordofan. Processors such as bakers and oil millers complain about the increase in value added tax (VAT) from 10% to 15% over a short period. Further, concerns were made about high input costs to producers that contributed to high prices in the Northern and White Nile States and to bakeries and millers such as those of electricity and yeast. At El Gedarif, the rise in crop prices has been accompanied with limited availability and higher prices of inputs such as herbicides that are on increasing demand, and also those of fuel and engine oil.

Box 4: Some agricultural subsidies provided, but taxes and rising input prices are still there:

- In the River Nile State prices of many inputs have increased as reported by the ABS: diesel from SDG 5.6 to SDG 5.7 per gallon, urea from SDG 55 to 57 per sack and wheat seeds from SDG 30 to 50 and then to SDG 75 per a 50-kg sack.
- At Damazin the Bakeries Trade Union complained about the rise of fire wood from SDG 25 to SDG 55 per m³, increase in a pack of yeast from SDG 80 in 2006 to SDG 90 in 2007/08 and rise of wages for processing a sack of flour from SDG 5 to SDG 7 in 2007, reaching SDG 12 in 2008.
- The Agricultural Mechanization Corporation at El Gedarif noted the existence of State collection of fees from agriculture, specifically those levied on owners of agricultural schemes at levels of SDG 2.75 per feddan for contract renewal, SDG 10 as charges for the Operation Chamber in addition to other charges levied according to the area at SD 1 for every 100 feddans. The Tax Chamber reported that, except for flour, all processed oil crops are subjected to a 15% VAT of its basic value. Grain traders are charged SDG 2 for each sack, while exported crops are charged SDG 0.75 per sack. In all, total charges at the grain market amount to SDG 4 per sack including injury charges (SDG 1), profit tax (SDG 2), market charges (SDG 0.25) and export stamp (SDG 0.75). On the other hand, input costs increased. For example the price of 2-4-D herbicide, which is now widely used in rain-fed agriculture, increased to SDG 17-20 per liter.
- According to the General Director of the White Nile State Ministry of Agriculture, taxation on agriculture has not been removed, only shifted to new items. For example a new storage charge is created at SDG 0.5 per sack of sorghum, groundnuts, wheat and millet, SDG 0.85 per sack of sesame, SDG 2 per sack of gum Arabic and an overall tax of SDG 2 per sack for all crops, while the injury tax is collected on all amounts inside trucks.

b) Policies

The free-market policy adopted since the early 1990s was cited by interviewed officials in the Northern and Khartoum States as a cause of rising and volatile commodity prices. Opening of sorghum exports was considered in the opinion of officials in Khartoum, White Nile, El Gedarif and Blue Nile to have contributed to the rise in prices. On the other hand, the Farmers' Union in El Gedarif, where crop production is largely undertaken by big farmers, object export bans as being inconsistent with the free-market policies. The Union sees the price rise of crops as a positive change in favor of farmers provided that there is no government intervention through the SRC. Absence of price stabilization policies, inappropriate land policies and complications in the Investment Act that hinder investment were causes of price hikes, while inefficient agricultural policies

were mentioned as part of the causes at the Red Sea State. Rising prices were also attributed to finance shortages at El Gedarif, Dongola and Port Sudan.

4. IMPACT OF PRICE RISES ON DIFFERENT SECTORS

Information on price rise impacts was solicited from various stakeholders but the main affected parties (negatively or positively) are producers, traders, processors and consumers. Impacts have been diverse on most of these groups and differ in different locations.

4.1 Producers

Farmers should have benefited from the price rise but this seems difficult without support. It can also be argued that it was still early for a tangible impact of price rises to take place on producers due to the annual nature of production. But for instance, the field survey results indicated that protection to small farmers in El Gedarif State, who produce all or most of kidney beans, groundnuts and maize, is weak except for the provision of seeds to only 10-25% of them. A constraint to small farmers there is lack of their integration into cooperatives that are now a 100 in number with a membership of over 120,000. A positive impact of high prices in the White Nile was regarded as providing incentives to farmers to engage more in agriculture and increase their crop areas (Box 5).

However, the effect of price increase of grains has been especially harming livestock herders in El Gedarif whose daily requirements for sorghum grain is estimated at 1500 sacks (135 tons). Due to short rainfall and influx of livestock from other states, purchased feeds have increased. The situation resulted in extra livestock sales to meet the rising feed costs while a sizeable number of animals died due to lack of fodder or feed. In the Red Sea prices of livestock decreased where nomads sell their animal at low prices to meet their needs and purchase high-priced fodder.

Box 5: Signs of both positive and negative impacts on producers are evident:

- The General Director of the White Nile State Ministry of Agriculture pointed out that crop areas have increases to reach 450 thousand feddans in 2008. Yet discussions at the State Headquarters indicated that high sorghum prices distorted the grain/sheep terms of trade where the price of a 9 kg-weight ram was SDG 150 while the price of a sack of sorghum (*ferterita*) was SDG 80. This means that a ram is worth only two sacks of sorghum. This might have contributed to the exceptionally sharp rise in sheep prices reported earlier for Kosti.
- Grain price rises were mentioned by the General Administration of Animal Resources, River Nile State to increase the cost of concentrates that form 60% of livestock feed within their livestock production activities. They gave estimates of up to 60% price increase in feed concentrates for dairy, up to 50% for each of laying chicken and livestock fattening feeds and 33% for broiler feeds.
- Uncertainty about prices resulted in reluctance of farmers to grow sorghum in 2008 due to its low prices in 2007. Expectations were that the 2008 season will witness area expansions but if reliable price policies are not in place farmers will be in a precarious situation.

4.2 Traders

There is high consensus among interviewees that price hikes were largely to the benefit of traders who buy crops at low prices from small farmers, perform storage and sell at high prices. Price rises of grains, flour and vegetable oils are directly transmitted to consumers. But interventions in the market through sorghum purchases by the Strategic

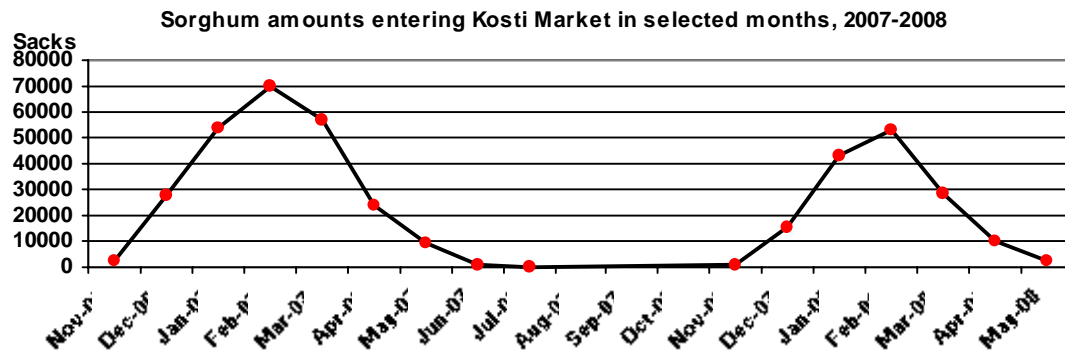
Reserve Corporation - however limited such interventions might be - have had a mitigating effect on sharp price rises.

On the other hand, it is estimated by grain traders in Khartoum that sorghum and millet quantities coming to the wholesale market have decreased by 50% but the turn-over is quite fast. However at El Gedarif, and apart from normal seasonal patterns, grain quantities coming to the El Gedarif auction market have been less affected due to the substantial capacity of storage by big traders and big farmers.

It was reported in South Darfur that revenues in auction markets, especially for small traders, decreased due to reduced transactions, and also Zakat proceeds dropped by 35%. In response to the situation of limited transactions, the ABS made a repayment waiver of 60% to 35% to defaulters.

Box 6: Price rise impact on traders in Northern and White Nile States

- Traders at Dongola, while attributing price rises to high transport costs as well as taxes and charges, they don't seem to be affected, reporting that any price rise is transferred to consumers.
- The amounts of sorghum entering Kosti market have decreased during the production season (Jan-March) between 2007 and 2008 as depicted in the figure below. The February peak in 2008 was 24% less than that of the February peak of 2007. This might be due to low supply and/or inability of traders to finance larger quantities at the 2008 high prices.



- Similarly at El Gedarif, amounts entering the market decreased between seasons 2006/07 and 2007/08 by 52% for sorghum and 23% for sesame.

4.3 Processors

A widely adopted reaction of bakeries to the high flour prices was reduction in bread weight to allow more flexibility in bread sales to consumers. This was reported in six out of the nine states covered by the survey (Khartoum, North Kordofan, Northern State, River Nile, El Gedarif, Northern). Bakers at Dongola complained from incurring lower profit margins, which they had to accept since their alternative was to go out of business.

Various responses were reported by interviewees in the field survey as to the scale of business by bakeries. In Dongola and as noted by the Bakers Union, purchases of wheat flour have decreased there by 20% due to lower bread demand. In contrast bakers in the River Nile State reported no change in their purchased quantities of flour but they

reduced bread weight. A flour mix from imported and local wheat flour developed by “*Seen*” Company proved successful as mentioned by bakers at Eddamer and is expected to result in lower cost. At Damazin in the Blue Nile State bakeries reduced quantities of processed flour from 14-15 sacks to 7-8 sacks per day; a reduction of about 50%. In Khartoum, on the other hand, the effect on bread sales had been only temporary; responding shortly to the shock when consumers took advantage of the presence of substitutes such as sorghum bread. Thereafter bread sales returned to their normal levels and even currently surpassing that level although part of the consumers are observed to reduce their consumption. This could obviously be related to the rising prices of sorghum and other substitutes (e.g., rice) on the one hand and the well-established consumption habits in favor of wheat bread on the other hand. At the Red Sea State the Bakers Union records reflected decreasing purchases of wheat flour by 20-40%.

Oil millers in Khartoum indicated that their sales had decreased since the price rise in vegetable oils in 2006 that currently reached a 100%. But all produced quantities were quickly sold. It is also the case that price increases or the cost of including any additives to the industry are directly transmitted to the consumers. However, their production costs had remained stable at SDG 240-250 irrespective of the price level of raw material.

4.4 Consumers

It is obvious that consumers are the most negatively affected group by the price rises; being over-proportional to their purchasing power and highly jeopardizing their food security status and reducing their living standards. Reduced quantities consumed and/or decreasing number of meals were mentioned by many respondents to have prevailed in almost all states. In Khartoum, and in spite of the absence of reduced bread consumption by part of the consumers, household budgetary allocation was largely disturbed.

The situation would especially be stringent on the poor who spend a large part of their incomes on food. In fact poverty is prevalent in the Sudan as mentioned earlier. Related to poverty is food insecurity and malnutrition. The WFP (2007) reported that the nutritional situation of children is characterized in Sudan by unusually high wasting (or global acute malnutrition- GAM) prevalence (WFP 2007). Households that are highly exposed to a shock and have weak coping capacity (low wealth, borderline food consumption) are vulnerable. Further, if the probability of a severe shock occurring is high, the risk for food insecurity for these households is also high. This might be the case with the high surge of prices as experienced recently. The field survey results in this study show that according to a survey conducted by the Zakat Chamber in El Gedarif, 90% of the population in the State are under the poverty line. A study conducted by the Technical Assistance to NGOs (TANGO 2005) showed that annual income per household was approximately 250,000 SD (\$156 per capita) in Kassala State and 125,000 SD (\$93 per capita) for Red Sea State; both way below the poverty line. The same study depicted that expenditure on food formed 67% and 79% in the two States, respectively. In Darfur – a conflict-stricken but resource rich area – expenditure on food from total household spending ranges between 62% and 65% for the food-insecure, vulnerable and food-secure households (WFP 2005).

Under such circumstances of low income, high expenditure on food and wide-spread poverty, implications as solicited from the field survey include consumers' reduced purchasing power and resort to substitutes of low nutritive quality, with negative implications on nutritional status and security issues. Consumption shifts were reported in almost all states and the situation was aggravated by the high rise in prices of substitutes such as rice, lentil and alternative types of grains such as sorghum in wheat consumption areas and the reverse in sorghum consumption areas. At the River Nile State there was a shift to sorghum, but its prices hiked and consumers had to return back to wheat. In the White Nile State high sorghum prices induced a consumption shift to wheat currently estimated by the General Director of the State Ministry of Agriculture in Kosti at a ratio of 60% wheat and 40% sorghum. In the Red Sea consumption change was to the benefit of wheat bread for many people in rural areas instead of sorghum and millet. The effect of prices rise there was dramatic on consumers. Besides decreasing their number of meals, consumers in South Darfur shifted to foods with low nutritive values. The impact was also transmitted to food aid policies there where a 50% reduction in food aid was reported and millet was excluded from the food aid basket, resulting further in its higher prices. In the Red Sea, where poverty largely prevails, the range of impacts was wider (Box 7).

Box 7: Dramatic effect of food price rise on poor families in the Red Sea State:

- A group of poor families visited in Port Sudan reported the following:
 - Consumption style has changed and many families reduced their quantity of consumed food.
 - The number of meals has been reduced to two instead of three meals per day.
 - All family income is spent on food items and there are no family savings.
 - Consumption of meat increased for prices of legumes have dramatically soared.
 - Consumption of milk has been reduced to 25% of former amounts and some families have completely abandoned milk in their diets.
- The Director of Early Warning System at Oxfam GB – an NGO – enumerated many impacts of price hikes on poor sectors of the population:
 - Migration from production to urban areas in search for other income sources.
 - School dropouts.
 - Drop in animal prices (probably because of high feed costs – complementary effect).
 - Smuggling of sorghum to Ethiopia and Eritrea where the price of one sack of sorghum reached SDG 220.
 - Moral disorder like theft and other immoral behavior.

Government employees and workers have been particularly encountered difficulties, in spite of some of the mitigation responses by various institutions. Under their stagnant salaries, employees are in hard struggle for maintaining their livelihood.

5. UNDERTAKEN AND REQUIRED INTERVENTIONS

Interviews of different stakeholders concerned with the price hikes include enquiries about possible interventions already undertaken in different states in response to the price hikes as well as further desired actions. As mentioned earlier price hikes are in their major part externally geared but there are internal intermingling factors that could have exacerbated the situation. Interventions discussed here are specifically those accompanying the state of soaring prices that could mitigate their harmful effects and utilize their beneficial ones. Those can be grouped into three categories: interventions in production expansion, finance and price interventions and direct poverty mitigating actions to reduce the effect of price rise on consumers.

5.1 Undertaken actions

a) Intervention in production expansion

Many production enhancing actions have been in place to increase domestic supply during 2007 and 2008:

- In El Gedarif, the State Ministry of Agriculture encourages and finances a change in the crop mix to grow groundnuts and sunflower that fetched high prices. Groundnuts was expanded for the first time by small farmers in an area of 20,000 feddans, planned to reach 30,000 feddans the following year, in addition to 100,000 feddans grown by big farmers. Encouraged by its prices that reached DG 850/ton in 2008 up from 580 in 2006 and provision of finance from commercial banks, sunflower area reached 150,000 feddans. The State's strategy targets diversification of cropping to increase sesame and sunflower production. Future expectations include a change in the crop mix in favor of cash crops (groundnuts and sunflower), stabilization of crop prices, with sorghum at a level around SDG 75/sack. This was in line with the strategy of the State Ministry of Finance, which aims at expanding production of sesame and groundnuts to benefit from the growing world market demand and abandon the policy of mono-cropping.
- In Dongola, the State Ministry of Finance is encouraging establishment of small cooperatives in addition to various projects that allow families to own production facilities, the most important being the Martyrs' Fund that targets 1000 families with a cost of SDG 3 million, finance provision to the Women Pooled Fund and support to the Women Union. Both interventions are within the Support Program for Productive Families with a total of SDG 2 million, 50% of which has already been approved.
- Strive for improving the security situation, for which raising production is a pivotal issue, is an ongoing concern in South Darfur State. Further, some productivity enhancing technology is also being adopted through distribution of 1081 tons of seeds of different crops in the State in 2008, introduction of ploughing in clay soils, improvement of infrastructure in rain-fed areas, and abolishment of fees and charges on commodities.
- Crop areas were reported to have increased in the River Nile State, where it is believed that the State has surpluses in sorghum and wheat.

“Grain balance records of the General Administration of Planning, Investment and Agricultural Economics of the State Ministry of Agriculture show that the State has surpluses of 40,718 tons of sorghum and 10,914 tons of wheat”

The Ministry of Animal Resources there has establishment a feed factory to assist in livestock production. In addition, the Legislative Council strives for improvements in investment legislation to encourage investment.

- In the Red Sea State, efforts succeeded in increasing the area cultivated in Toker Delta to 80,000 feddans in season 2008/2009 to be cultivated with sorghum, millet, sunflower, and legumes, as compared with 31,000 feddans in the previous season. The intervention has been supported by introduction of short maturing varieties and encouragement of small farmers towards garden production. A land-use map was about to be completed to guide agricultural production while investment in fisheries is increasing.

b) Input subsidies and finance interventions

- In most of the states covered, the ABS provides subsidized diesel and fertilizers at reductions of SDG 1 per gallon of diesel and SDG 20 per sack of fertilizers in 2008. In Dongola the subsidies, in addition to provision of inputs and extension services, target expansion in wheat production. In the White Nile and in addition to the fuel and fertilizer subsidies, the ABS provides 50% free seeds for sunflower production.

“According to the ABS, the rise in wheat price to SDG 100 per sack in the River Nile State in contrast to farmers’ contracts with the ABS of SDG 70 per sack and the market price rise again to SDG 125 per sack have assisted the Bank in recovery of its loans”

- Microfinance seems to be expanding in many states, a situation conducive to improving production capacities of small and poor families and assisting in mitigating price hikes and reducing poverty. For instance, purchases of 10 sheep per farmer in Tendelti area, White Nile State were made through this mode by the ABS. The ABS in the Northern State provides microfinance at 90% of its portfolio and at 10% profit margin (Murabah). Provision of microfinance in El Gedarif State was reported to induce a shift in the finance balance in favor of small farmers to an extent of 73% of the portfolio compared to 4% in the past. In North Kordofan the ABS increased microfinance to reach 10-15% of its credit portfolio. A similar picture seems to exist in the area of enhancing the Productive Families’ Program such as one which is active in the White Nile and other States.
- In Dongola, the Legislative Council reports the realization of what is known in the State as the “First Jump Project” for poverty mitigation for poor families that is complemented by action by the Zakat Chamber with a total fund of SDG 16.82 million from federal and state sources. The Project has diversified objectives to reduce income and human poverty. There is also a local NGO (Charity and Solidarity Organization) that provides various types of developmental support to poor families.

c) Direct poverty mitigating actions

- Zakat collection and distribution under the responsibility of the Zakat Chamber plays an important role within interventions that strive to reduce poverty. Besides direct monetary and in kind support to the poor, the Chamber has diversified its activities to support production programs such as provision of inputs that is reported in all states.

- State ministries also intervene to support their employees and workers. The ABS provided wheat sold at SDG 100 per sack in the Northern State and in North Kordofan provided sorghum to state employees at subsidized prices of SDG 68 per sack compared to the market price of SDG 100/sack. In South Darfur the presence of a strategic reserve allowed distribution of 10,000 tons of sorghum to the state working force at 45% lower price: 1,900 tons sold in installments for six months and 9000 tons from the Zakat Chamber. Many states also encourage establishment of consumption cooperative and provide support to social solidarity funds. In El Gedarif, the SRC has supported the State with about 14,000 sacks (126 tons) of sorghum, of which 4,000 went to the Zakat Chamber and the rest sold at SDG 60/sack compared to a ruling market price of SDG 180/sack.
- NGOs play a role in direct mitigation of food security and poverty as well as support to productive activities. Those visited are OXFAM GB and ACORD Organization in the Red Sea. OXFAM provided assistance in the earth embankments in Toker Delta, water harvesting in traditional agriculture, and introduction of new agricultural system likes sprinkler and drip irrigation. They also help in extension, settlement of nomads and provision of livestock services, and strengthening agricultural institutions and supporting fishermen. ACORD support nomads through a revolving fund for dry fodder at lower than market prices to save animals beside providing low-prices animal medicines, support small farmers by preparing the land, making terraces and providing agricultural inputs, and provide human medicines with lower prices in some localities. They also support women in some localities by constructing small income generating projects.

5.2 Required interventions

In spite of the variety of undertaken interventions described above, much still remains to be desired. A number of actions were proposed by various respondents within the field survey that are believed to harness soaring prices. Part of these suggestions is short-term and others are long-term, some are structural while others require short to medium-term actions. But all are plausible interventions that will be conducive to increasing domestic production, containing sharp price rises, reducing poverty and contributing to agricultural development in its broad sense. The most important of these can be grouped into five categories, namely: a) Production enhancing actions, b) strengthening investment in agriculture, c) Improvement of market functioning, d) Better storage and regular supply, and e) Foreign trade interventions. They are highlighted in the following points.

a) Production enhancing actions

Many respondents' reactions converge to fall within production increase target, which is a major factor to curb sharp price rises on the one hand, and to benefit producers from the higher price margin on the other. Some of these reactions are short-term in nature, specifically ones that advocates support to producers with direct provision of in-kind input subsidy without the intermediation of commercial banks. It seems that producers' past experience with finance provision through a consortium of commercial banks was not that appealing. Medium-term desired actions included strengthening of research to raise productivity, initiation of cooperatives for small farmers, and development of mixed and organic farming through water harvesting for both crops and animals in dry areas.

Other demands are more of long-term and structural in nature, including modernization of traditionally-based agriculture and diverting the irrigated sector to grain production. While these are sensible options, diverting the irrigated sector to grain production could be debatable due to the need for cash crops there, possible emergence of rotational problems and the already prevailing expansive grain production in the rain-fed sector.

b) Strengthening investment in agriculture

This is a highly required and actually highly advocated area given the rising dependence of oil and fear of a “Dutch Disease” (see for example DTIS 2008). It has strong relation to the issue of production expansion and has also become an important government concern through its strived Agricultural Revival Program. Responses here include adoption of a more favorable environment for investment in agricultural production, enhanced role of the Agricultural Bank of Sudan, and support provision to small-scale business.

c) Improvement of market functioning

A range of plausible suggestions were solicited that address the marketing issue. These are mostly short-term oriented. Of these, important interventions that mostly need quick policy decisions comprise building farmers capabilities to be aware of the market needs and produce for the market, eliminating fees and charges levied on roads, containing market monopoly or oligopoly by activation of marketing cooperatives and supervision of commodity movement in terms of quantity and quality, reduction of the value-added tax and energy price for vegetable oil producers and bread bakers, and government intervention to stabilize the market in such a way that the price strikes a balance for producers and consumers. Another highly relevant requirement is the establishment of marketing institutions, which might be a long-term action. A widely mentioned desire, even among government officials, is to revisit the free-market policies for their market destabilizing effect. This might face difficulties within the current economic environment worldwide but mitigation policy measures could be implemented to harness the negative impacts of the well-known intensive and harshly implemented market decontrol in Sudan.

d) Better storage and regular supply

An efficiently functioning storage mechanism is obviously imperative for regulating market supply as well as prices. Claims in this respect are for improved storage capacities at the state level, formation of strategic reserves capable of action according to need, and related to this, is equipping the SRC to buy products immediately after harvest. These requirements can be classified as short-term interventions.

e) Foreign trade interventions

Two reactions to the issue of trade are addressed by respondents. One is banning grain exports, which is already somehow in place but should better form a temporary option because if production is promoted such an action would be redundant and in fact contrary to the benefit of producers and the economy as a whole. The other is activation of border trade and establishment of free zones to ensure free commodity movement. Such options are apparently plausible and some efforts seem to be going in this direction that truly needs more activation, regulation and monitoring.

6. CONCLUSIONS AND RECOMMENDATIONS

6.1 Conclusions

a) Magnitude of price hikes

Food price hikes encountered in wide parts of the world have also been experienced in Sudan, mainly over the past two years. Of the food products addressed in this study, which form about 93% of the agricultural GDP value in 2004, price rise was especially high for cereals. Acknowledging price differences among various state markets, the rise in grain wholesale, grain retail, flour retail and bread prices of both sorghum and wheat was enormous and so was the wedge between grain retail and flour retail prices. Such a high mark-up reflects high marketing margins, but probably also specifically high processing costs and, not to talk about the price wedge between flour and bread, is indicative of a heavy burden on consumers. The rise in millet prices, although also high, was less dramatic but that of rice was huge, being similar to that of sorghum and wheat. Prices of oils seeds and vegetable oils soar with similar patterns, but livestock and meat prices have not been affected in a notable manner. Nevertheless, milk prices, which have links to the imported powder milk international prices have increased. Preliminary analyses of prices of horticultural commodities reveal no particular rising trends and price movements are largely governed by the seasonality factor. On the other hand, the limited amount and poor quality of available data on food legumes did not allow reliable assessment to draw useful conclusions.

b) Determinants of price changes

The major part of price hikes during 2007 – 2008 period was largely externally driven, yet domestic conditions might have considerable interactions in negative or positive ways to influence domestic prices that are also known to be intrinsically high. Many macroeconomic and sectoral policies such as inflation, exchange rate and finance to agriculture seem to be in favor of reduction in food prices or their stability but they were probably not adequate to trigger major shifts in food supply. The agricultural sector suffers from structural problems of low productivity and low and variable production caused by erratic natural and other factors with no sufficient proper policies in place to alleviate the situation. On the other hand, foreign trade policy has mixed effects on domestic prices where peak tariff and high taxes tend to raise prices for some products such as vegetable oils and milk products while some state interventions in commodity export regulation induce low prices for others such as the case with sorghum. In fact, within the food price hikes period of the past two years domestic production has been relatively rising, indicating that price movements were not attributed to decreasing production. However, encouraged exports for a commodity such as sorghum might have induced increases in its domestic price. While food price rises are highly transmissions of world market prices, high substitutability among commodities such as cereals would certainly have cross-price elasticity effects. Other factors that influence food price rises are smuggling into neighboring countries, limitations in storage facilities, ever-rising consumption, especially for cereals and particularly for livestock feed, and monopsony/monopoly behavior of traders, big farmers and big wheat milling companies. In war-stricken areas such as Darfur, prices are influenced by the pattern of flow of food aid. Further, structural problems, particularly levies, high production costs and the free-market policy adopted since the early 1990s and absence of counteracting price stabilization policies are partly held responsible for keeping food prices at high levels.

c) Impacts of price hikes

Price hikes have had impact on producers, traders, processors and consumers.

i) Producers: The impact on producers is generally positive and there were signs of area expansions in response to high prices such as in the White Nile and El Gedarif States. However, reaping the full benefits is jeopardized by the weak position of small producers and unstable prices. Since small producers are also consumers of their products, their situation requires striking a balance between benefits from production and demand for consumption. On the other hand, livestock producers have encountered a negative impact due to the high rise in livestock feed as experienced in the White Nile and River Nile States.

ii) Traders: Traders seem to be the highest gainers, buying at relatively low prices, performing storage and transmitting the market price rise to consumers. Yet, sorghum purchases by the Strategic Reserve Corporation might have had put some downward pressure on the sharply rising prices. Nevertheless, amounts of grains entering markets such as El Gedarif and Kosti have been low, probably due to speculative behavior of traders. But although traders' transactions have been accordingly low, their turn-over was quite high.

iii) Processors: Processors in bakeries widely tended to reduce bread weight in reaction to the high flour prices in order to allow more flexibility in bread sales to consumers. While some bakeries reduced their purchases of wheat flour, others resorted to a blend of imported and local wheat flour to reduce costs. But generally reductions in bread sales seemed to be short-lived, arising in response to the first high price shock as the case in Khartoum but different income groups have different changes in bread consumption based on prices of wheat bread substitutes on the one hand and the well-established consumption habits in favor of wheat bread on the other hand. Other impacts on bakers are the rising processing costs and accordingly lower profit margins. Oil millers faced decreased oil sales but all produced quantities were quickly sold. Their production costs remain stable irrespective of the price level of raw material while price rises are directly transmitted to the consumers.

iv) Consumers: Impact on consumers has been more striking, being the most negatively affected group by the food price rises, which are over-proportional to their purchasing power and highly jeopardized their food security and reduced their living standards. Decreased quantities consumed and/or number of meals and resort to low-nutritive substitutes were prevalent while household budgetary allocation was largely disturbed. The effect of price rise was especially dramatic on poor households such as in the Red Sea State, resulting in reduced and changed style of food consumption, migration, school drop-outs, smuggling and many moral problems. Among the affected groups are also public employees and workers who struggle to maintain their livelihood in spite of some mitigation support by various government institutions.

c) Undertaken remedial response actions

A number of remedial actions in response to the soaring prices have been made by different parties that might have reduced the impact of sharp price rises. They could be categorized into intervention in production-enhancing actions, input subsidies and finance interventions, and direct poverty mitigating actions. Interventions in production include

expansion and diversification through modest finance provision, encouraging formation of cooperatives, establishment of productive activities including those for women, introduction of some productivity enhancing technologies and strive for improving the security situation in areas of civil strife as in Darfur. Input subsidies and finance interventions are subsidized fertilizer, fuel, seeds and promotion of cost-effective microfinance. Many direct poverty-mitigating actions are in place where the Zakat Chamber has diversified its activities to support production programs, state ministries provided support to their employees and workers as well as encouraging the establishment of consumption cooperatives and providing support to social solidarity funds. The Agricultural Bank of Sudan and the Strategic Reserve offered sorghum quantities for sale at subsidized prices while NGOs such as OXFAM GB and ACORD are intensively engaged in direct mitigation of food insecurity and provision of socioeconomic services.

However, it can be argued that all of the above-mentioned interventions are limited in scale and localized in nature. A number of plausible desired suggestions for more actions emerged from the study. They target areas of production enhancement, higher investment in agriculture, improved functioning of the market, better storage and regular supply, and conducive foreign trade policy.

6.2 Recommendations

A number of wider actions are needed that will be conducive to exploitation of the opportunities offered by rising prices and mitigating their negative effects on consumers. The following recommendations can therefore be proposed, which are grouped into short, medium and long-term, taking into consideration complementarities that may exist among the three temporal levels.

a) Short-term interventions:

- Short-term quick response is required to mitigate the harmful effect of soaring food prices. This could be in the form of targeted financial and food assistance to poorer sector of the population, namely the urban poor, including government workers and the landless rural population. The existing social institutions, charity organizations, NGOs and solidarity groups will need to be strengthened and financially supported to widen their coverage. Further, short-term targeted food subsidies form a plausible option for providing relief to a wide sector of affected people.
- As rightly impelled by the CWTO through its revision of legislation to utilize a range of concessions provided by the WTO discipline (CWTOA 2007):

“The Minister of Finance in consultation with the Minister (of Agriculture) may stock-hold food intended for food security at administrative (low) prices and may designate from time to time floor prices for such stock-holding operations. The Minister (of Agriculture) likewise may use appropriate administrative non-market prices and distribution measures to ensure accessibility and affordability of basic food stuffs in the process.”
- Mechanisms that expedite adoption of available technology should be put in place. It is the State’s role to strengthen extension and technology transfer activities under close cooperation among extension, farmers and research parties, and with provision

of subsidized improved seeds, fertilizers and establishment of simple water harvesting techniques.

- Traders' monopolistic behavior and banks speculative tendency will need to be curbed in order that markets function more efficiently. Capacity building of farmers in terms of provision of market information and training in utilizing such information to respond efficiently to the market changes form needed action. The foreseen SIFSIA program on market technical and capacity building is an important step in this direction.
- A range of levies in terms of fees and charges at various stages of production, transport and processing that add to marketing costs and raise transaction costs should be abandoned, namely those not connected with provision of services. Since most of on-road and other taxes are enforced at the state level, the Ministry of Finance has a role to play in compensating states for foregone revenue. An encouraging step has already been taken by the Ministry in removing such levies by starting to phase-Out the injury tax as reported recently in the media. On the other hand, rationalization of the level of taxation, especially that for the processing industry will need to be adopted.
- Establishment of adequate proper storage should be facilitated at the national, state, public institutions, commercial and household levels to reduce storage losses and regulate the market behavior of essential food security commodities. The SRC may need to build food storage at the state level in coordination with the state governments. This requires a strong commitment from the Ministry of finance to avail adequate funds for grain purchases. Further, commercial storage should be motivated while household storage requires a technical and financial push from the government in terms of provision of credit and assisted promotion of already available storage technology. Movement of commodities should be enhanced via abolition of taxes and controls as mentioned above and improvement in infrastructure a will be mentioned later under long-term actions.
- Implementation of regulatory functions are needed in such aspects as supervision of bread weight and quality according to the prices ruling in the market as well as other related areas in the food market such as vegetable oils processing.

b) Medium-term interventions:

- Increasing domestic supply is pivotal in counteracting the effect of soaring prices and increasing benefits to producers. Productivity enhancement is a key factor for increasing domestic supply, reducing production costs, improving accessibility to consumers and boosting competitiveness of Sudanese products in the international market. This should be coupled with expansion in production to utilize the country's huge resources. Modalities for increasing food supply include:
 - Substantial public investment in agricultural research, extension and technology transfer is vital for raising productivity and quality of food products.
 - Increased agricultural finance: on the one hand, the Agricultural Revival Program will need to be progressively implemented and, on the other hand, the CBoS

should proceed in its program on microfinance and encourage commercial banks to allocate a higher share of their lending portfolio to agricultural production.

- Motivation of agricultural private investment through active promotion and easier implementation of the available Investment Act and continued improvement in its content to match changing circumstances. For instance, multiple taxation, the way it is collected and low transparency of the tax legislation are still impeding investment (DTIS 2008). On the other side, and in order to serve national interest and as endorsed by the CWTO (CWTO 2005), investment may be subject to one or more of four conditions, namely use of local inputs, direction of part of the produce to domestic consumption, investor's reliance on own foreign capital sources, balance of investor's exports with their imported inputs, and returns be balanced with expenditure in terms of foreign currency.
- Better organization of border trade by the state where studies are needed to provide a strong base for its rationalization to serve the interests and livelihood of petty border traders and to conform to national interests.

b) Long-term/continuing interventions:

- The structure of Sudan's import tariff needs intensive analysis with the objective of attaining a *pareto optimal* condition whereby food imports flow is eased and at the same time domestic producers are not harmed. Sudan is currently negotiating its tariff structure within its WTO accession process. While its MFN bound tariff offer is set in a way conducive to encouraging domestic production and flexible enough to accommodate seasonal tariffs, tariff-rate quotas, special safeguards, and anti-dumping (CWTOA 2006), actually applied tariff manipulation requires continuous analysis of various impacts that aid informed flexible policy decisions. The Sudan's Commission for WTO Affairs has impact studies among its agenda that require support from the government and regional and international organizations (CWTOA 2008).
- In the presence of an efficient tariff system and high economic stability, state interventions in physical control of traded commodity movement should be discontinued while trade could be managed by manipulations in the tariff rates according to the prevailing internal and external economic conditions.
- The state efforts (Central Bank of Sudan and Ministry of Finance and National Economy) in containing inflation and exchange rate variation will need to continue to still bring more stability along with economic efficiency in the economy.
- Establishment of efficient strong marketing institutions where legislative aspects should be developed and effectively implemented for efficient safe storage and movement of food commodities in and outside the country.
- Revival of the culture of cooperation, especially that in the area of agricultural production and revision and modernization of the cooperatives legislations making use of experiences elsewhere in the world and its implementation in favor of the development of large scale and diversified cooperatives.
- Close monitoring of internal and external markets is needed to allow formulation of appropriate investment, production, marketing and trade policies. Further, and in

addition to price information, improvement is needed in the amount and quality of data related to the movement of commodities among regions.

- Consumption patterns will need to be monitored along with quantification of demand for food products for human consumption and livestock feed. For instance it is opportune to conduct a study on household incomes and expenditure based on primary data, which will provide valuable information to policy decisions on production, commodity supply, producer and consumer subsidies and food security. This will need to be extended for linking local to external demand for food and feed.

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Research Team

Name	Affiliation
Hamid H. M. Faki (Team Leader)	Agricultural Economics and Policy Research Center, ARC
Elfadil A. Ismail	Food Research Center, ARC
Abdelaziz A. Hashim	Agricultural Economics and Policy Research Center, ARC
Ibrahim A. El-Dukheri	Agricultural Economics and Policy Research Center, ARC
Abdelmoneim T. Ahmed	Agricultural Economics and Policy Research Center, ARC
Azhari Mahgoub	Planning and Agricultural Economics Administration, MoAF
Hassab Elrasoul Hag Elsaeed	Planning and Agricultural Economics Administration, MoAF
Bakhita Mahgoub	Planning and Agricultural Economics Administration, MoAF
Abdelmagied Eltayeb	Planning and Agricultural Economics Administration, MoAF
Suad Abdalla Ali	Planning and Agricultural Economics Administration, MoAF
Nawal Sid Ahmed (Member Secretary)	Planning and Agricultural Economics Administration, MoAF

Annex 1: Terms of Reference

1. Background

With above normal crop production this year², cereal prices were expected to show some stability and/or decrease during the harvest time (November – January for Sorghum and Millet and March – April for Wheat) as harvests flowing into the market. Contrary to seasonal trends, nominal wholesale prices of major cereals generally show an increasing trend and become substantially higher than average. May sorghum prices demonstrated high level increase - compared to previous months, May 2008 sorghum (*feterita*) prices increased by about 46 percent in Khartoum since December 2007 and by about 50 percent in Gadarif, a typical grain surplus producing State. Sorghum prices are also much more volatile than other cereal prices³.

Wheat prices generally followed an upward trend since the beginning of the year and showed stability between February and March 2008. The current trend is not as one would predict, given the current tight supply into the markets. However, price of wheat in Khartoum has risen by more than 80 percent compared to same time last year⁴, in contrast to a 30 – 40 percent increase for other cereals. Wheat prices in Khartoum is also 53 percent higher compared to the previous five year average. Global trends including low wheat stocks in 2007 and 2008⁵, increase in demand from India and China, increase in demand of grains for bio-fuels, and hence tightened supplies and forecasted poor harvests of main exporting countries, especially Australia, are part of the attributed reasons for an elevated price. Other cereal prices have also shown comparable increases in all traditional surplus and deficit areas of the country. It is presumed that consumers of wheat-based products (bread in particular) have been hit particularly hard by increasing prices.

Similar increasing and all time high level trends have also been observed in the consumer market for other commodities. General inflation in Sudan also reaches about 16 percent in March 2008, compared with only 5 percent rate in December 2007. Even with the slowdown in inflation rates in April, on-going economic conditions are not expected keeping up. Furthermore, food prices relative to non-food prices in Khartoum showed a year-through increase since last year. According to CBS, these general trends represent historical record highs and the highest since 2001.

Given the very high level of current food prices in the country (and in the world market at large), the trend is particularly worrying this year as the increase is universal for other commodities. There is no indication that such food price hikes would be halted any time soon.

² Ministry of Agriculture and Forestry data archives.

³ The Coefficient of Variation (CV), which measures dispersion or fluctuation of data points around their mean, results for sorghum, millet and wheat for 86 cases show the value of 36.7, 33.8, and 24.8, respectively.

⁴ Although wheat prices in the international market have more than doubled in the same time frame, the local impact is somewhat diffused due to on-going interventions. Global dramatic increases in oil prices, poor weather in some areas, growing demand (population increase and bio-fuel) and lower food reserves continue to be the reasons for wheat price hikes.

⁵ Forecasted by FAO, and this is the lowest since 1982.

Looking at the current trend, there is an on-going concern by the government, donors, UN institutions and NGOs, as prices are likely to increase further as stocks from the harvest continue to dwindle. This impact will be magnified between June and August, when the majority of the rural poor will depend on markets for most of their consumption and when prices reach their peak. Hence, a thorough investigation of the determinants of why prices are soaring, and its implications on the poor and what short run policy and intervention options are available to contain its increase and impact looks to be pertinent.

Both government and non-government organizations have a strong interest in better understanding what is currently driving food inflation and what are the causalities of the driving force to food inflation in Sudan? Understanding the implications of this for public expenditure generally and more specifically for a number of government and donor programmes looks to be critical. Furthermore, examining the determinants of soaring food prices and current inflation alone will not provide the full answers, the analysis needs to go further steps of analyzing its impact on the poor and other influences on the rural and urban economies and come up with some short run policy program response options.

2. Terms of Reference

2.1 - Objectives and Approach

Objectives

- To examine the magnitude of food price increases in Sudan
- To identify the determinants of food price increases and assessing marketed food supply and food demand and their interactions
- To examine the impacts of current soaring food prices on the poor (urban and rural)
- To analyze short term policy and program response options in containing, reversing and mitigating the impacts of escalating food prices

Approaches

It is recommended that this work is conducted in phases:

1. Brief analysis on basic facts and make presentations to a technical discussion group, which will be called by SIFSIA
2. Desk review, data collation, validation and selected field visits
3. Final report - analysis, conclusions and short run policy or intervention recommendations

Phase 1: Brief analysis on basic facts

There is a general consensus that food prices have increased significantly compared to the previous several months and compared to last year as well. The focus here is to flush out the basic facts and justify the need for a thorough analysis. What is critically missing are documentations of current facts which are scattered around and those need to be compiled and presented so as to make further investigations. These brief reviews and compiled facts will be presented to a technical discussion forum which will be organized by SIFSIA-N.

The consultants should talk to key government partners, including Ministry of Agriculture and Forestry (MoAF), Ministry of Animal Resources (MoAR), Ministry of Finance and National Economy (MoFNE), Humanitarian Aid Commission (HAC), Agricultural Banks, Banks of Sudan, CBS, and other relevant Federal and State level institutions.

The consultants should also have discussions with relevant technical staff of the World Bank, FAO, IFAD, WFP and a range of development partners including the EC, DFID, and USAID.

Phase 2: Desk review, data collation, validation and selected field visits

It is believed that several secondary data sources are apparently available and the desk review should be able to assess all these available data sets. Exhaustive food inflation and consumer price indices are well covered by the Central Bureau of Statistics. The Ministry of Agriculture, Ministry of Foreign Trade, Ministry of Finance, and Ministry of Health are the other sources. UN agencies, donors, and NGOs are also other sources of survey and regular monitoring information. It is expected that the team would be able to visit selected States so as to have a clear understanding of what has transpired into these representative states or markets.

However, the actual availability and quality of data continues to be a concern. Hence, the second phase of this consultancy should involve identifying, examining and to the extent possible validating the various available data sources. This is also likely to support some qualitative analysis, which will be useful in verifying the data.

In some cases where some of the findings lead to further investigations beyond the specific period of assignment, this should be clearly articulated to the coordinating team at SIFSIA. Consultants are expected to spell out the problem why it is not accomplished and recommend the way forward.

Phase 3: Final Report - Analysis, Conclusions and Short Run Policy Recommendations

After completing the preceding phases, this phase will involve a thorough investigation of underlying causes or determinants of soaring food prices and analyze interactions among determinants. This analysis then is expected to lead to set of conclusions and short run policy options in containing, reversing and mitigating the negative impacts of food prices rises in the 15 Northern States of Sudan.

2.2 Basic questions to be answered

The following questions are simple directions and some of them may need to be further opened depending on the findings of consultancy. The analysis may also lead to further questions for consideration. If the consultants are not able to answer some of the questions, they should be able to identify those areas for further work.

1. Price analysis (trend, variability, seasonality, etc.) - Is the recent increase in food prices similar across all States? If not, why not? What are the key reasons for these increases? What are the major determinants of general inflation? What is the contribution of food inflation? Which one derives them most and why? What kind of inter - linkages exists between the rural and urban and food and non-food markets?

2. What are the magnitudes of wheat and wheat flour imports (trends, prices, changes in consumption patterns linked to urbanization, i.e. more people eating bread, etc). What is the magnitude of cereals being used as animal feed (in the poultry industry which may have revived after decimation by the bird flu in 2006 and/or livestock export market).
3. What is the magnitude of increase in incomes (rural vs urban) in 2007 - 2008? Are there any significant changes in the income composition? Who is currently gaining (net gain) from the current price hikes and why? Are there significant changes in demand for specific kind of food or non-food commodity and why?
4. Are there noticeable substitution effects on-going? Or are there noticeable decreases in consumption? Or are there any other coping mechanisms widely exercised due to soaring food prices and inflation? If so, give examples and why? Has there been a switch both within and across types of commodities in the rural consumption basket?
5. Are there recent changes in the composition of production and marketable surplus types? Are there observable changes in own consumption patterns? Marketable surpluses of food should be given enough attention versus production focus though the inter-linkages may further be analyzed.
6. Are markets (especially rural) integrated for major food items? If so, are the market signals (like price effects) in one smoothly transferred to the other market?
7. An inventory of existing policy and programme with direct impact on food access by the poor (policies and programmes that either increase/decrease cereal prices and/or impact food access by the poor?
8. What kind of short run (medium) term government policies are being exercised recently in supporting the poor? Are they bringing any impact and why? Or which ones are functioning and which one not?
9. Are there any significant recent cash injections by the government which lead to as a source of food and general inflation? Are the poorest of the poor benefiting? If not, why not?
10. To what extent are the benefits of government policy in supporting the poor or producers eroded by the current soaring prices?
11. What other short run policy options are feasible in mitigating the impacts of soaring food prices and contain the rise in prices?

a. Deliverable/ Outputs

The following activities and deliverables are expected from the consultancy:

1. Before the commencement of the consultancy, the composition of team members and their roles and responsibilities and a detailed action plan should be submitted and be presented to SIFSIA
2. Review/inventory and document previous market studies in Sudan.
3. Synthesize and prepare presentations from the preliminary findings in the assignments above to a technical discussion forum, which is planned to be held within three weeks of the assignment.
4. Participate, facilitate, and compile the outputs of the technical discussion forum, which will be held in Khartoum.
5. A summary list of all available data sources, including commentary on the completeness and accuracy of the data.

6. Excel and/or any database files containing all cleaned data.
7. A short note outlining the methodology the consultant intends to apply in different phases, including any primary data collection that may be required.
8. Executive summary of findings and policy and programme response recommendations of no more than 5 pages.
9. A draft report of no more than 40 pages (excluding annexes and executive summary).
10. Present the findings to a technical discussion forum, which will be organized by SIFSIA.
11. Incorporate comments from the forum and submit the final version of the report.

b. Duration and Timing

The study would start from 25th of June 2008 and the work would be completed on the 25th of August 2008.

12. Inputs to be provided by the RO

The RO will provide all the infrastructure and logistical support required for implementation, including allocation and management of all staff and equipment resources. The consultancy team from Agricultural Research Corporation (ARC) is expected to have sufficient number of experts on the ground to deliver the assigned tasks in the specified duration of mission. In addition, six Ministry of Agriculture and Forestry (MAF) experts are expected to be members of the research team. The compositions, and roles and responsibilities of each MAF expert are attached in Annex I. The compositions of ARC experts are also attached as Annex I. However, the details of the roles and responsibilities ARC team are yet to be finalized by the ARC. Allowances and honorarium for these experts will be covered by the ARC, depending on the roles and responsibilities of each expert.

At a minimum, the consultancy team will comprise Senior Economist (Team Leader), a Grain Market Expert and an experienced Statistician with strong understanding of rural economic development and livelihood issues and at least 5 years of professional experience in these areas. The consultants will also have a strong experience of working in the Sudan context.

Annex II: Team Compositions and their roles and responsibilities:

I. Team composition from the AEPRC

1.1 List of participants from AEPRC

- Prof. Hamid Faki (team leader): Ph.D. Agric. Economics (production, farm management, policy analysis)
- Dr. Abdelaziz Abdelfattah: Ph.D. Agricultural marketing (worked also on agricultural technology issues and policy analysis)
- Dr. Abdelmoneim Taha Ahmed: Ph.D. Agric Economics (production, technology-related policies, M&E)
- Dr. Elfadil Ismail: Ph.D. Agric Economics (agricultural marketing, also worked on economics of food technology)
- Dr. Ibrahim Eldukheri: Ph.D. Agric Economics (system analysis; mathematical approach, worked also on food security issues)

II. Team composition from Directorate of Planning and Agricultural Economics, Ministry of Agriculture and Forestry

2.1 List of participants from MAF

1. Azhari Mahjoub Farah, Director of Agricultural Statistics Department
2. Bakhita Mahjoub El Shafee, Director of Agricultural Economics Department,
3. Abdelmagied Mohamed El Tayeb, Director of Agricultural Planning and Policies Department
4. Nawal Sid Ahmed Zein Elabdein, Agricultural Marketing Department, price unit
5. Hassab El Rasool Haj El Saeed, Director of Agricultural Marketing Department
6. Suad Abdalla Ramram, head of Agricultural Policy Unit

2.2 Roles and responsibilities of participants from Ministry of Agriculture and Forestry

First Group – High level professional participation: Azhari, Bakhita, and Abdelmejid

Under the direct supervision of Professor Hamid Faki (team leader), MoAF experts Azhari, Bakhita, and Abdelmejid will be expected to participate in all phases of the study. In achieving the above stated objectives of the study, these experts are expected to allocate about 50% of their working time during the market study period. These professionals will have the following roles and responsibilities:

- Work with the AEPRC team stated above on the Review/inventory and document previous market studies in Sudan
- Participate in the desk review, questionnaire design, data collation, validation and selected field visits
- Facilitate the data collection and analysis processes at Federal and State level, as required by the team leader
- Work with the team in synthesizing and preparing presentations from the preliminary findings in the assignments above to a technical discussion forum, which is planned to be held within three weeks of the assignment.
- Participate in the preparation of a summary list of all available data sources, including commentary on the completeness and accuracy of the data.
- Support for the compilation of any excel and/or any database files containing all cleaned data.
- Proactively participate in the report writing and presentation of the research document - analysis, conclusions and short run policy or intervention recommendations
- Any other work as required by the team leader

Second Group – Research Assistant - Nawal

Nawal, under the general supervision of the team leader, will serve as a research assistant for the two groups of researchers from the two institutions. Similarly she is expected to spend 50% of her time during the assignment period. Her main roles and responsibilities include:

- Provide some secretarial services for the research team
- Assisting the team in accomplishing their assigned tasks
- Participating in some technical discussions and meetings of the research team
- Facilitate data provisions and analysis from the MAF
- Participate in any other task, as approved by the team leader.

Third Group – Supervisors and coordinators of data collection and analysis – Hassab and Suad

Under the direct supervision of the team leader, Hassab and Suaad Abdalla are expected to participate in selected portion of the overall study. These experts are expected to allocate 50 percent of their working time during the assignment period. These two experts have the roles and the responsibilities of the following:

- Support the above two teams in their review/inventory and document previous market studies in Sudan
- Participate in the data collation, validation and selected field visits
- Supervise and coordinate the data collection and analysis processes at Federal and State level, as required by the team leader
- Support the team in synthesizing and preparing presentations on preliminary findings
- Document a summary list of all available data sources, including commentary on the completeness and accuracy of the data.
- Compile any excel and/or any database files containing all cleaned data.
- Support the report writing and presentation of the research document - analysis, conclusions and short run policy or intervention recommendations
- Any other work as required by the team leader

Annex 2: Interviewees, Field Survey Guidelines and Concise Summary of responses

A) Interviewees in the informal field survey in the nine markets covered

Interviewees	Regional Markets								
	Khartoum	El Obeid	Dongola	Eddamer	White Nile	El Fashir	Damazin	El Gedarif	Damazin
a) Actors in the Market:									
Oil Millers	✓					✓			
Traders/ Grain Market	✓	✓	✓	✓	✓	✓		✓	✓
Livestock Market		✓				✓			
Sorghum Millers	✓					✓			
Bakers/Bakers Union	✓	✓	✓	✓		✓	✓		
Consumers			✓	✓		✓	✓	✓	
Store Owners		✓							
b) Ministries and institutions:									
State Ministry of Agriculture	✓		✓	✓	✓	✓	✓	✓	✓
State Ministry of Animal Resources				✓				✓	
State Ministry of Finance		✓	✓	✓	✓	✓	✓	✓	✓
State Ministry of Trade				✓					
Legislative Council		✓	✓	✓		✓	✓		
Zakat Chamber		✓	✓	✓	✓	✓	✓		✓
Tax Chamber								✓	
Agricultural Bank of Sudan		✓	✓	✓	✓	✓	✓		✓
Strategic reserve Corporation								✓	
Academia/Prominent People			✓			✓		✓	
Agricultural Mechanization Corporation								✓	
c) Trade Unions, Producers & NGOs:									
Farmers Union/Farmers			✓				✓	✓	
Pastoralists Union								✓	
Agricultural Chamber/Business Union					✓			✓	✓
NGOs			✓			✓	✓		

B) Guidelines for interviews' discussions

1. Explanation of the issue with regard to the occurring price hikes externally and internally.
2. Facilities available for the interviewee(s) to perform his/her/their activities.
3. Role of the interviewee(s) in the commodity(ies) of his/her/their concern and his/her/their mode of operation (excluding reasons of normal seasonal pattern of price movement or general constraints that usually cause price rises).
4. Magnitude of price changes in the commodity(ies) of concern to the interviewee(s) since 2006.
5. Reasons for price rise from the perspective of the interviewee(s).
6. Impact of price rise on the operation of the interviewee(s), whether the personal impact or on the institution where applicable, such as on amounts coming to the market, level of transactions, incomes and the like.
7. Nature of response of the interviewee(s) to the price rise (actions undertaken).
8. Actions seen relevant by the interviewee(s) that could utilize benefits of the price rises and/or curb their negative effects.

c) Crude summary of interviewees' responses by state in the field informal survey

1) Price rise magnitudes and their reasons

State	Description
Khartoum	<p>Sorghum and millet prices, which are believed by wholesale traders to have hiked by 300% since 2006, are said to be connected with low production in the past seasons resulting in low supply. Flour millers state similar arguments stating a 200% rise in sorghum flour.</p> <p>The rise in vegetable oil prices is attributed by some oil millers to speculative behavior of commercial banks, providing large credit amounts to traders who buy large quantities of oil seeds that go into storage. This triggers a monopolistic speculative situation that prevails in the oil seeds auction markets and leads to high prices after purchases at low prices from producers.</p>
El Gedarif	<p>According to the Ministry of Agriculture there are price increases in sorghum, sesame, groundnuts, sunflower, and to a lesser extent, meats and eggs. Due to quarantine measures faba bean flow from Ethiopia to the State has been banned, leading to doubling of its prices.</p> <p>The rise in crop prices has been accompanied with limited availability and higher prices of inputs such as herbicides that are on increasing demand and also fuel by 21%) and engine oil prices. It has also led to an increase in prices of almost all commodities caused by some panic in the market.</p> <p>The Farmers' Union believes that the price increase goes to the benefit of traders who buy crops at low prices from small farmers. Protection to small farmers, who produce all or most of kidney beans, groundnuts and maize, is still weak except for provision of seeds to only 10-25% of those farmers. A constraint to small farmers is lack of their integration into cooperatives, where now cooperatives' membership is over 120,000 within 100 such cooperatives.</p> <p>According to the Strategic Reserve Corporation (SRC), lack of earlier stocks, smuggling to neighboring countries and sorghum exports have contributed to the price rise of grains. Sorghum stocks that stood at 200,000 tons in 2006/07 have been depleted to 20,000 tons at present due to weak and irregular government finance. However, farmers think that the SRC is not a successful practice since it makes its purchases from traders and not from institutions such as the Mechanized Corporation and also delays payments to farmers. Nevertheless, the SRC has supported the State with about 14,000 sacks (126 tons) of sorghum of which 4,000 went to Zakat Chamber and the rest sold at SDG 60/sack compared to a ruling market price of SDG 180/sack. In spite of its problems, the SRC has some stabilizing effect on prices.</p>
Kordofan	<p>Price rises attributed to production and supply problems in addition to season-induced causes. Banks time of account closing in November and December coincides with the time of harvest and the need for credit to finance sales. One of the impacts of wheat and flour price rises is the reduced bread weight to match the level of price rise.</p>
Dongola	<p>Rise in prices is attributed to the rise in international prices and domestic problems related to productivity, high production</p>

	<p>costs, storage problems, taxes and charges and absence of price stabilization policies. Land policies, lack of finance and complications in the Investment Act that retard investment. The Ministry of Finance blames the free-market policy, rise in input prices and increasing consumption associated with low productivity, market monopoly exercised by big traders in the absence of big efficient marketing firms and the high VAT. Further the State has not benefited from the border trade with Egypt where pass through the State to other parts of the country.</p> <p>The Farmers Union complains about excessive direct taxation, expensive inputs, opening of market to some imported products such as fruits.</p>
White Nile	<p>Price rise is a response to the international situation. But problems of low production, high input costs and high taxes, fees and charge.</p> <p>Prices of livestock are affected by rising prices of all feed types due to the rise in sorghum prices where the price of a sheep is equivalent to the price of two sacks of sorghum. High sorghum prices are connected with low production, movement of the grain to other states and market monopoly. Meat prices have been stable.</p> <p>Ministry of Finance relates rising prices to the international effect, lack of storage and rising consumption, and lack of statistics that provide information on supply and consumption needs. CBS: international prices, low production and opening of exports</p>
South Darfur	<p>Reasons for high prices: international price rise, rise in cost of transport due to high petrol price and remoteness of the State, security problems that in addition to weather factors led to low production in past seasons.</p>
Eddamer	<p>Reasons: low production and supply, high international prices, monopoly especially for sorghum and wheat. Sorghum prices soared to double those of sorghum (270 vs 135 per sack). Ministry of Animal Resources price rise is due to feed price rise. No significant rise in red meat prices but poultry meat prices doubles. Prices of concentrates almost doubled between 2006 and 2008. There is increase in live animals prices but no so drastically.</p> <p>Traders: production estimates are faulty based on productivity of high-yielding farms. Lack of strategic reserve and high production and low prices in 2006 discouraged production in 2007 and there was no government intervention. ABS monopoly exists</p>
Damazin	<p>Monopoly by 15-20 big traders. MoA: prices can be said to be normal, only fluctuations. ABS: reason: high crop movement out of the State, increased consumption due to increase in refugees</p> <p>Bakers: Soaring wheat flour prices from SDG 78/sack in 2005 to SDG 103 in 2007, increased firewood prices and other baking inputs (yeast) and labor wages.</p> <p>Grain market: lack of large storage capacities. Reasons: export of sorghum</p>
Red Sea	<p>Oxfam: Limited production sector compared to the services sector, climatic factors. Academia: biofuel, finance problems, increasing demand and low supply, inappropriate policies, taxation</p>

2) Impact

State	Description
Khartoum	<p>Oil millers indicate that their sales have decreased since the price rise in vegetable oils in 2006, which they experienced a 100% in its rise. But on the other hand all produced quantities sales are quickly sold. It is also the case that price increases or the cost of including any additions to the industry are directly transmitted to the consumers. However, their production costs remain stable at SDG 240-250 irrespective of the price level of raw material.</p> <p>It is estimated by grain traders that sorghum and millet quantities coming to the wholesale have decreased by 50% due to the sharp price rises, but the turn-over is quite fast that all quantities are sold in a short time. Price rises in both grains and flour are directly transmitted to consumers. Since there is no intervention in sorghum and millet markets, the market forces are solely responsible for price formation. But it can be argued that interventions in the market through sorghum sales by the Strategic Reserve Corporation, however limited such interventions might be.</p> <p>The price hikes in wheat are reported by bakers to have reflected on bread weight in spite of government interventions to abolish some taxes and provide a supervised control on bread weight. The effect on sales is had been only temporary responding shortly to the shock when consumers took advantage of the presence of substitutes such as sorghum bread. Thereafter bread sales returned to their normal levels and even currently surpassing that level, although part of the consumers are observed to reduce their consumption. This could obviously be related to the rising prices of sorghum and other substitutes (e.g., rice) on the one hand and the well-established consumption habits in favor of wheat bread on the other hand. However, the situation would be expected to reflect on the distribution of consumers incomes among different needs, and would especially be stringent on the poor who spend a large part of their income on food.</p> <p>Its negative effects are notable through consumers' reduced purchasing power and resort to substitutes, with negative implications on nutritional status and security issues.</p>
El Gedarif	<p>The effect of price increase of grains has been especially harming livestock herders whose daily requirements for sorghum grain is estimated at 1500 sacks (135 tons). Due to short rainfall and influx of livestock from other states, purchased feeds have increased. The situation resulted in extra livestock sales to meet the rising feed costs while a sizeable number of animals died due to lack of fodder or feed.</p> <p>On the other hand, and apart from normal seasonal patterns, grain quantities coming to the El Gedarif auction market have not been affected by the rise in prices due to the substantial capacity of storage by big traders, a situation that indicates monopoly behavior of traders. However, it is difficult to clearly differentiate traders from big farmers who also own similar capabilities. Consumers complain from the price rise over-proportional to their purchasing power. Sorghum prices soared to SDG 130-140 per sack between 2005 and 2006. Bread has decreased in weight and increased in price, while milk prices also rose to SDG 0.9 per rottle. There are indications of reduced meals and shift to other types of food or recipes. However, meat has not witnessed a</p>

	<p>significant price increase, nor has sugar.</p> <p>The Farmers' Union considers the price rise of crops as a positive change in favor of farmers provided that there is no government intervention through the SRC. They also object export bans, which is incompatible with the free-market policies. Future expectations include a change in the crop mix in favor of cash crops (groundnuts and sunflower), stabilization of crop prices, with sorghum at a level around SDG 75/sack</p>
North Kordofan	One of the impacts of wheat and flour price rises is the reduced bread weight to match the level of price rise.
Dongola	Bread consumption has decreased and bakers have responded by reducing the bread weight sold at the same equivalent price. They are incurring lower profit margins but their alternative is to go out of business. Their purchases of wheat flour have decreased by 20% due to lower demand where consumers shifted to other alternatives in spite of the particularly high importance to consumers. Consumers reported drastic reduction in their living standards that is reflected in declining purchasing power and reduction of meals. This is aggravated by the high rise in prices of substitutes such as rice, lentil and sorghum. With stagnant salaries, employees are in hard struggle for maintaining their livelihood.
White Nile	There is a positive impact of high prices reflected by providing incentives to farmers to engage more in agriculture and increase their crop areas. But they induced consumers to shift from sorghum to wheat currently estimated at a ratio of 60% wheat and 40% sorghum.
South Darfur	A 50% reduction in food aid and exclusion of millet from the food aid basket, resulting further in its higher prices. Revenues in auction markets have decreased and also Zakat proceeds by 35%. Decreased number of meals for poor families, and shift to foods with low nutritive values. The ABS made a waiver of 60% to 35% to defaulters. Reduction in revenues of small traders due to decreasing demand. Flour millers sales doubled due to increasing demand for grains instead of bread
Eddamer	Consumption shift to sorghum. Decrease in amounts of wheat consumed. Bakers: no change in amounts of flour purchase but bread weight decreased; a flour mix from imported and local wheat proved successful (Seen Company)
Damazin	<p>Ministry of Finance: government employees negatively affected with no increase in salaries</p> <p>Bakers: Decrease in quantities bakes from 14-15 sacks to 7-8 sacks per day</p> <p>Consumers: change in food pattern, impact of household budget expenditure</p>
Red Sea	<p>Ministry of Agriculture: Reduction of the purchasing power of the small farmers.</p> <ul style="list-style-type: none"> - The price of livestock reduced and the nomads sell their animal with low prices to meet their needs and for the unwilling of purchasing high price fodder. - Investment in fisheries are increasing <p>Oxfam GB: Migration from production areas to urban areas searching for other income sources.</p> <ul style="list-style-type: none"> - Drop-out of school.

	<ul style="list-style-type: none"> - Drop in animal prices. - Smuggling (sorghum to Ethiopia and arterial) the price of one sack of sorghum reached 220 SDG. - manner disorder (thieving , prostitute <p>The Agricultural Bank: - Gab in the family budget</p> <ul style="list-style-type: none"> - Bad Nutrition situation and diseases in long run <p>Specialist from the red sea university: Gabs in the family budget</p> <ul style="list-style-type: none"> - Bad nutrition situation and hence diseases and illness and increasing medical cost. - Neglecting of education, clothing and the family well fare. - No savings <p>Bakers union: The purchasing power for wheat flour was reduced by 20-40% from registered quantity.</p> <ul style="list-style-type: none"> - The consumption Pattern was change in the benefit of bread for many people in the rural areas left sorghum & millet because of the high price =To fill the gab between supply and demand of bread ‘Siga’ and ‘Wheta’ enter the market of producing bread
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3) Interventions

State	Description
Khartoum	<p>Reduce production costs of raw material (oil seeds)</p> <p>Elimination of fees and charges levied on roads</p> <p>Reduce the value-added tax on oil producers that was increased from 10% to 12% to its current level of 15%.</p> <p>Grain traders propose government intervention to stabilize the market in such a way that the price strikes a balance between the objectives of both producers and consumers. Connected to this, they blame the free-market policies for the high rise in prices.</p> <p>Support producers with direct provision of in-kind input subsidy without the intermediation of commercial banks.</p> <p>Reduce fees and charges levied on roads (SDG 8/scak of sorghum) and reduce taxes on traders.</p> <p>Bakers see mitigation opportunities in reducing the cost of power (electricity) as well as reduction of taxes.</p> <p>An official in Khartoum State’s Ministry of Agriculture expressed opinion on remedial actions in the form of immediate ban on grain exports, diversion of irrigated cropping to grains, elimination of all state fees and charges, revision of free-market policies, and provision of in-kind food stuff to poor families. Further, the Agriculture Revival programs incorporate support for small-scale business that will be conducive to mitigating the situation.</p>
El Gedarif	<p>Support programs through Zakat and other social funds to poor families as well as commodity sales in installment to government employees have been adopted to mitigate poverty and counteract price rises. However, oil processing in the State faces problems of lack of efficient processing technology for small oil mills and breakage and power problems for big mills.</p> <p>Required measures and constraints mentioned by the academia, farmers and other knowledgeable people include:</p>

	<p>Modernization of the traditionally-based agriculture</p> <p>Farmers support from the state</p> <p>Initiation of cooperatives for small farmers separate from the local cooperatives union but under the Farmers Union.</p> <p>Climate change has led to increased soil erosion and winds leading to dust coverage of the prevailing heavy cracking soils.</p> <p>Drinking water shortage, its hygiene problems and its high prices in the state is an important constraint to development.</p> <p>The latest survey by the Zakat Chamber reveals that 90% of the State's population is under the poverty line.</p> <p>Large quantities of sesame exports have been returned due to its incompatibility with international standards, a situation that is responsible for the later decline in its prices.</p> <p>Importance of formation of a strategic reserve capable of action according to need.</p> <p>Consideration of development of mixed farming and organic farming through installation of water 'hafirs' for livestock drinking needs.</p> <p>Strengthen research to raise productivity</p> <p>Support to homestead farms and small business by women to face rising food prices</p>
Kordofan	<p>The Agricultural bank of Sudan increased microfinance to reach 10-15% of its credit portfolio. It further provided sorghum to state employees at subsidized prices of SDG 68 per sack compared to the market price of SDG 100/sack. The Zakat Chamber provides its usual support in various ways to different sectors of needy people and is accordingly contributing to the price rise mitigation. The Ministry of Finance adheres to the regulation of eliminating road fees and charges while charges at crop markets are kept strictly at the level of 5% of the commodity value.</p>
Dongola	<p>Interventions by the Ministry of Agriculture include subsidies to fertilizers and petrol, encouragement of expansion in wheat production, provision of inputs and extension services. The Ministry of Finance is encouraging establishment of small cooperatives in addition to various projects that allow families to own production facilities, the most important being the Martyrs' Fund that targets 1000 families with a cost of SDG 3 million, finance provision to the Women Pooled Fund and support to the Women Union, both within the Support Program for Productive Families with a total of SDG 2 million, 50% of which has already been approved. The Legislative Council reports the realization of what is known in the State as the "First Jump Project" for poverty mitigation for poor families that is complemented by action by the Zakat Chamber with a total fund of SDG 16.82 million from federal and state sources. The Project has diversified objectives to reduce income and human poverty. There is also a charity organization (NGO) that provides various types of support to poor families.</p> <p>Proposed actions:</p> <p>Containment of market monopoly by activation of cooperatives and supervision of commodity movement in terms of quantity and quality</p> <p>Establishment of marketing institutions</p>

	<p>Activation of border trade and establishment of free zones to ensure free commodity movement and benefit from the comparative advantage of Sudanese products.</p> <p>The Agricultural Bank of Sudan provides microfinance at 90% of its portfolio at 10% profit margin (Murabah) but is not adequate to cover costs. It also provided wheat sold at SDG 100 per sack and fertilizer with an SDG 20 subsidy per sack (sold at SDG 57 compared to an import price of SDG 77 per sack)</p>
White Nile	<p>Establishment of consumption cooperatives, social solidarity funds supported by the Ministry of Finance. ABS: provision of inputs and the subsidies on fertilizers and 50% free seeds for sunflower, microfinance, purchases of 10 sheep to farmers in Tendelti area, Productive families program. Zakat: various support including that to production activities.</p>
South Darfur	<p>Security is a key factor</p> <p>Productivity enhancing technology through distribution of 1081 tons of seeds of different crops and abolishment of fees and charges on commodities</p> <p>Presence of a strategic reserve that allowed distribution of 10000 tons of sorghum to state working force at 45% lower price, 1900 tons sold in installments for six months, and 9000 tons from the Zakat Chamber. All this has led to mitigation in prices during September 2008</p>
Eddamer	<p>Ministry of Agriculture has almost no role in reducing prices and that of organizations is limited. Charges on roads to Khartoum have been abandoned. Areas increased and the State has surpluses in sorghum and wheat. Ministry of Animal resources: establishment of a feed factory. Legislative Council support to working force, improvement in investment legislation to encourage investment.</p> <p>Bakers: reduction in taxes and charges on flour will reduce its prices and the prices of bread.</p> <p>Zakat: support in various forms including direct financial support and production support</p> <p>Ministry of Trade: price records, but they have no role on prices. There are meager storage facilities at th merchants' level storage facilities need to be established</p> <p>ABS: subsidy to diesel and fertilizers, but no support for seeds – establishment of strategic reserve will support the Banks role.</p>
Damazin	<p>Interventions:</p> <p>Ministry of Agriculture has no significant role.</p> <p>Ministry of Finance; ensure abolition of road fees and charges.</p> <p>Required interventions: storage facilities, increase production, record of market quantities, strengthen role of the strategic reserve.</p> <p>Zakat: support production by providing seeds to poor farmers</p> <p>Ministry of Finance: indirect role through infrastructural facilities</p> <p>Required: processing industries, cooperatives, facilitate investment</p>

	<p>Bakers: reduce taxes and charges on forestry products Grain market: storage, abandon taxes, subsidize inputs, fight monopoly (most big farmers) NGOs: 'Mubadiroon': limited role Farmers' Union: facilitates finance and protection of producers through contact with government to make purchases. Important: increase production through technology, extension and increased areas.</p>
Red Sea	<p>Recommendations:- - Capacity building of the farmers to be aware of the market needs and produce for the market. - subsidizing the farmers and encourage them to adopt the technical package to increase their production so not to leave the agricultural activities and seek for higher income in other sectors. - Determine some areas in El Gedarif state to be cultivated by some residents of Red sea state and take their products to Red Sea State. Oxfam GB: Early preparations of maintaining the earth embankments in Delta Toker. Support water harvesting system for the traditional agriculture in the rural areas. - Introduction of new agric system likes sprinkler and drip irrigation - Increases the role of extension to raise awareness of the producers and consumers. - Settlement of nomads. - Providing livestock services. - Strengthening the agricultural institutions. - Subsidizing 12 group of fishermen ACORD Organization: - Subsidized the nomads by rotating box for dry fodder with prices lower than that in the market to safe animals, besides providing animal medicines with lower prices. - Support small farmers by preparing the land, making terraces and providing agricultural inputs - Provide human medicines with lower prices in some localities. - Support women in some localities by constructing small income generating projects. The Agricultural Bank: subsidized the sterilizer by 20 SDG per sack (from 77 to 57 SDG / Sack). - Financing the pesticides for rain-fed cotton - Providing credit to producing family with a reduced rate (from 24% to 10%) Polices Recommended by the bank: - - Adoption of a policy to provide credit for small producers for inputs without insurance. - Formulation of policies enabling the bank to direct purchase from the producers to avoid middlemen. - Direct the strategic reserve to buy the products immediately after harvesting end entering the financing of harvesting.</p>

	<ul style="list-style-type: none"> - Training of the farmers. - Increase the vertical production. - Encourage the investment in Agric, production <p>Specialist from the red sea university: Solutions: -</p> <ul style="list-style-type: none"> - Formulation of reasonable agric policies and implementation. - Enhance the role of Sudan Bank policies. - Capacity building of farmers for vertical increase of Agric production. - Encouragement of investment in agric (local & forgoing) - Encouraging of cultivation of home garden. <p>Zakat Champer: -</p> <p>The role to reduce the negative impact of price rising for poor:-</p> <ul style="list-style-type: none"> - Increasing the share from Zakat collected to distributed to poor families un to 5o% this share could increase more to meet the need of families with low or Zero income. - Distributing or provide ownership of production needs to the families that have the ability to produce. - provide fund for health (medicines). <p>Ministry of Finance: The ministry policy prevents employment for the previous two years thus increase the poverty rate (negative impact).</p> <ul style="list-style-type: none"> - Reducing taxes and fees (in their opinion) will not reduce the prices but reduce the income of the state
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Annex 3

Data used in the analysis: please see the accompanying spreadsheet.