

The Maputo Market Study: Research Methods

**By
MOA/MSU Research Team**

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I. INTRODUCTION AND OBJECTIVES

The economic liberalization measures that began in Mozambique in 1987 under the Economic Rehabilitation Program have unleashed enormous change in the way food is marketed in the country. Nowhere has the response been greater than in the so-called "informal" marketing sector of the capital city of Maputo.

The term "informal sector" has become increasingly common, even in academic circles, despite the lack of a precise and widely accepted definition. In this work, the term will be refer to any person participating in the food trade without a legal trader's license. This definition includes traders operating without licenses who nevertheless pay stall rental fees to municipal authorities. Such traders are in a legally ambiguous situation. While they may be argued to enjoy *de facto* legality, mere tolerance from authorities can change quickly in Mozambique's volatile setting. Recent heated public debate regarding the desirability of the continued existence of this sector underscores this point.

The informal food marketing sector first showed itself in 1987 with the appearance on street corners of groupings of traders, overwhelmingly women, selling very small quantities of basic foods to passers by. These incipient markets were illegal and suffered from frequent police harassment, thus the use of names, still common today, such as *dumbanengue* ("trust your feet" in the local dialect). Today, this sector is a rapidly evolving system of wholesale and retail markets supplying a wide range of food items to most consumers in Maputo and Matola. More recently, this sector has exhibited a growing internal differentiation. New markets much like the original *dumbanengues* continue to emerge on street corners and empty lots, with little or no supporting physical infrastructure. Concurrently, many original *dumbanengues* have developed into established market places with large numbers of traders and increasing physical infrastructure. These more established markets tend to show clear and direct links to the registered wholesalers (*armazenistas*) and retail store owners (*lojistas*) of the formal marketing sector. Thus, in these cases, the distinction between the formal and informal sectors is beginning to blur.

This emerging commercial system has now extended north into Gaza and Inhambane provinces. The trading network that has emerged is helping to equalize prices and relative supplies in the two areas.¹ Within Maputo, it has almost entirely supplanted the urban ration system (*Novo Sistema de Abastecimento*). Depending on the product analyzed, the total value of sales in informal markets is between three and 14 times greater than that in the formal sector retail shops known as *lojas*.²

Despite the large and growing importance of this sector, there is little systematic information regarding its organization, its behavior, and its effects on the welfare of consumers. Such knowledge is essential if the Government of Mozambique (GRM) is to design a coherent and socially beneficial response to this phenomenon. The need for such a response is made more urgent by the increased levels of organization and investment now reflected in much of the informal sector. It has become increasingly evident that

¹ "Commercial" food aid is food donated by foreign governments to the GRM and meant for commercial sale to consumers. The proceeds are to be deposited in accounts to finance development activities. This is the food aid which is routinely marketed in the informal sector. "Emergency" food aid is meant for free distribution to people without the resources to purchase food. This report and others based on the Maputo Market Study focus on commercial food aid.

² See Sahn and Desai, 1992.

this sector will not simply "go away." Among the critical policy issues related directly or indirectly to the informal sector are:

- Should this sector even be allowed to exist, and if so, in what form? Heated public debate in recent months has highlighted the deep divisions over this issue. The way in which the debate is resolved will have far reaching consequences for the welfare of consumers, producers, and both formal and informal sector traders.
- How can commercial food aid be most efficiently distributed to poor consumers in Maputo and north of the city in the provinces of Maputo, Gaza, and Inhambane? What officially recognized role, if any, should the informal sector play?
- What is the most socially beneficial mix of large and small scale maize milling in the country? This issue is of great consequence for the poor, for two reasons. First, small mills produce a different product with a lower price, which might provide significant cost savings. Second, these mills may also provide employment and entrepreneurial opportunities that the large, capital intensive mills do not.
- How can increased national production of basic grains such as white maize and rice be best promoted? How do food aid shipments of yellow maize affect domestic production incentives of these grains?

The pervasive presence of the informal marketing sector means that none of these issues can be addressed without affecting it. Too, the increasing organization of the informal sector, and its intersection with the formal sector, means that it cannot be targeted for policy action without affecting these issues.

For these reasons, the Ministry of Agriculture of Mozambique (MOA), in collaboration with Michigan State University Department of Agricultural Economics (MSU), and with funding from the United States Agency for International Development (USAID), undertook the first phase of the Maputo Market Study during June, July, and August 1992. This study was part of a broader set of research and policy dialogue activities carried out under the MOA/MSU/USAID Food Security Project in Mozambique. The work was specifically associated with and benefited from the ongoing data collection and research activities of the Agricultural Market Information and Analysis System (SIMA). This system operates under the Food Security project within the Division of Prices of the National Directorate of Agricultural Economics, Ministry of Agriculture.

The objectives of the Maputo Market Study were:

1. To develop an initial description and preliminary analysis of the structure and conduct of the informal food wholesaling and retailing sector in Maputo, with emphasis on the marketing of maize grain and flours,
2. To quantify the principal costs incurred and approximate margins earned by traders in the sector,
3. To analyze price behavior in the sector and assess the efficiency and effectiveness of its markets,
4. To evaluate the effects of food aid, especially U.S. yellow maize grain commercial aid, on the

organization and behavior of the sector, and on prices paid by consumers,

5. To diagnose the principal problems facing the sector, and
6. To evaluate the consequences of alternative actions by the Government of Mozambique (GRM) and donors to address these problems.

The study focused on the more established informal sector markets, and on the links between these markets and the formal sector, especially *armazenistas*. No attempt was made to study the new *dumbanengues* that continue to emerge. Too, the formal sector *lojas* were not studied except to the extent that they intersected with the informal sector.

This report is one of several based on the Maputo Market Study. It presents a brief description and documentation of the methods used in the study, including problems encountered and how they were dealt with. It is hoped that this report will help improve the design of similar future research within Mozambique. It should also serve as a point of reference for the series of analytical reports based on the study. Each of these reports provides a much more detailed analysis of selected aspects of the informal food marketing system in Maputo. These reports are:

- The Organization, Behavior, and Performance of the Informal Food Marketing System in Maputo,
- Food Price Behavior in the Maputo Informal Sector,
- The Economics of Commercial Food Aid Pricing and Distribution: Lessons From Mozambique, and
- The Maputo Market Study: Synthesis of Research Findings and Policy Implications

II. RESEARCH ACTIVITIES

The research activities associated with the Maputo Market Study included rapid appraisals preceding the arrival of the research team, a series of formal interviews and data collection activities during the

Figure 1. Chronology of Research Activities for the Maputo Market Study

Time Period	Research Activity	Description
Late 1990-Early 1991	SIMA design	Initial identification of markets and key food products
April and June, 1992	Rapid appraisals in preparation for MMS	1) Identification of key food markets and their relative importance, 2) Careful identification of maize meal types
June - August, 1992	The Maputo Market Study	Intensive formal and informal data collection activities
September, 1992 - Present	On-going data collection and analysis	Selected data collection and analysis to refine and extend findings from MMS

months of June through August 1992, and on-going data collection and analysis designed to extend and refine the knowledge gained during the first phase. These activities are presented chronologically in Figure 1.

A. RAPID MARKET APPRAISALS

The research team began developing its knowledge of the informal food marketing sector in Maputo in late 1990 and early 1991, with the design of the SIMA. The team visited numerous retail markets and identified Xipamanine as the largest and most representative market in the city (see Figure 2 for the location of markets within Maputo). It was selected for weekly price monitoring in the SIMA. Through continued market visits after the launching of the SIMA, team members in early 1991 documented the emergence of the Bazuca area near Xipamanine as a specialized wholesale market. Experimental price collection began in this market in September 1991. Throughout this time, the team paid close attention to the variety of maize meal types and investigated their production processes and relative prices. The design and operation of the SIMA thus made important contributions to the team's knowledge and understanding of the evolving informal food marketing system in Maputo.

Rapid market appraisal activities directly related to the Maputo Market Study began in April 1992. At this time, team members began a systematic process of qualitative research with three principal objectives:

1. To identify retail and wholesale market places in Maputo where significant volumes of food were sold,
2. To develop an initial appreciation of the roles and importance of each market within the city's food marketing system,
3. To develop an initial classification of trader types and to identify the markets in which each operate, and
4. To identify the range of basic grains and grain products being transacted in the market, with special emphasis on distinguishing between different maize meal types.

In April, team members conducted systematic market visits, met with and interviewed members of the Association of Cereals Processors (APROC), and visited many local maize mills. Members of APROC accompanied the team on its market visits. In all, the team visited seven food markets in the Maputo/Matola area: Praça dos Combatentes (also known as *Xiquelene* in the local dialect), Componde, and Mafalala within Maputo; Benfica on the northern outskirts of the city; and Matola D, Matola Cidade, and Matola 700 in the city of Matola. Informal interviews with traders in each market allowed investigators to develop an initial understanding of the importance of each and their relationship to each other. It was at this time that investigators began to appreciate Bazuca's key role as a supply source for informal sector retailers in other markets.

Visits to mills, discussions with APROC members (all of them millers), and careful observation in the markets, allowed the team to distinguish more clearly between types of maize flours and to identify the production processes associated with each. This detailed knowledge of product types became a key factor in the design of the Maputo Market Study. It also allowed the SIMA to be modified to represent more accurately the range of products transacted in the market. The team also noted product variation in other products. At least two types of peanuts were identified, along with two types of wheat flour and three types of rice.

Based on the knowledge gained during April, researchers made a tentative selection of markets to be studied, developed an initial design for the formal data collection activities, and produced questionnaire forms based on this design. Final rapid appraisal work in June allowed the design and questionnaires to be refined, and markets to be selected.

B. FORMAL DATA COLLECTION

1. Objectives

Rapid appraisal work prior to the formal Maputo Market Study suggested that Bazuca was the key wholesale distribution point for the informal food retailing system in Maputo. This work also showed that Bazuca was supplied principally though not exclusively from private wholesaler warehouses

located near the port, in an area known as the *Baixa*.³ Based on this knowledge, formal data collection activities focused on three areas of investigation:

1. The structure and conduct of the *Baixa-Bazuca* trade, especially in maize grain and meals. Questions addressed included the volume of product moving into Bazuca; the firm from which the product was purchased; the volume and destination of product flow out of the market; the number, size, and types of traders operating in Bazuca; the manner in which they obtained, processed, stored, and sold their product; and prices paid and other costs incurred. A key objective of this research area was to understand the marketing of commercial food aid through this system. The team was particularly interested in the effect of the arrival of a food aid shipment on market prices and trader practices.
2. The roles played by other important retail markets in Maputo. Questions addressed included to what extent wholesaling activity independent of Bazuca takes place in these other markets, and what the relationship is between these other markets and the *Baixa*.
3. Price relationships between principal markets in Maputo. For example, how quickly and to what extent does the effect of a commercial food aid shipment spread from Bazuca and Xipamanine to other retail markets in the city? Such issues are important measures of the extent to which food marketing in Maputo has become an interrelated system rather than a set of isolated activities.

2. Market Events During the Formal Data Collection Period

Formal data collection activities were carried out in a highly volatile market with rapidly changing supply conditions and imperfect, unequally distributed information. A major challenge facing the study was to achieve the flexibility necessary to modify data collection activities as needed in response to these changing market events. Such flexibility would allow the study to take advantage of "natural experiments" and to observe market response to them. A food aid arrival during a period of great scarcity was one such experiment that the team studied in detail.

The top portion of Figure 3 presents the timing of selected market events and behavior from June 29 through the end of August, when formal data collection activities took place. The bottom portion of the figure presents the schedule of research activities carried out during this time.

Commercial yellow maize food aid last arrived before the formal data collection activities on May 9, when a ship with 32,000 MT of U.S. grain arrived in port. Yellow maize grain prices fell dramatically from very high levels following this arrival (Figure 4). As the study began in late June, however, a yellow maize scarcity was beginning to develop again. The first row of Figure 3 reveals both a strong upward trend in retail yellow maize grain prices and increasing instability around that trend through the end of July. By the week of July 27, *caneca* prices reached a peak of Mt 1,000, only to fall to Mt 450 as commercial food aid

³ The Portuguese name is in reference to the low elevation of the port area in comparison to the rest of the city.

grain arrived from a European Economic Community (EEC) shipment.⁴ The price increases can be ascribed to the growing scarcity, while the growing instability might be explained by uncertainty regarding the timing of the boat's arrival. Once the EEC boat began to unload, prices fell quickly and dramatically. Within a week, they stabilized at lower levels. For each week thereafter, the spread between the weekly high and low prices was only Mt 100/*caneca*. Arrival of a commercial food aid grain shipment from the United States only two weeks after the EEC shipment likely strengthened this outcome.

The EEC and the U.S. organized their maize distribution shipments quite differently, providing an excellent opportunity for study. The 15,000 MT of EEC grain were delivered in equal amounts to just two consignees. In stark contrast, 27 consignees unloaded 22,000 MT of grain from the U.S. shipment, and the largest had just 13.5% of the total. Through very careful price monitoring and frequent informal interviews in the market and the *Baixa*, the research team documented an example of a short term price increase potentially caused by the market power created by the delivery of 15,000 MT to only two traders. See MOA/MSU Research Team "The Maputo Market Study: The Organization, Behavior, and Performance of the Informal Food Marketing System" for a detailed discussion of this incident.

3. Formal Data Collection Activities

Formal data collection activities included regular price monitoring in Bazuca, Xipamanine, and two other retail markets; periodic intensive monitoring of inflows and outflows from Bazuca; and a series of interviews with wholesale Bazuca traders and retail traders in selected markets.

Price Collection: Retail prices were generally collected Mondays, Wednesdays, and Fridays in three markets spread throughout the northern portions of the "Cidade de Cimento".⁵ These markets were Xipamanine, located very near Bazuca in the western portion of the city; Vulcano, located north of Xipamanine near the airport; and Componde, located in the northeastern section of the city near Xiquelene and Mucoriamama markets. Besides the Central (Municipal) market, all significant retail food markets in Maputo are located in these lower income neighborhoods outside the downtown area. The central market was not chosen because the team judged that it served a clientele that was significantly better off economically than the vast majority of Maputo consumers. The team used three criteria in choosing these three markets. First, each had to have a sufficient volume of transactions and number of traders to be considered an established market. Second, each should serve a typical low income clientele. Finally, the team desired a representative geographical coverage of the city. These markets did exhibit differences. Xipamanine is unquestionably the principal market in Maputo, and is linked very tightly to Bazuca. Vulcano is a much smaller market, closer to the *cidade de caniço*, and apparently serves a lower income clientele than Xipamanine. Componde is larger than Vulcano. It is

⁴ The "caneca" has become the standard unit of measure in informal sector Maputo markets. It is a 750 ml can that originally held powdered milk. Filled over the rim with product from the market, it holds between 800 ml and 850 ml.

⁵ This means the "cement city", and is contrasted to the *cidade de caniço*, or the "cane city". The latter has grown up over the past decade, and is characterized by thatch huts and very little municipal infrastructure. The cement city was constructed earlier and in general has more permanent structures, paved streets, and other infrastructure. The three markets chosen appear to serve both cane city and cement city dwellers. Benfica, mentioned earlier in the report and visited in a rapid appraisal, is the principal market in the cane city.

one of three markets located very close to each other in the northeastern portion of the *cidade de cimento*.

Informal sector wholesale prices ("Redistributor prices" in the Figure) were collected three days a week at Bazuca, and later at Componde market as well.⁶ Study findings suggested that Componde was the only other market in the study area that had significant wholesale activity, though it was much smaller than Bazuca. Other markets such as Mucoriana showed sporadic and small scale wholesaling, especially when supplies in Maputo were especially large.

The frequency of price collection provides an example of the flexibility referred to above. The EEC shipment of yellow maize grain arrived during the week of July 27 after a period of great scarcity. On the day of the arrival and for some days after, enumerators collected prices every day, sometimes two to three times a day, to track very closely the markets' response to this arrival. This intensive enumeration, and the nearly constant presence in the market by researchers during this time proved invaluable in understanding and documenting the markets' response.

Questionnaire forms for this collection, adapted from the on-going SIMA, provided the basis for the forms now used in the redesigned SIMA. See Appendix B for these and all other forms used in the Maputo Market Study. A detailed analysis of food price behavior in Maputo may be found in MOA/MSU Research Team, "Food Price Behavior in the Maputo Informal Sector".

Bazuca Arrivals and Departures: The central role of Bazuca as a supply source for informal sector retailers resulted in a strong focus on understanding the behavior of this market. Four times, for three successive days each time, enumerators accompanied by researchers spent the entire day in Bazuca market. During this time, questionnaire forms were used to document each vehicle arriving or departing from the market, the quantity and type of product on the vehicle, and other key information regarding the individuals trading the product (see Appendix B, Form 2 and Form 3). This intensive data collection was conducted twice during periods of relative scarcity, and twice while supplies of maize grain and meals were more abundant. Such an approach was chosen under the hypothesis that the behavior of the markets changes in systematic ways with changing supply conditions.

The information gathered during these periods helped illuminate many important issues, including the type and size of traders operating in the market, their supply sources, and the volume of product flow that the market can sustain. In addition, this work began to show clearly that Maputo and the provinces of Gaza and Inhambane were linked by a commercial food trading network, with Bazuca and the *Baixa* a part of this network. This knowledge then helped orient more informal interviews that the team was conducting on a continued basis with traders. See MOA/MSU Research Team "The Maputo Market Study: The Structure and Conduct of Informal Food Marketing" for a detailed discussion of the structure and conduct of the Maputo food market.

Trader Interviews and Associated Data Collection: Monitoring of Bazuca arrivals and departures provided a good indication of the structure of the food trade between the *Baixa* and Bazuca. It also showed that product was moving from Bazuca to other retail markets within Maputo and outside to the Gaza and Inhambane provinces. This collection did not sufficiently clarify the trading practices of those involved, however. Nor did it shed light on retail trading practices. For this purpose, the

⁶ In this and other reports, the terms "redistribution wholesaler" and "floor trader" will be used more or less interchangeably to refer to informal sector wholesalers selling their product by the bag out of Bazuca market.

research team designed a series of data collection activities. Enumerators and researchers formally interviewed floor traders in Bazuca regarding purchase quantities, rate of turnover, transport, milling, storage and other practices and associated costs (see Forms 5A and 5B in Appendix B). Similar interviews were conducted with retailers of unrefined yellow maize meal (Form 5A). *Baixa* wholesalers were interviewed informally and sales practices were observed. Storage volumes and costs were determined, and case studies were conducted to estimate trader operating costs. The observed variability of bag weights among floor traders, especially for unrefined yellow maize meal, lead the team to conduct bag weight and milling experiments. All this information was used to understand better the trading environment facing participants, including the significant risks they face, and their adaptation to that environment. It was also used to quantify the costs they incur, and to make preliminary estimates of the returns to trading activities.

Other Data Collection: Other informal data collection included visits to the port to observe ship unloading practices and interview port authorities, visits to the *Empresa de Abastecimento da Cidade de Maputo* (EACM), COGROPA, and NSA shops, and interviews with donors (USAID and EEC) and consultants who had investigated similar issues.

C. ON-GOING DATA COLLECTION AND ANALYSIS

The research team has continued regular data collection since the end of the intensive efforts in late August 1992. Prices in Xipamanine, Vulcano, and Componde are collected every Tuesday and Thursday, in addition to the regular Saturday SIMA collection in Xipamanine and Bazuca. This will allow better analysis of market performance and a more detailed tracking of market movements. The timeliness that this allows should be especially useful during periods of great uncertainty in the market.

To date, the research team has designed two additional questionnaires and has completed them weekly to investigate selected issues. Form 6 in Appendix B provided better insights into retailer supply sources in Xipamanine, Vulcano, and Componde, and reinforced earlier findings regarding the key role of Bazuca. It will likely be used in the future to document changing supply sources as the market develops and as the effects of the drought diminish with the onset of the next harvest. Form 7 helped provide important information on the amount of time that floor traders had been in the business, and how they rose to the level of floor traders. Further questionnaires will be used strategically over time to continue investigating specific issues.

Finally, the team continues its collection of detailed data on commercial and emergency food aid arrivals and discharges from boats. This data is being used to evaluate important questions regarding the effects of the food aid program on retail prices in Maputo.

III. DIFFICULTIES ENCOUNTERED

Like all field research, problems emerged as the research proceeded. The success of the research effort depended partly on anticipating as many problems as possible and designing solutions ahead of time. But not all problems could be anticipated. Thus, the effective and continual use of informal techniques to identify problems, and the flexibility of researchers to develop solutions during the research, were also key. The problems most affected the efficacy of formal data collection activities, but could be identified and resolved only through informal techniques.

The difficulties encountered lie in four categories: accuracy of trader response, the use of non-standard units, quality variation within an apparently homogeneous product, and collection and interpretation of volume data.

A. ACCURACY OF TRADER RESPONSE

The accuracy of respondents is of concern in any interview based research. Dishonest or misleading responses are more likely as the perceived sensitivity of a question increases. In this study, the research team identified two areas as potentially sensitive. First, it was anticipated that traders might be unwilling to reveal their supply sources. The principal reason for this concern was that some products traded in informal markets had been diverted from NSA. Too, it was not clear whether the trade with Swaziland satisfied all customs requirements. The second area of concern related to information about trader costs and prices paid and received. Any obvious attempt by enumerators to estimate trader profit margins was not likely to be successful.

Several approaches were used to minimize the probability of misleading responses, and to reduce the effects of any such responses that the team did receive. First, the team maintained a frequent, friendly presence in the market. Enumerators and researchers were open with the traders, explaining what was being done and why to those being interviewed and others nearby observing the interview. Questionnaire forms were shown to traders and explained question by question to reduce suspicion. Besides interviews, researchers frequently conversed with traders about general issues not directly related to the topics at hand. U.S. researchers learned key phrases in *Shangana*, the local dialect, and used them whenever possible. The team also relied heavily on one enumerator who was a native *Shangana* speaker to verify findings by others and investigate sensitive issues. The team believes that this friendly, open approach contributed greatly to reducing traders' suspicion and facilitating more open responses.

More objective checks were also used to corroborate information. These included observation to complement questioning, and asking the same question of various traders. The latter approach was used extensively in collecting information about costs and prices. To a large degree, independent responses to questions about costs such as storage, transport, and milling, and about prices paid and charged, clustered within quite narrow ranges. The team interpreted such convergence of response as confirming the validity of the information being obtained.

Such checks could not be used when asking individual traders where they purchased their product. Trader responses, however, were generally quite specific, citing the name of the *armazenista* or state enterprise where they obtained maize grain, rice, or other products. In a small minority of instances, traders gave only a general response such as "*armazenista*", or "*Baixa*". The team finds no reason to believe that traders' specific responses were ever misleading.

B. NON-STANDARD UNITS

The use of non-standard units of measure in Maputo markets presented special challenges for researchers. At retail, traders use small cans to measure product. Among redistribution wholesalers, bag weights often differ across traders and over time.

The use of small cans by retailers introduces two difficulties. First, the way traders fill the cans means that two traders using the same size of can may deliver differing volumes of product. Second, different products have different densities, meaning a given volume of, for example, maize meal, will have a different weight than the same volume of rice. Each of these problems was recognized and resolved during the original design of the SIMA, long before the Maputo Market Study. In brief, SIMA researchers developed procedures to determine systematically the volume of product in the cans, and experimentally determined densities for each product to use in calculating kilogram prices. See MOA/MSU Working Paper No. 2 for more detail on these procedures.

It is worth noting that Maputo retail markets have in practice achieved a degree of standardization. For most products, the unit of measure that is used is a 750 ml can (*caneca*) that previously held powdered milk. The volumes received with these cans do vary by as much as 10% across products, and weights will also vary. But for a given product across traders, volumes generally vary by no more than 2% to 3%. Furthermore, all traders in all markets studied in Maputo use the same unit and have done so for at least the past three years. Thus, for a given product, these *caneca* prices give a valid measure of price change over time, and of price relationships across markets. They do not give a valid measure of relative prices across products, and would give incorrect results if used in margin analyses.

Varying bag weights at the redistribution wholesale level is more difficult to deal with. This problem is especially acute in products that are repackaged prior to sale at Bazuca, such as locally processed yellow maize meal. Research indicates that the weight of these nominally 50 kg bags can vary from 50 kg to as low as 22 kg. Thus, reporting of bag prices for this product can give very misleading information regarding actual product prices per kilogram. The same research indicates that bag weights appear to be relatively stable for products that are not repackaged prior to sale on the floor at Bazuca. These include maize grain and rice, maize meal from Mozambique's industrial mill (*Companhia Industrial Matola - CIM*) and from Swaziland, and sugar from Swaziland.

The research team was unable to develop a method to correct systematically for variations in bag weights of locally processed yellow maize meal. As a result, redistribution wholesale prices for this product are not used in any analyses. Prices at this level are used for the products the team believes maintain an acceptably stable bag weight: yellow maize grain, rice, maize meal from *CIM* and from Swaziland, and sugar from Swaziland.

C. QUALITY VARIATION

As in most markets, food products in Maputo show a great deal of quality variation. Not all of this variation is immediately apparent to even experienced researchers. In addition, the informal trade recognizes no official system of grades and standards. As a result, prices can show large variability due only to quality differences. It thus becomes extremely important that any data collection effort distinguish carefully between different types and qualities of product.

Maize meals provide the best illustration. There are at least four types of yellow maize meal on the market, each with a different price. The highest quality is hand-pounded meal (*farinha pilada*), which has the pericarp and some germ removed through hand pounding before milling. Next are two types of

industrially processed meals. Partially refined meal (*Farinha sem farelo*) has some pericarp and germ removed, and has the texture of a typical maize meal. *Tixota* is a much coarser meal with some pericarp and germ removed, and is generally preferred to partially refined meal. The cheapest meal is produced locally in small hammer mills, where none of the pericarp or germ is removed. This unrefined meal (*farinha com farelo*) is most demanded by the mass of poor consumers.

A researcher or enumerator must be quite familiar with the means of distinguishing each of these meals to avoid mixing products in the price reporting. Even if this is done, however, other difficulties remain. Within the general class of unrefined meal, there is some quality variation depending on the type of screen that is used in the hammer mill. These different qualities may also carry different prices. Industrial mills can also produce varying qualities of the basic partially refined meal. Finally, it appears that some traders mix the cheaper unrefined meal with the more preferred partially refined meal and attempt to sell it as the latter.

Other products also show quality variation that might not be caught without careful observation. Maize grain can vary in price by as much as 35% to 40%, depending on its cleanliness and other factors. Rice can also vary in price depending on its origin and perceived quality. In none of these cases was the research team able to identify standard terminology used by traders to distinguish the different qualities. This greatly increases the difficulty of collecting valid price information.

The research team dealt with these issues both in the field, when data was collected, and in the office, when it was processed. In the field, researchers and enumerators distinguished systematically among the four basic types of maize meals identified above. For yellow maize grain, the team established U.S. commercial food aid grain as the standard quality, since this dominated the market. Any other type of grain that also carried a price differential was identified and coded as a different product. During the study, some yellow grain apparently meant for emergency distribution appeared in the market carrying a sharp price premium. The team did not include this data in the analysis of maize prices, since it would have given misleading results.

The team distinguished between three different classes of rice, to ensure that different qualities were not mixed. Data were collected separately for medium quality rice (*arroz corrente*, considered the typical quality in the market); high quality rice (*arroz extra*, considered by traders to be of superior quality, with fewer broken grains); and a rice called *trinca* in Portuguese, with a much larger proportion of broken grains than the other two types. Interestingly, these presumably different qualities often carried the same price in the market.

D. COLLECTION AND INTERPRETATION OF VOLUME DATA

Market research in many Third World countries has long highlighted the difficulty of collecting data on market volumes. Maputo is no different. The lack of even a rudimentary accounting system for inflows and outflows means that the research team must collect all such data. Doing this is made very difficult by conditions in the market: variable opening and closing hours, traffic congestion and associated dust and automobile exhaust which sometimes reach extreme levels, and the sheer difficulty of noting every incoming and outgoing vehicle and establishing volumes and other desired information. In practice, three enumerators backed by one or two researchers remained in the market for 12 and sometimes more hours a day when collecting this data (see section II.B.3 above for more detail).

Once the data were collected, interpretation had to proceed with caution. Specifically, rapid changes in supply conditions meant that data collected during any one period could give very misleading results if extrapolated over longer periods. For this reason, the team performed such collection during four different three-day periods, two during periods of more abundant supply, and two when supplies were appreciably reduced.

IV. SUMMARY OF THE RESEARCH APPROACH

In summary, the research approach in the Maputo Market Study exhibited four key characteristics. First, this research built upon knowledge already gained from the market work conducted to design and operate the SIMA. Second, the research was an iterative combination of formal and informal techniques. Rapid appraisal work prior to the formal data collection helped structure this collection. Insights from this latter research then helped identify key issues which needed to be investigated more fully. Intensive informal interaction with traders was used to do this. Completing the circle, these interactions helped focus other formal data collection efforts. Third, researchers and enumerators remained flexible in their data collection efforts, with two principal objectives. The research team desired to take advantage of natural experiments such as the arrival of a food aid ship during a period of great scarcity. Such flexible response to these opportunities proved crucial in deepening and refining researchers' understanding of the market. Also, flexibility was required to identify problems encountered in the data collection and resolve them during the course of the study. Finally, the knowledge gained from this work has been used to design a program of continued strategic data collection and analysis. This program will not only improve understanding of the market, but will help provide more timely information during periods of great uncertainty. It is hoped that the information may also be used to suggest key actions on the part of the GRM and donors to improve the food marketing system serving Maputo and surrounding areas.

ANNEXES

ANNEX A

MMS COMPUTER FILE DOCUMENTATION

SUBDIRECTORY STRUCTURE

The subdirectory structure for MMS computer files distinguishes between files related to the data archive and those related to data analysis. The former are stored in C:\MMSDATA and subdirectories under it, while the latter are stored in C:\MMSANAL and its subdirectories. The directories and subdirectories are:

DATA ARCHIVE DIRECTORIES	DATA ANALYSIS DIRECTORIES
C:\MMSDATA	C:\MMSANAL
C:\MMSDATA\INCLUDE	C:\MMSANAL\INCLUDE
C:\MMSDATA\WP	C:\MMSANAL\LISTING
	C:\MMSANAL\WORK
	C:\MMSANAL\WP

Briefly, the data archive contains the following types of files:

1. All cleaned data files ready for data analysis. These files contain all variables entered directly from Date Entry, any necessary conversion factors, and selected computed variables such as standard unit volumes. These are found in C:\MMSDATA.
2. Table-lookup files used to convert non-standard units to standard units (e.g., milk cans of maize meal to kilograms of maize meal). These files are also found in C:\MMSDATA.
3. Any SPSS/PC+ include files used to make necessary changes and transformations in the data files prior to use. These files are found in C:\MMSDATA\INCLUDE.
4. Questionnaire forms, data documentation, and other word processor files. These files are stored in C:\MMSDATA\WP ("WP" indicating WordPerfect)

Files related to data analysis include:

1. SPSS/PC+ include files which perform data analyses. These are found in C:\MMSANAL\INCLUDE.
2. Working data files (SPSS/PC+ system files) which are created and saved during the course of data analysis. An effort is made to minimize the number of such files saved. These files are found in C:\MMSANAL\WORK.
3. Word processing files, including all notes and reports produced from the data analysis. These files are located in C:\MMSANAL\WP.

DOCUMENTATION OF ARCHIVE SYSTEM AND TABLE LOOKUP FILES

Path = C:\MMSDATA*.*

January 22, 1993

FILE NAME	DESCRIPTION	VARIABLES
FICHA2.SYS	Inflow to Bazuca. Collected summer 92.	DIA, HORA, MES, ANO, PERIOD, INQ, BOA, B1-B10,
FICHA3.SYS	Outflow from Bazuca. Collected summer 92.	DIA, MES, ANO, PERIOD, MERCADO, INQ, C0-C8
FICHA5A.SYS	Interviews of Revendedores (Wholesalers in Bazuca) of all products except FMACF. Collected summer 92.	DIA, MES, INQ, R1-R18, VPREC, CONVR6, CONVR9, KG_BUY, KG_GRND
FICHA5B.SYS	Interviews of Revendedores of FMACF. Collected summer 92.	DIA, MES, ANO, INQ, RB1-RB35, COMP_PRE, COMP_PES
FICHA5C.SYS	Interviews of retailers of FMACF (Xipa or Campo or both?). Collected summer 92.	DIA, MES, INQ, RC1-RC35, MERCADO, LATAPREC
FICHA6.SYS	Sources of supply of maize grain and meals, retailers in Xipamanine, Vulcano, Componde, Mucoriamama, and Xiquelene; wholesalers in Bazuca, Componde, and Xiquelene. This data collected by Xico between Sep and Dec, 1992	MERCADO, MES, DIA, FA1, FA2, FA3, FA4, FA5
FICHA7.SYS	Time of operation as floor traders, and trading activities prior to becoming floor traders	MES, DIA, R1-R11C
CENSMEST.SYS	Census of floor traders in Bazuca Collected summer 92.	DIA, MES, INQ, HORA, PROD, ID, NSAC, SELCASE
MESTPREC.SYS	Daily prices in Xipamanine, Bazuca, and other markets in Maputo. These first collected by all 3 enumerators during summer. Xico has since continued the collection. Updates come from SEM-???.SYS files created in Maputo, inputted by Simão	ANO, MES, DIA, MERCADO, PROD, P1-P8, INQ, HORA, ERROR, SELCASE, TEMP, GMADOA, FLAGP6, SELCA, NEWVOL
ARRIVALS.SYS	Food aid arrivals from all sources, May 1990 - July 1992. Created from a JOIN ADD of AID9091.SYS and AID9192.SYS, which came from the MINCOM/Dpto Seg. Alim. yearly summaries Data is at	YEAR, MONTH, DAY, DONOR, DESTINAT, COMMODIT, ORIGIN, PLEDGED, DISCHARG, STATUS, DIST_PT, FILE, COMMERC
SGS.SYS	Daily unloadings of food aid. This is being updated with data sent periodically by Maputo office. Should be used as <u>second source</u> for daily unloadings data of USAID commodities. First source on U.S. grain should be SANTOS.SYS. SGS.SYS should be first and probably only source for non-USAID commodities	DAY, MONTH, SHIPNAME, CONSIGNE, QUANTITY

FILE NAME	DESCRIPTION	VARIABLES
SANTOS.SYS	Daily unloadings from Fernando Santos' Lotus files at USAID. This is the first source on daily unloadings, BUT is limited only to USAID shipments.	DIA, B9, TONS, PROV, SACKSREC, B3
USAWK.SYS	Combination of USAID collected Mucoriamama market and SIMA data. Used in Maputo for reports to U.S. Embassy. in E.L., will be used to access Mucoriamama data	
CONVF5.SYS	Table Look-up file of conversion factors for all FICHA5?.SYS	R6, CONVR6, R9, CONVR9, RB6, CONVRB6, RB10, CONVRB10, RB20, CONVRB20, RC6, CONVRC6, RC10, CONVRC10, RC20, CONVRC20
DENSITY.WK1	Original data for calculation of conversion factors	

ANNEX B

QUESTIONNAIRES

FICHA DO INQUERITO DO MERCADO
NIVEL RETALHISTA
MERCADOS

Dia _____
Mes _____
Mercado _____

Produto	Oferta no Mercado	Razões pela Oferta Observada	Unidade	Nº. de Unidades na nossa medida	Nº. de ml na nossa medida	Preço unitario	Oferta em 4 semanas	Razões pela Oferta Prognosticada
	1 Muito 2 Reg. 3 Pouco 4 Nao Existe		1 unidade 2 kilo 3 litro 7 lata de 10 L 8 lata de 20 L	Responde só se P3 = 1	Responde só se P3 = 1		1 Muito 2 Reg. 3 Pouco 4 Não Exist. 5 Não Sabe	
PROD	P1	P2	P3	P4	P5	P6	P7	P8
1 GMB/MOZ								
1 GMB/MOZ								
1 GMB/MOZ								
2 GMB/DOADO								
2 GMB/DOADO								
2 GMB/DOADO								
3 GMB/IMPORTADO								
3 GMB/IMPORTADO								
3 GMB/IMPORTADO								
4 FMBSF/IMPORTADO								
4 FMBSF/IMPORTADO								
4 FMBSF/IMPORTADO								
5 FMBSF/NACIONAL								
5 FMBSF/NACIONAL								
5 FMBSF/NACIONAL								
6 FMBSF/PILADO								
6 FMBSF/PILADO								
6 FMBSF/PILADO								
7 FMBCF								
7 FMBCF								
7 FMBCF								

FICHA DO INQUERITO DO MERCADO
NIVEL RETALHISTA
MERCADOS

Dia _____
Mes _____
Mercado _____

Produto	Oferta no Mercado	Razões pela Oferta Observada	Unidade	No. de Unidades na nossa medida	No. de ml na nossa medida	Preço unitario	Oferta em 4 semanas	Razões pela Oferta Prognosticada
	1 Muito 2 Reg. 3 Pouco 4 Nao Existe		1 unidade 2 kilo 3 litro 7 lata de 10 L 8 lata de 20 L	Responde so se P3 = 1	Responde so se P3 = 1		1 Muito 2 Reg. 3 Pouco 4 Nao Exist. 5 Nao Sabe	
PROD	P1	P2	P3	P4	P5	P6	P7	P8
8 GMA								
8 GMA								
8 GMA								
9 FMASF/IMPORTADO								
9 FMASF/IMPORTADO								
9 FMASF/IMPORTADO								
10 FMASF/TIXOTA								
10 FMASF/TIXOTA								
10 FMASF/TIXOTA								
11 FMASF/NACIONAL								
11 FMASF/NACIONAL								
11 FMASF/NACIONAL								
12 FMASF/PILADO								
12 FMASF/PILADO								
12 FMASF/PILADO								
13 FMACF								
13 FMACF								
13 FMACF								
14 FMAND								
14 FMAND								
14 FMAND								

FICHA DO INQUERITO DO MERCADO
NIVEL RETALHISTA
MERCADOS

Dia _____
Mes _____
Mercado _____

Produto	Oferta no Mercado	Razões pela Oferta Observada	Unidade	No. de Unidade s na nossa medida	No. de ml na nossa medida	Preço unitario	Oferta em 4 semanas	Razões pela Oferta Prognosticada
	1 Muito 2 Reg. 3 Pouco 4 Nao Existe		1 unidade 2 kilo 3 litro 7 lata de 10 L 8 lata de 20 L	Responde e so se P3 = 1	Responde so se P3 = 1		1 Muito 2 Reg. 3 Pouco 4 Nao Exist. 5 Nao Sabe	
PROD	P1	P2	P3	P4	P5	P6	P7	P8
15 FTRIG/NAC								
15 FTRIG/NAC								
15 FTRIG/NAC								
16 FTRIG/IMP								
16 FTRIG/IMP								
16 FTRIG/IMP								
17 FEIJ. NHEMBA								
17 FEIJ. NHEMBA								
17 FEIJ. NHEMBA								
18 FEIJ. MANT/NAC.								
18 FEIJ. MANT/NAC.								
18 FEIJ. MANT/NAC.								
19 ARROZ "TRINCA"								
19 ARROZ "TRINCA"								
19 ARROZ "TRINCA"								
20 ARROZ CORRENTE								
20 ARROZ CORRENTE								
20 ARROZ CORRENTE								
21 ARROZ EXTRA								
21 ARROZ EXTRA								
21 ARROZ EXTRA								

FICHA DO INQUERITO DO MERCADO
NIVEL RETALHISTA
MERCADOS

Dia _____
Mes _____
Mercado _____

Produto	Oferta no Mercado	Razões pela Oferta Observada	Unidade	No. de Unidades na nossa medida	No. de ml na nossa medida	Preço unitario	Oferta em 4 semanas	Razões pela Oferta Prognosticada
PROD	P1	P2	P3	P4	P5	P6	P7	P8
	1 Muito 2 Reg. 3 Pouco 4 Nao Existe		1 unidade 2 kilo 3 litro 7 lata de 10 L 8 lata de 20 L	Responde e so se P3 = 1	Responde so se P3 = 1		1 Muito 2 Reg. 3 Pouco 4 Nao Exist. 5 Nao Sabe	
22 ACUCAR AMAR.								
22 ACUCAR AMAR.								
22 ACUCAR AMAR.								
23 ACUCAR BRANCO								
23 ACUCAR BRANCO								
23 ACUCAR BRANCO								
24 OLEO AVUL/NAC								
24 OLEO AVULA/NAC.								
24 OLEO AVUL/NAC								
25 OLEO IMP./AVULSO								
25 OLEO IMP./AVULSO								
25 OLEO IMP./AVULSO								
26 AMEND. PEQ.								
26 AMEND. PEQ.								
26 AMEND. PEQ.								
27 AMEND. GRANDE								
27 AMEND. GRANDE								
27 AMEND. GRANDE								
29 MAND. FRESCA								
29 MAND. FRESCA								
29 MAND. FRESCA								

NO. DA ENTREVISTA	SEXO DO VENDEDOR	POR QUANTOS MESES TEM COMPRADO E VENDIDO PRODUTOS AGRICOLAS EM SACOS?	SI ANTES VENDIA PRODUTOS AGRICOLAS A RETALHO (EM CANECA), POR QUANTOS MESES FEZ ISTO?	PRODUTO QUE ESTA A VENDER AGORA (PRODUTO NO CHAO)	A VEZES VENDE OUTROS PRODUTOS?	NO. DE SACOS NO CHAO AGORA	VOCE A VEZES VENDE PRODUTO A RETALHO (VENDAS EM CANECA)?	QUAIS PRODUTOS COSTUMA VENDER EM CANECA?				ANTES DE COMECAR A COMPRAR E VENDER EM SACOS, COSTUMAVA VENDER ALGUM PRODUTO EM CANECA?	QUAIS PRODUTOS ANTES VENDIA EM CANECA?			
								R9A	R9 B	R9 C	R9 D		R10	R11 A	R11 B	R11 C
	1 Hom 2 Mul	Entre o numero de meses que está a fazer esta compra/venta em sacos	Entre o numero de meses que fez a compra/venta em canecas	8 GMA 9 FMASF/SUAZ 11 FMASF/CIM 13 FMACF 14 FTRIG 16 ARROZ	1 NUNCA 2 A VEZES 3 FREQUENTEMENTE		0 NAO (-->R9) 1 SIM	8 GMA 9 FMASF/SUAZ 11 FMASF/CIM 13 FMACF 14 FTRIG 16 ARROZ OUTRO (ESP.)	0 NAO (-->FIM) 1 SIM (-->R10)		8 GMA 9 FMASF/SUAZ 11 FMASF/CIM 13 FMACF 14 FTRIG 16 ARROZ OUTRO (ESP.)					
R1	R2	R3	R4	R5	R6	R7	R8	R9A	R9 B	R9 C	R9 D	R10	R11 A	R11 B	R11 C	R11 D
1																
2																
3																
4																
5																
6																
7																
8																
9																
10																
11																
12																
13																
14																
15																
16																
17																
18																
19																
20																

NDEA Working Papers

1. Informing The Process of Agricultural Market Reform in Mozambique: A Progress Report.
2. A Pilot Agricultural Market Information and Analysis System in Mozambique: Concepts and Methods.
3. Inquérito ao Sector Familiar da Província de Nampula: Observações Metodológicas
- 3E. A Socio-Economic Survey of the Smallholder Sector in The Province of Nampula: Research Methods (**translated from Portuguese**)
4. Inquérito ao Sector Familiar da Província de Nampula: Comercialização Agrícola
- 4E. A Socio-Economic Survey in The Province of Nampula: Agricultural Marketing in the Smallholder Sector (**translated from Portuguese**)
5. Inquérito ao Sector Familiar da Província de Nampula: O Algodão na Economia Camponesa
- 5E. A Socio-Economic Survey in The Province of Nampula: Cotton in the Smallholder Economy (**translated from Portuguese**)
6. The Determinants of Household Income and Consumption in Rural Nampula Province: Implications for Food Security and Agricultural Policy Reform
- 6P. Determinantes do Rendimento e Consumo Familiar nas Zonas Rurais da Província de Nampula: Implicações para a Segurança Alimentar e as Reformas de Política Agrária (**Traduzido do Inglês**)
7. A Socio-Economic Survey In The Province of Nampula: Smallholder Land Access and Utilization (**In Preparation**)
8. Dengo, Maria Nita, "Household Expenditure Behavior and Consumption Growth Linkages in Rural Nampula Province, Mozambique", M.Sc. Thesis, Dept. of Agricultural Economics, Michigan State University (**Reprint**)
9. The Maputo Market Study: Research Methods
10. The Maputo Market Study: The Organization, Behavior, and Performance of the Informal Food Marketing System (**forthcoming**)
11. The Maputo Market Study: Food Price Behavior in the Maputo Informal Sector (**forthcoming**)
12. The Economics of Food Aid Pricing and Distribution: Lessons from Mozambique (**forthcoming**)
13. The Maputo Market Study: Synthesis of Research Findings and Policy Implications (**forthcoming**)

Figure 2. Partial Map of the City of Maputo, with Location of Principal Informal Market Places

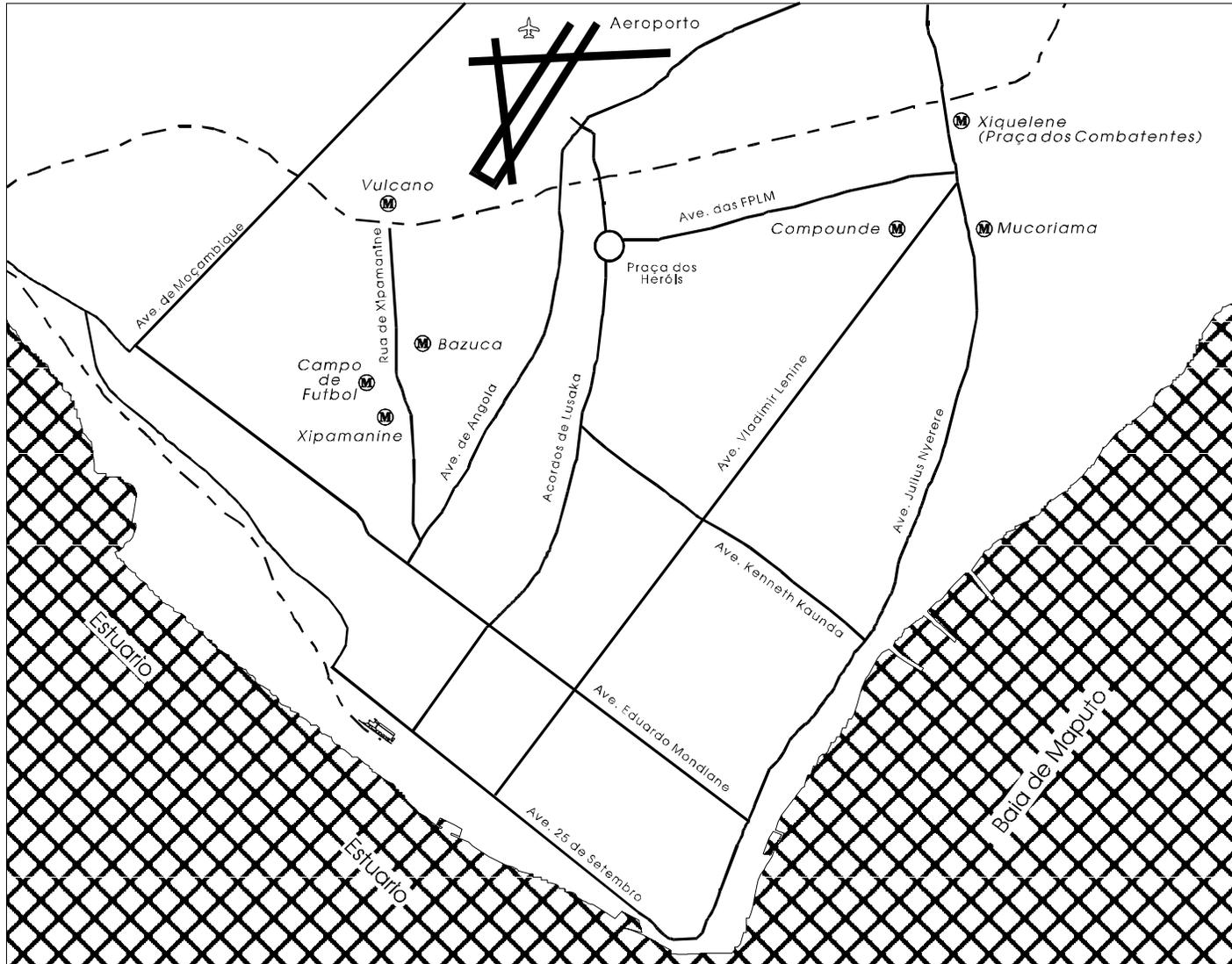


Figure 3. Research Activities Matrix, MOA/MSU/USAID Maputo Market Study (June 29 - August 25, 1992)

Key Market Events/Behavior	Weeks of June	Weeks of July				Weeks of August			
	29	6	13	20	27	3	10	17	24
Retail Prices for Yellow Maize Grain, Xip. Market		567	444	575	732	480	475	525	433
- Retail weekly mean price (Mt/caneca ¹)		600	500	750	1000	500	500	600	500
- Maximum price		500	350	500	450	400	400	500	400
- Minimum price		100	150	250	550	100	100	100	100
- Spread		20%	43%	50%	122%	25%	25%	20%	25%
- % Spread [(Max-Min)/Min]									
Commercial Food Aid Arrival (Metric Tons Unloaded)	-	-	-	-	6000	7000	2000	-	-
- EEC Shipment	-	-	-	-	-	-	3200	4040	14970
- USAID Shipment									
Research Activities									
Retail Price Collection									
Xipamanine	X X X X	X X X X	X X X X	X X X X	X X X X	X X X X	X X X X	X X X X	X X X X
Componde	X X X	X X X	X X X	X X X	X X X	X X X	X X X	X X X	X X X
Vulcano	X X X	X X X	X X X	X X X	X X X	X X X	X X X	X X X	X X X
Redistributor Price Collection									
Basuca	X X X	X X X	X X X	X X X	X X X	X X X	X X X	X X X	X X X
Componde				X X X	X X X	X X X	X X X	X X X	X X X
Other Basuca Data Collection									
Product Inflow/Outflow	X X X			X X X			X X X	X X X	
Floor Trader Interviews									
- Yellow whole meal traders				X	X	X		X	
- Traders of all other products				X	X	X		X	
Census of traders and product present				X	X	X	X	X	X
Storage volume & costs									
Other Market Information									
Port visits					X	X			
Wholesaler interviews in "Baixa"									
Retailer interviews									
- Xipamanine		X	X	X					
- Componde				X					
- Vulcano				X					
Trader cost case studies								X	
Bag & can weight experiments	X	X		X	X	X		X	
Milling experiments & data from APROC							X		
EACM and COGROPA visits							X	X	X
NSA shop visits			X						
Interviews with donors/consultants					USAID sem.		EEC	Austral	

¹ The "caneca" has become the standard unit of measure in informal sector Maputo markets. It is a 750 ml can that originally held powdered milk. Filled over the rim with product from the market, it holds between 800 ml and 850 ml.

² Retail prices were collected three to four times a week, as indicated by the number of X's.