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Planning for Drought in Mozambique: Balancing the Roles of Food Aid and Food Markets

By

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Key Points

1. Despite continued widespread poverty, Mozambique has made great strides towards sustainable food security in the past five years, based largely on improvements in production and in the food marketing system.

2. The management of food aid in Mozambique during the 1992 Southern Africa drought had positive effects on the development of the informal food marketing sector and the small-scale maize milling sector, both of which have contributed to the improved market performance and food security observed since that time.

3. Lack of coordination between commercial and emergency food aid programs during the 1992 drought created serious problems of oversupply and low prices for a full year after the ending of the drought.

4. To protect the progress that Mozambique has attained in the area of food market performance and food security, and to ensure continued positive development in this regard, it is imperative that commercial and emergency food aid programs be better coordinated in future drought crises, and that both be designed with the aim of meeting the humanitarian needs of the population while significantly enhancing the role that food markets play in responding to such crises.

5. Specific steps include a) improving the marketing and household level data content of Vulnerability Assessment methods to better assess markets' and households' abilities to respond to drought, b) implementing market facilitating mechanisms such as aggressive market information at national, regional and international levels; increased access to foreign exchange credit to facilitate private imports; and coordinated use of cash for work, monetization and market monitoring in specific areas to help markets respond where food aid distributions would be otherwise be necessary, and c) actively publicizing the details of the drought response program.

I. Introduction

A decade after the beginning of economic liberalization, and five years after the ending of the country's devastating civil war, Mozambique's food system has made impressive strides in increasing availability of and access to food for most of its population. Staple food production has set records each of the past four years and an entirely new food marketing system has emerged to channel this production to consumers. As a result, real prices of a wide range of food staples have fallen dramatically, and their availability in markets has increased. As market performance has improved, there has been a parallel improvement in nutritional indicators among children in most areas of the country.

This progress would not have been possible without the ending in 1992 of the country's long civil war; generally good rains since that time have also played an important role. Yet Mozambique's success is due to more than peace and rain; policy decisions beginning in the early 1990's were instrumental in creating the preconditions for the nation's food system to respond effectively to the improved political and climatic environment since 1992. The handling of commercial food aid prior to and during the 1992 Southern Africa drought was one of the important policy decisions, facilitating as it did the emergence of an increasingly dynamic informal marketing and small-scale maize milling sector. Yet the commercial and emergency food aid responses in 1992 also suffered from a serious lack of coordination, which created problems of oversupply and low prices, and disrupted domestic marketing of maize for nearly a year after the drought was over.

It needs also to be remembered that, despite the rapid development of food markets in the country over the past decade (and especially the past five years), Mozambique's food system remains very small-scale, with high unit costs, and subject to great volatility. Clearly, significant improvements remain to be made, and must be made in food market performance if needed progress in food security is to be assured. Given the fact that Southern Africa and much of Mozambique are subject to drought every three- to-seven years, food aid policy will have important effects on how the food marketing system develops. With a potentially serious drought looming in 1998, it is imperative that government and donors learn both the positive and negative lessons from 1992 and continue to advance their thinking and practice regarding the appropriate role of food aid and food markets in responding to such a crisis.

This paper first traces the progress the country has made in food security during the past five years, focusing on the role that markets have played in improving food access for households. It then highlights the enormous challenges the country continues to face in this regard before turning to the issue of planning for drought in 1998 and succeeding years. It draws heavily from the 1992 experience in Mozambique, and emphasizes the need to rethink emergency and commercial food aid response to protect the progress already achieved in the private food marketing system and encourage its further development.

II. Food Markets and Food Security: Progress and Continuing Challenges

The marketing of food through free and open markets in Mozambique is a very recent phenomenon. Legal barriers to such activity began to fall less than a decade ago, and engaging in such activities outside of urban centers became safe only with the ending of the civil war five years ago. Prior to this time, both Colonial and FRELIMO[1] governments strictly controlled food marketing with a system of geographical monopolies, fixed prices at all levels of the system, and heavy direct government participation. As a result, like many young systems, Mozambique's private food marketing system has shown tremendous progress while continuing to suffer from glaring weaknesses. It is important to keep both of these facts in mind as government and donors decide how best to achieve continued improvement in food security in the country.

Progress to Date

Progress toward improved and more sustainable food security in recent years in Mozambique is evident in four dimensions: 1) increasing per capita calorie availability in the face of dramatic reductions in food aid, 2) lower and more stable prices throughout the country for a range of food staples, 3) a food system which now provides consumers with a broader range of low-cost staples from which to choose, and 4) improved food market integration. One important result of these changes is that rates of child stunting have fallen from 13% in 1992 to 10.8% in 1996 and the number of districts with rates of 16% or greater (indicating high risk for malnutrition) fell from 39 in 1992 to 23 in 1996 (GOM 1997). From 1991 (prior to the Southern Africa drought of 1992) to 1996, stunting rates declined in 7 of 10 provinces and in Maputo city.[2]

Total cereal production and per capita calorie availability from cereals in Mozambique have increased substantially in recent years, and the contribution of food aid to availability has fallen dramatically (Table 1, Figure 1). Production has increased every year since the 1992 Southern Africa drought, and in 1997/98 was the highest on record, 2.5 times that in 1989/90. Per capita calorie availability from all cereals in 1997/98 is projected to be higher than any year since at least 1989/90. Food aid's contribution fell to only 4% in 1996/97, and is projected to rise slightly to 7% during 1997/98, down from 72% during the 1992 Southern Africa drought and from an average of 49% for the three years prior to the drought. During the past two years, food aid shipments have been dominated by commercial wheat food aid for wheat millers, more an indicator of donor government needs to dispose of surpluses than of inability on Mozambique's part to feed itself.

This increased availability has been accompanied by lower and more stable prices of staple foods throughout the country. White maize in the capital city of Maputo demonstrates this trend most dramatically (Figure 2). Comparing pre- and post-drought periods (March 1990 to March 1992, and March 1993 to September 1997, respectively), real mean prices during the latter fell by 31% and their standard deviation fell by 27%. Prices of other staples have also fallen in all regions of the country. Table 2 presents information on real price trends from 1991 through 1997 for six products, three domestically produced (white maize grain, "manteiga" bean and peanut) and three which are primarily imported (rice, brown sugar and imported oil) in the three principal cities of the country. Results show a strong and broad-based trend towards lower real prices during the period: in 16 of 18 cases, the trend is negative and statistically significant, with reductions ranging from 6.3% to nearly 55%.

Lower and more stable white maize grain prices for urban consumers have been complemented by continued availability in urban markets of low-cost food staples such as whole ("99%") maize meals and maize grains, complementing higher cost staples such as refined maize meals and rice (Figure 3). The disappearance of yellow maize grain and meals from markets in Maputo since the end of 1996 is surprising, given Maputo consumers' demonstrated willingness to switch to yellow maize with modest price discounts (Tschirley and Santos, 1995; Jayne, et. al., 1995). Low income consumers are the quickest to switch, and have thus paid the highest cost from the market's recent failure to make these products readily available. Nonetheless, it is known that commercial traders in rural areas of the South continue to import yellow maize for milling into whole meal, attracted by the low prices in South Africa.[3]

Lower and more stable food prices and continued availability of a range of staples with varying prices, reflect a marketing system which has succeeded in connecting surplus regions within and outside the country with consuming regions in Mozambique. Donovan (1996) showed significant improvements in market integration between the Center and South in the post-war and post-drought period, and measures of market integration within the north show appreciable improvements in that region in the past two years (MAP/MSU 1997). Above all, it is known that Mozambican traders have regularly supplied the South of the country with surpluses of maize grain and other staples from the Center, with white and yellow maize meals from South Africa and, during drought years (1995) or years of significant exports (1997), have reached into the north to supply both the Center and South with staples. This active north-south trade within the country has been carried-out almost exclusively by unregistered traders, many of them women, who have entered the market in the past five- to six years.

Determinants

The ending of the war was the *sine qua non* for improvements in food security. Yet the rapid progress the country has made in the past five to six years is based on more than the ending of the war; policy choices made prior to the peace accords created the conditions for rapid recovery once hostilities ceased. The key policy changes related to general food marketing policy, and to specific policies on the monetization of yellow maize food aid.

Starting in 1987, the country embarked on a program of donor-financed economic reform under the Economic Rehabilitation Program (ERP). This program would introduce Mozambique for the first time in its history to relatively free and open markets.[4] By late 1990, national policy makers had removed restrictions on product movement across district and provincial boundaries, and had eliminated the system, in place since colonial times, of official geographical monopolies for registered private traders. Some response to these changes could be seen by late 1990, but risk of attack and restrictive practices by local authorities made progress slow (MAP/MSU 1990). By the 1991 harvest, evidence was emerging in the north of the country that informal traders in rural areas had begun to compete with some of the previous monopolists, paying higher average prices to farmers (MAP/MSU 1991). By at least 1992, it was clear that new entrants dominated the food marketing system in the capital city of Maputo, despite the government's continued policy that basic foods should be sold through the government shops in the *Novo Sistema de Abastecimento* (NSA) at official prices. These traders, nearly all of them unlicenced, handled most of the domestic production which was able to reach the city, and also regularly brought maize meal, wheat flour, sugar, vegetable oil, and other food products to the

city from Swaziland and South Africa (MAP/MSU 1993a; Sahn and Desai 1992).

Concurrent with the disintegration of the ration shop system and the emergence of the informal trading sector, donors were looking for more market-oriented means of distributing monetized food aid. Beginning with shipments in mid-1991, donors negotiated with the Government of Mozambique for the grain to be sold directly to registered private wholesalers ("consignees") at fixed prices in the port cities. Many consignees were included, ensuring a competitive system at this level (Tschirley, et. al. 1996). These consignees then sold into the highly competitive informal market, which, in combination with the economic reforms under ERP, fueled the growth of this trading sector and of the small-scale maize milling sector.[5]

These two sectors were flourishing by the time the peace accords were signed in October 1992, and have provided the foundation for Mozambique's progress in food security since that time. They have done so by 1) linking rural and urban areas through trade flows, 2) linking Mozambique with its neighbors through active cross-border imports of food in the South and, more recently, exports of maize grain and pigeon pea from the Center and North, and 3) channeling maize through the small-scale milling sector. The following paragraphs will explain each of these three points.

Within the informal trading sector, a class of entrepreneurial inter-regional wholesalers emerged to link production and consumption zones with active trade flows. Beginning strongly in 1994, and with even greater coverage during the drought year of 1995, these traders scoured central and northern Mozambique for maize, beans, and peanuts to be sold in urban centers (see MAP/MSU 1995a for more information on this sector). Measures of integration between southern, central, and northern maize markets improved dramatically during these years, attesting to the effects of this trade (see Donovan 1996 for evidence on southern-central integration).

This trade has long extended across Mozambique's borders for imports, and recently has done the same on exports. Active cross-border trade in foodstuffs was evident in Maputo well before the end of the war, and was instrumental during that time in increasing food availability for poor consumers (MAP/MSU 1993). This trade has continued to develop since the peace accords, with South Africa becoming the primary source of supply, and played a key role in containing price increases in southern Mozambique during the 1995/96 hungry season. Production that year had been relatively poor, and seasonal food price rises began shortly after the harvest. When news of reduced food aid shipments reached markets in January and February 1996, prices surged. Informal traders continued their long-established practice of bringing white and yellow maize meals from South Africa, stabilizing prices in the capital and resulting in an unusual two month "price inversion" where prices were lower in the perpetually deficit Maputo market than in normally surplus zones of the Center. The ease of changing money in the informal foreign exchange market has been an important factor facilitating this trade. Formal imports of rice from the world market have also contributed to food security by maintaining a steady availability of this product, very little of which is produced in the country.

Exports of maize and other staples from northern and central provinces began in 1996/97 and have developed more strongly in 1997/98. Cereals production during 1996/97 set a new record,

resulting in very low producer prices through most of the year, especially in the surplus Center and North. These low producer prices continued into the 1997 harvest, which once again set a new record (see Table 1). However, significant seasonal price rises began to be seen in September, and continued in October (five and six months after the beginning of the harvest). Producer prices in the Center rose by more than 75% from beginning September to beginning November, while those in the North rose between 33% and 45% during the same period. This price rise is associated with very active export trade with Malawi and Zambia, as well as exports outside of the region. Official data show exports of about 30,000 mt of maize grain during the first six months of the year, but unofficial estimates through September are that up to 100,000 mt have left the country. These are significant quantities in a country with production of little over 1,000,000 mt in 1997 and estimated marketings of 20-25%. There has also been a growing trade in pigeon peas both within and outside the region, though official figures are not currently available on the volumes of that trade.

A very important result of this opening of the export market is that larger and better capitalized formal sector traders have become more active in the food trade. As long as this trade was confined to domestic markets, these larger traders preferred to devote their resources to higher value consumer goods where they could earn more attractive margins. With the possibility now of exporting several thousand metric tons at a time, several of the most important northern traders have entered the maize market, frequently relying on informals to perform the assembly function. This entry of larger traders into the food market holds important implications for the future development of the agricultural economy in the north of the country, an issue which will be examined further below.

In urban areas, the growth of the informal trade made it possible for the small-scale milling sector to flourish. Prior to liberalization, grain was channeled through a system of official geographical monopolies at fixed prices, eventually reaching the state buying agency AGRICOM, which then sold the grain destined for milling to large industrial mills. These mills produced refined white meal which, due to high processing costs, the state subsidized for most urban consumers through its NSA shops. The enormous costs that such a centralized and capital intensive system imposes on consumers and government budgets have been well documented in Zimbabwe and Kenya (Jayne, et. al., 1995). As in these countries, liberalization in Mozambique brought dramatic growth in the number of small hammer mills: 93% of these mills operating in Maputo as of early 1994 had been purchased since 1987, when the ERP was initiated and when yellow maize food aid quantities began to increase (Jayne, et. al., 1995). These small hammer mills, which now number over one thousand spread throughout the country (MAP/MSU 1995b), ensure access by poor urban (and, increasingly, rural) consumers to cheap white and yellow whole meals, stretching their limited purchasing power.

Continuing Challenges

Despite this progress, food marketing in Mozambique remains very small-scale, suffers from high unit costs, and is subject to great volatility. The vast majority of retail trade is conducted by many thousands of traders who transact less than 50 kg per day. Informal wholesalers typically do not transact more than 10-15 tons every two weeks, and many move much less than this. As a result, unit margins and returns to capital need to be high for traders simply to earn a livable wage.

In Maputo in 1992, retail traders of maize grain and whole meals earned net margins of 8%-19% on capital turned-over every one or two days (MAP/MSU 1993). Annual returns to capital were 1,500% to 7,000%. Yet the typical trader transacted only about 50 kg of product per day and earned an income equal to only 6%-27% of that needed to feed a family of average size at the time.

Informal wholesalers, who dominate the north-south trade in the country today, tend also to be small scale. Based on interviews with three wholesalers in Maputo who regularly purchase maize grain in the center of the country, Table 3 shows the return to capital that these traders would require to feed an average-size family from their earnings as traders. The smallest of the three would require a net margin of 14.6% and an annual return to capital of 381%; the largest a margin of 4.1% and an annual return of 107%. These are not the scales of operation that are needed if costs are to be reduced and food security improved for poor consumers.

Added to the costs of small-scale operations are very high transport costs. Transporting grain 40 km from key production zones of the center to major markets in the same region in June 1997 (the dry season, when roads are most passable) cost 19%-25% of the sales price in the major market. Transporting that grain from this major market to Maputo in the south brought transport costs to 33%-55% of the sales price in Maputo. This combination of high transport costs and high unit margins reduces prices for producers and increases them for consumers, reducing the food security of both.

Price volatility continues to be a serious problem, perhaps illustrated most clearly this year. Despite another record crop, maize prices have risen 33% to 75% during the past two months in producing areas of the country in response to the export of as much as 100,000 mt of maize. Without substantial commercial imports of grain (commercial maize food aid is not being contemplated), prices rises could rival the 120-250% seasonal increases seen in late 1995 and early 1996, occasioned by the poor harvest in 1995.

In summary, Mozambique's experience over the past decade illustrates both the promise and the limitations of liberalization. Due initially to government's inability to enforce centrally planned economic policies, but increasingly over time to active policy reform, an environment was created in which markets could function relatively free of legal constraints. In response, a new class of traders and small-scale millers emerged, grew and began to differentiate, linking urban markets with rural production areas and overland sources of imports. This process was well underway prior to the ending of the war in 1992, when this trade provided a critical complement to the large volumes of food aid that fed the cities; after the war, it was the basis for the impressive reductions in real prices and improvements in market integration that have been observed. Yet the system remains small-scale, high-cost, and volatile. These problems are structural and will not be resolved without greatly increased investment in the food system from both the public and private sectors. The "easy" gains have largely been realized; future progress is likely to be slower and require a sustained commitment from government and donors to policies and investments that reduce costs and volatility. Given the recurrent nature of drought in Mozambique and the Southern Africa region, policies for drought response will figure highly among those that must be carefully evaluated to ensure that they contribute to, rather than detract from, these goals.

III. Planning for Drought in 1998 and Beyond

As government and donors attempt to protect the gains already made in Mozambique's food marketing system and encourage its further development, at least three factors argue for decisive steps to ensure an enhanced role for markets in responding to drought in Southern Africa. First, food market liberalization in food exporting developed economies has reduced their food surpluses, and food aid resources have fallen dramatically as a result. This is especially true in the United States, where the program which channels government-owned surpluses into emergency food aid (section 416b) has all but disappeared, and where resources for government-to-government grants for the purchase of commercial food aid (Title III) fell by 1995 to little over 20% of their previous levels in nominal terms (lower in real terms). Only Title II managed to maintain its resource levels between 1991 and 1995.

Second, drought is a recurrent event in Mozambique and in the Southern African region, occurring typically once every three-to-seven years. Even in the absence of serious reductions in the availability of food aid resources, it seems obvious that countries experiencing such frequent crises need to strengthen their ability to deal with them in a financially sustainable manner. Since serious reductions in food aid resources have occurred and appear likely to persist, developing such self-reliant strategies is imperative. In light also of the severe budgetary restrictions that many countries operate under, now and in the foreseeable future, strategies that do not give a central role to markets in drought response will simply not be sustainable.

Finally, the economic liberalization of the past decade means that continued improvement in the quality of life in Mozambique and other countries in the region depends fundamentally on improved performance of its markets, especially for food.[6] Past approaches to the programming, pricing and distribution of food aid have had negative effects on the performance of food markets in recipient countries when they resulted in excessive supplies of low-cost food in the recipient country.[7] Repeating this type of experience every three- to seven years will hinder the development of local food marketing systems able to mobilize domestic surpluses when they exist and access international supplies on a commercial basis when needed.

This is **not** an argument against the use of food aid in responding to drought. It is likely that some level of food aid resources will continue to be available generally and their availability will likely increase when poor countries are affected by severe crises. These countries, Mozambique included, would be poorly served by advice to not utilize these resources. This **is** an argument to enhance the role that markets play in the mixture of responses to drought. This paper will show that food markets played a very important role in the distribution of food aid in past years in Mozambique; this experience needs to be pushed forward to further enhance markets' role in responding to future crises, to the benefit of Mozambican consumers and farmers.

Key Challenges

The key challenge of government and donors during 1998 and in future crises is to plan and execute the food aid response to drought to meet the real humanitarian needs of the populace while facilitating a maximum role for markets. This will require a reversal in the typical approach to designing drought response. We suggest a three-step process:

- **Start by focusing on markets**: Determine what markets are capable of in terms of the volume of additional grain they can bring to the country through commercial imports, geographical areas they can cover (whether with commercial imports or monetized food aid), and proportions of the population in these areas that will have sufficient purchasing power, at some "reasonable" level of prices, to ensure a minimally adequate diet,

- **Facilitate market response**: To the extent that this anticipated response by unaided markets is insufficient, determine what mechanisms can be put in place to facilitate a greater role for markets (e.g., additional balance of payments support or a foreign exchange credit facility for use in importing food staples, temporary transport subsidies on specific routes), and

- **Then turn to food aid**: Design the food aid response to cover only those geographical areas and populations that markets are not expected to cover.

Some might claim that the process just described does not differ substantially from that which is typically followed, i.e., that food aid response is always designed to meet only the additional food needs of a country during a crisis. Yet several factors suggest that this approach is, in fact, qualitatively different from that typically found in crisis response. First, we suggest that the process **begin** with markets and that it include an explicit evaluation of what role they can play. This must include the development and application of methodologies to determine quantitatively where and how quickly markets can be expected to move food to outlying areas, and what the approximate price mark-up will be in these areas. Ideally, these estimates would be complemented by methodologies to estimate the effect of drought, not just on the production levels of households but on their **purchasing power**. This will involve explicit consideration and quantification of the extent to which household coping mechanisms, especially non-farm income strategies, are able to offset the negative effects of drought. Combining estimates of price levels and of purchasing power of households will allow more accurate assessment of the ability of markets to meet food needs in an area, and by deduction the need for emergency assistance. Thus, a key insight from this approach is that the performance of markets and the volume of emergency resources required are negative functions of each other: reducing marketing costs or increasing household purchasing power reduces the need for emergency assistance.

Second, the approach being encouraged here explicitly contemplates market-facilitating functions. Food markets in Mozambique and in developing countries in general suffer from high unit costs for domestic marketing and constrained access to foreign exchange and credit to finance food imports. Combined, these two factors can, in the short-run during a crisis, lead to skyrocketing food prices. This is especially true when the crisis affects an entire region rather than a country, as in a drought in Southern Africa. In such a case, the informal border trade that occurs continually among most countries in the region is less able to address overall deficits. Yet governments, with the assistance of donors, can put in place temporary measures which may dramatically increase the ability of markets to respond to these crises. At least three examples are worth mentioning, though many more could be investigated:

- **A foreign exchange credit facility** tied to imports of staple foods. Such a facility, if properly designed to maximize ease of access by traders, could substantially increase the total volume of food available in markets.

- **A temporary transport subsidy** on selected overland routes could increase the number of traders and the volume of food reaching outlying areas.[8]

- **Cash for work** in selected areas could increase the market flow of food and reduce or eliminate the need for emergency food distributions in those areas. Such cash for work projects would need to be well publicized, including timing and total cash to be disbursed, to ensure that traders realize ahead of time that there will be increased purchasing power in the area. If there are concerns about the availability of food, donors could monetize food aid in a nearby urban market, or pre-position grain which could be monetized should prices in the cash for work zone exceed certain pre-defined limits. Price monitoring of a range of basic staples would be a necessary adjunct to such an approach.

Together, such temporary measures could dramatically reduce market prices in broad areas of the country and thereby reduce the volume of emergency resources which the country requires.

Finally, the probable results of this approach can be distinguished from those of more traditional approaches in three ways:

- **Greater reliance on market mechanisms**. Focusing first on private food markets, assessing their ability to access external supplies and to distribute those and monetized food aid supplies to consumers is likely to reveal a greater market response capacity than had been previously supposed. Utilizing available empirical data to examine households' ability to protect their purchasing power in the face of droughts is likely to reveal that some households' food security strategies are more effective than had been previously thought. Both of these findings will move crisis response planners in the direction of greater reliance on market mechanisms. Identifying specific temporary interventions to facilitate market response will accentuate this movement.

- **Lower total costs of drought response**. Greater reliance on private markets will lead directly to a reduction in the costs of emergency response through reduced volumes of emergency and, possibly, commercial food aid and reduced transport costs for both types.

- **Strengthened ability of markets to respond to drought in the future**. Like anyone else, traders learn by doing. Being allowed more room to respond commercially to the market opportunities that arise from crisis situations, they will increase their knowledge, improve their practices, and be better able to respond in the future. If they are confident that food aid will be managed in similar ways in the future, and if droughts are periodic events as they are in Southern Africa, traders can be expected also to increase their investment in importing and distribution capacities. As this occurs, emergency response costs can be expected to continue falling in the future.

Markets and Coordination of the Food Aid Response: Mozambique's Experience in 1992

Markets played an important role in responding to the 1992 drought, even before the war ended. During the 1992/93 marketing year (April 1992 - March 1993, the period affected by the 1992 production shortfall), approximately 40% of the maize food aid, and 36% of all food aid, was monetized (MAP/MSU 1996). These monetized food aid volumes arrived primarily between May 1992 and January 1993, being sold in Maputo in the South and to a lesser extent Beira in the Center. Despite the war (which ended only in October 1992), this aid flowed quickly to markets throughout the South and Center of the country through the informal marketing system. Traders from outside Maputo regularly arrived in the main informal wholesale market in Maputo to purchase grain for shipment north. Traders based in Maputo also shipped grain to outlying markets. As a result of this type of trading activity, yellow maize prices in southern markets closely tracked those in Maputo, while those in the center tracked prices in Beira (Tschirley 1994). Since yellow maize was not produced in the country, this close price tracking can be explained only by the observed trade flows.[9]

In addition to distributing food aid broadly throughout the South and Center regions of the country, informal food markets channeled much of this aid into the small-scale maize milling sector, with substantial benefits to poor consumers. Based on much lower processing costs,[10] market prices of whole yellow and white meals in Maputo averaged 76% and 80%, respectively, of the prices of refined meals of the same color during 1991-1997. Whole yellow and white meals were also present in Maputo markets during this time in 160% and 31% more months, respectively, than their refined counterparts. Research shows that households that purchase whole yellow meal have mean incomes approximately 25% below those of non-purchasing households, and that low income households are nearly twice as likely as higher income households to consume whole meals when these carry modest (20%) price discounts relative to refined meals (Tschirley, et al., 1996). Finally, whole meals yield 15% to 40% more human food per unit of grain than do refined meals, and at a lower price. This must be seen as a clear benefit in a country such as Mozambique, where the vast majority of the population has incomes too low to be significant consumers of meat products (livestock are the principal consumers of the by-products from refined meal production).

Despite the important role played by markets in the food aid response, coordination between the food aid agencies and the private sector had serious shortcomings. The emergency and commercial food aid programs also showed little success in coordinating their activities. The results of this lack of coordination were apparent throughout 1993 and into 1994 in the form of depressed prices of white and yellow maize. In the commercial food aid program, donors determined quantities on the basis of a food balance sheet, fixed parameters for per capita maize consumption, and estimates of the population able to purchase grain in markets. Once Ministry of Commerce and donors determined overall quantities of aid and a specific ship had been scheduled for arrival, consignees were allocated quotas. Despite their knowledge of market conditions in their areas of operation, consignees (the first-buyers of the food aid, selected by Ministry of Commerce and donors) were not consulted on overall quantities needed nor on the timing of arrivals.

In hindsight, it is clear that such an approach was based on a series of assumptions which, because they were unstated and probably not clearly perceived by those involved at the time,

could not be evaluated properly. Beginning at the most general level, at least three related assumptions can be highlighted:

- First, that consignees would want whatever quantities had been programmed for the commercial food aid program, despite the fact that these traders had not been consulted on the overall quantities.

- This view was based on another implicit assumption, namely, that market conditions making it attractive to purchase the commercial food aid would persist throughout the drought.

- Finally, this implicit assumption about market conditions was based on still another assumption: that emergency food aid would not appreciably affect markets.

Assumptions supported other assumptions which determined program design. Mozambique was not unique in this respect, basing its program on assumptions that were unstated and probably only vaguely perceived. Unfortunately, such errors may be especially likely in the hectic planning environment often created during a crisis like that of the 1992 drought. Yet the risks of such an approach are clear: if any of the lower-level assumptions proved incorrect, the program design could run into serious difficulties.

This is precisely what happened. Unprecedented volumes of emergency food aid arrived in Maputo during December 1992 and January 1993, requiring the Maputo port to handle nearly three times more emergency grain than during any previous two month period. Coming on top of similarly unprecedented commercial food aid arrivals in October and November 1992, these quantities overwhelmed the capacity of the port (and the emergency food distribution system), with results that invalidated each of the three assumptions highlighted above. First, large volumes of emergency grain were diverted to markets. Though precise figures cannot be established, knowledgeable sources within the emergency program in Mozambique estimate that one-third of all emergency grain during this time was ultimately sold on markets. Second, these diversions, plus the arrival in June 1993 of approximately 40,000 metric tons of emergency grain in Maputo (the largest monthly figure on record, arriving in the middle of the good 1993 harvest), changed market conditions dramatically. Throughout 1993, real prices of yellow maize grain at retail in Maputo were approximately one-half the levels of 1990 and 1991. Real white maize prices from April through November 1993 were 78% (68%) their level during the same period of 1991 (1990). In the central region, where data do not permit historical comparison, retail yellow maize prices throughout 1993 and into 1994 were less than half those in Maputo, and white maize prices were less than 40% of the Maputo levels and less than one-third of import parity levels. Finally, the low market prices lead many consignees to refuse their full quotas of commercial food aid, and grain accumulated and began to spoil.

Consignees refused their quotas because market prices had fallen to levels below even the prices that they had to pay to receive the food aid grain. Consignees who had paid these prices in recent months suffered significant losses as a result of the oversupply. Some of these same traders had earned large rents prior to the drought and in its initial phases when market prices were still high. This highlights a final failing of the food aid system in 1992: the setting of consignee prices. These prices were not related in any systematic way to international border

prices, and fell to as little as a third of import parity levels. Paying these low prices and then selling into a competitive market when that market was still under deficit occasioned very large rents for participating consignees. That consignees could later in the process lose money after paying even these very low prices is a measure of the extent of oversupply that food aid had created in the market.

In short, food aid policy had both positive and negative effects on the development of food markets in 1992. Government and donors deserve high praise for their decision in 1991 to adopt a more market-based food aid distribution policy, and for sticking with that policy through the 1992 drought. Yet they thought through only a portion of the issues that need to be considered if one wishes fundamentally to alter the approach to food aid programming. Issues of commercial food aid pricing and distribution, and of how to avoid the almost universal tendency to overestimate the need for emergency food aid, must be more carefully considered now and in the future.

Coordination Challenges in 1998 and Beyond: Measures to Improve the Ability of Markets to Respond to Crises

Government and donors built the 1992 drought response on two legs: emergency and monetized food aid. The drought was severe throughout the region, meaning that border trade in maize came to a standstill, and the country had essentially no ability to access commercial supplies from outside the region. The situation has changed a great deal in the past five years. Foreign exchange is more available, and many traders have a track record of regularly importing rice from world and maize from regional markets. Poor Mozambican consumers have demonstrated their willingness to consume yellow maize when it is discounted to white; profit opportunities will thus emerge from importing yellow maize as the white maize price jumps in a drought. The size and liquidity of the world yellow maize markets means that this product will be available to those willing and able to purchase it. Thus, the drought response in 1998 and beyond will likely include three legs, emergency and commercial food aid and private commercial imports, and the coordination challenge is thus likely to be even greater than it was in 1992.

Government and donors run two related risks if they do not deal effectively with this challenge. On the one hand, they could displace private imports with an oversupply of food aid and create confusion on the market side. If potential importers expect that food aid supplies might swamp the market as they did in 1992, they will either not enter the import market at all, or will do so in much reduced volume. Indeed, given the experience of 1992, traders are likely to require strong assurances that a repeat of the 1992 oversupply will not occur if they are to be convinced to risk their capital importing maize. Clearly government and donors need to take active steps to ensure coordination among themselves and with potential private importers.

The second risk that the coordination problem introduces is of insufficient market supply, with attendant price spikes and increased hunger. If government and donors anticipate a private sector response through commercial imports but fail to coordinate with the traders who would be its authors, the response could very well not emerge. The country could then be caught in the disaster of insufficient food supplies, very high prices, and starving people; the very specter that so often leads to an excessive food aid response in the first place.

Both of these situations can be avoided by designing and executing a transparent food aid program that is planned and publicized well in advance. There are at least three areas where donors and government need to play crucial roles: 1) improving the marketing content of Vulnerability Assessment methodologies, 2) implementing market facilitating mechanisms, and 3) aggressively publicizing the resulting drought response program in all its details.

Improve the marketing and household level data content of Vulnerability Assessment (VA) methods: It is common practice to use VA tools to identify those areas likely to be most affected by drought, both in terms of reduced production and decreased purchasing power. Yet the usefulness of these tools could be significantly enhanced by incorporating more detailed coverage of marketing issues, and by utilizing household level data wherever available. VA teams need to incorporate experienced food marketing analysts to utilize available price and transport data (including information on road quality and transport times, which could proxy for scarce transport cost data) to evaluate where markets will be capable of responding to effective demand, and at what price. Development of a national price mark-up surface (utilizing available GIS software) reflecting the margins markets would require to supply different areas of the country would be a very useful starting point in designing drought response strategies that maximize the contribution of markets. If available, use of national household level data sets to calculate detailed breakdowns of household income shares would complement what VA teams typically do in this area. Especially valuable would be the ability of such data to reflect the diversity of households in given areas. VA methods which rely on key informant interviews are unlikely to capture such variability, and this is crucial to effective targeting. In Mozambique, efforts are being made in both these regards; it is important that lessons be learned from this experience to guide future efforts at **data collection** as well as analysis.

Implement market facilitating mechanisms: At the national level, at least three areas deserve attention in facilitating market response to drought. These are 1) market information, 2) access to foreign exchange, and 3) access to import credit. In addition to these nationwide actions, government and donors should choose from a menu of options to facilitate local market response.

Market information should be disseminated aggressively and often through written bulletins, radio broadcasts, press releases and other measures judged to be effective. Information should include a) updates every two- to three months of national, regional and world production forecasts for white and yellow maize, b) weekly updates of national, regional and world spot and futures prices for white and yellow maize and rice, including interpretation of the meaning of futures price movements, c) regular updates (monthly if possible) of the national balance sheet projections based on updates of the national stock situation and of private sector import intentions, and d) regular updates on trade policies and practices in neighboring countries including timely advising of any important changes in policy or practice, such as announcements of measures to close borders to grain exports (a phenomenon which is already occurring in the region as of early November 1997).

Access to and availability of foreign exchange may need to be improved if the macro economy is to be isolated from the drought shock and if sufficient numbers of traders are to be able to import to make the system competitive. Mozambique has worked hard to achieve macroeconomic stability, with a stable currency, low inflation and falling real interest rates.

These are preconditions for sustained growth, and must be protected in the face of drought. The Ministry of Finance and International Monetary Fund's local mission must be involved in the drought planning process to review ways in which the stabilization and adjustment program can be made to accommodate an increased need for foreign exchange (and credit - see below) without destabilizing effects on the exchange rate. Donors and the Mozambican central bank then need to be flexible in designing mechanisms that increase access to foreign exchange and do not exclude all but the largest handful of traders.

Access to credit in foreign exchange should be an integral part of any such mechanism. Allowing repayment in meticais would be necessary, as traders will sell their product locally. There exists a risk of currency devaluation and resultant depletion of the credit fund, but this can be addressed through effective design and implementation of the foreign exchange fund.

In addition to these national measures, government and donors need to identify specific locations where markets *could* function but are expected not to function effectively during the crisis due to some combination of insufficient effective demand, lack of food availability, and high marketing costs. These problems could be addressed through a combination of cash for work projects in the affected areas, monetization or maintenance of a reserve of monetizable grain in nearby major markets (to be sold under specific and widely publicized circumstances, linked to market price behavior), and temporary transport subsidies. Effective implementation of such strategies will require frequent monitoring of market and related food supply conditions in the target areas, and aggressive publicizing of the details of all cash for work programs so that traders know where, when, and how much money is being injected into these local economies. Such activities will break new operational ground for most food aid agencies, and they cannot be expected to adopt them without serious evaluation. Careful experimentation with such activities in a manageable number of locations during initial phases may go a long way toward overcoming bureaucratic and conceptual resistance within the agencies and toward refining the implementation strategies themselves.

Actively publicize the resulting drought response program in all its details, including volumes, timing and geographical targets for free distribution; volumes, prices and locations of monetization of commercial food aid; location, timing and value of cash for work programs; and details of any localized measures such as pre-positioned grain which can be distributed free or monetized under appropriate conditions. Those specific conditions need also to be disseminated with the rest of the program.

IV. Conclusions

This paper has highlighted both the positive and negative effects of the response to the 1992 Southern Africa drought in Mozambique, and has argued that government and donors need to take concrete steps to enhance the role that markets play in responding to future crises. This argument should be understood in the context of a package of initiatives which are needed to ensure continued progress towards sustainable food security. These initiatives include 1) consolidating reforms in the trading sector, 2) investing in cost-reducing marketing infra-structure, 3) investing in the country's ability to identify and disseminate improved production technologies, and 4) continuing investment to improve the information base (and Mozambican analytical capacity to use it) on food production, marketing, prices and consumption, as well as

on socio-economic characteristics of smallholder households.

Geographical and agro-climatic conditions in Mozambique mean that food security in drought-prone southern areas, and production incentives in the more productive northern areas, will both depend on trade. This trade will be primarily regional when Southern African production is good, and north-south within Mozambique when regional production is poor (Coulter 1996)[11]. Simplifying international trade policy and clarifying the murky national regulatory environment are both important steps for ensuring and strengthening regional and internal trade links.

Continued rehabilitation of the road network, especially rural feeder roads, is necessary to reduce the costs of marketing maize and other products out of productive but isolated rural areas. Associated with the strengthening of the country's export capacity is a need to improve storage facilities and credit availability, possibly linked to inventory credit schemes in the North. Consolidating reform in the trading sector is also necessary if traders are to make these and other investments necessary to increase their scale of operation and reduce operating costs.

In the medium- and long-runs, food security in Mozambique will increasingly depend on improvements in agricultural productivity. This improved productivity will require substantial investment in its research and extension systems, and in a private sector input distribution system able to facilitate farmer use of yield-increasing inputs on food and cash crops. After years of war and neglect, the country's agricultural research and extension system is exceptionally weak. Use by smallholders (85% of the population) of inputs beyond hand tools is nearly non-existent outside of certain cotton outgrower schemes in northern provinces.[12] Technology development and input delivery systems must be developed in tandem if the country is attain the necessary improvements in its productive base.

The Mozambican Government has been very pragmatic to undertake empirically based dialogue on food and agricultural policy. With the long-run commitment of various donors, selected Government organizations have begun to develop improved data bases on markets, and on participants and problems in the rural sector. These efforts need to continue to be strengthened. Among other benefits, these efforts will contribute directly to the issue addressed in this paper, allowing government and donors to better assess and improve markets' abilities to respond to the recurrent drought crises which will continue to affect Mozambique in future years.

Endnotes

1. FRELIMO stands for *Frente para a Liberalizacao de Mocambique*, the revolutionary movement that defeated the Portuguese in 1975 and has ruled the country ever since, winning national elections in 1994 after nearly 20 years of one-party rule.

2. It is likely that interventions specifically designed to improve access to and utilization of food by vulnerable households have also had some effect on these numbers. Yet the reach of these programs is greatly limited by budgetary constraints and quantification of their nutritional effects is difficult. See GOM (1997) for further details.

3. Personal communication with co-owner of Inácio de Souza, wholesaler and miller north of Maputo, 17 October 1997.

4. Mozambique had no history of free private markets prior to the late 1980's. Private trade under both the colonial and FRELIMO regimes was highly controlled, including fixed prices at all levels of the system.

5. A negative element of this system is that prices charged to consignees were not related in any systematic way to international border prices, and were often less than half import parity levels. Paying these low prices and then selling into a competitive market under deficit conditions occasioned very large rents for participating consignees. This issue will be addressed further below. See Tschirley, et al. (1996) for more detail.

6. Government action is also needed, but from the perspective of strengthening and complementing markets, and at times ameliorating their less socially desirable effects, not substituting for them.

7. Food aid programs have also had positive effects on market development under certain circumstances, as highlighted earlier in this paper. See MAP/MSU Food Security Project Flash 2E (English) or 2P (Portuguese) and Working Papers 12 (English) and 12P (Portuguese) for further details.

8. The word "subsidy" today frequently evokes an automatic rejection by donors and, increasingly, host governments. Yet such a subsidy would effectively substitute for donor- or government financed trucking of food aid into areas deemed "too isolated" from markets. Just as such targeted food distribution would be temporary, a transport subsidy would be temporary. It is also likely to be far cheaper than food aid distribution, and it should contribute to private sector capacity to respond to future shortages.

9. These statements are based on close observation of Maputo's Bazuca wholesale market during May-August 1992. During this time, Food Security Project personnel were conducting an assessment of Maputo's informal food marketing system and were present in the market nearly every day observing marketing activity and interviewing traders. See MAP/MSU 1993 for more detail on the results of that study.

10. See Jayne, et al. (1995) for representative calculations of milling costs in industrial roller mills and small-scale hammer mills.

11. Production in northern Mozambique is much less risky than in other areas of the country, and is not strongly correlated with production in the rest of Southern Africa. For example, production in this area was better than average during 1992, when the rest of Southern Africa suffered its devastating drought.

12. Some farmers in these schemes use these inputs in maize as well as cotton, achieving maize yields 3-4 time above mean yields without inputs. These still nascent practices demonstrate the potential in Mozambique for complementarities between cash crops and food crops, as have been found in many other countries of Sub-Saharan Africa (MAP/MSU 1996).

Table 1. Cereal supply in Mozambique, by source, 1989/90 - 1997/98

	Production				Food Aid										
Year[1]	White Maize	Rice	Sorghum/ Millet	Total	Commerc. yellow maize[1]	Emerg. Yellow maize	Total yellow maize	Emerg. white maize	Rice	Wheat	Total Cereals food aid	Commer. Cereals imports (net)	Total cereal avail.	Cereal food aid as % of total cereal avail.	Pop.[3] ('000)
1989/90	330,000	95,000	177,000	602,000	83,000	145,000	228,000	61,000	72,000	109,000	470,000	0	1,072,000	44%	15,000
1990/91	452,900	96,400	181,000	730,300	126,000	221,200	347,200	76,500	47,600	116,400	587,700	0	1,318,000	45%	15,405
1991/92	327,100	56,300	154,900	538,300	124,900	248,800	373,700	98,300	58,500	123,000	653,500	0	1,191,800	55%	15,820
1992/93	132,600	33,000	71,000	237,000	271,700	389,200	660,900	18,700	61,600	47,700	788,900	70,000	1,095,900	72%	16,248
1993/94	533,100	49,000	165,000	747,100	77,000	208,100	285,100	0	28,517	57,000	370,617	86,700	1,204,417	31%	16,686
1994/95	527,000	97,000	193,000	817,000	70,200	123,900	194,100	70,900	50,000	103,100	418,100	105,000	1,340,100	31%	17,137
1995/96	733,800	76,000	278,700	1,088,500	56,000	40,000	96,000	40,000	24,200	70,900	233,800	153,700	1,473,300	16%	17,600
1996/97	947,000	139,000	291,000	1,377,000	0	0	0	17,500	14,600	36,899	68,999	100,000	1,545,999	4%	18,075
1997/98	1,042,734	180,272	307,290	1,530,296	0	0	0	4,875	n/a	112,966	117,841	40,000	1,708,137	7%	18,563

[1] Marketing year: April - March for DSA and MSU sources (May - April for some sources); Production refers to the relevant production for that marketing year. Based on the 1994 Early Warning Unit/Ministry of Agriculture database, approximately 90% of total maize production is destined for human consumption, with the remaining 10% for seed and losses; for the other cereal crops, 88% for human consumption, and 12% for seed, animal feed, and losses. The Early Warning Unit estimates that 23% of maize produced for human consumption is marketed; the rest is consumed on farm.

[2] White maize imports are not included (where color identification was possible); in the 1990's, amounts have not been high due to supply problems in the region. Local purchase of white maize for food aid distribution was also not included as food aid since it is included in the production estimates.

[3] Entirely rice and wheat flour except 1994/95, when less than 10,000 metric tons of white maize were imported from South Africa. Informal imports are unrecorded and so not included here.

Sources: Ministry of Commerce, Department of Food Security, **Boletim de Segurança Alimentar** (issues: Bol 4, 1991/92; Bol. 3, 1992/93; Bol. 3, 1993/94); Ministry of Commerce, Department of Food Security, **Food Aid Pledges and Shipments,** 1990/91 to 1994/95 (November 1994); FAO **Production Yearbook,** 1989/90 - 1991/92 issues; World Food Programme Interfais database; Famine Early Warning Unit, Ministry of Agriculture production database; and MOA/MSU Food aid arrivals database (See MOA/MSU 1993 WP#13 for further information).

Table 2. Real price trends for selected food products in principal cities of Mozambique, 1991-1997

Market/ Product	Mean Price (Mts/kg)[1]		Percent Change 91/92-96/97	Trend
	4/91-3/92[2]	10/96-9/97		
Maputo (South)				
White maize grain	4,241	2,569	-39.4	Negative
Manteiga Bean	10,523	11,663	10.8	Positive
Peanut	11,520	5,212	-54.7	Negative
Rice	8,026	5,009	-37.5	Negative
Brown Sugar	8,415	6,698	-20.4	Negative
Imported Oil	18,698	14,549	-22.1	Negative
Beira (Center)				
White maize grain	2036	1630	-19.9	Negative[4]
Manteiga Bean	15,311	9,206	-39.8	Negative
Peanut	15,452	7,901	-48.8	Negative
Rice	9,530	6,410	-32.7	Negative
Brown Sugar	10,703	7,595	-29.0	Negative
Imported Oil	19,897	14,972	-24.7	Negative
Nampula (North)				
White maize grain	2,162	1,029	-52.4	Negative
Manteiga Bean	11,528	8,365	-27.4	Negative
Peanut	10,132	4,959	-51.0	Negative
Rice	8,788	7,334	-16.5	Negative
Brown Sugar	12,880	12,060	-6.3	Negative
Imported Oil	22,999	14,232	-38.1	Negativa

Table 3. Yearly return to capital need to feed a family of 8, wholesale traders working between Chimoio and Maputo, June 1997

	Trader 1	Trader 2	Trader 3
Quantity purchased (kg)	3.500	5.300	12.500
Capital invested (MT/kg)	1.400	1.400	1.400
Turn-over time	2 weeks	2 weeks	2 weeks
Margin needed to feed a family of 8[1]	14.6%	9.7%	4.1%
Equivalent in terms of annual return to capital	381%	251%	107%

[1] Method adapted from Sahn and Desai (1993), explained in MAP/MSU (1993)

Figure 1. Per capita calorie availability from cereals (maize, millet, sorghum, rice, wheat) in Mozambique, by source, 1989/90-1997/98

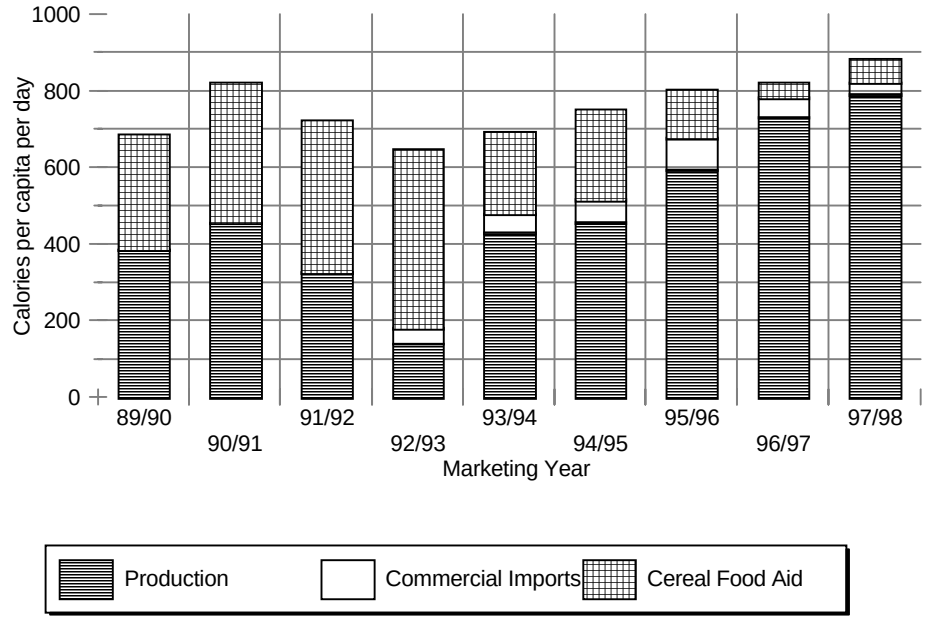


Figure 2. Real prices of white maize grain in Maputo markets, 3/90 - 9/97 (Base=8/97)

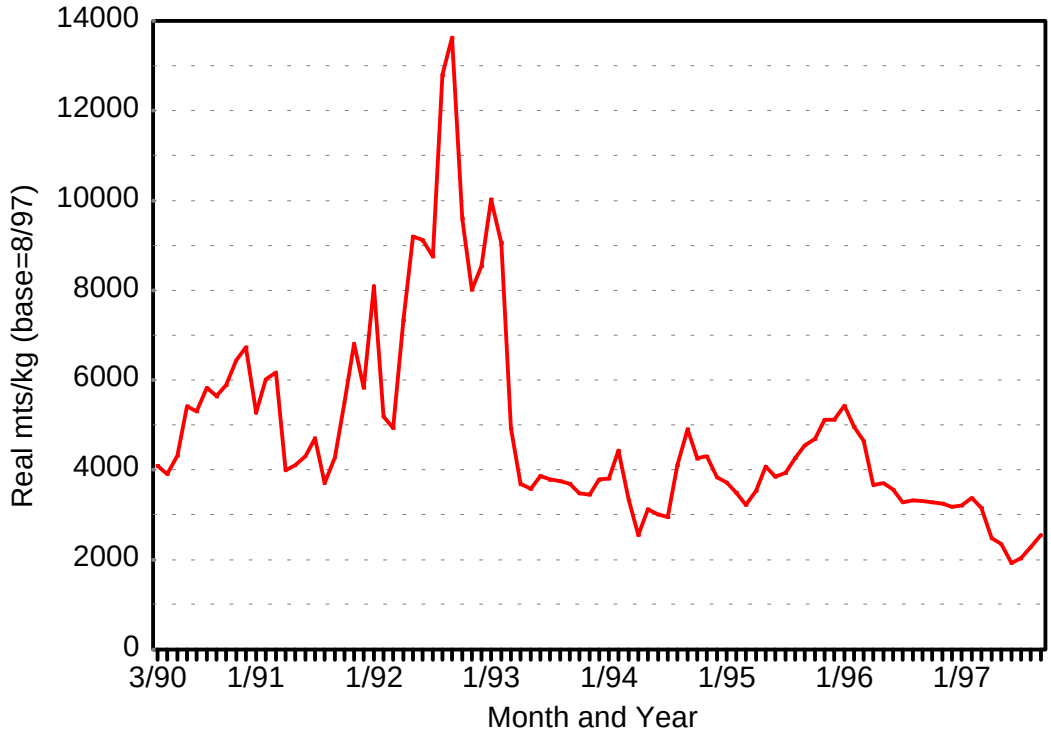
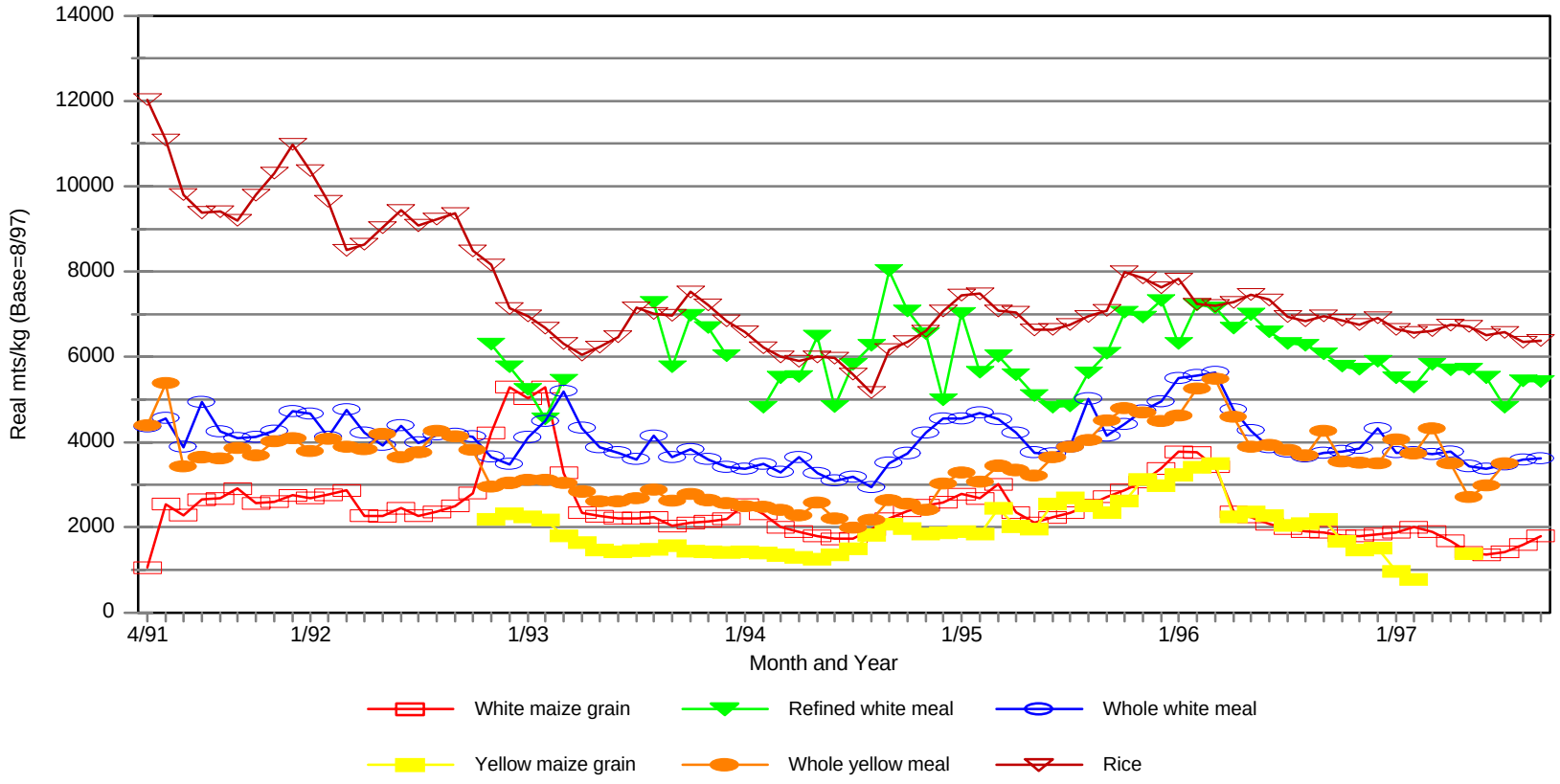


Figure 3. Real prices of food staples in Maputo, 5/91 - 9/97 (base=8/97)



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