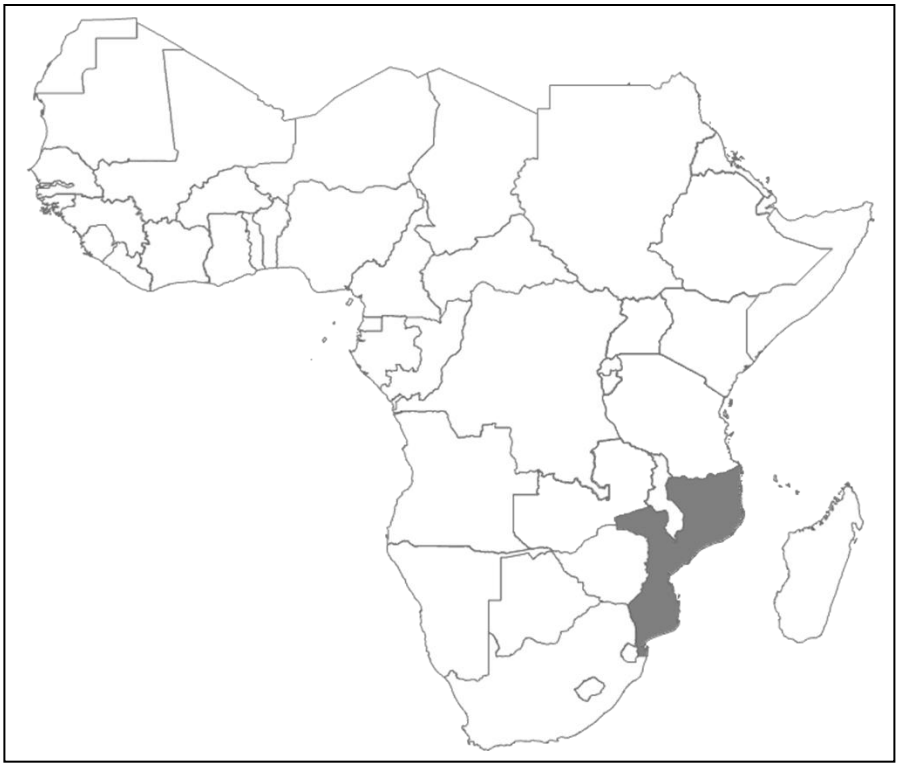
Staple food prices in Mozambique



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1 Introduction

Mozambique is located along the Indian Ocean coastline of southern Africa and covers over 799,380 Km^2 hectares, including over 36 million hectares of arable land. The recent population census indicates that over 70% of Mozambique's population lives in rural areas, and that population is growing. The remaining 30% live in urban areas, including the capital Maputo with 1.1 million people. With about 80 percent of its population of 20 million dependent on agriculture for their livelihood, the agricultural sector remains the key sector in the economy for achieving economic growth. While there has been significant economic growth in recent years, with GDP growth averaging 8.6 percent annually, there is still a high proportion of the population living below $1/day. Food accessibility is clearly a major issue for many households, both rural and urban, in spite of increasing food production levels and incomes. As will be seen in greater detail, due to geographical and historical factors, there are large differences in food staple consumption and production between regions of Mozambique. Analysis of price dynamics helps us to understand these relationships, especially as prices respond to external drivers as well as domestic ones.

Figure 1. Map of M2ÎI·Y õʎIjdzŜ

The rise in world food and fuel prices created difficulties in Mozambique, including a day of street protests in early 2008 over an increase in transport costs and bread. As a response to the rising prices, the government developed their Action Plan for Food Production (Plano de Acção da Produção Agrícola, known as PAPA) (Mozambique 2008), designed to increase domestic food availability through various measures to enhance crop production and productivity, thereby lowering domestic food prices and relying less on imports from the world markets. To put this plan into context, it is important to look at the role of different staples, price fluctuations for them, and key regional differences within the country.

2 Importance of staple foods in the diet

Nationally, cassava, maize, and rice serve as the major food staples in Mozambique, followed by wheat and millet. Table 1 shows the national average consumption across several of the key staples, with cassava taking the lead as a consumption staple.

As was mentioned above, due to regional differences, a national statistic on staple foods may be misleading. Mozambican consumers, both urban and rural, tend to shift their consumption based on the relative prices of the main staples. Thus, when rice prices are lower than maize flour prices in urban areas, many households shift from maize to rice consumption. In the north, when maize prices are low, producers may prefer to eat their own maize rather than sell

it. Wheat consumption in both rural and urban areas has been growing. Table 2 uses the 2002/2003 consumption data to demonstrate the regional differences in the structure of consumption expenditures during a specific year.

Table 1. Importance of staple foods in diet of Mozambique, 2005-2007 averages

Commodity	Quantity consumed (kg/person/year)	Daily caloric intake (kcal/person/day)	Share of total caloric intake (percent)
Maize	58	462	22%
Cassava	247	740	36%
Wheat	20	147	7%
Rice	15	145	7%
Others	87	587	28%
Total	427	2082	100%

Source: FAO, 2009a

Table 2. Importance of staple foods in urban consumption expenditures in Mozambique, by Region 2002/2003

Commodity	% of urban consumption expenditures			
	South	Center	North	Overall
Maize	3.1	23.6	15.5	13.4
Cassava/Potatoes	4.7	6.1	21.1	10.9
Wheat (bread)	13	5	3.9	7.5
Rice	8.6	9.8	7.0	8.4
Other	70.6	55.5	52.5	59.8

Source: Barslund, 2007

While less than 1 percent of the total supply of wheat comes from domestic production, it is a commodity that has seen increases in consumption in both rural and urban zones, due to the consumption convenience of bread and other wheat flour products.

In many parts of northern Mozambique, maize is seen as a cash crop, whereas cassava is seen as the main consumption crop. Recent work by Haggblade, et al. (2009) is valuable for understanding the dynamic interaction of food staples, especially maize and cassava in both urban and rural areas. Table 3 evaluates staple food consumption in rural area based on classification of zones according to maize or cassava as the principle food staple, determining zones in which both are consumed as staple foods. When maize prices are low, farmers may retain more for consumption, but when prices are remunerative, farmers will sell the majority of their maize production and cassava remains the most important consumption staple. The central region remains strongly tied to maize as a consumption staple, although rice, and more recently wheat, can also be very important for some consumers.[3]

[3] For more basic information on agriculture in Mozambique, see Donovan and Bias, 2003.

Table 3. Food consumption by food staple zone in Mozambique

	Food Staple Zone			National Average
	Maize belt	Dual staple	Cassava belt	
	(kg/person/year)			
Maize				
Rural	76	57	38	61
Urban	122	65	42	70
National	79	59	38	63
Cassava				
Rural	46	76	100	70
Urban	2	121	175	121
National	43	87	107	80
Maize + Cassava				
Rural	122	133	138	133
Urban	124	186	217	182
National	122	146	146	143

Notes: Cassava is in dry weight. Estimates based on Food Balance sheets and national consumption survey.

Source: Haggblade, Longabaugh, and Tschirley, 2009.

3 Production and trade of main staple foods

The Green Revolution Strategy (MINAG, 2007) was approved in 2007 and identified key national programs, whose implementation is expected to increase production and productivity of smallholder farmers thus increasing the availability of food. PAPA, along with the drafted Strategic Plan for Development of the Agricultural Sector (PEDSA) 2009-2019, are focusing on key commodities of maize, rice, wheat, cassava, potatoes, and oilseeds.

Mozambique's agricultural production of food staples is dominated by smallholders, with an average of 0.9 hectares of cultivated land, as of 2007. Among the 99% of rural households that are smallholders, 25% percent are led by women and they are active in agricultural production, although disadvantaged by lower education levels, limited access to credit, and reliance on low paying agricultural jobs. Use of purchased inputs is very limited (only 4% used fertilizers in 2007 national survey), and there are limited efforts with production subsidies, including seed fairs and a new input voucher scheme. Most rural households are net buyers of food staples, a pattern that is strong in rural areas of the south, but even in the north and center, about 50% of rural households are net buyers of their key staple foods (Tschirley and Abdula 2007).

Table 4. Production and trade of food staples in Mozambique, 2009/2010 Balance Sheet

Commodity	Production	Imports	Exports	Imports as a percentage of apparent consumption	Exports as a percentage of production
Maize	1932	220	233	11.5%	12%
Cassava	7437	0	5	0%	<1%
Wheat	10	429	2	99%	<1%
Rice	165	258	0	61%	0%

Source: MIC, 2009.

Note: Apparent consumption is production plus imports minus exports and non-food uses. These data are considered provisional, and the production estimates reflect higher estimates than would be predicted based on TIA household survey data.

3.1 Maize

As with most food staples, maize production in Mozambique is based on hand hoe and rainfed agriculture with minimum external inputs. Growth in production has occurred over the past decade primarily due to land expansion, but the lack of animal traction and mechanization constrains additional growth. Without attention to soil fertility, productivity gains will also be highly constrained, even with access to improved varieties, and on-farm yields are estimated to be 1-1.4 tons per hectare. About 78 percent of all rural households grew maize in 2008, although only 18 percent sold maize into the market. Maize is mainly cultivated in the center and north of Mozambique (See Annex Figure 1 for the geographic dispersion of maize production.)

3.2 Cassava

Cassava is a very important crop in northern Mozambique and contributes to food security in selected regions of the south (See Annex Figure 2 for the geographic dispersion of cassava production). There are production constraints from diseases (including brown streak disease in the north and cassava mosaic disease, mainly in the southern areas). It is commonly intercropped with beans and other crops, often left for 24 months, with and without ratooning. In the north, many households will harvest a portion of the cassava for dry cassava sales in the early months of the year and fresh cassava sales in March-April, before the maize harvest. However, the majority of cassava grown is for home consumption, due to the scarcity of marketing and processing facilities. In selected areas of the south, cassava is also grown and consumed fresh and in processed form (“rale”), especially in Inhambane Province.

3.3 Rice

Rice is grown in two primary areas. First there are the irrigated areas in Chokwe in the south, where large scale irrigation schemes were installed in colonial times and are now under the production of smallholders with government management assistance. The greatest quantity of rice is produced in the zones of the center, south, and north, based on minimum water control

and rainfed conditions. As indicated in Bias and Donovan (2003), the center of the country has the greatest potential area for rice production growth.

4 Staple food price patterns

For this work, prices for Maputo (in the consumption zone of the south) and Nampula (in the northern production zone) will be the two markets examined. [4]

4.1 Maize

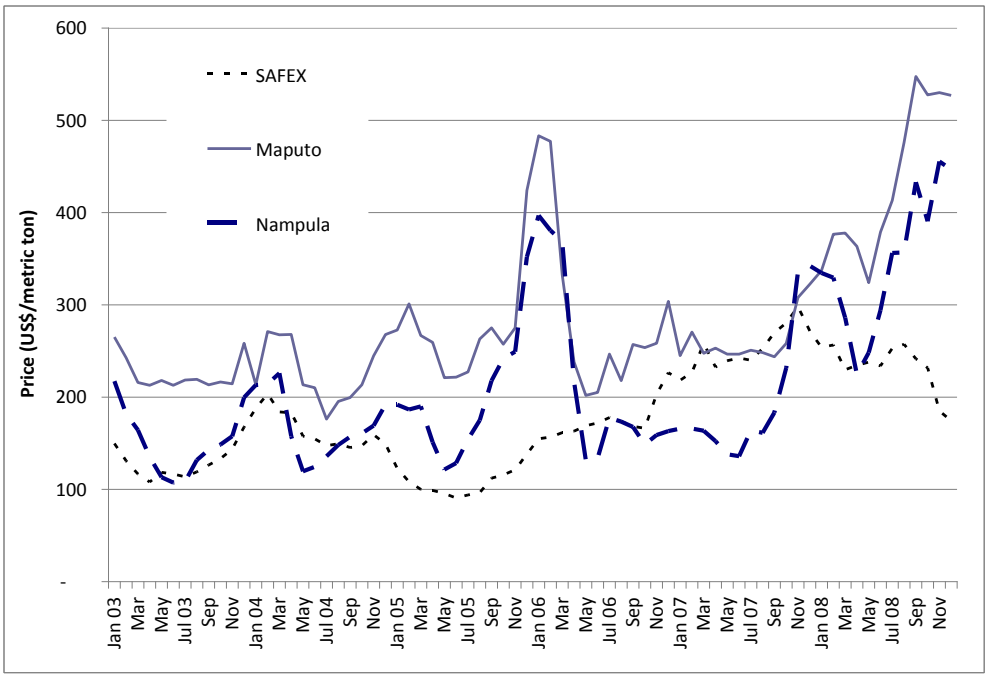
In the mid-2000s, Tschirley et al (2006) demonstrated that Mozambique's maize prices were the least volatile in the region (excluding South Africa) and attributed this to the government's trade policies, both internal and external. Maize prices show distinctly seasonal prices, as production is based on rainfed production systems and there is a single main rainy season. In the northern markets, maize surpluses are normally exported to Malawi and other neighboring countries. In southern Mozambique, local maize enters the public markets strongly in the months of June through August, into September, but then supplies taper off, and consumers must purchase maize flour from the industrial mills, based mainly on imported maize grain. Thus southern maize grain prices tend to be linked to South African maize prices and prices for maize in other markets of the south and center. In the northern regions, maize is a cash crop for many farmers, with cassava being the key food staple and maize prices tend not to be linked to southern and central market prices (Tostao and Brorsen 2005). Other research by Jayne et al. (2009) demonstrates the close relationship between maize prices in Malawi and in northern Mozambique.

In recent years, there have been two clear exceptions to the general seasonality patterns of maize prices and links with international prices, especially in northern Mozambique. First there are the price spikes of 2005. It was not a good production year but the crop forecasting system did not capture the losses and so predictions of a good crop year resulted in unexpectedly high prices. Traders did not know with enough time to bring in the supplies to fill in the gaps. Secondly, there was a period of relatively flat prices for maize in the north, in which the seasonal highs do not occur. Prices for maize remained flat from August 2006 through July 2007 due to production and prices in neighboring Malawi, after a crop year with input subsidies and relatively good rains. Northern Mozambican surpluses faced a weak market.

Another aspect to note is that the high prices in Mozambique seen in the recent period have not declined as world market prices declined. Analysis is needed to understand this dynamic, but it is hypothesized that increasing domestic demand for maize for human and animal consumption in the center and north have kept pressure on maize supplies, resulting in high prices.

[4] Ideally this research would include more markets within Mozambique. Price data are available and will be evaluated in the coming months.

Figure 2. White maize prices in Maputo, Nampula and SAFEX, USD/metric ton



Source: FAO and SIMA.

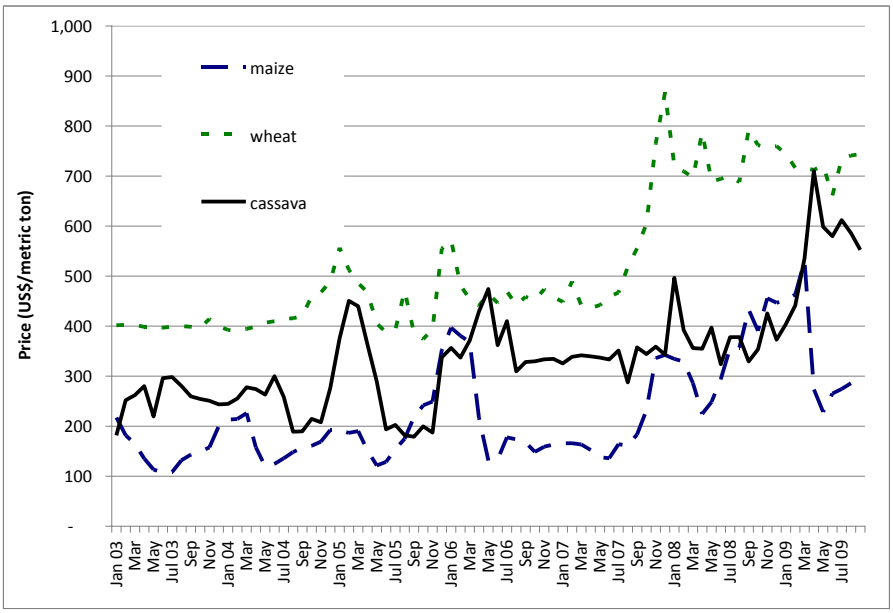
4.2 Cassava

Cassava flour prices in Mozambique are available for the northern zones, where that commodity is most commonly found. As shown in Figure 2, movements in cassava flour in Nampula generally follow trends in wheat flour and maize, with seasonal changes. Maize flour substitutes for cassava flour during the times when maize prices are lowest, and then gradually, as maize prices go up, cassava flour is in greater demand and sees increased pressure on supplies and prices, in a fairly consistent seasonal pattern. Further analysis is needed, as cassava flour may be a fairly small part of the cassava marketing, compared to dried cassava pieces, for which prices are more difficult to obtain, due to the bulkiness of the product and the lack of scales in the markets.

4.3 Rice

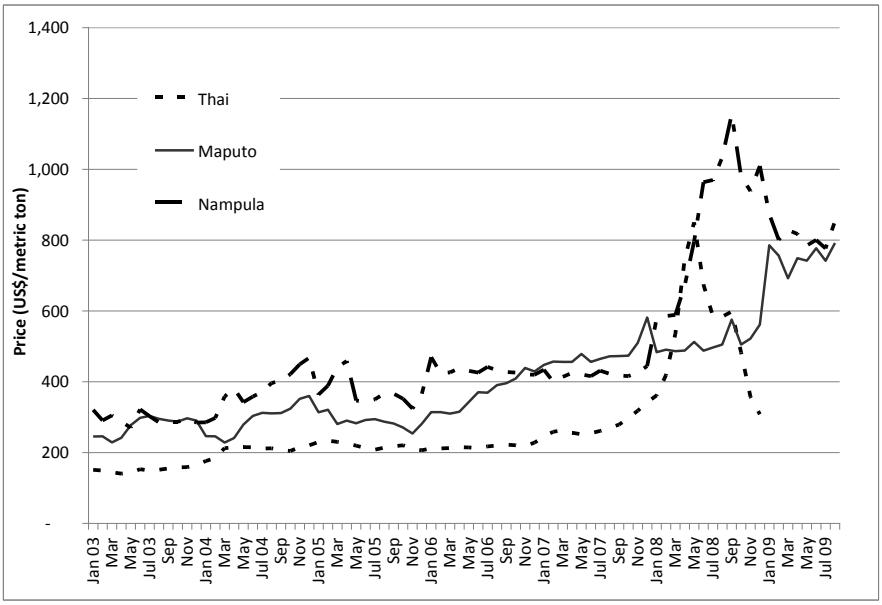
Since most rice production in Mozambique is currently consumed in the producing households, it is expected that rice prices in the markets will reflect world market prices. As incomes rise, there are markets segments appearing for higher quality rice, although the bulk of current rice imports is 25 percent broken rice from low cost producers in Indian, Vietnam and other Asian countries.

Figure 3. Nampula prices for maize grain, wheat flour, and cassava flour, USD/metric ton



Source: SIMA, Mozambique.

Figure 4. Rice Prices: Thai, Maputo and Nampula (USD/metric ton)

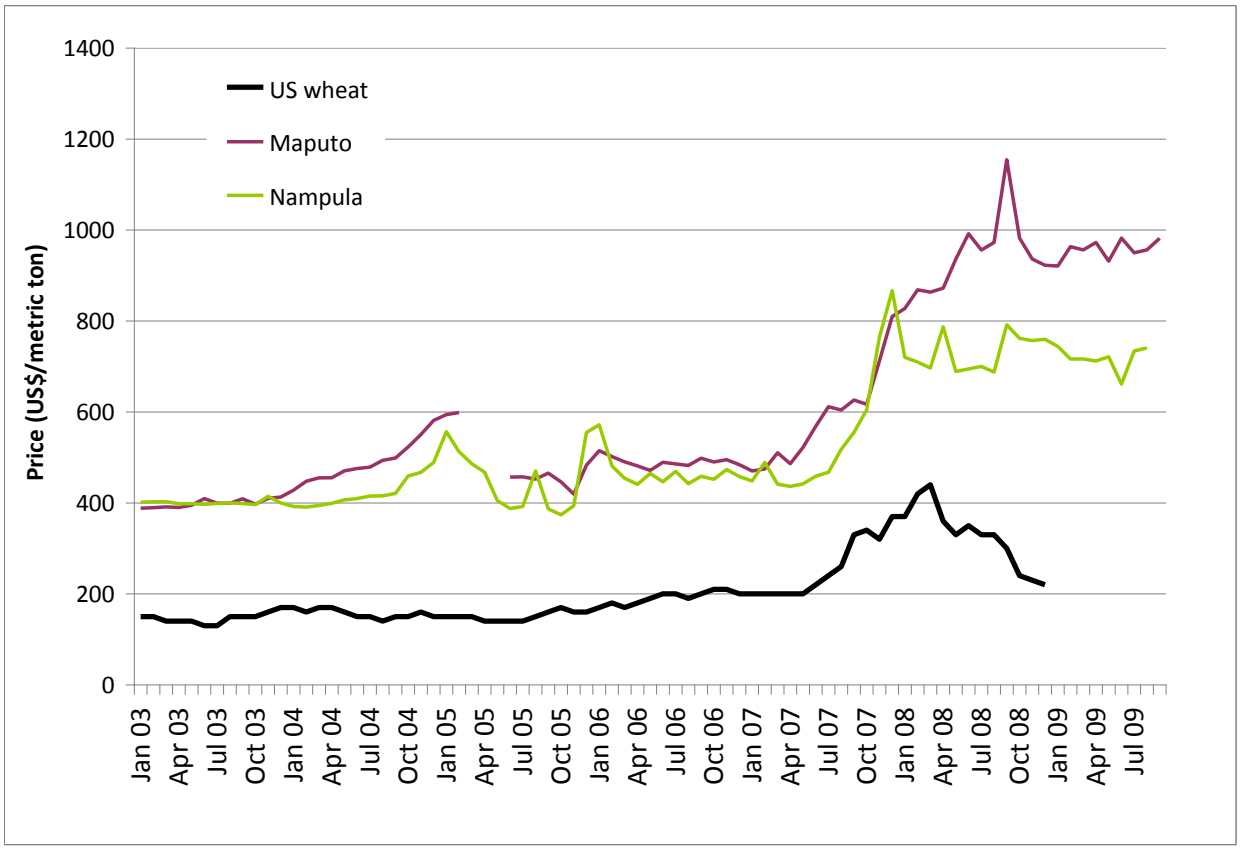


4.4 Wheat

Wheat is almost entirely imported, and thus we expect domestic wheat flour prices will follow international prices fairly closely. However, there are several periods of volatility in wheat prices that do not reflect international price shifts and are more clearly related to domestic staple production shortfalls (as in late 2005 into 2006). Interesting to note is the difference

between Nampula and Maputo prices for wheat flour since early 2008. Research will be needed to understand the relationship of these price movements with available of commercial imports, entrance of new millers, as well as the presence of monetized food aid, given that the Maputo and Nampula prices followed closely similar paths in the earlier years.

Figure 5. Wheat prices for Maputo, Nampula, and US wheat



Source: FAO and SIMA, Mozambique.

5 Food price policy

Mozambique has had a history of food price policies that differ in many ways from its neighbors, partially due to its geography and infrastructure and partially due to institutional differences that have led to a different development path. Alfieri and colleagues (2007) provide details on shifts in agricultural and related policies from the colonial period into the early 2000s.

5.1 Trade policy

Mozambique has generally taken a stance of open trade policies for the food staples. Policies regarding tariffs, quotas, and bans on imports and exports of staple food crops. Mozambique has reduced import duties on agricultural commodities since signing GATT in 1992 and becoming a founding member of WTO. As noted recently by Tschirley (2009), the Value Added Tax (VAT) on imported maize grain is a key policy instrument that affects maize markets,

especially in the south. The VAT is applied to all maize imports, thus is effectively an import tariff, but large scale processors who import maize grain and process it for sales into the market receive a rebate on VAT payments. While this is not a costless action, the millers retain a clear advantage over maize meal derived from small scale local processing, such that very little maize grain is imported for this purpose and the local maize supplies quickly become non-competitive as price climb after the main marketing season.

Regarding domestic trade, Tostão and Brorsen (2005) demonstrated that domestic trade for maize from the northern production regions to the southern consumption regions was restricted by non-price considerations, such as high transport and other transaction costs, rather than any policy restrictions on commodity movement or locally high prices. The analysis shows that there are seasonal opportunities for trade, if such costs can be reduced. Hence the PAPA stresses investment in infrastructure as part of the government's agricultural production strategy.

In recent seasons, there has been concern at the local level of excessive sales and exports of maize and other food staples. In the name of food security, district officials have called for more regulation of trade, particularly in the north with exports to Malawi. While not authorized at a national level, there have been incidents of restricting the outflow of maize and other staple foods in the interest of ensuring local food supplies. There are local development funds that have also been used as a commercialization credit to encourage local traders to buy maize and other staples in the marketing season for later sales in the hungry season.[5]

5.2 Public food stocks and price controls

While there are currently no price controls or public stocks of food staples, Mozambique has a long history of price control and direct public participation in the markets as a buyer and seller of key agricultural commodities (Alfieri et al 2007). In the 1980s and early 1990s, with AGRICOM and later the Cereals Institute of Mozambique (known as ICM), the government bought and sold key food staples in the markets, especially maize, at government set prices designed to keep the cost of food low for consumers. However, in 1996, ICM was re-structured and currently owns warehouses which are rented out to the private sector and ICM is not active in any sales or purchases. Thus, since about 1997, for the major food staples, there are no price controls in effect. The private sector is free to set the prices according to competitive markets, although the government may issue indicative (nonbinding) prices. This does not mean that markets are competitive for all commodities, however, and a thorough analysis is needed for that purpose.

5.3 Food aid

Food aid in recent years in Mozambique has largely consisted of wheat and edible oils for monetization, along with selected imports for distribution programs through the World Food program. School feeding programs and assistance to families affected by HIV are key destinations for the food aid for direct distribution. Rice is also received by the government for

[5] These local funds, known as OILL ("Orcamento local"), began in 2007 and are part of the central government's effort to decentralize and provide more flexible resources at the district level. It is as yet unknown if the commercialization credits have been effective in affecting food prices and availability.

the markets and distribution. The government has in the past attempted to ensure that all monetization of food aid commodities goes through GOM to the private sector, thus providing programmatic support to the government, but since at least 2002, extensive monetization by USAID to their cooperating non-governmental organizations has been approved and receives positive reviews from the government. A recent document shows the importance of the wheat imports as food aid in recent years (Donovan et al, 2009), although there are indications that additional work is needed to understand current price dynamics in northern Mozambique for wheat.

Table 5. Wheat imports and food aid in Mozambique, 2003-2007

Year	Total commercially imported wheat	Total food aid wheat	Food aid as % imported wheat
2003	333.6	110.1	33
2004	377	104.1	27.6
2005	340.3	17.5	5.1
2006	381.7	48	12.6
2007	294.4	78.8	26.8
Average	**345.4**	**71.7**	**21.0**

New efforts with WFPs's Purchase for Progress (P4P) program will be important to track to understand the price impacts of those purchases. There appears to be heavy pressure on existing supplies in Mozambique for maize and bean that WFP is buying. While the goal is to improve prices received at the farm level, P4P is not designed to put pressure on consumer prices, so program evaluation will be required to look at prices dynamics.

5.4 Response to the food crisis

As mentioned earlier, GOM developed their PAPA in response to the world food price spikes. The goal is to increase local production, reducing dependence on imports from the region and the world, while enhancing productivity to ensure competitiveness with food imports. As Arndt et al. (2008) demonstrate through economic modeling, increasing production and productivity of domestic staples would be beneficial to southern Mozambican consumers, especially urban ones. The investments so far have been limited, but are based in the recognition that Mozambican farmers need modern inputs of improved seeds and production management systems that will increase the production per unit of labor as well as per unit of land.

In the past, production growth has occurred primarily due to extensification of land, rather than improved productivity. Investments in wheat production and irrigation infrastructure are highlighted, and PAPA calls for the removal of the 2.5 percent import duties on agricultural inputs. The seed system will see changes with greater public activity in seed production and provision as well as subsidies for distribution of improved seeds for a range of commodities. Thus, with PAPA, there is a focus on the productivity aspects for the key staple crops.

There is also a key part of the PAPA on establishment of food reserves in the three key regions of the country (Mozambique 2008). The key instruments to achieve this include public

investments in storage facilities, government contracts to the private sector to purchase food staples for the reserves and some credit guarantees or interest subsidies to encourage private participation in the reserves.

Other measures are included in the PAPA without much specificity, such as discouraging exports of food staples and encouraging national institutions to buy local production. At the same time, PAPA discusses facilitating exports to make sure that any increase in food production can be absorbed without substantially reducing producer incentives.

6 Summary and conclusions

Mozambican consumers show a willingness to shift among the basic consumption staples according to relative prices, both in urban and rural areas. That flexibility helps to cushion world price shocks, where locally produced cassava is available, but in the southern provinces, where most staples are imported, high world prices have strong effects on urban consumers.

Mozambique is uniquely situated to be a major force in regional food staples production as well as supplying regional markets for staples. Price volatility in the northern zones can be paired to events in neighboring countries, especially for maize. PAPA is the government's strategy to address the food price crisis and focus on the country's food production potential. Government investments in roads and other infrastructure will need to continue with strong support from donors to enable trading systems to operate efficiently and to encourage the entrance of new agents in trading and processing. Analysis of prices indicates increasing market integration among markets in the country, as well as with markets in the region. Farmers will need to develop more productive crop management systems, and will need to adapt as climate challenges increase to avoid increasing risks and price volatility. This requires also public and private sector support for technology development and diffusion. It remains to be seen if government direct investment in storage facilities and in food reserve stocks will provide a solid basis for food security and have any impact on seasonal price fluctuations.

Mozambique has been committed to open borders, allowing exports to neighboring countries, resulting in prices in northern Mozambique that are closely tied to Malawian prices. If Malawi or other neighbors close their borders to trade, there may be possible actions from the Mozambican side to limit trade as well, negatively affecting Mozambican producers and traders in the surplus zones of the north. Price volatility in Mozambique tends to be less than its neighbors' volatility for basic food staples, but increased price problems can be expected if regional trade policies remain in flux and if agricultural subsidy programs are used for short term gains in production without sufficient investments in agricultural marketing.

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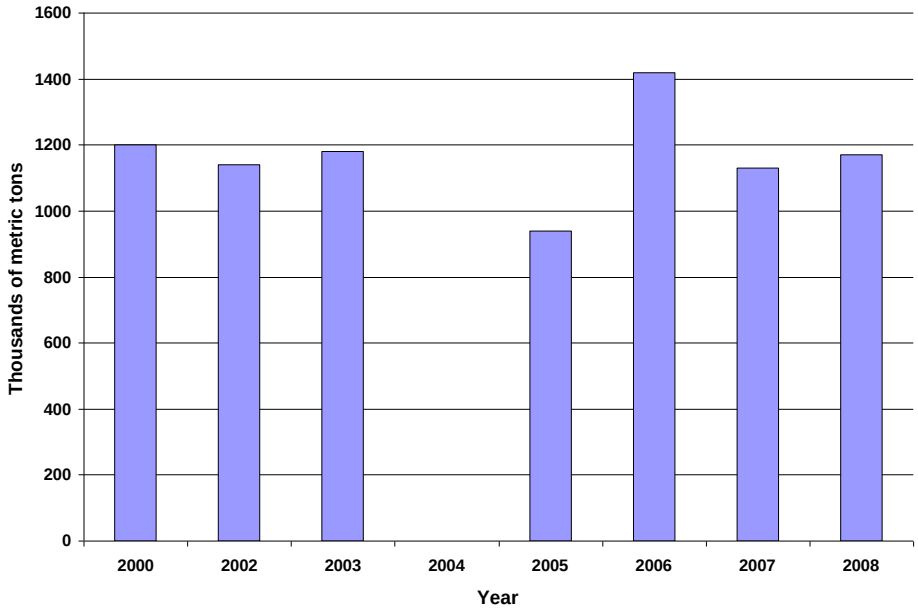
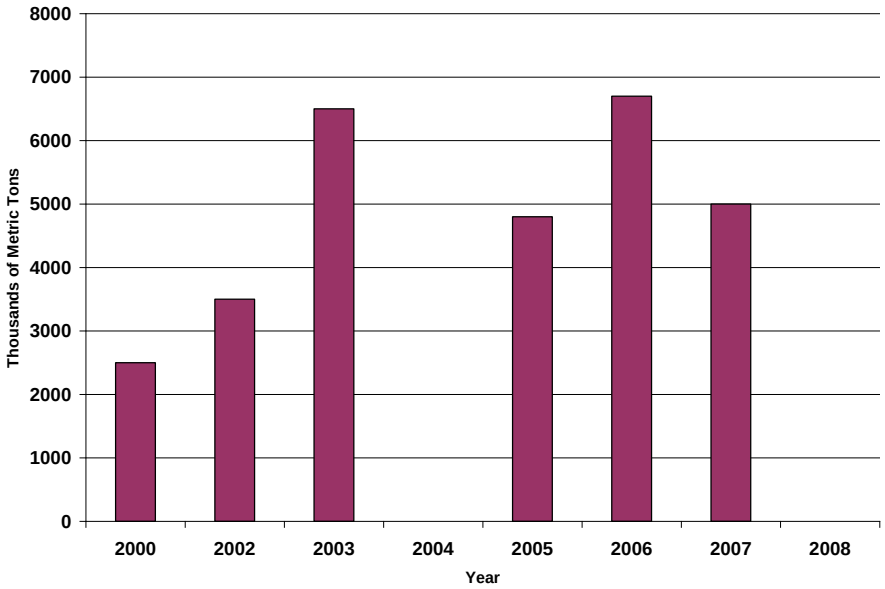
Annex Figure 1 Maize production estimates



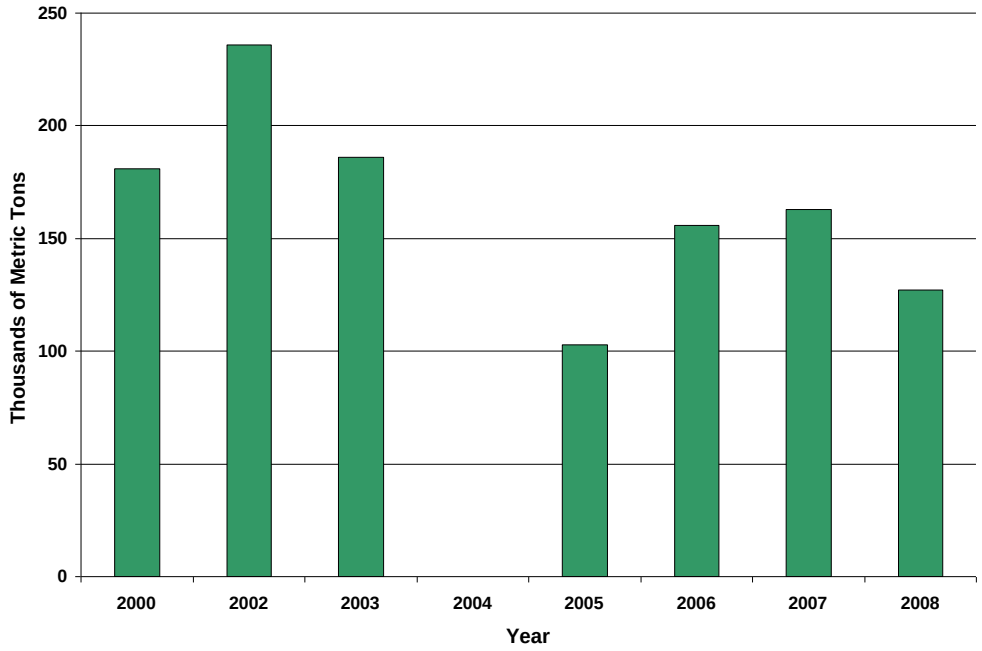
Source: Census of Agriculture 2000, National Institute of Statistics (INE); and Trabalho do Inquerito Agricola (TIA) (Rural Household Surveys), Ministry of Agriculture.

Annex Figure 2 Cassava production estimates (fresh weight)



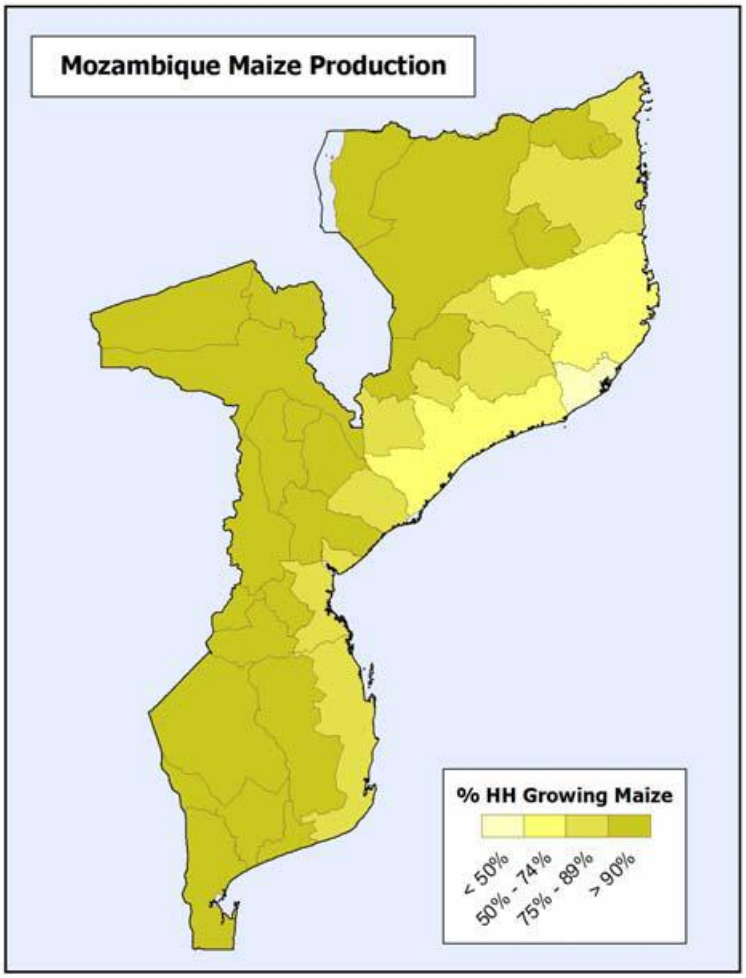
Source: Census of Agriculture 2000, National Institute of Statistics (INE); and Trabalho do Inquérito Agricola (TIA) (Rural Household Surveys), Ministry of Agriculture.

Annex Figure 3 Rice production estimates



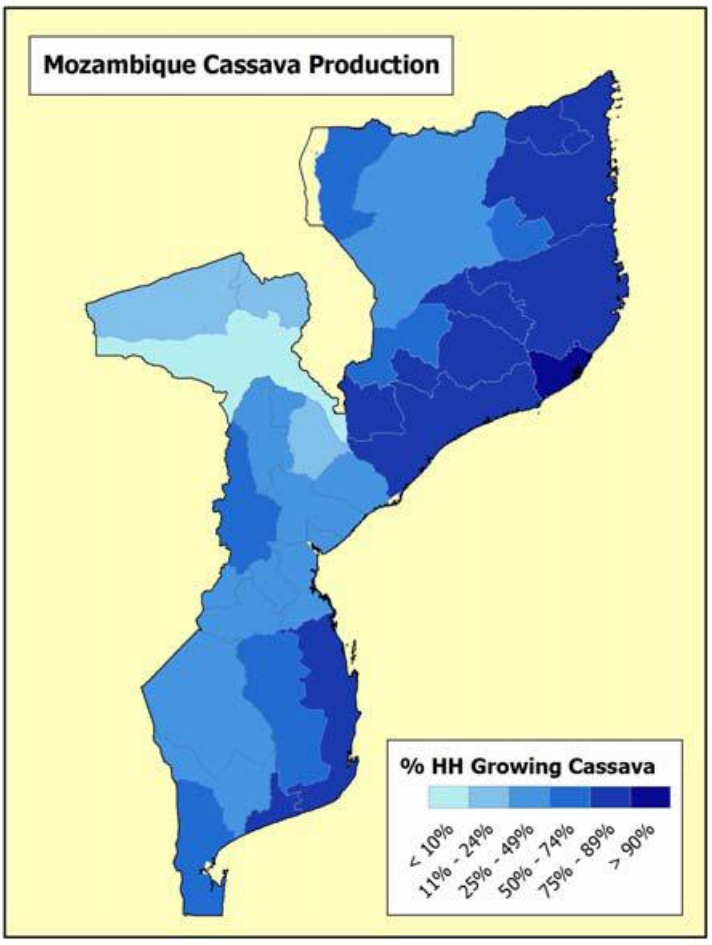
Source: Census of Agriculture 2000, National Institute of Statistics (INE); and Trabalho do Inquérito Agricola (TIA) (Rural Household Surveys), Ministry of Agriculture.

Annex Figure 4 Maize Production Map, 2005/6



Source: Haggblade and Nielson, 2007.

Annex Figure 5 Cassava production map, 2005/6



Source: Haggblade and Nielson, 2007.