

Staple Food Prices in sub-Saharan Africa in the Context of a Crisis: Challenges and Policy Options

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ULYSSES project assess the literature on prices volatility of food, feed and non-food commodities. It attempts to determine the causes of markets' volatility, identifying the drivers and factors causing markets volatility. Projections for supply shocks, demand changes and climate change impacts on agricultural production are performed to assess the likelihood of more volatile markets. ULYSSES is concerned also about the impact of markets' volatility in the food supply chain in the EU and in developing countries, analysing traditional and new instruments to manage price risks. It also evaluates impacts on households in the EU and developing countries. Results will help the consortium draw policy-relevant conclusions that help the EU define market management strategies within the CAP after 2013 and inform EU's standing in the international context. The project is led by Universidad Polit cnica de Madrid.

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Introduction

Agriculture in the 21st century has to produce more food, feed and fibre for a growing and more affluent world population, produce more feedstocks for a potentially huge bioenergy market, and make a significant contribution to food security and overall development in many agriculture-dependent developing countries. It has to achieve a sustainable increase in production with a smaller labour force and under growing threats from climate change, environmental degradation and higher oil prices. As an important source of greenhouse gases, the agricultural sector is also expected to contribute to climate change mitigation by reducing its own emissions of carbon dioxide, methane and nitrous oxide.

The sector has recently experienced a number of severe shocks, including weather-related disasters, record high oil prices, and food security fears and resultant trade restrictions. International food prices spiked in 2011 for the second time in three years. Higher food prices will substantially hurt poor net food consumers because food is typically a large share of expenditures for the poor. Food price increases can have important effects on effective purchasing power, even if they do not directly affect nominal income per se. The urban poor as well as the rural poor who are net buyers of food are also affected as they shift to less nutritious foods. On the other hand, farmers who are net food producers are likely to benefit from higher prices, which, other things being equal will tend to increase their incomes. The benefit increases for those expanding their investment, but if higher prices are accompanied by a higher volatility, associated production risks may lower supply even when prices are higher (World Bank and IMF, 2011). With little or no supply response to high and volatile prices, food supply may remain tight and prices may tend to rise even further in the long term.

High food prices can result in overall inflation, especially in poor countries where consumers often spend more than 50% of their income on food. Fearing political instability, government expenditure may be shifted away from capital accumulation spending to less productive expenditures such as universal food subsidies. In some situations, governments may adopt tighter monetary policies to deal with domestic food inflation but this may negatively impact on domestic food production and overall growth in the short term. Rising international prices in recent years have also increased the food import bill of low income food-deficit countries, exacerbating balance of payment and budgetary problems (World Bank and IMF, 2011).

The objective of this study is to assess the extent of food price volatilities and levels and examine the effectiveness of the policy responses. More specifically, the study attempts to: (i) compare and contrast price volatility and price levels of three staple grains (maize, rice and wheat); (ii) identify the main structural problems contributing to volatility and high price levels; and (iii) examine the adequacy and effectiveness of the policy responses in addressing the root causes of the problems.

Monthly nominal price data from the FAO-GIEWS price database (FAO, 2013) as well as monthly data from the International Monetary Fund (2011) on the consumer price index (CPI)



are used to examine price volatility and levels. Our first choice was to use where possible retail price data as these are the prices paid by consumers. However, if no retail price data were available for a particular case study, we used wholesale prices, which are usually closely linked to retail prices. We measured price volatility based on price movements by computing the standard deviation of log difference in prices (SDLOG). Coefficient of variation (CV), the standard deviation of prices over a particular period divided by the mean price over the same period, is commonly used to measure price volatility but the CV can be misleading if there are strong trends in the data. Economists often use the standard deviation of changes in logarithm of prices (SDLOG) as a better alternative. The formula for SDLOG is: Standard deviation of $(\log P_t - \log P_{t-1})$ or $\text{std log } (P_t/P_{t-1})$.

The rest of the paper is organized as follows: section 2 describes food price levels and volatilities while section 3 discusses key structural drivers. Section 4 reviews the policy responses and challenges of addressing high and volatile prices. The paper concludes with conclusions and recommendations in section 5.

2. Staple food price levels and volatilities in SSA

Market volatility refers to sudden variations of market prices from period to period. Large and unpredictable variations in prices have posed fundamental food security risks for consumers and governments, while discouraging investment in agricultural production. Rapid and unpredictable changes in food prices can wreak havoc on markets, increase both food insecurity and poverty, and are associated with political and social instability. Import dependent countries may also find international prices too unpredictable. Price risks reduce the quantity and quality of investments, including by smallholder (Timmer, 2011). But it is not only volatility that policy makers have to contend with. Price levels are also of serious concern.

2.1 *Price volatilities in domestic markets*

The SDLOGs are calculated based on monthly real prices in domestic currency for the entire period from the beginning of 2005 to the beginning of 2011. In addition SDLOGs are calculated for each year from 2005 to 2011 based on 12 month periods, which starts in April and ends in March. We compared these various measures of volatility across countries and commodities as well as international prices.

2.1.1 *Maize price volatility*

Average white maize price volatility is found to be higher in SSA (9.7%) than in Latin America and Caribbean, LAC (7.9%) or Asia (5.5%) over the period 2005 - 11. Prices in SSA were also more volatile than international markets for yellow maize or white maize (of South

Africa). Some years such as 2005-06, 2008-09 and 2009-10 have been particularly very volatile in SSA.

Among SSA countries with above average levels of volatility are Uganda, Rwanda, Nigeria, Mozambique, Benin, Malawi and Tanzania. Uganda is a major exporter (through cross-border trade) to the region, including Kenya, DRC, Rwanda, South Sudan and Tanzania, and the maize market is relatively more open (ECA, AU and ADB, 2010). As a result of strong commercial links, the political turmoil in Kenya during 2007 and 2008 increased demand for maize from Uganda, leading to a sharp increase in prices in Ugandan domestic markets, although the country was self-sufficient.¹ Rwanda's maize market is also linked to Uganda and the Democratic Republic of Congo, DRC, (neighbourhood effect). Political instability and security concerns in the region seem to have affected maize market. As most of the countries are landlocked and the cost of imports or exports is high (because of high transport), the gap between import and export parity prices is wide, implying that domestic prices rise and fall within a wide band.

In the same manner, political and economic problems in Zimbabwe have influenced prices in Malawi and Mozambique (neighbourhood effect). For instance, the Malawi government exported some 283 thousand tons in late 2007 to Zimbabwe but the action led to shortages and a 65% increase in prices (Minot, 2010). Malawian maize is also sold through informal cross-border trade. In July 2010, the Malawi government lifted the maize export ban, resulting in a sharp rise in exports of maize through both formal and informal routes (mainly to Zimbabwe through Mozambique) (FEWSNET, 2011)². Being landlocked and inconsistent government interventions in Malawi are also reported to have caused price instability (see section below). Attempts to control prices created confusion among traders (Minot, 2010).

In Nigeria, demand for maize is related to sorghum, which is known to have low and unstable yield because of erratic rainfall pattern (in areas where the crop is grown). Breweries often resort to maize when sorghum is in short supply and this situation is expected to lead to demand shock and price volatility. As a trade corridor and immediate neighbour, Benin's maize price behaviour is correlated with Nigeria. On the other hand, Cape Verde and Niger are among countries with highest level of import dependence and have lower rates of volatility but higher price levels (Annex 1).

On average, maize prices in the world markets (US Yellow No. 2) are more volatile (7.5%) than domestic markets in Asia (5.5%) or LAC (7.4%) but lower than the African markets (9.6%). Maize price volatility is also higher than rice or wheat volatility. As maize is predominantly grown locally in SSA, the high level of volatility appears to have been induced locally by production shocks and underdeveloped markets with limited capacity for inter-seasonal and inter-regional arbitrage (see section 3).

¹ The crisis in Kenya led to a 75% nominal price increase on the Kampala market between January 2007 and July 2008 (Haggblade, S. and R. Dewina, Staple Food Prices in Uganda, Paper prepared for the Comesa policy seminar on "Variation in staple food prices: Causes, consequence, and policy options", Maputo, Mozambique, 25-26 January 2010 Under the African Agricultural Marketing Project (AAMP).

² FEWSNET, MALAWI Food Security Outlook Update, August.



Tab.1: Maize Volatility SDLOG in Real local currency (%)

	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2005-2011
SSA	10.0	9.1	8.4	10.2	9.4	7.3	9.7
Benin	13.4	8.1	8.1	20.3	11.7	6.2	12.2
Burkina Faso	13.5	4.7	4.5	10.3	5.2	3.9	7.8
Cameroon	4.6	8.1	4.6	2.4	4.8	2.8	5.0
Cape		0.7	10.0	3.8	0.7	2.1	4.8
Chad	10.2	7.2	5.9	12.9	9.6	10.6	9.4
Kenya	6.1	8.8	4.6	7.3	4.5	13.2	8.1
Malawi			8.4	12.5	11.7	5.0	10.5
Niger	9.9	2.6	4.7	5.4	3.3	4.1	5.5
Nigeria	11.8	12.0	12.1	16.1	13.0	10.3	12.9
Mozambique	11.6	18.8	6.9	9.8	15.4	6.5	12.7
Ethiopia	10.0	3.7	7.7	11.4	4.9	6.6	7.7
Rwanda	12.9	11.7	17.9	10.1	18.7	12.7	14.0
Tanzania		11.0	13.5	7.1	9.6	5.1	10.3
Uganda		17.2	11.2	15.7	20.6	13.7	15.8
Zambia	5.9	12.3	6.4	8.2	7.5		8.6
Asia*	2.60	5.11	3.55	6.98	6.29	6.40	5.52
Latin America**	7.50	6.16	7.88	7.78	5.80	7.02	7.42
World							
US Yellow No. 2	4.6	6.9	7.6	10.0	6.4	6.5	7.5
Argentina	5.1	7.3	8.5	12.5	5.5	4.6	7.7
South A.	9.1	8.7	6.9	5.3	8.8	5.3	8.1

Source: Based on GIEWS (FAO)

* Philippines and Thailand

** Costa Rica, Dominican Rep., El Salvador, Guatemala, Haiti, Honduras, Nicaragua, Panama, Bolivia, Brazil, Colombia and Peru

2.1.2 Rice Price Volatility

Over the period 2005 to 2011, average rice price volatility has been higher in SSA (5.7%) than in Asia (4.6%) or LAC (4.6%). Annual price volatilities have also been higher in Africa in nearly all the years from 2005/06 to 2010/11. The years 2008/09 and 2009/10 have been particularly most volatile in the region and this coincides with the period of highest average price (in US\$) of rice in the region. Rice import in SSA accounts for a larger share of the total consumption and price volatilities are likely to be influenced by international rice market. At country level, Uganda, Malawi and Tanzania (from Eastern and Southern Africa) experienced higher levels of rice price fluctuations. Uganda and Malawi are not major consumers of rice and import quantities are small (on average about 65,000 tons in Uganda and 10,000 tons in Malawi during the period 2005-06 to 2009-10. Tanzania, on the other hand, is a major consumer of rice and net rice importer but the market is not well developed (Kilima, 2006). Many of the East African countries with high levels of maize price volatility have also suffered from high levels of rice price volatility (e.g. Uganda, Malawi, and Tanzania). Benin,



Niger and Cameroon (from West Africa) had relatively less month-to-month variability of prices but price levels were relatively higher. All three rely on imports for 77 to 80 percent of their annual rice consumption (2005-06 to 2009-10).

Rice prices in the world markets, especially for Thailand and Vietnam markets, are generally more volatile than domestic markets in SSA, Asia or LAC. This could be attributed to the fact that governments of exporting countries tend to keep their markets relatively more open and free than most importing countries. Asian countries such as India and the Philippines were able to ensure relatively stable rice prices using various instruments such as government stocks, procurement, distribution and trade policies. Rice prices were also stable in Indonesia and China (not in the sample countries) during the world food crisis of 2007/08 (Dawe and Morales-Opazo, 2009). Releasing stocks, increasing distribution of subsidized staple food items, reducing import tariffs and imposing export bans, along with raising minimum purchase prices and increasing input subsidies to provide incentive to farmers are among the measures used to insulate domestic prices from international price volatility (Jones, 2010).



Table 2: Rice Volatility SDLOG in Real local currency (%)

	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2005-2011
SSA	4.4	4.9	4.9	6.5	5.8	4.7	5.7
Benin	1.4	3.3	3.6	3.5	2.1	1.8	2.9
Burkina Faso		1.6	4.3	7.2	2.5	2.3	4.1
Cameroon	4.9	2.9	2.2	4.4	1.6	1.2	3.1
Cape		3.1	3.1	6.7	2.1	2.0	3.9
Chad	5.4	6.4	4.1	7.1	6.6	4.2	5.6
Malawi			6.5	7.3	8.4	12.4	9.1
Mali		3.7	6.0	6.0	6.5	4.2	5.3
Mauritania	4.8	2.3	1.2	2.5	10.8		5.5
Niger	4.1	1.4	2.4	2.6	2.3	4.1	2.9
Senegal			3.6	5.9	2.7	2.0	3.9
Mozambique	5.8	3.8	6.5	4.8	4.3	3.8	4.9
Tanzania		10.9	10.1	8.0	5.8	5.8	8.0
Uganda		14.5	10.5	18.0	19.1	12.5	15.4
Asia*	2.9	5.5	4.5	5.3	3.6	2.6	4.6
Latin America**	2.1	2.7	4.6	5.7	4.4	3.6	4.6
World							
US 4%	3.2	3.0	6.5	10.3	4.0	7.5	6.6
Thai 100%	3.0	1.8	11.1	15.6	5.8	4.9	8.7
Vietnam 25%	3.0	2.4	18.1	17.3	9.5	8.9	10.7

Source: Based on GIEWS (FAO)

* Bangladesh, Cambodia, India, Lao, Myanmar, Nepal, Pakistan, Philippines, Sri Lanka

** Costa Rica, Dominican Rep., El Salvador, Guatemala, Haiti, Honduras, Nicaragua, Panama, Bolivia, Brazil, Colombia and Peru and Uruguay

2.1.3 Wheat Price Volatility

The average price volatility of wheat is slightly higher in SSA (5.6%) than in Asia (5.2%) or in LAC (4.8%) for countries with data. Annual average levels of volatility were also higher in 2007/08 and 2008/09 in nearly all cases. Within SSA, Sudan, South Africa and Ethiopia, the three countries with highest level of per capita wheat consumption, registered above average levels of volatility. Domestic wheat production also accounts for a larger share (between 37 and 80% of the total cereal import) in the three countries. Volatilities are lower in Cape Verde and Mauritania where over 80% of the total requirement is imported.

International wheat market prices, on average, tend to be more volatile than domestic markets in SSA, Asia or LAC. The use of longer term supply contracts with exporting countries may have helped lower domestic price volatility in many importing countries.



Tab 3: Wheat Volatility SDLOG in Real local currency (%)

	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2005-2011
Africa	6.6	3.8	6.1	6.1	4.0	4.5	5.6
Cameroon	8.2	1.2	5.7	4.0	3.0	1.9	4.6
Cape		1.3	6.9	1.8	2.2	2.2	3.6
Mauritania	4.3	1.1	4.7	2.0	1.9		3.2
Ethiopia	3.8	3.3	4.1	11.9	3.7	4.3	5.9
South A.	4.5	8.6	7.8	6.6	4.0	5.3	7.1
Sudan	12.4	7.4	7.7	10.4	9.1	9.0	9.5
Asia*	4.4	4.7	6.3	4.6	3.2	4.0	5.2
Latin America**	2.5	4.8	7.2	7.0	3.6	3.9	5.9
World							
US Hard Winter	3.9	3.9	8.3	8.9	6.4	10.1	8.2
Canadian Wheat	3.3	5.0	13.6	6.3	5.8	6.5	8.4
Argentina	4.0	3.6	7.1	10.9	5.8		6.9

Source: Based on GIEWS (FAO)

* Bangladesh, India, Nepal, Pakistan, Sri Lanka

** Costa Rica, El Salvador, Bolivia, Brazil, Colombia, Peru and Uruguay

2.2 Comparison of Price Levels

This section offers a comparison of international and domestic price levels. Domestic prices were converted to US dollars to make this comparison.

2.2.1 Maize Prices

The average retail price of maize for the period 2005-11 was US \$305 in SSA, compared to US \$295 in Asia and US \$498 in LAC (Annex 2a). Maize prices are highest in LAC where the average share of import in total supply is 37%, compared to 14% in SSA and 6% in Asia³ (Annex 1).

³ The wide gap between domestic and international prices shows that the costs of logistics and transport are very high. For instance, in LAC, the bulk of imported grain arrives by ocean shipping and thus involves maritime transport, port transfers, customs clearance and inspection, warehousing, modal transfers, domestic rail, trucking and/or barge shipping and final distribution. These logistics chains typically add 30 to 100 percent onto the price of delivered goods. The World Bank and IDB, (2009), Logistics, Transport and Food Prices in LAC: Policy Guidance for Improving Efficiency and Reducing Costs, Second Meeting of the Finance Ministers of the Americas and the Caribbean, Chile, Viña del Mar, Chile, July 3rd.



International maize prices are significantly lower than domestic prices. For instance, the price of US No. 2 yellow maize was only US \$167 over the last six years. Maize prices were even lower in Argentina, a major exporting country, averaging only US \$117. In South Africa, another maize exporting country, the average price was only US \$191, implying that the average price for African countries was some 60% higher. The price difference was found to be even much higher between South Africa and Mozambique: in December 2008, SAFEX maize grain prices were quoted at \$167/MT in South Africa while prices in Maputo, Mozambique reached a record high of \$546/MT with no evidence of co-movement of prices between the two countries despite the trade volume data which indicates maize grain exports from South Africa into Mozambique. Some possible reasons could include market power (the existence of market power could limit the extent of arbitrage), high transport costs and asymmetric information (Traub, et. Al. 2010)⁴

In SSA, the biggest annual increase in maize prices occurred between 2007-08 and 2008-09 when prices rose by 50%, compared to 15% in Asia and 16% in LAC (Figure 1). Average annual increase was 10% in SSA during the previous year (2006-07 to 2007-08), compared to 17% in Asia and 20% in LAC. On average, price levels over the last three years (2008-09 to 2010-11) were 33% higher than the levels in 2007-08 in SSA, compared to 17% in Asia and 14% in LAC.

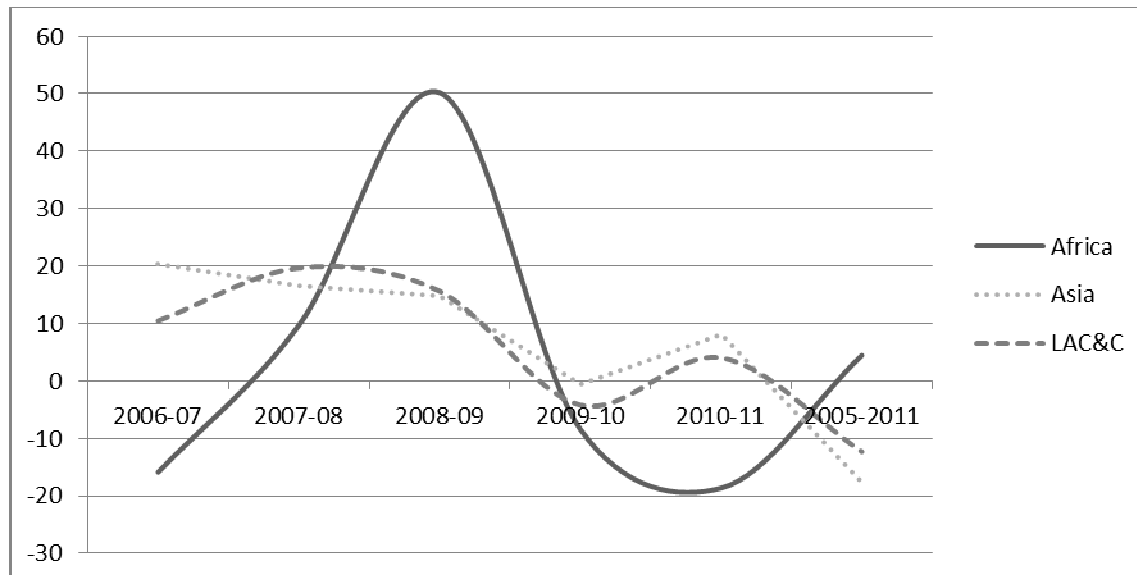
The negative impact of the significant price increase over an extended period on African consumers is evident when the cost of buying 0.2 tons (200 kg)⁵ of maize is expressed as a share of average per capita income. On average, it costs about 9% of per capita income, compared to 2% in Asia and 3% in Latin America.

⁴ Traub, L. N., Myers, R J.; Jayne, T.S. and Meyer, F. (2010) Measuring Integration and Efficiency in Maize Grain Markets: The Case of South Africa and Mozambique *Contributed Paper presented at the Joint 3rd African Association of Agricultural Economists (AAAE) and 48th Agricultural Economists Association of South Africa (AEASA) Conference, Cape Town, South Africa, September 19-23, 2010. Economists (AAAE) and 48th Agricultural Economists Association of South Africa(AEASA) Conference, Cape Town, South Africa, September 19-23, 2010.*

⁵ World annual cereal use per person (including animal feeds) peaked in the mid-1980s at 334 kg and has since fallen to 317 kg (1997-99 average) (FAO, World Agriculture: towards 2015/30, Rome, 2002.) It is thought that annual per capita consumption of maize may go up to 200kg.



Figure 1: Changes in maize price levels by region (%)



Source: Based on Annex 2a.

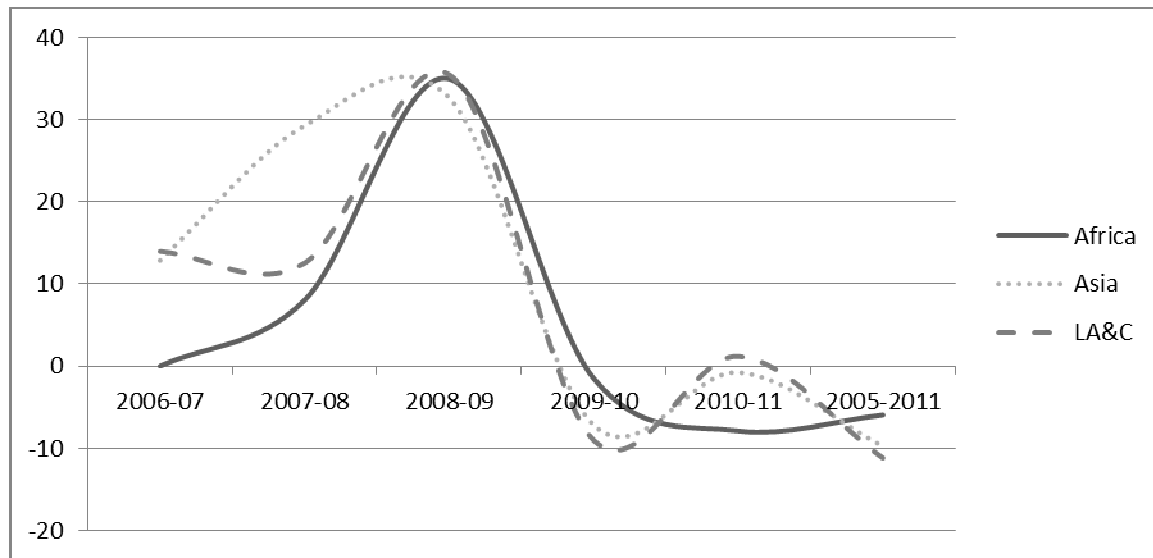
2.2.2 Rice Prices

The average retail price of rice for the period 2005-11 was US \$791 in SSA, compared to US \$463 in Asia and US \$906 in LAC (Annex 2b). Rice prices were lowest in Asia where most countries are self-sufficient. The share of imports in total rice supply is only 3% in Asia, compared to 52% in SSA and 29% in LAC (Annex 1). Average Asian prices are even lower than international prices for Thailand 100% or US 4% during the period 2005-11.

Rice price increases during the period 2008-09 to 2010-11, on average, have been higher among African countries (30%) than Asian (26%) or LAC (28%) (Figure 2). The cost of 0.2 tons (200 kg) rice as a proportion of per capita income is also very high in SSA (22%), compared to 10% in Asia and 5% in LAC.



Figure 2: Rice price levels (%) by region



Source: Based on Annex 2b

2.2.3 Wheat prices

For the sample countries under consideration, the average retail price of wheat for the period 2005-11 was US \$548 in SSA, compared to US \$371 in Asia and US\$811 in LAC (Annex 2c). As in the case of rice, wheat prices are lower in Asia where most of the sample countries (e.g. India, Pakistan and Nepal) are relatively self-sufficient. Retail wheat prices in Asia were only 20 to 49% higher than the international prices (US No. Hard Winter, and Canadian 13.5%). By contrast, wheat prices were 84 to 129% higher in SSA and 159 to 221% higher in LAC. The average share of import in total supply is much higher among the sample countries of SSA and LAC (55 to 58%) (Annex 1).

3. Key structural drivers of volatile and high prices

At global level, price volatility is caused by a wide variety of supply and factors. Demand is steadily increasing due to population growth, urbanization and rising income levels. Population growth, though it has slowed down compared to the 1970s and 1980s, still remains strong, especially in Africa. Urbanization has accelerated and per capita income risen in many countries. Both high income and urbanization increase demand for a larger and a more varied food supply, much of which is meat based. In addition, biofuels have added pressure on demand, depending mainly on energy prices and government policies. In contrast to the steady increase in demand, supply appears to be characterized by uncertainty and variability. Agricultural production is increasingly constrained by natural resource limitations and policy



decisions, at least in some areas. Higher and volatile oil prices and depreciation of the dollar in 2008 against most currencies have also contributed volatility of agricultural commodity prices.

In SSA, nearly all the different factors have contributed to price volatility and high price levels. However, two key structural problems stand out as most important in the region: (i) widening gap between domestic cereal supply and demand; (ii) marketing constraints.

3.1 Production variability and widening gap between variable domestic food supply and steadily increasing demand

Food consumption in SSA is expanding rapidly as a result of high population growth, rapid urbanization and income growth. SSA has the highest population growth rate in the world and Africa's urban areas are expanding rapidly, growing at a world annual fastest rate of 3.5 per cent. Urban people consume more high value foods and beverages than rural people. Real per-capita GDP growth averaged 4.3% per annum during the period 2004-08 (IMF, 2010). By contrast, grain production has been constrained by weather factors, uncertain policy and price environments, inadequate and inconsistent use of productive inputs, among others.

Fluctuation of cereal production in SSA has been very high in SSA. Even among developing countries with similar mean yields, variability is nearly always higher in countries of Sub-Saharan Africa. Countries such as Zimbabwe, Malawi and Zambia have one of the highest coefficients of variation (CV) in maize production, while countries where rice is major food staple in Asia, coefficient of variation in production are very low (Smale, et al., 2011). As shown in Table 4, the CV of maize production has increased for most countries during the period 2003-2009 as compared to 1998-2002. Maize price variability is thus closely linked to fluctuations in production.



Table 4: Coefficient of Variation of Maize Production

Country group	Coefficient of variation	
	1998-2002	2003-2009
SSA		
Benin	9.33	19.46
Burkina Faso	23.45	25.64
Cameroon	6.36	16.33
Cape Verde	74.4	52.33
Chad	41.96	26.1
Ethiopia	12.27	14.85
Kenya	9.56	11.22
Malawi	22.47	36.8
Mozambique	7.71	15.04
Niger	28.84	122.93
Nigeria	10.77	14.09
Rwanda	22.72	57.2
Uganda	10.44	6.29
United Rep. of Tanzania	32.9	17.83
Zambia	22.17	23.48
Total (aggregate output)	5.55	11.46
(average of countries)	22.36	30.64
Asia		
Thailand	7.17	15.64
Philippines	3.53	7.17
Total (aggregate output)	2.9	10.44
(average of countries)	5.35	11.4
Latin America		
Bolivia	17.02	19.02
Brazil	14.16	16.76
Colombia	19.66	5.32
Costa Rica	37.48	28.62
Dominican Republic	15.42	16.92
El Salvador	7.37	11.27
Guatemala	2.32	20.36
Haiti	14.11	13.2
Honduras	5.22	12.59
Nicaragua	22.92	11.61
Panama	15.78	2.62
Peru	13.91	9.37
Total (aggregate output)	13.15	15.53
(average of countries)	15.45	13.97
World		
US	3.81	10.03
Argentina	14.13	22.06
South Africa	18.79	23.21
Total World (aggregate output)	1.57	8.94

Source: Based on FAOSTAT (FAO)



3.2 Market constraints

Food marketing costs are affected by a range of factors including the quality of transportation infrastructure, scale of operation, grades and standards, access to market information, access to finance, regulation of agricultural marketing and transport, government intervention in food markets, macroeconomic policy, political stability in neighbouring countries and trade policy. In SSA, inadequate markets have contributed to high and volatile prices. According to a case study conducted in Kenya, high cost of storage and lack of appropriate storage and associated facilities, especially at community and household levels, have affected maize marketing. Warehouse facilities that provide cleaning, sorting, drying and bagging services are largely non-existent. Recent attempts to introduce warehouse receipt system are also constrained by high cost and reluctance of banks to accept the receipts (KENFAP, 2011). Hence, it is impossible to pool quantities of grain bought from small farmers for storage and transport and achieve returns to scale.

The cost of transport is significantly higher in SSA than elsewhere, due to a combination of poor roads, high fuel prices, and administrative procedures which cause delays. For instance, vehicle operating cost per kilometer for two-axle trucks in the United Republic of Tanzania is 50.1 US cents, substantially higher than the operating costs in Pakistan (21 cents) and Indonesia (19.7 cents). Higher fuel prices, maintenance costs, tire costs and overheads in the United Republic of Tanzania account for the wide margin of difference⁶ (Table 5). Limited use of bulk transport systems and poor interconnection of networks have resulted in high cost of marketing and trade in Africa (ECA, AU and ADB, 2010). Grain prices are high for consumers and low for producers.

Table 5: Estimated composition of operating costs for two-axle trucks (US cents per km)
Tanzania Pakistan Indonesia

	Tanzania	Pakistan	Indonesia
Capital Costs	10.6	1.8	2.7
Fuel	15.4	9.3	5.8
Crew	2.7	3.2	3.2
Oil	1	1	0.7
Maintenance	6.1	2.2	4.3
Tires	7.8	1.1	1.2
Overhead	6.5	2.4	1.8
Total	50.1	21	19.7

Source: ECA, AU and ADB, 2010

Domestic markets can come under pressure from political and security problems in neighbouring countries. Countries sharing borders or trade routes are linked through formal

⁶ ECA, AU and ADB. (2010). Assessing Regional Integration in Africa IV: Enhancing African Trade, Addis Ababa



trade and informal cross-border trade. As demand or supply shocks in the affected country cannot be contained within its borders, domestic markets of neighbours are likely to be affected by the spill-over effects with sudden increases in prices even when the country is self-sufficient. With limited stocks or storage capacity, the domestic markets often cannot easily absorb the shocks. Some countries may seize such opportunity and increase production and export more. On the other hand, export bans or trade restrictions tend to aggravate the problem further. Domestic markets are also affected by the situations in international markets, and this is particularly true for imported cereals such as rice and wheat.

4. Policy responses and challenges of addressing high and volatile prices

4.1 Policy responses

A variety of different measures have been introduced by African governments to mitigate the impact of the 2007/08 food crisis. The responses have varied considerably but could be grouped into basic types: (i) consumer support measures; and (ii) producer-support actions.

4.1.1 Consumer support measures

Government responses in favour of consumers have commonly taken two forms: country-wide support schemes; and (ii) targeted safety net programs. Country-wide or general consumer support schemes included: trade measures such as reducing tariffs or import restrictions and restricting exports as well as domestic market related measures such as reducing domestic taxes, releasing public stock (grain), and controlling prices. A survey of 27 African countries showed that reducing tariffs and custom fees was one of the most popular instruments used to lower prices for consumers: the measure was applied by 17 countries (63%) during the period Dec. 2007 – Oct. 2008 and by 12 (44%) after the peak of the crisis (Oct. 2008 -2011). Export bans were imposed by 9 countries and 4 countries during and after the crisis respectively. Only three countries attempted to increase tariffs in Oct. 2008- 2011 (Annex 3a). Among domestic market related measures, reducing VAT and releasing stocks (from strategic reserve) were relatively popular. Administrative price controls were attempted by 10 countries (37%) during the crisis and by 4 (15%) afterwards (Annex 3b).

Cash and food transfers are the two most common forms of targeted safety net programs used in response to the 2007/08 food crisis. According to the survey of 27 countries, 14 countries (52%) implemented cash and food transfers during the crisis. The number of countries with safety net programs increased to 15 (56%) after the crisis (Annex 3b). In response to the high prices, several countries have expanded their emergency food distributions and food-for-work programs. School feeding programs have also gained importance in food assistance programs. (Demeke, et al., 2009).



4.1.2 Producer support measures

One of the main producer support measures implemented in response to the 2007/08 crisis is subsidizing inputs. Farmers were encouraged to increase production through input subsidies. However, only a few countries offered such support to their producers: eight countries (30%) during the crisis and nine countries (33%) after the crisis (Annex 3c). One of the well-known cases of targeted input subsidy is the Agricultural Inputs Subsidy Program of Malawi. In 2008/9, for example, the program involved selection of over 1.5 million fertilizer coupon beneficiaries (from over 2.5 million farm households) and distributed over 3.4 million bags of fertilizer (Dorward, et al., 2009). A few countries have allocated budgets to ensure improved access to credit, input markets, market information and irrigation (Demeke, et al. 2009).

4.2 Policy challenges

The responses of African countries to the food crisis have not solved the problem. High and volatile prices have continued to undermine food security and poverty alleviation goals. Three major policy challenges lie at the root of the food problem: (i) the challenge of balancing consumer versus producer support measures; (ii) the challenge of food self-sufficiency versus import dependence; (iii) and the challenge of lowering marketing costs and stabilizing prices.

4.2.1 The policy challenge of consumer versus producer support measures

Consumer support measures had minimal impact on prices and negative impact on producers. For instance, since tariffs have already been declining in a number of countries (as a result of SAPs and various bilateral and multilateral trade agreements), the measure was adequate for offsetting only a small part of the overall rise in the international prices. In other words, tariff changes were not large enough to offset the large world price increases (Abbott, 2010). Local prices tended to respond to international prices and inflationary expectations rather than changes in import duties. Price controls seldom work, especially in countries where there are little or no public stock for distribution at government fixed prices. In many countries politicians and state officials blame private traders for price rises in order to gain public sympathy when markets respond to the forces of demand and supply. Price controls force business people to reduce their operation (to cut down their losses) but such measures are likely to widen the gap between supply and demand even further.

In general, two key issues need to be considered when applying country-wide consumer support measures, specifically reducing tariffs and domestic taxes, export bans, price controls, food aid, and releasing stocks at subsidized prices. First, sudden and often unplanned interventions to lower prices can have negative impacts on the business environment, particularly on grain traders and producers. With shortage and market instability, traders face huge uncertainty about the cost of acquiring their next supply. Trying to crack down on traders suspected of 'hoarding' grain may reduce the incentive for stockholding and contribute to increased price volatility in the future (Schneider, 2008).

Second, because general price subsidies transfer income to everyone, their fiscal cost can be high and divert resources from development activities. The rich can also receive a greater allocation per capita than the poor. In many countries, general subsidies fail to reach many of the rural poor as outlets for sale of subsidized goods are often concentrated in urban areas



(World Bank, 1990)⁷. Targeted safety net programs have become more popular than general subsidies in recent years. However, effective safety nets take a long time to design and finance and are unlikely to help in conditions of high food prices and where the targeted poor are a significant proportion of the population (Timmer, 2010). Moreover, safety net program in Sub-Saharan African countries suffer from significant leakages to the non-poor, fiscal and administrative constraints (Wodon and Zaman, 2010), and limited linkage to production support.

Support to producers has been inadequate and ineffective because of consumer support policies, high marketing costs, volatile prices and rising input prices. Most of the consumer oriented measures lower prices and thus prevent the transmission of high prices to producers. Producer prices are lower because of high transport and marketing costs as well. More importantly, dramatic increase in oil prices that began in 2003 has raised not only the cost of farm power and transport, but also the cost of fertilizer (because oil is an important cost item in fertilizer production). Rising input prices have thus worked against the benefit of increased output prices (for producers). Because of the steady increase in input prices in the last decade, the ratio of output to input prices (a broad indicator of farm profitability) have declined⁸. The challenge for farmers in poor countries is the environment in which output price increases are not completely and rapidly transmitted to producers, while increases in the price of inputs, especially where these are imported, are passed on fully and quickly (FAO, 2009). While producers in developed and many emerging and developing countries in Asia and LAC are protected through public and private risk management schemes, African farmers operate under very high production and price uncertainties (Demeke et al., 2012).

4.2.2 The challenge of food self-sufficiency versus import dependence

Despite the different pronouncements and declarations to increasing food production and ensure food security (e.g. CAADP), Africa as a whole has increasingly become dependent on food import. When international prices were low before 2005, most African countries made no effort to protect their producers from the negative impact of low prices. In fact, African governments adopted trade liberalization policies and eliminated support for domestic producers, while governments in other parts of the world protected their farmers from low and falling prices of the 1980s, 1990s and early 2000s. The policy environment led to import surges in many countries between 1980 and 2003 (FAO, 2007⁹). Import dependence became a problem when prices started rising in 2005 and culminated in the 2007/08 crisis. The response of most governments, as discussed above, was to lower tariffs and increase import levels to

⁷ World Bank, (1990). World Development Report 1990, Washington D.C.

⁸ Increasing productivity can offset the negative income consequences of a declining ratio but recent trends in agricultural productivity in most developing country (especially in Africa) are not encouraging (FAO, 2009).

⁹ According to FAO, although all the 102 developing countries considered have experienced import surges, some have been affected more often than others: in Asia, Bangladesh and India; in Africa, Ghana, Kenya, Malawi, Nigeria and Zimbabwe; and in Latin America, Ecuador and Honduras. Some 50 countries (or nearly half of those covered by the analysis) experienced more than 70 import surges during the 23 years studied (1980 to 2003). FAO. (2007). The State of Agricultural Commodity Markets, Rome



meet demand. As a result, food imports increased beyond levels which can be considered as sustainable or affordable. Food trade deficit has increased sharply in recent years. In East Africa, for instance, food trade deficit increased from an annual average of 1.5 billion in 1994 to 2004 to 2.9 billion US\$ in 2005-09 (Annex 4).

4.2.3 The policy challenges of developing national and regional markets – problem of lowering marketing costs and stabilizing prices

Many governments have programs in support of input and output market development¹⁰. However, past and recent policy responses to food crisis have discouraged private sector investment in market and value chain development. Policy measures such as unexpected changes in import tariffs and stock policies, price controls, restriction of private grain trade and transport, export bans among neighbouring countries and foreign exchange controls have discouraged private investment in storage and marketing facilities.

Governments have attempted to control prices and restrict private grain trade with the objective of keeping prices low for consumers. Private speculative storage is often discouraged on the assumption that private stockpiling disrupts the market by creating artificial shortages. However, anti-speculative stockpiling policies could rather result in falling stocks and supply shortfalls, which further aggravate price volatility. Policy makers only need to encourage intertemporal private trade to be more competitive. A recent study in Ethiopia also found that speculative stockpiling leads to temporal market integration in the long run and it is an important determinant of grain price formation (Tadesse and Guttormsen, 2011).

Granting legal monopoly to parastatals to buy and sell grains before the reform, and pursuing inconsistent policies after the reform have given rise to a variable and risky incentive environment. The situation in Africa is similar to Timmer's (2009) description that '... if public management of grain reserves is erratic, poorly funded, or captured by special interests, private expectations will be destabilized, making market instability even worse'.

¹⁰ See for instance FAPDA website: : <http://www.fao.org/tc/fapda-tool/Main.html>

5. Conclusions

African countries endure relatively higher levels of price volatility. Volatility is particularly high for maize. Staple grain prices have also become relatively more expensive, relative to income, in SSA. Rice and wheat prices have become too expensive for the poor. Greater degree of import dependence is associated with lower volatility but higher price levels. On the other hand, countries less dependent on import (more self-sufficient) tend to have lower prices but higher levels of volatility.

Structural problems have affected price levels and volatilities in SSA. First, maize production variability has increased markedly in recent years in most countries with data. Cereal production has also declined significantly in recent years in countries affected by political or civil conflicts. Because of commercial links (formal and informal trade) staple grain prices in more peaceful countries are affected by production declines and political turmoil in neighbouring countries. At the same time, demand has steadily increased due to high population growth and rapid urbanization in nearly all African countries. High income growth in many countries has also contributed to the widening gap between demand and variable supply. Attempting to bridge the deficit through commercial import has widened the food trade deficit, raised the cost of staples, and increased vulnerability to international price volatility.

Second, the problem of grain prices is exacerbated by inadequate national and regional markets in SSA. High transport costs, inappropriate and high cost of storage, small scale operations, high cost of finance, and limited access to information, among others, have contributed to price volatility and high price levels for consumers but low prices for producers. Neither the public nor the private sector maintains enough stock of grains to offset the impact of production variability on prices. Because of poor roads, lack of bulk transport systems, high cost of operating and maintenance costs, the cost of transport is significantly higher in SSA than elsewhere.

Policy responses in the wake of the food crisis have focused on short-term coping mechanism rather than addressing key structural problems, production variability and market underdevelopment and failure. Greater attention has been given to protecting consumers through policy measures such as reducing tariffs and VAT, releasing stocks, banning export, and undermining private sector thorough ad-hoc interventions with little regard to the impact of such measures on producers and traders. Unpredictable changes in policy and high price volatility have raised the cost of doing business in the area of grain marketing.

African countries need to support and invest in national and regional market development. Supporting traders, warehouse operators, millers/ processors and transporters has several advantages: it would help reduce prices for consumers while raising prices for producers, contribute to market stability, and facilitate structural transformation of the food and



agricultural sector. The performance of food and agriculture is better in countries where public and private sector work together to stabilize prices. Policy makers should also have a regional perspective to market development as grain trade ties are relatively strong among neighbouring countries. It is also important to realize that regional trade could help reduce price variation by spreading supplies across geographically dispersed markets.

Finally, increasing agricultural productivity and preventing food crisis 'rather than trying to cope after the fact with their impact on the poor is the only way to avoid substantial, perhaps permanent, damage to the welfare of poor households' (Timmer, 2010). Protecting consumers should not be done at the expense addressing structural problems of increasing production and developing markets. Support to producers and market improvement has a long term benefit of increasing domestic supply and lowering prices for consumers.

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Annex 1: Share of import in total supply (%)

Region/ countries	Maize	Rice	Wheat
SSA			
Benin	0.40	79.59	-
Burkina Faso	2.65	66.57	-
Cameroon	1.27	79.60	72.17
Cape Verde	59.31	87.51	88.18
Chad	7.24	25.04	-
Kenya	14.11	-	-
Malawi	4.04	16.21	-
Mauritania	-	7.38	83.20
Niger	73.12	65.93	-
Nigeria	0.88	76.72	-
Senegal	-	63.43	-
Mozambique	8.09	65.43	-
Ethiopia	1.25	-	26.11
Rwanda	42.71	-	
South Africa	3.88	-	
Tanzania	2.07	7.75	30.84
Uganda	1.26	36.22	-
Zambia	3.44	-	-
Sudan	-	-	46.30
ASIA			
Bangladesh	-	2.55	52.49
Cambodia	-	0.24	-
India	-	0.07	1.81
Laos	-	1.37	-
Myanmar	-	0.12	-
Nepal	-	5.33	0.34
Pakistan	-	0.06	4.61
Philippines	5.25	13.99	-
Sri Lanka	-	2.27	74.92
Thailand	5.96	0.86	-
Viet Nam		1.09	-
LAC			
Costa Rica	90.99	31.47	89.37
Dominican	85.26	1.81	-
El Salvador	31.64	68.70	76.62
Guatemala	29.16	69.99	
Haiti	5.66	70.28	
Honduras	36.14	67.22	
Nicaragua	14.60	32.19	
Panama	78.94	19.74	
Argentina	0.02	-	0.02
Bolivia	0.48	3.26	53.52
Brazil	1.74	6.21	54.94
Colombia	61.05	5.47	89.45
Peru	45.63	4.53	71.79
Uruguay	-	0.01	2.03



Annex 2a: Maize prices in USD

	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2005-2011
SSA	283	238	261	392	359	292	305
Benin	315	224	257	487	358	305	324
Burkina Faso	301	215	241	346	334	278	286
Cameroon	411	404	388	470	584	462	453
Cape Verde		345	415	533	581	566	488
Chad	378	329	334	451	464	365	387
Kenya	199	205	210	351	374	230	262
Malawi			184	390	281	227	270
Niger	408	312	348	518	484	408	413
Nigeria	367	229	305	474	370	320	344
Mozambique	249	153	224	397	267	251	257
Ethiopia	181	175	226	464	282	189	253
Rwanda	237	272	256	352	343	230	284
Tanzania		167	201	277	305	214	233
Uganda		162	150	296	285	163	211
Zambia	224	177	194	266	249		222
Asia*	207	249	290	333	331	358	295
Latin America**	373	412	493	570	546	568	498
World							
US No.2 Yellow maize	100	138	175	209	164	215	167
South A.	130	197	249	208	184	177	191
Argentina	74	104	125	129	118	152	117

Source: Based on GIEWS (FAO)

* Philippines and Thailand

** Costa Rica, Dominican Rep., El Salvador, Guatemala, Haiti, Honduras, Nicaragua, Panama, Bolivia, Brazil, Colombia and Peru



Annex 2b: Rice prices in USD

	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2005-2011
SSA	636	636	687	927	913	841	791
Benin	617	651	776	1019	1006	967	840
Burkina Faso		491	570	832	795	737	685
Cameroon	585	639	700	902	882	819	754
Cape		701	796	1038	1095	1065	939
Chad	783	821	905	1206	1107	1033	976
Malawi			750	1102	1098	1076	1006
Mali		528	570	748	643	602	618
Mauritania	742	774	763	857	940		815
Niger	614	644	744	957	965	884	801
Senegal			536	804	798	699	709
Mozambique	474	518	610	925	812	788	688
Tanzania		572	605	790	883	742	721
Uganda		657	609	876	850	677	734
Asia*	288	325	420	557	517	513	463
Latin America**	638	727	818	1108	1008	1020	906
World							
Pakistan 25%	229	239	335	503	369	390	344
Thailand 100%	295	316	388	695	558	500	459
US 4%	336	419	474	760	541	523	516
Vietnam 25%	239	259	371	532	392	395	364

Source: Based on GIEWS (FAO)

* Bangladesh, Cambodia, India, Lao, Myanmar, Nepal, Pakistan, Philippines and Sri Lanka

** Costa Rica, Dominican Rep., El Salvador, Guatemala, Haiti, Honduras, Nicaragua, Panama, Bolivia, Brazil, Colombia, Peru and Uruguay



Annex 2c: Wheat price in USD

	2005-06	2006-07	2007-08	2008-09	2009-10	2010-11	2005-2011
SSA	387	428	582	687	590	559	548
Cameroon	690	760	974	997	907	786	852
Cape Verde		529	703	816	785	719	710
Mauritania	468	449	584	692	590		556
Sudan	371	302	468	658	509	587	482
South Africa	158	214	419	381	292	373	306
Ethiopia	247	315	346	579	460	328	379
Asia*	235	265	377	403	366	422	371
Latin America**	507	536	746	953	855	901	811
World							
U.S. Hardwinter	163	207	324	297	226	276	249
Canadian Wheat	200	223	398	380	289	361	308

Source: Based on GIEWS (FAO)

* Bangladesh, India, Nepal, Pakistan and Sri Lanka

** Costa Rica, El Salvador, Argentina, Bolivia, Brazil, Colombia, Peru and Uruguay



Annex 3a: Consumer oriented policy decision – trade related

Country	Export Ban				Import Tariff			
	During Food Price Crisis Dec 2007- Oct 2008		After the peak of Crisis/Financial Crisis Oct 2008-2011		During Food Price Crisis Dec 2007- Oct 2008		After the peak of Crisis/Financial Crisis Oct 2008-2011	
	Imposed	Lifted	Imposed	Lifted	Increased	Decreased	Increased	Decreased
Benin						✓		
Burkina Faso						✓		
Cape Verde						✓		
DRC								✓
Eritrea								
Ethiopia	✓2008		✓2011	✓2010		✓		
Ghana						✓2008	✓2009	
Guinea	✓							
Guinea Bissau								✓
Kenya	✓08		✓2009-10-11			✓		✓
Liberia	✓		✓			✓		✓
Madagascar						✓		
Malawi	✓			✓2009				
Mali						✓		
Mozambique								✓
Niger						✓		
Nigeria						✓2008	✓2010	✓2009
Rwanda						✓		✓
Senegal	✓					✓		
Sierra Leone						✓		✓
Swaziland								
Sudan								
Tanzania	✓		✓09-11	✓2010		✓		✓
Togo	✓					✓		
Uganda			✓09-11					✓
Zambia	✓			✓2009				✓
Zimbabwe						✓2008	✓2011	✓2009

Source: Based on FAPDA (FAO)



Annex 3b: Consumer oriented policy decision – domestic market relate

Country	During Food Price Crisis Dec 2007- Oct 2008				After the peak of Crisis/Financial Crisis Oct 2008-2011			
	Safety Nets	Strategic Grain Reserve	Removed/ Reduced VAT	Price Control	Safety Nets	Strategic Grain Reserve	Removed/ Reduced VAT	Price Control
Benin	✓	✓		✓				
Burkina Faso	✓		✓		✓	✓		
Cape Verde	✓			✓	✓			
DRC				✓			✓	
Eritrea		✓			✓			
Ethiopia	✓	✓	✓	✓	✓		✓	
Ghana	✓				✓	✓		
Guinea	✓							
Guinea Bissau					✓		✓	
Kenya		✓	✓					
Liberia	✓							
Madagascar	✓		✓					
Malawi				✓	✓			✓
Mali				✓	✓			
Mozambique					✓			✓
Niger	✓	✓	✓		✓			
Nigeria	✓					✓		
Rwanda						✓	✓	
Senegal	✓	✓	✓	✓	✓			✓
Sierra Leone	✓	✓						
Swaziland								✓
Sudan			✓	✓				
Tanzania	✓		✓		✓	✓	✓	
Togo	✓	✓		✓	✓	✓		
Uganda			✓					
Zambia					✓	✓		
Zimbabwe					✓	✓	✓	
	14	8	9	10	15	8	6	4

Source: Based on FAPDA (FAO)



Annex 3c: Producer oriented measures

Country	Agricultural Input Subsidy	
	During Food Price Crisis Dec 2007- Oct 2008	After the peak of Crisis/Financial Crisis Oct 2008-2011
Benin		
Burkina Faso		
Cape Verde		
DRC		
Eritrea		
Ethiopia		
Ghana	✓	✓
Guinea		
Guinea Bissau		
Kenya	✓	✓
Liberia		
Madagascar	✓	✓
Malawi	✓	✓
Mali		✓
Mozambique		
Niger		
Nigeria		✓
Rwanda		✓
Senegal	✓	
Sierra Leone		
Swaziland		
Sudan	✓	
Tanzania	✓	✓
Togo		✓
Uganda		
Zambia	✓	
Zimbabwe		✓

Source: Based on FAPDA (FAO)

Annex 4: Trade Balance (food excluding fish, coffee, tea) in 000 USD

Regions/Countries Name					
	1968-83	1984-93	1994-04	2005-09	1968-09
Eastern Africa	249329	-295287	-1517358	-2904535	-553365
Middle Africa	-120957	-579594	-1350940	-2501537	-698721
Northern Africa	-2536057	-5336774	-8207815	-12031640	-5363564
Southern Africa	824036	390447	349491	178362	540022
Western Africa	97025	-50409	-1151995	-2920647	-413896
Total Africa	-1486623	-5871618	-11878616	-20179997	-6489524

Source: Based on FAOSTAT (FAO)