

MAIZE MARKETING IN UGANDA //

BY

FAUSTIN RWIGEMA

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(a) First Supervisor



DR. H.K. MARITIM

(b) Second Supervisor



PROFESSOR O.L.E. MBATIA

DEDICATION

To my wife Ancilla Akayezu

LIST OF ABBREVIATIONS

<u>ABBREVIATIONS</u>	<u>MEANING</u>
P.M.B.	Produce Marketing Board
M.A.F.	Ministry of Agriculture and Forestry
U.C.T.U.	Uganda Co-operative Transport Union
m.t.	Metric tons
Kg.	Kilogram
B.O.U.A.S	Bank of Uganda Agricultural Secretariat
US\$	United States dollars
U.shs.	Uganda Shillings (US\$1 is equal to Ush.550 at the open market exchange rate and Ush.250 at the official exchange rate, April 1989)

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ABSTRACT

The maize marketing system in Uganda has several problems. The official maize marketing body, the Produce Marketing Board, has been unable to effectively buy the maize from the producers. This has been thought to be mainly due to its rigid pricing system of fixing pan-seasonal prices against a background of high inflation rate. The private traders who have taken on an increasing role of marketing the maize have been thought to be faced with a lot of problems. These include availability of working capital, transport and storage facilities. The purpose of this thesis is to describe the organization of the Uganda maize marketing system and to assess the structure, conduct and performance of the marketing system.

The primary data collected between March and May 1989 and secondary data from the relevant bodies were analysed and revealed the following results:-

Firstly, the rural-urban maize flow was mainly in the hands of the private traders who controlled more than 59 per cent of the marketed maize while the official Produce Marketing Board channel handled about 41 per cent or less. Secondly, the Produce Marketing Board pricing method restricts it from purchasing the amount of produce it would require. Thirdly, the volume of maize traded was concentrated in relatively few hands, with 10 per cent of the traders controlling 36 per cent of the maize handled. This was attributed to the existence of barriers to entry in the maize trade especially the capital required by the traders, which determined the volume of maize handled. Fourthly, it was

observed that though the markets were highly integrated price-wise, with all centres having correlation coefficients of greater than 0.6, this was due to traders' collusive tactics in influencing maize buying and selling prices to their advantage. It was further observed that traders earned profit of between 20 and 62 per cent of the marketing margin. This had the effect of either unnecessarily raising the consumer prices or affecting the rural seller, and possibly the farmer, in the form of low prices received for their maize.

For the improvement of the maize marketing system, it is recommended that the banking sector offer small traders credit facilities as this would greatly enhance their competitive position. The introduction of a dynamic market intelligence division to collect market information and inform the producers, the marketing intermediaries and consumers would go a long way in reducing the major marketing imperfections currently existing in the maize marketing system. The improvement of road conditions would also facilitate movement of produce and increase market arbitration.

The Produce Marketing Board stores that are not optimally utilized could be hired out to private traders (who have too small or poorly constructed stores) to enable them store produce which they can sell during times of scarcity. The Board could use the middle income consumer price index to adjust the maize buying and selling prices. This could then be announced either monthly or quarterly depending on whether prices in the parallel market have changed appreciably. The Board could also use its storage facilities to maintain strategic reserves.

CHAPTER ONE

INTRODUCTION

Agriculture plays an important role in Uganda's economy. In 1987 it accounted for 50 per cent of the Gross Domestic Product, over 95 per cent of the exports and 40 per cent of the Government Revenue (Uganda, 1988). It provides income to as many as 93 per cent of the population (Uganda, December 1984). The main staple foods are bananas, cassava, sweet potatoes, finger millet, maize and sorghum. In 1986 production of these commodities stood at 11.5 million metric tons, m.t., of which bananas accounted for 58.5 per cent, cassava 16.5 per cent, sweet potatoes 16.5 per cent, finger millet 3.5 per cent, maize 2.6 per cent and sorghum 2.6 per cent (Appendix 1). Since some of these crops are bulky in relation to their calorific value, a look at the main cereals - finger millet, maize and sorghum shows that maize accounted for 31 per cent of their total tonnage. Maize like most agricultural crops in Uganda, is grown under smallholder sector which employs over 80 per cent of the population (Uganda, December 1984). The marketing system which bridges the producer and the consumer can be understood by first looking at the salient aspects of production and consumption.

1.1 MAIZE PRODUCTION IN UGANDA

1.1.1 Historical Background

Maize was introduced in Uganda between 1863 - 1880 (Miracle, 1966). It grows between 0 and 8000 feet above the sea level, (Allute et al, 1976) implying that given suitable soil and

rainfall conditions, it can be grown in almost any part of Uganda. The growing of maize in Uganda was encouraged by the Colonial Government (Miracle, 1966). Initially, people used it as a luxury meal by eating it green. The famine of 1928 made the Colonial Government supply maize flour as relief and was also used in later famines. People were encouraged to grow it and by 1953, the area under maize was 267,870 hectares (Table 1.1)

TABLE 1.1: AREA UNDER MAIZE IN UGANDA AND PRICE PER BAG IN BUGANDA PROVINCE, 1939 - 1955

YEAR	HECTARAGE: ALL UGANDA (HECTARES OF MAIZE PLANTED)	PRICE: BUGANDA PROVINCE (SHS ¹ PER BAG)
1939	37,710	a
1944	127,990	7
1945	63,830	8
1946	124,540	8
1947	104,510	10
1948	119,700	8
1949	127,330	10
1950	128,120	10
1951	108,440	14
1952	121,910	45
1953	267,870	30
1954	190,890	b
1955	153,610	b

¹ Shillings in old East African currency units

KEY: a - Price free; no data
 b - "Price free"; estimated to have averaged Shs.17 and Shs.30 per bag in 1954 and 1955 respectively

SOURCE : ADAPTED FROM MIRACLE: Maize in Tropical Africa, 1966, p. 135

The increment in hectarage was a result of Uganda being called upon to produce as much maize as possible as part of her contribution to the Second World War effort and to fill postwar deficits in Kenya and the then Tanganyika (now Tanzania

mainland). Prices were guaranteed at a high level to encourage production and in some years, seed was freely issued. This resulted in more than tripled production by 1953 until incentives were removed in 1954 (Miracle, 1966). ✓

1.1.2 Recent Trends in Maize Production

Maize currently is grown in all districts of Uganda at subsistence level. The major maize producing areas are the vicinity of Lake Victoria extending to the Central Plateau, the high altitude areas of Kigezi (now Rukungiri and Kabale districts), the Rwenzoris, the West Nile plateau (Arua and Nebbi districts) and the Mount Elgon slopes (appendix 2 and Figure 1).

Figure 1 : ADMINISTRATIVE DISTRICT BOUNDARIES IN UGANDA, 1989
(MAP TO SHOW AREAS REFERRED TO IN THE STUDY)



KEY

- DISTRICT BOUNDARIES
- INTERNATIONAL BOUNDARIES

SOURCE : ADAPTED FROM BANK OF UGANDA AGRICULTURAL SECRETARIAT (MAY-JULY, 1988).

In most areas, ploughing is done manually using the hoe. However, in some places like Kapchorwa, Teso and Mbale, ploughing may be done using ox-ploughs; and of recent, tractors are gaining importance in ploughing. It was also found by the author that apart from Kapchorwa where some farmers use hybrid maize seed bought from Kenya, most other areas use seed retained at harvest. Fertilizers are rarely used.

Table 1.2 below gives the estimates of maize production provided by the Food and Agriculture Organization (FAO), the Ministry of Agriculture and Forestry (Uganda) (MAF), and the World Bank (1982). The figure obtained by FAO, MAF and World Bank at times vary from each other. This is because FAO estimates the production figures using the product of maize-area harvested and yield per hectare. Some times these estimates vary from the actual production figures given by MAF. The world Bank gets its figures from MAF and these two tend to agree with each other most of the time. The MAF figures are thus assumed to be most reliable.

TABLE 1.2 : VARIOUS ESTIMATES OF AREA UNDER MAIZE , YIELD AND TOTAL MAIZE PRODUCTION IN UGANDA: 1952 - 87

YEAR	FAO PRODUCTION YEAR BOOK ¹			SOURCE OF DATA MAF ² ANNUAL REPORTS		WORLD BANK ³	
	AREA HARVESTED	YIELD	TOTAL MAIZE PRODUCTION	AREA MAIZE HARVESTED	TOTAL MAIZE PRODUCTION	AREA HARVESTED	TOTAL MAIZE PRODUCTION
	'000 HA	MT/HA	'000 MT	'000HA	'000 MT	'000HA	'000 M.T
1952/56	186	0.950	176	n.a	n.a	n.a	n.a
1961	178	1.098	196	n.a	n.a	n.a	n.a
1962	171	1.112	190	n.a	n.a	n.a	n.a
1963	160	1.103	176	n.a	n.a	n.a	n.a
1964	193	1.140	220	n.a	n.a	n.a	n.a
1965	284	1.056	300	n.a	n.a	n.a	n.a
1966	306	0.892	273	n.a	n.a	n.a	n.a
1967	204	1.130	230	n.a	n.a	n.a	337
1968	275	1.136	335	n.a	n.a	n.a	307
1969	296	1.140	338	n.a	n.a	n.a	397
1970	300	1.117	335	n.a	n.a	n.a	388
1971	295	1.136	335	n.a	n.a	280	421
1972	300	1.250	375	n.a	n.a	415	500
1973	414	1.013	419	n.a	n.a	314	419
1974	388	1.302	505	n.a	n.a	388	430
1975	540	1.611	870	n.a	n.a	475	571
1976	526	1.200	632	n.a	n.a	526	674
1977	429	1.200	515	429	566	429	566
1978	550F	1.200	660F	450	594	450	594
1979	500F	0.906	453F	272	253	272	453
1980	258	1.109	286	258	286	259	286
1981	260	1.315	342	260	342	260	342
1982	280	1.404	393	285	393	280	393
1983	300	1.377	413	295	413	295	413
1984	347	0.810	281	347	281	347	291
1985	220	1.143	252	289	343	n.a	n.a
1986	322	0.887	286	295	354	n.a	n.a
1987	279	1.182	330	307	363	n.a	n.a
PROVISIONAL ANNUAL GROWTH RATES FOR							
1973-87(%)	-2.8	1.1	-1.7	-3.3*	-4.3*	0.9	-3.3
1973-78(%)	5.8	3.4	9.5	4.9*	4.9*	7.5	7.2
1978-87(%)	-7.3	1.7	-7.4	-4.2	-5.3	-4.2*	-11.2*

Notes

1. F = FAO'S OWN ESTIMATES

2. * = FIGURES USED DO NOT COVER THE WHOLE STATED PERIOD

3. n.a = NOT AVAILABLE

SOURCES: 1 = FAO PRODUCTION YEAR BOOKS (VOLUMES 34 TO 42 OF 1980 TO 1988)

2 = MAF: MINISTRY OF AGRICULTURE AND FORESTRY, ANNUAL REPORTS (VARIOUS)

3 = WORLD BANK: UGANDA: COUNTRY ECONOMIC MEMORANDUM, 1982

These figures show that production increased at the rate of 7.2 per cent p.a. between 1973 and 1978 (World Bank Column). There was however, a general decline in production of about 3.3 per cent p.a. between 1973 and 1987 (World Bank Column). A closer observation of 1978-87 production figures shows that there was a sharp decline in production of about 5.3 per cent p.a., 11.2 per cent p.a. and 7.3 per cent p.a. given by MAF, World Bank Column and FAO respectively. This was due to the 1979/80 "Liberation War" when Tanzanian troops and Uganda exiles toppled the Military government of Idi Amin, coupled with the 1980-81 drought, which brought production down from 594,000 m.t. in 1978 to 286,000 m.t. in 1980 (World Bank Column). From 1981, production rose steadily reaching an output of 413,000 tonnes in 1983 but again dropped to 281000 tonnes in 1984 due to the 1984 drought (MAF Column). From 1984 there was an upward increase in production and by 1987 this had risen to 363,000 tonnes - an increase of 8.9 per cent per annum (MAF Column).

1.2 MAIZE CONSUMPTION IN UGANDA

Atiku et al (1976) observed that maize flour was the main item of diet consumed by workers in Jinja and Kampala. They further pointed out that among the factors influencing the demand for maize in Uganda, was firstly, the rapid population growth in urban areas of between 4 and 10 per cent attributed to migration of people to towns in search of employment, and secondly, the relatively low price of maize that could be afforded by most

urban workers. The trend for rapid population growth was partially checked in 1970s when adverse security, chaotic and worsening economic conditions, collapsed industries, inflation, among others, made urban life unattractive (Uganda, 1984). Secondly, maize demand increased due to the government's emphasis on beef, milk, broilers and egg production as a means of diversifying the Uganda economy which has resulted in increased demand for maize as a high energy feed for livestock. It is the main grain used for feeding animals in many commercial and research farms in Uganda (Atiku et al, 1976). The authors also reported that maize is used for brewing local beer and has a potential industrial use in making starch and cooking oil. They reported that United Nations calculations showed that the income elasticity of demand for maize like most cereal foods is low, and was 0.2.

The increase in demand for maize would thus mainly come from increased population which as reported by Bank of Uganda Agricultural Secretariat, B.O.U.A.S, (Oct. 1988, p.10), increased by 3.2 per cent p.a. during 1976-81 while at the same time, food production declined at a rate 0.2 per cent and per capita food availability decreased by as much as 1.8 per cent p.a. (Table 1.3)

TABLE 1.3: PERCENTAGE GROWTH RATES OF POPULATION, FOOD AND AGRICULTURAL PRODUCTION IN UGANDA 1961-81

PERIOD	POPULATION GROWTH RATE	PRODUCTION		PER CAPITA	FOOD AVAILABILITY
		FOOD	AGRICULTURAL PRODUCTION	FOOD	AGRICULTURAL PRODUCTION ✓
1961-70	2.7	2.7	3.7	n.a	1.1
1970-76	3.3	1.2	0.6	-2.0	-2.6
1976-81	3.2	-0.2	n.a	-1.8	n.a

KEY;

N.A - NOT APPLICABLE

SOURCE: BANK OF UGANDA AGRICULTURAL SECRETARIAT (MAY-JULY, 1988, P.10)

An increase in maize production would partially help in alleviating the declining rate of per capita food availability. The per capita maize consumption is estimated in table 1.4 below. Currently, more than one third of Uganda's population consumes maize (Bank of Uganda Agricultural Secretariat, October, 1988, p.5).

TABLE 1.4: ESTIMATION OF PER CAPITA MAIZE CONSUMPTION IN UGANDA, 1982 - 86

YEAR	POPULATION (IN '000s)	AREA PLANTED '000m.t	MAIZE PRODUCTION '000m.t	MAIZE EXPORTS '000m.t	LOSS AT PRIMARY LEVEL '000m.t	RETENTION FOR SEED '000m.t	ESTIMATED HOME CONSUMPTION '000m.t	PER CAPITA CONSUMPTION (Kg/year)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
1982	14057	260	393	1.6	1.6	13.8	376.0	27.7
1983	14625	295	413	30.3	14.5	7.4	360.8	24.7
1984	15150	347	281	29.7	9.8	8.7	232.8	15.4
1985	15477	289	252	9.8	8.8	7.2	226.2	14.6
1986	16026	322	286	2.2	10.0	8.1	265.7	16.6

ASSUMPTIONS: (1) LOSS AT PRIMARY LEVEL ESTIMATED AT 3.5 PER CENT (B.O.U.A.S OCT, 1988 p.58)
 (2) RETENTIONS FOR SEED ESTIMATED AT 25 KG/HA

SOURCE: COLUMN (1) = FAO = PRODUCTION YEARBOOKS, ROME (VOLUMES 37 TO 42 OF 1983-88)
 (2) = APPENDIX 1
 (3) (4) = UGANDA = BACKGROUND TO THE BUDGET 1988/89

REST = AUTHOR'S ESTIMATES.

1.3 PROBLEM IDENTIFICATION

The performance of the agricultural marketing system in a country is of vital importance if both the consumer, the producer and the marketing intermediaries are to be satisfied. Efficiency in performance of the marketing system is likely to induce more production as producers will be gaining from better prices paid by consumers, and consumers will be paying a price reflecting the cost of the goods consumed.

There are two major maize marketing intermediaries namely, the Produce Marketing Board (PMB) and the private traders who transport maize from the surplus to deficit areas. To a lesser degree, the Primary Co-operative Societies are also involved in the ferrying of maize but these still either sell the maize to the PMB or to the private market channel.

In Uganda, there are various factors that act as a hinderance to the efficient performance of the maize marketing system. There are problems that are specific to either the PMB or to the private traders, and there are those that are common to both. The first problem is that the PMB fixes uniform buying prices throughout the country every financial year (Table 1.5).

TABLE 1.5: PMB BUYING PRICES AT DIFFERENT CHANNEL LEVELS FROM 14TH NOVEMBER 1988

UGANDA SHILLINGS ¹ PER KG			
MARKET LEVEL	BUYING CENTRE	REGIONAL DEPOT	CENTRAL DEPOT
BUYING PRICE PER KG (USHS)	35	40	45

1. The official and the open market exchange rate in November 1988 was Ushs.200 and Ushs.500 to one US Dollar respectively.

Note: It is assumed that the price difference of Ushs.5 between the Buying Centre and the Regional Depot or between the Regional and Central Depots caters for PMB transfer costs.

SOURCE: PMB, STATISTICS DEPARTMENT, KAMPALA, FEBRUARY 1989

Mention should first be made that maize bought by the PMB and the private traders is the white type. Normally the buyer (PMB or private trader) takes a sample from the bag and examines it manually to see if it is uniformly white and dry enough and to make sure that it is not moulded, dirty (with mud, stones or rubbish) broken or weeviled. The maize is then weighed and the seller is paid. The PMB requires that the moisture content in maize should not exceed 14 per cent. It also requires that the percentage of differently coloured maize in the white maize should not exceed 5 per cent. The private traders use the same criteria as the PMB's, only that they put less emphasis on some quality characteristics depending on their customers. Any maize that the buyer feels does not meet the minimum quality requirements with respect to the above mentioned quality

characteristics is either rejected or bought at a discount depending on the extent of the defect. Prices quoted in this study shall thus refer to maize with the minimum acceptable quality. ✓

With Uganda's high rate of inflation of about 150 per cent per annum (April, 1987 - April, 1988)¹, the farmers' costs will continue to rise throughout the year. Consequently, the PMB prices may then fall below the open market prices. Given this situation then, the questions that arise are: What effect does this fixing of prices over a "long" period of time amid such a high rate of inflation, have on the quantity of maize bought by the PMB? How does the PMB arrive at buying prices and are these justified? What effect does the pan-territorial pricing have on market integration? How do private traders benefit from such a pricing arrangement in "surplus" and deficit areas?

Maize transportation and storage facilities also pose a problem to both the PMB and the private traders. A report by a Commonwealth Secretariat Team of Experts (1979) revealed that due to Uganda's economic mismanagement of the 1970's, shortage of vehicles and spare parts continued worsening for several years. The report further says that the fleet of heavy commercial vehicles (lorries) in Uganda, which amounted to about 7,000 in 1970 had declined by about 50 per cent by 1978. This condition continued to worsen and by 1987 the number had fallen to about 3,235 (Uganda, 1988). This shortage of vehicles is likely to be

¹ Adopted from Appendix 3

a constraint to the maize marketing intermediaries. For example, the PMB has 10 buying centres, 3 regional depots, 2 central depots and several seasonal buying centres. Theoretically, each buying centre should have one lorry (BOUAS, May-July 1988, p.43). Yet it currently (1989) has only 13 lorries which are expected not only to operate at the PMB buying centres but also carry out intra-regional and regional-central depot produce transfers.

Viewed against the background of the decline in the number of vehicles, the private traders also face transport problems. The questions that arise here are: What are the modes of transport used by these two marketing intermediaries? Where do the marketing intermediaries get enough transport from?

Apart from the problems related to transport, the PMB and the private traders have storage problems. The PMB seems to lack enough storage facilities. This is reflected in the fact that the PMB has a storage capacity of 73000 m.t while the total marketable produce estimated for the year 1988/89 in the country was 245,681 m.t (Appendix 2). The PMB has a proposal to build 29 new buying centres (BOUAS, October 1988) and to expand the existing ones (Appendix 4) and it is hoped this will, to some extent, reduce the storage problems. On the other hand, a preliminary survey showed that some private traders who did not have enough stores stored the excess maize in open air and just covered it with tarpaulin. With such state of affairs, the questions that arise are:- Are the PMB stores optimally used? Who stores maize currently, given that the official storage

capacity is far less than the marketable produce? What are the underlying causes of the storage problems encountered by private traders?

The private traders have their unique problems with regard to their role in maize marketing. With PMB's marketing problems, the private traders have to play an important role in the transfer of maize from rural surplus areas to deficit centres. The questions that arise here are: How significant are the private traders in the maize trade? What is the competitive nature of the private traders? What type of transfer costs are incurred by these marketing intermediaries? What are the profit rates of these traders?

1.4 JUSTIFICATION OF THE STUDY

The need for increase in diversification of food production in the rural areas to create a surplus for rising urban nutritional needs has been stressed by the Uganda government (Uganda, 1988). The population of Kampala rose from 331,890 in 1969 to 544,400 in 1984 (Uganda, 1984). Kampala city alone contains about 50 per cent of Uganda's total urban population (Uganda, 1988). There is thus a need to meet the increased urban food needs through increased food production like of maize, among others.

The Government would like to boost production to achieve self-sufficiency so as to meet the country's food demand, to increase farmers' income and improve their living standards and

welfare (Uganda, 1988). The Government would also like to generate surpluses in maize to enable her earn foreign exchange and, through the PMB, fulfill her barter trade obligations. This calls for a study not only of the PMB operations but also the private traders.

A study is necessary to look into the competitive nature of the private traders and the constraints they face. The private traders' strategies, policies and operations need to be determined so as to assess their effectiveness in the transfer of maize from the surplus to deficit areas and thus be able to predict their future role in the maize trade.

The PMB marketing operations, strategies and policies also need to be looked into so as to assess its capability to compete with the private traders and to fulfill its obligations.

1.5 OBJECTIVES OF THE STUDY

The main objective of the study is to analyse the extent and nature of market imperfections as maize moves from the producer to the final consumption points.

In particular, the specific objectives of the study are:

- (i) to describe the maize marketing system in Uganda. Special attention will be given to marketing intermediaries and other functionaries involved in the marketing of maize in the country.
- (ii) to assess the structure of the system and the conduct of maize marketing intermediaries and finally,

- (iii) to evaluate the performance in terms of operational and pricing efficiencies in the maize marketing system.

1.6 HYPOTHESES TO BE TESTED

The hypotheses to be tested are directly related to the objectives of the study. These hypotheses are:

- (i) that there are substantial barriers to entry in the maize trade.

This hypothesis stems from the feeling that capital and transport facilities may be limiting factors for potential entrant traders making market arbitration difficult.

- (ii) that the price mark-ups in the transfer of traded maize are not accounted for by the transfer costs.

This hypothesis is based on the premise that since the Government does not fix the traders' buying and selling prices, and since there may be barriers to entry in the maize trade, the traders involved in the transfer of maize may collude in influencing buying and selling prices. This hypothesis also assumes that these high mark-ups are perpetrated because there is low market information flow in the maize marketing system.

- (iii) that prices offered to maize sellers in the rural areas, and possibly to farmers, are not completely influenced by the urban maize selling prices.

This hypothesis is borne out of the feeling that the few traders involved in the price of maize may not always pass the increase in the price of maize, over to the rural sellers because of the collusive arrangements by traders.

1.7 ORGANIZATION OF THIS STUDY

This chapter has reviewed the importance of maize in Uganda and the changes in production, marketing and consumption, that have taken place over the years. It has also reviewed the problems facing the maize marketing intermediaries. The objectives of the study have also been set out as: the description of the maize marketing system, the assessment of the salient aspects of market structure and conduct, and how these affect the maize market performance. The chapter has also highlighted some hypotheses that will be used in the assessment of the competitive nature and efficiency aspects of the maize marketing system.

To be able to achieve the above stated objectives, the rest of the study has been divided into five more chapters: Chapter two discusses literature review. It first presents the analytical framework that is used in most agricultural marketing research and the framework that has been adopted in this study. It also reviews several studies on agricultural marketing that have been carried in several countries including those done in Uganda.

Chapter three discusses the methods used in analysing the data and data collection. Chapter four describes the maize marketing channels and marketing intermediaries. It analyses some of the characteristics of marketing intermediaries relating to transport, storage and maize grain loss. Chapter five assesses the market structure and conduct and the impact these have on market performance. It analyses the competitive nature of the marketing intermediaries by looking at the maize market concentration, conditions of entry and market transparency. Analysis of the policies, strategies and tactics of the market participants is also used in the assessment of competitive actions of the marketing intermediaries. The effect the market structure and conduct have on efficiency of the marketing system is assessed using both relative technical and pricing efficiencies. Lastly, chapter six summarises the major findings of the study, and gives possible policy recommendations for the improvement of the maize marketing system.

CHAPTER TWO

LITERATURE REVIEW

This chapter looks at the conceptual framework for analysing agricultural marketing. It also reviews some studies on agricultural marketing that have been carried out in Uganda and elsewhere.

Pritchard (1969) has identified four elements necessary for analysing agricultural marketing systems in less developed countries. These elements are market structure analysis, a set of economic theories relevant to marketing, the theory of effective or workable competition and the general theory of economic growth.

Market structure analysis provides a model that may be used to assess performance of the agricultural marketing system. The key elements of the model are those of market structure, conduct and performance.

Bain (1968) defines market structure as those "characteristics of organization of a market which influence strategically, the nature of competition and pricing within the markets in which the market participants buy or sell". The characteristics most emphasised are the number of independent buyers and sellers, the degree of buyer and seller concentration, the degree of product or service differentiation and the condition of entry to market (Hays, 1975 p.3).

Market conduct refers to "patterns of behaviour which firms follow in adapting or adjusting to the markets in which they buy or sell (Bain, 1968 p.9). Hays (1975) suggested the important dimensions of conduct to include the methods employed by the firm in determining price and output, the product and sales promotion policy and the presence or absence of coercive tactics directed against either established rivals or potential entrants.

Market performance refers to the economic results that flow from the industry and how well it performs in terms of efficiency and progressiveness given its technical environment (Bain, 1968). These results can be measured in terms of prices, profits, product or service volumes, product qualities, product innovation and technical progress, among others (Hays, 1975 p.3). Market performance therefore, measures how the system approaches the "ideal" in satisfying the parties involved in the marketing. Economic theory predicts that in any economic system, market structure affects market conduct which in turn affects market performance.

The second element pertains to the theories of general economics relevant to agricultural marketing, namely: consumer's demand for farm products, the price system that reflects these demands back to distributors and producers, and the methods or practices used in exchanging title and getting the physical product from the producer to the consumer in the form and space required.

The third element concerns the theory of "effective" or "workable" competition which is a result of modification of the perfectly competitive model. The perfectly competitive market structure results in the most efficient market systems while the monopolistic market structures are relatively less efficient. The perfectly competitive market assumes that there is a large number of sellers and buyers. This would imply that the product handled by each seller or buyer is too small to affect the price should a single seller or buyer withdraw from or enter the market. It further assumes that the product is homogeneous so that no buyer is influenced by product quality; that consumers have no preference for particular sellers and that market information on supply, prices, standards and quality is perfect. The implications are that if all the buying and selling is carried out at a particular point in space and at a single instant in time, then a uniform price will prevail in the market.

The concept of the market is also expanded so that spatial and temporal price differences reflect transfer and storage costs respectively (Hays, 1975). Firms would earn some profits in the short run to reward the entrepreneurs' risk and management but excessive profits in the long run would act as a sign of unworkable/unacceptable competition. This workable competition theory also suggest that firms would be able to attain technical efficiency in use of capital resources.

The perfectly competitive market theory helps as a benchmark measure since the market does not exist in real world where a range of oligopolistic markets exist between the perfectly competitive and monopolistic markets.

Bain (1968) suggested a reasonably satisfactory competitive market structure that gives "workable" or "acceptable" or "effective" market performance as that having low degree of seller concentration, some extent of product differentiation and easy entry and exit.

The fourth element is that of the general theory of economic growth and its relationship to agricultural marketing. Bain (1968) predicted that in "workable" competition, the market would be able to adapt to changing market conditions. An effective agricultural marketing system facilitates an optimum allocation of resources in agricultural production and is a direct contributor to the total product as it increases place, time and form utilities of agricultural products.

Utilizing this broad research framework and using the market structure - conduct - performance approach to draw up a "checklist" for a number of variables, then the approximation to conditions of effective competition can be assessed and conclusions may be drawn about the efficiency of the maize marketing system in Uganda.

Harris (1982, pp.26-28) however cautions that analysis of market performance using the structure - conduct - performance approach has several limitations. It is argued that structural analysis of competition without regard to structural inter-relationships between production, exchange and distribution does not completely explain the marketing system. Harris (1982) also cautions that concentrating attention on behaviour of the commodity market without studying the inter-relationship between several commodity markets and between circulation of commodity and that of money, may limit the conclusions arrived at. These are essential to an understanding of the role that agricultural markets play in economic development fields like technological change in agricultural production, among others. Carrying out these studies however needs more data which is beyond the scope of this study. Some of the studies done on agricultural marketing are reviewed below. These studies are considered relevant because they offer various approaches to marketing research on aspects of competition and marketing efficiency that are used in evaluating market performance.

Maritim (1982) in a study on "Maize Marketing in Kenya" used the market structure, conduct and performance, among other tools, to assess the inter-regional commodity flow pattern. Features of the maize marketing system were described using availability and costs of transport and storage. Market structure was assessed using market concentration and the observed levels of inequality were explained using conditions of entry in the market and market transparency.

Maritim (1982) found that maize marketing was relatively concentrated and this was attributed to legal restrictions on maize movement between regions, low market transparency and high capital requirement in the maize trade. This formed part of the basis for his conclusion that market imperfections in the maize marketing existed. Maritim (1982) established that price differentials among markets were more than accounted for by transport and related handling costs. This was attributed to both market structure and government, through National Cereals and Produce Board, controls imposed on the system, like price fixing and issuing of inter-regional maize movement permits. It was observed that 60 per cent of the markets surveyed did not have National Cereals and Produce Board appointed agents and in the areas where they operated, they just waited for maize to be delivered by producers to their premises.

To assess the pricing efficiency among markets, Maritim (1982) used a bivariate correlation of 8 weeks moving averages of prices in 62 markets. Data from Central, Eastern, Rift Valley, Western and Nyanza provinces in Kenya were used. Maritim (1982) made the assumption that with effective market integration, a correlation coefficient "r" of 0.9 or more should be expected and inter-regional pricing efficiency was assumed satisfactory if "r" was 0.7 or greater. The results showed that the proportion of the correlation coefficient values greater than 0.6 was 35 per cent of the total values of "r" for Western and Nyanza provinces. This percentage represented the highest inter-

regional integration. The proportions of "r" greater than or equal 0.9 for inter-provincial markets were highest between Western and Nyanza (13.7 per cent) and least between Rift Valley and Western (0 per cent). This led him to conclude that there was poor inter-regional market integration.

Maritim (1982) however did not attempt to calculate capacity utilization of the vehicles and stores used by the marketing intermediaries. This would have given an indication of how capital resources are being utilized and hence its effect on allocative efficiency of the maize marketing system.

Jones (1972) did a study of the grain marketing system in Sierra Leone, Nigeria and Kenya by assessing market structure, conduct and performance. Jones (1972) looked at the organization of the marketing system, the traders' margins, seasonality of price variations and competition. In Southern Nigeria, seasonal price variations between rice, cassava, cowpeas, maize and yams in various markets were analysed. Seasonal price and storage costs and intermarket price correlations were also assessed. In Kenya, Jones (1972) studied the marketing systems of maize, beans, potatoes and bananas but concentrated mainly on maize, whereas in Sierra Leone, he studied the marketing systems of rice, palm oil, peanuts and cassava. In grain marketing, salient features observed were lack of market intelligence with respect to prices, erratic seasonal price changes accompanied by lack of seasonal stocks stored by farmers or traders and occasional shortages of maize in Kenya. Jones (1972) observed that the markets have rare collusions, easy entry and minimum cheating in

Nigeria (Op.cit,p.158). In the case of the government controlled maize market in Kenya and rice market in Sierra Leone, it was concluded that market control hampered private traders from actively participating in the grain marketing.

Hays (1985) also studied the marketing and storage of food grains in Northern Nigeria. Hays (1975) used market structure, conduct and performance approach supported by other characteristics that lead to progressiveness of the marketing system to enable him assess the efficiency of the millet and sorghum markets in Northern Nigeria. Hays (1975) assessed structural characteristics that determine market imperfections like storage, capital and credit, managerial level of traders and market information flow. He also assessed pricing efficiency using marketing margins, price correlations between 15 spatially separated markets and temporal pricing efficiency.

Price correlations between 15 spatially separated markets were obtained for both millet and sorghum. It was found that none of the correlation coefficients between any two markets was above 0.9 and only 1 per cent were above 0.80 for both crops. These low correlations between various markets convinced him to conclude that imperfections existed in the marketing system. Hays (1975) observed that these made effective arbitrage in response to spatial price differentials difficult. Spatial pricing was analysed by comparing monthly retail prices in the grain supplying areas with the parity price in the consuming markets. Price spreads were calculated between Zaria town and

the six markets supplying it with millet and sorghum. These markets were Katsina, Kafinsoli, Daudawa, Sokoto, Gusau and Kano. The parity price in the consuming market was calculated as the retail price in the consuming market less the costs of transferring the grain from the supplying area to the consuming area. The parity price in the consuming area was expected to approximately equal to the retail price in the supplying area. This was calculated for the months of 1969 to 1971.

Hays (1975) observed that the average price spread or price differentials between the two markets less transfer costs were negative most of the times for both millet and sorghum.¹ In Kafinsoli for example, it was observed that the price spread for millet was negative for all the months of 1969 and 1971 and most of the months of 1970. With respect to sorghum, the price spread was positive for most of 1969, but negative for 1970 and 1971. The positive price spreads only came from erratic nature of supply, inadequate dissemination of information on prices and supply in various markets and the lack of specialization in trade on the part of traders taking part in arbitrage between these markets rather than planned manipulation under monopolistic or monopsonistic conditions. This led him to conclude that it is not possible to accept the hypothesis that the markets for millet (and sorghum) are closely inter-related.

¹ Price spread is also calculated as parity price less retail price in the supplying market.

With respect to temporal pricing efficiency, Hays (1975) analysed the 1969-71 seasonal price variations in relation to costs of storing grain. Hays (1975) observed that in a perfect market, economic theory suggests that post-harvest price rise should equal the cost of storing the grain. This approach however neglected inflation component. The costs of storage used were rent, grain loss, depreciation of sacks and interest of capital used to purchase the grain for storage.

Hays (1975) found that average net seasonal rise in price per month were most of the times positive and thus traders had the opportunity of earning more than normal profits. However, since other characteristics related to storage show that storing was mainly done by farmers, the traders could not have gained from these seasonal price rises and any profit could have been used to reward the risk involved in this trade. This led him to conclude that there was no evidence to suggest that the temporal pricing was inefficient. To be able to accurately establish traders profit, individual traders should have been assessed rather than using prices in the markets.

Schmidt (1979) studied maize and beans marketing system in Kenya. The study assessed the functioning of the Kenya maize and beans marketing system with regard to interaction of the formal (controlled) and the informal (uncontrolled) subsystems. Schmidt (1979) analysed the market structure in terms of the degree of market concentration, market transparency and entry conditions. Schmidt (1979) found the uncontrolled market to be

relatively unconcentrated (or having a large number of traders), and having low barriers to entry. Thus, the market concentration and conditions of entry were conducive to the functioning of a competitive market. This, however, was being weighed down by lack of market transparency. It was observed that there was lack of uniform measurements and standard grades in the maize buying and selling operations. The traders also tended to be only concerned with knowledge of prices within their immediate neighbourhood. The controlled subsystem was a monopoly of the Maize and Produce Board (MPB) which fixed prices at which it bought and sold the maize. Schmidt (1979) concluded that the informal subsystem was more competitive than the controlled subsystem.

Schmidt (1979) assessed market performance by evaluating the operational and pricing efficiencies. In assessing the operational (or technical) efficiency, Schmidt (1979) used the costs incurred in performing the various marketing functions and investigated whether these were necessary or not, or whether they could be reduced. Some of the costs were found unnecessary and could be reduced or eliminated if the controls imposed on the marketing system, like mandatory selling of maize to MPB or inter-provincial maize movement permits, were relaxed. The costs that could be reduced were bribes to traffic police and the costs of transferring maize from the MPB's agents to her stores and later from the MPB stores back to the agents for sale.

To test whether the private market traders were exploitative, Schmidt (1979) used a regression of maize selling price on buying price. He also used correlation of profit margins on buying price. It was found that 70 per cent of the variation in selling prices were explained by buying prices and the regression coefficient of 0.916 was significantly different from one (1). The low correlation coefficient between profit margins and buying price (-0.137) indicated that profit margins were independent of prices. This led him to conclude that traders worked with fairly constant profit margins and if any excess profits were earned, this could not have resulted from unscrupulous nature of traders, but due to other structural imperfections in the maize trade.

Other studies done in agricultural marketing utilizing aspects of market structure, conduct and performance include Waswa-Wangia (1977), Ireri (1976), Kariungi (1976) and Ngumi (1976) in Kenya; Oloya and Poleman (1972) and Atiku et al (1976) in Uganda. Waswa-Wangia (1977) studied the competition and efficiency of food retailing to the low income consumers in Nairobi areas of Mathare Valley, Makadara and Huruma Estate. Waswa-Wangia (1977) analysed market concentration using percentages of sales by the first biggest 2, 4 and 8 retailers.

There was low seller concentration in the food retail with low initial business capital though traders lacked enough capital to hold optimal volumes and for purchase of equipment like refrigerators. Credit was not easily available as this would

only be given to organized business enterprises. There was sufficient information flow among the retailers as most of them based their selling prices on the wholesale prices which tended to be the same for people or traders in the same locality. There was high produce wastage and spoilage especially with fresh food items and thus high marketing costs that necessitated high prices to the consumers for the none price controlled items. This was partly used to show that market imperfections existed in the low income retail trade. Bargaining was also used as a means of increasing the retailer's sales. Efficiency in retailing was studied using marketing margins, spoilage and wastage, productivity and progressiveness.

Waswa-Wangia (1977) recommended among other measures, the formation of groups which could then be given credit from banks and food suppliers. It would seem however, that getting credit from suppliers would be individual arrangement with the supplier.

Ireri (1976) carried out a study of the structure, conduct and performance of Kutus and Ithare maize markets of Kirinyaga district as a maize surplus area while Kariungi (1976) did a similar study in Tulia, Kitui and Kabati maize markets of Kitui district, as a maize deficit area. These studies were simultaneously carried out by Ireri (1976) and Kariungi (1976).

Ireri (1976) studied maize distribution, price movements, interregional wholesale price correlations and market information flow. It was found that the Maize and Produce Board took only 10 per cent and 3 per cent of the maize traded in Kutus and

Ithare markets respectively while the rest was taken by the private traders to Kitui and Machakos. Ireri (1976) also found that free market prices fluctuated appreciably and were consistently below the Board's prices both in surplus and deficit areas in the glut season when the research was being carried out. This was at variance with with the Board's objective of influencing prices. There was low interregional market integration. This led him to conclude that the official pricing system caused price distortions in the maize trade in a country like Kenya which had distinct maize deficit and surplus areas.

Kariungi (1976) also studied maize marketing in Kitui, Tulia and Kabati market of Kitui district. Data collected related to quantities of maize moving through Kitui, Tulia and Kabati open-air markets, the Maize and Produce Board and the shops; the price movements in the open-air markets; the origin of the maize traded, and the transportation and storage costs. Kariungi (1976) found that the Board's arbitration between Kirinyaga and Kitui districts was minimal. The local open-air markets in Kitui were characterized by uniformity of retail prices during the glut season in the neighbouring Kirinyaga district. Illicit traders shipped a lot of maize which depressed the prices and was thus beneficial to Kitui consumers. He also found that both the local and inter-regional subsystems were not integrated and had a considerable degree of monopolistic competition. The correlation coefficients between both retail and wholesale prices in the markets studied were found to be less

than 0.5. This was attributed to poor market intelligence between regions. The lack of physical handling facilities, lack of standardized measures and storage facilities contributed to market disintegration (Kariungi 1976, p.68).

Among other researchers who have utilized price correlations among markets as an indicator of pricing efficiency are Thakur (1973) in India and Lele (1965). Lele's (1965) study of sorghum marketing in India found 46 per cent of the correlations to be above 0.8 with only about 10 per cent less than 0.7. Thakur (1973) also analysed the pricing efficiency of marketed apples in four wholesale markets of New Delhi, Calcutta, Madras and Bombay, and found that correlation coefficients ranged from a low of 0.72 (between New Delhi and Bombay) to a high of 0.86 (between Calcutta and Madras). These high correlations between prices in various markets led them to conclude that the markets were competitive.

The study by Ngumi (1976) on seasonality of supply patterns and pricing efficiency for slaughter cattle in Kenya also showed that market distortions are brought about by market controls. Ngumi (1976) observed that the Kenya Meat Commission arbitrarily fixed beef meat prices without regard to seasonal fluctuations or market forces of demand and supply. Smith (1969) in a paper entitled "Resource Allocation, Income Redistribution and Agricultural Pricing Policies in Kenya" pointed out that agricultural price policies are better suited to secure an optimal allocation of resources rather than as a device for

redistribution of income to the rural areas. The paper goes on to say that for optimal allocation of resources concept, it can be argued that in an area where there are various land use options, the adoption of any agricultural activity can be encouraged or discouraged by use of certain pricing policy.

In Uganda, maize production could also be stimulated by appropriate maize price policies. An investigation into the price policies of the maize marketing intermediaries was therefore appropriate at this time. Past studies on maize marketing in Uganda have tended to be confined to mere price changes in the markets without due regard to structural and competitive aspects of the market that influence the marketing efficiency.

Atiku et al (1976) carried out a study on maize marketing in Uganda with particular reference to the Northern Region (Arua, Moyo, Nebbi, Apac and Lira districts). These areas were producing maize mainly for subsistence purposes. The study was carried out in order to assess the possibility and prospects of maize becoming an important cash crop in Northern Uganda. The authors collected data on quantity and price of maize in selected markets. A regression analysis of quantity of maize marketed on its price showed that only 2 per cent of the variation in the marketed quantity of maize was due to variations in price. They further found out that the price elasticity of supply was 0.46 indicating that the quantity offered for sale was not very responsive to price changes. Using a t-test statistic on gazetted and local market prices for the period 1968 - 73, it was

found that there was a significant difference between the two prices - the local market price was greater than the gazetted prices.

The fact that maize production in northern Uganda was not price-responsive, could in fact imply that there are factors militating against maize production to make it one of the cash crops. Several gaps were left by the study by Atiku et al (1976). For example, no attempt was made by these authors to establish the marketing imperfections existing in the maize trade. The study neglected barriers to entry in the maize market. It is possible that the traders lacked capital to purchase the maize or had no knowledge of market prospects outside the region. The study should have also addressed how the private traders set their prices in both the maize source areas and in the market outlets. Marketing facilities like vehicles, stores and weighing scales, among others, should have been assessed to establish both their availability and cost.

To determine the efficiency of the marketing system, the study should have assessed the profit margins of the marketing intermediaries so as to establish whether marketing margins reflected transfer costs. Another aspect that could have been investigated is the storage activities and storage costs of both the traders and the producers and the costs to be interpreted in relation to maize price rises over time. Maize wastage and spoilage could have been estimated and used as an indicator of the level of marketing efficiency.

A slightly related study though on different commodities is that by Oloya and Poleman (1972). These two authors examined whether market imperfections existed in the food marketing systems in Kampala by analyzing retail price movements over time. The commodities covered were cooking bananas (matoke), sweet potatoes and fresh cassava. The prices of these commodities in Mulago and Nsambya markets were regressed and the results obtained used to determine the existence of market imperfections. A coefficient of determination, r^2 , of less than 0.5 was taken to imply that the two markets are not well integrated. They found that the coefficients of determination were 0.144 for plantains, 0.000 for sweet potatoes and 0.117 for fresh cassava. These figures suggested that the variation in prices in one market did not vary directly with the prices of the same commodity in the other market. These low coefficients of determination suggested that the allocation of commodities between the two markets was less than optimal and this convinced them to conclude that the two markets were not closely integrated.

This study by Oloya and Poleman (1972) also neglected the important aspects of market structure and the pricing policies, the behaviour of market participants and how these affect or relate to market performance. For a clear understanding of performance of a marketing system, salient features in the market structure and conduct have to be understood. These would then help in explaining the observed marketing inefficiency.

CONCLUSION

This chapter has presented the theoretical framework used in most studies on agricultural marketing. Several studies on produce marketing that have been carried out in several countries have also been reviewed to throw light on the approaches used. It seems that the appropriate approach to the assessment of any marketing system depends on the nature of the problem and the data available. As is evident from the above, published studies on maize marketing in Uganda are scanty. The few studies that have been carried out on produce marketing in Uganda, have given little attention to the the salient aspects of market structure and conduct which determine competition and efficiency of the marketing system. Atiku et al (1976) did not address themselves to either the constraints faced by the Produce Marketing Board and private traders or to the market conduct of these marketing intermediaries.

CHAPTER THREE

METHODOLOGY

This chapter describes the methods used in assessing the performance of the Uganda maize marketing system. The market structure, conduct and performance approach was used to draw up a 'checklist' for a number of variables. These variables were assessed to determine how they affect the degree of competition and efficiency of the maize market. The first section explains how primary and secondary data used in this study were collected, and the second section discusses the methodologies used.

3.1 SAMPLING METHODS AND DATA COLLECTION

Two types of data were collected. These were primary and secondary data.

3.1.1 Data Sources

Secondary data were mainly obtained from the Ministry of Agriculture and Forestry, Ministry of Marketing and Co-operatives, the Produce Marketing Board, Bank of Uganda Agricultural Secretariat and vehicle dealers. Discussions were also held with the relevant authorities which provided the secondary data.

Primary data were obtained from the Produce Marketing Board, the private traders and primary co-operative societies. The private traders interviewed were store owners, transport traders, posho millers and wholesalers.

Two hundred and sixty five questionnaires were administered by the enumerators who had been trained by the author. Most traders were interviewed only once using the questionnaire form A. In centres where traders were few and it was felt that transportation costs or prices had changed after a certain period, say two or three weeks, or where the same trader used different means of transport, then this trader would again be interviewed to determine the new transfer costs or maize buying and selling prices. To avoid repetition of all other questions on form A, a new form (Form B) would be used. The formats of these two questionnaires are given in appendices A1A and A1B.

3.1.2 Pretest Survey

A pretest survey was carried out in Kampala at Uganda Railway Yard depot and Kamwenge trading centre. The purposes of this pilot survey were to test the validity of the questionnaire and get an initial glimpse of the problems that would be encountered in the main survey. Only five (5) respondents in each centre were interviewed. Results of the pilot survey which were analysed within one week, helped in the final design of the questionnaire (Appendix A1A and A1B).

3.1.3 Sampling Method

The centres and respondents were chosen using the following method:

Firstly, a list of maize-producing districts of Uganda was obtained from the Produce Marketing Board (see Appendix 2). A

list of the top 10 maize-producing districts was made after adjusting the 'population' districts by eliminating insecure ones affected by rebel activity. This gave Iganga, Tororo, Kapchorwa, Mubende, Mbale, Kamuli, Kabalore (Kamwenge centre), Mbarara, Masindi and Jinja districts. Four districts were chosen by simple random method. These were Kabalore (Kamwenge centre), Tororo, Mubende and Mbale (Sironko centre) districts. Kampala as the major consuming area had two major market areas, Kawempe and Railway Yard depot and these were chosen.

When Mubende and Tororo were visited, it was found that there were virtually no traders in these places as the maize had just got exhausted. Because of time limitation, it was not possible to wait for another season, so Mubende was replaced with Jinja and Tororo with Kapchorwa (Figure 1 and 2).

In selecting the respondents at the chosen centres, the enumerators were to wait for the traders bringing maize. A trader arriving would be interviewed, if it was found that he had not been interviewed before. Where more than one traders arrived at the same time, those who had been interviewed before were first excluded, then a trader would be selected from the new ones (those not already interviewed) by simple random method. If he refused to co-operate, another trader would be chosen by random method from the remaining ones. After interviewing the chosen respondent (which was estimated to take up to 30 minutes), the next trader would be chosen according to the above procedure. This continued until between 3 and 7 respondents had been

interviewed. The exercise was carried out three times a week. This rate was expected to give about 50 respondents per centre in the 9 weeks of the survey. Store owners were interviewed at the opportune time the enumerator found, as these operated from their stores at the centres.

3.1.4 The Sample Size

From the six centres, a total of 220 respondents were interviewed (Table 3.1). There were 45 repeated respondents giving 265 cases. The initial plan was to interview equal numbers of respondents from the six centres but some areas had more maize marketing intermediaries than others leading to the adjustment of the sample selected at each centre to reflect the relative magnitude of number of traders.

TABLE 3.1: SAMPLE SIZE USED DURING THE INTERVIEW IN THE SIX CENTRES IN UGANDA, MARCH-MAY, 1989

(NUMBER OF TRADERS INTERVIEWED)

CENTRE	NUMBER OF PMB AGENTS	NUMBER OF PRIVATE AGENTS	OTHER	SUB-TOTAL	REPEATED CASES	GRAND TOTAL
1. KAMWENGE	29	27	0	56	11	67
2. SIRONKO	1	24	0	25	2	27
3. KAPCHORWA	5	29	0	34	11	45
4. JINJA	3	19	1	23	3	26
5. KAWEMPE	1	32	4	37	3	40
6. UGANDA RAILWAY YARD DEPOT (KAMPALA)	1	38	6	45	15	60
TOTAL	40	169	11	220	45	265

NB: - OTHER - INCLUDE PRIMARY CO-OPERATIVE SOCIETIES AND GOVERNMENT PARASTATALS LIKE UGANDA GRAIN MILLING CORPORATION

SOURCE: SURVEY RESULTS.

3.1.5 The Formal Survey and Questionnaire Administration

After deploying the enumerators in the sampled areas, the survey started in all the centres on the same day. The main method used in collecting data was by personal interviews by enumerators administering the questionnaires (Appendix A1A and A1B). At the chosen centres, a trader bringing maize was first asked if he was the actual trader in-charge of the maize consignment. If he confirmed it, then the enumerator administered first questionnaire (appendix A1A) if he had not been interviewed before. At the selling points, the posho mill owners, the wholesalers, the managers of the Railway Yard depot or the store owners helped in identifying the maize traders and also assisted in informing the enumerator when these traders normally arrive. For the store or posho mill owners, the interview was carried out once and if later the enumerator felt that there had been price/cost changes, then he revisited the trader with form B of the questionnaire.

3.2 METHODS OF DATA ANALYSIS

The main tools and methods used in data analysis were descriptive statistics, correlation and regression analyses. The maize marketing system was first assessed by describing the maize marketing channels and marketing intermediaries. Certain characteristics of the marketing system relating to costs, availability and modes of transport were discussed. Also assessed, were storage costs and storage activities.

Market structure influences market conduct which in turn influences market performance. Competition and efficiency were assessed using elements of 'Market Structure Analysis' as shown below.

3:2:1 MARKET STRUCTURE

In assessing market structure, three indicators of competition were used, namely: maize market concentration, the conditions of entry in the maize market and market transparency.

3:2:1:1 MAIZE MARKET CONCENTRATION

Maize market concentration was used to establish the level of market control. It gives an indication of the existence or absence of potential monopoly power (Bain, 1968). Three methods of assessing market concentration were used to support each other and these were:-

i) The Percentage of the Volume of Maize Handled:

Maize market concentration was measured by the percentage of the volume of maize handled, each month, by the first largest 4 and 8 traders and the first largest 5 per cent and 10 per cent of the traders. If a high percentage of the maize volume is handled by a small percentage of traders, this normally indicates that the marketing system has monopolistic tendencies and hence poor market competition.

ii) Lorenz Concentration Curves:

The Lorenz concentration curves were also used to indicate the level of inequality in the maize marketing system. If the maize volume handled was equally distributed among the traders, then any given proportion of traders would handle an equivalent proportion of the traded maize. For example, 10 per cent of the traders would handle 10 per cent of the maize while say, 30 percent of the traders would handle 30 per cent of the traded maize and so on. Thus, cumulative percentages of the maize handled would equal the cumulative percentages of the traders. Graphically cumulative percentages of volume of maize handled (on the vertical axis) plotted against cumulative percentages of number of traders (on the horizontal axis) would give a curve lying along the line of equal distribution if the volume of the maize handled by the traders was equally distributed among the traders. The line of equal distribution is a line bisecting the horizontal and vertical axes (i.e the 45° line). If the traders are arranged in ascending order of the volume of maize handled, and the maize handled is not equally distributed, then the Lorenz curve just described above, would lie below the line of equal distribution. This would be so because the first 5 per cent, say, of the traders would handle less than 5 per cent of the maize transacted, and so on. Cumulative percentages of the monthly quantity of maize handled by the traders were plotted against the cumulative percentages of the number of traders

to give the Lorenz curves for the different centres selected. The further away the curve (Lorenz curve) is from the line of equal distribution, the greater is the degree of inequality.

The degree of inequality can also be measured using gini coefficients as explained below.

iii) Gini Coefficient

The gini coefficient is obtained as the ratio of the area between the Lorenz curve and the line of equal distribution, relative to the total area below the line of equal distribution. This is known as the graphical method. The value of the gini coefficient ranges between zero, for complete equality, and one (1) for complete inequality. High gini coefficients indicate monopolistic tendencies while low values of the gini coefficient indicate low monopolistic tendencies.

An alternative approach to the calculation of the gini coefficient suggested by Andic and Peacock (1961, p.208), is given below

$$\text{Gini coefficient} = \sum_{k=2}^n (P_{k-1}Q_k - Q_{k-1}P_k) \frac{1}{10,000}$$

for k = 2, 3, n

n = number of cumulative percentages being considered, P and Q, in our case, represent cumulative percentages of traders and the monthly volumes of maize traded

respectively, and the division by 10,000 is done to eliminate the effect of the magnitude of the two percentages, P and Q being multiplied (i.e 100 x 100). This gives the gini coefficient as a proportion which is less than 1.

Both the graphical method and the Andic and Peacock (1961) gini coefficient formula were used to establish the extent of inequality in all the selected centres. The observed levels of market control were explained by assessing the conditions of entry in the maize market.

3:2:1:2 CONDITIONS OF ENTRY

A business organization that is making profits will attract other firms to enter the business to partake of these profits unless they are significant barriers to entry. Their ability to enter the industry will be determined by the existing barriers to enter the industry. The condition of entry to an industry determines the competitive relationships between established sellers and potential entrants sellers and thus, the force of potential competition by new entrants (Bain, 1968 p.251). The height of the barriers to entry to an industry may strongly influence both the conduct and performance of established sellers and the stability of the seller concentration and product differentiation within the industry. The condition of entry may be taken to mean the "advantage" of the established firms over potential entrants. Dahl et al (1977) point out that among the

factors that may influence entry to and exit from the industry, are unique managerial or technical competence held by existing firms and absolute entry costs that are prohibitive. The conditions of entry were assessed by examining managerial knowhow, legal restraints, capital requirements and the availability of physical facilities.

MANAGERIAL KNOWHOW

For a firm to survive in business, it has to be able to adapt itself to changing market conditions such as consumer demand, competition and technology. This entrepreneurial ability can be measured by the firm operators' educational level and experience in business.

(a) Formal Education

The formal education will be judged satisfactory for the entrepreneurial requirement in maize trade, if the trade has primary education level of seven years.

(b) Business Experience

The number of years a trader has been in business is expected to increase the entrepreneurial ability of the trader due to the accumulated practical knowledge. The number of years one has been in business was also examined using simple cross tabulation.

LEGAL RESTRAINTS

Legal restrictions like obtaining trading licence and restrictions on areas of operation may act as a barrier to entry in the market. If these are imposed on a marketing system, they may affect traders' competitive level and hence marketing efficiency. Studies done in Kenya by Schmidt (1979) and Jones (1972), among others indicated that legal restrictions adversely affected agricultural marketing. Simple proportions of traders having problems in obtaining licences and in operating in different areas were assessed.

CAPITAL REQUIREMENT

Lack of capital constitutes a barrier to entry in a market (Bain, 1968). For a trader to enter the maize trade, he requires capital to start the business. This is required for the purchasing or hiring of physical facilities like transport vehicles, stores, weighing scales and money to purchase and market the maize. He may however borrow from lenders if these are available.

Capital required by traders was assessed using mean values and its range distribution. To assess the extent to which the capital possessed by the traders is scattered around the mean, the standard deviation and coefficient of variation were both used. The standard deviation will give an indication of the variability, and hence, the inequality in the amount of capital possessed by the traders. A small standard deviation would imply

that the variability in capital possessed by traders is just due to random factors while a large value of the standard deviation would call for an investigation into possible factors causing the large variability. The coefficient of variation, CV, is a more appropriate measure when comparing variability for data whose means are of divergent magnitudes. The coefficient of variation is defined as the population standard deviation divided by the mean and expressed as a percentage (Gupta 1985 and Wonnacott and Wonnacott, 1972). When the population standard deviation is not available, the sample estimate for the population standard deviation is used. The estimate for population standard deviation, S, for a sample was calculated as,

$$s = \sqrt{\frac{\sum(x_i - \bar{x})^2}{n - 1}}$$

where x_i = capital possessed by trader i in Uganda shillings

n = number of traders in the sample

Closely related to capital possessed by traders is the possibility of traders who do not have their own capital to borrow from other sources, the availability of transport and storage, and lastly the ease with which traders obtain other facilities like gunny bags and weighing scales. The availability of these was also examined using simple proportions.

3.2.1.3 MARKET TRANSPARENCY

Markets may not be integrated due to low degree of market transparency i.e lack of market information flow to encourage arbitration. The market knowledge is the information held by market participants (buyers and sellers) that permit them to make informed decisions in the market environment in which they operate (Dahl et al 1977, p 234). Important elements of market transparency examined were the market participants' awareness of their competitors' source of maize supply and their buying price, and their competitors' market outlets and prices fetched in these markets. These were examined to determine whether market information flow affected the intensity of competition.

All this information on conditions of entry were used to test the hypothesis that substantial barriers to entry in the maize market exist.

3.2.2 MARKET CONDUCT

Market conduct relates to firm's policies towards its product market and towards moves made by its rivals. The behaviour of the firms will thus have the following major components:-

- i) The methods the firms use to determine price and output.
- ii) The methods which the firms use to determine product's quality and
- iii) The methods which the firms use in order to react to moves made by their rivals.

The methods used in the determination of price levels and profit margins have an effect on competition and efficiency of a marketing system. The policies, strategies and tactics used by the marketing intermediaries in purchasing and selling operations have always called for government intervention in agricultural marketing, through marketing boards and price controls (Schmidt, 1979 and Maritim, 1982). In a perfectly competitive market, prices are determined by the forces of demand and supply and there are zero profits in the long run. To assess the scope for improving the competitive level of market participants, the marketing intermediaries' methods of determining buying and selling prices were examined by analysing the Produce Marketing Board's maize pricing methods and the price setting by private traders. Tactics of competition like diversification of maize source areas or market outlets and collusion by established traders against new entrants which may affect market competition were also examined.

3.2.3. MARKET PERFORMANCE

3.2.3.1 THEORETICAL BACKGROUND

Market performance as already noted refers to the economic results that flow from the industry and how well it performs in terms of efficiency and progressiveness given its technical environment (Bain, 1968). Market structure tends to influence the firms' behaviour. Market conduct links the industry's structure to the quality of its performance. In evaluating market performance, we are concerned with the actual

performance of individual industries in relation to their potential. The objective is to try and identify gaps between the actual and potential performance of these individual industries. We should then be in position to see whether there are ways of eliminating these gaps.

Marketing research is more useful when oriented to a concept of an ideal or perfect market (Bressler and King, 1970). A marketing system is judged to be efficient with respect to some standard or available alternatives. For the total marketing system or industry to be efficient, then :

1. all firms must be economically efficient
2. the industry must be organized to take full advantages of scale and location economies.
3. the industry must be operating under an exchange mechanism that generates prices which conform to a competitive standard such as the perfect market model.

The degree to which the first and second conditions are achieved together is referred to as "Productive Efficiency".

Bain (1968) suggests that there is a positive correlation between competitive nature of a market and its efficiency. The concept of efficiency in marketing varies in importance according to the level of social and economic development of a country. This probably explains the various approaches used by researchers in evaluating the marketing systems. (Farrell, 1957) classified the marketing efficiency measures into technical efficiency and pricing efficiency. Technical (or operational) efficiency concerns the methods of reducing the cost of doing a certain job while not affecting

consumer satisfaction with the output. Hence, it is concerned with technical aspects in marketing which affect cost per unit of output. Pricing efficiency (or allocative efficiency) concerns the improvements in the exchange process like operations of buying, selling and pricing aspects. Economic efficiency in marketing combines both technical and pricing efficiency. In marketing, economic efficiency and marketing efficiency are taken to imply the same thing.

Assessment of the marketing efficiency normally involves relative measures. In assessing the maize marketing system both relative technical and pricing efficiencies were used.

3.2.3.2 EVALUATION OF THE MAIZE MARKET PERFORMANCE

3.2.3.2.1 Relative Technical Efficiency

Technical aspects that affect maize marketing costs used were grain losses during the marketing process, the types and costs of vehicles used and the capacity utilization of the capital resources like vehicles and stores.

(a) Grain Losses

Grain losses that increase cost per unit of maize marketed was measured using the amount of grain lost in each centre through the various grain loss agents like pests, rain, spillage and shrinkage.

(b) Transport Costs

Comparison of transport costs per bag per kilometre was assessed for the available modes of transport and the cheaper mode judged the most efficient.

(c) Capital Resource Utilization

Low vehicle and storage capacity utilization would increase cost per unit of the maize handled.

If capital resources are under-utilized over a long period of time, this tends to increase costs per unit of product handled thereby lowering efficiency of the marketing system. Vehicle capacity utilization was calculated for the centres in question, as the number of bags of maize and other produce carried on vehicles divided by the total number of bags it is expected to carry. Theoretically, storage capacity utilization may be used as an indicator of relative technical efficiency for two or more marketing intermediaries by observing their capacity utilization over a long period of time covering both the seasons of high and low demand. Persistent excess capacity during the on-season with excess demand of the commodity would indicate technical inefficiency in storage (Bain, 1968). Over-used stores indicate a need for more stores to be built while under-utilized ones indicates misuse of resources and increased costs per unit quantity of maize stored. Storage capacity utilization was calculated as the total number of bags of maize and other produce held in the stores divided by the number of bags the stores are expected to hold. The measure has the limitation that figures used were only those stated during the interview. It would have

been more desirable to monitor the changes in these figures for each trader over time but available resources and time could not allow this. The storage capacity utilization for the private traders were compared to that of the Produce Marketing Board.

Where the facility is over-utilized like overloaded vehicles or the produce lying outside the store because of lack of extra space in the store, this would be indicated by more than 100 per cent capacity utilization! This would indicate lack of capital resources and hence a sign of market imperfection.

3.2.3.2.2 Relative Pricing Efficiency

The perfectly competitive market model assumes that a uniform price will prevail in the market at a particular point in space and at a single instant in time.

Firstly, efficiency in spatial pricing would require that differences in prices between two spatially separated markets only reflect transport and related handling costs (Hays, 1975). This is due to the assumption that if market organization satisfies the conditions of a competitive market, intermarket price differentials would result in arbitrage by traders until price differentials in excess of the amount of transfer costs are eliminated.

Secondly, the perfect market model requires that prices in different markets should move in accordance with the forces of demand and supply. The extent to which these prices in the different markets react in unison to forces of demand and supply gives an indication of market integration (Hays, 1975). The

methodology that is usually used involves computation of bivariate correlation coefficients between prices in different markets. These coefficients are interpreted as indices of market integration giving an overall indication of the degree of interrelationship in the mechanism of price formation between various markets (Op. cit, 1975). This method has been used by, among others, Lele (1965) when analysing sorghum marketing in India, Thakur (1973) when analysing the pricing efficiency of marketed apples in four wholesale markets in India, Maritim (1982) when assessing the inter-regional commodity flow pattern in maize marketing in Kenya and Jones (1972) when analysing marketing of staple foods in tropical Africa.

Another method used is the regression analysis. Schmidt (1979) used interface pricing efficiency to test to what extent profit margins of traders are statistically dependent on buying and/or selling prices. If margins are independent of prices and thus constant in absolute terms, then price changes are being passed on to the next market channel level (Op. cit p.92). Independent margins may statistically be indicated by a low correlation between margins and prices, or a slope coefficient of the linear regression of margins on prices that is not significantly different or very close to zero. This corresponds to a situation in which selling and buying prices are highly correlated, and the regression coefficient is not significantly different from or is very close to one (1).

Lastly, the analysis of pricing efficiency requires that price differences over time reflect the costs of storage. In a competitive market situation these storage costs would equal the

rise in price over time. However, owing to unreliable data on costs of storage and the high rate of inflation, it was not found safe to do a comparison of the monthly storage costs and the price rises as an indication of intertemporal pricing efficiency.

Evaluation of the spatial pricing and market integration, was carried out using the following methods:

1. Marketing Margin analysis and hypothesis testing

Gross margin (marketing margin or price mark-up) will only refer to the trader's maize selling price less the buying price. The 'profit' or the value of the price mark-up above the transfer cost is deemed unjustified if the mean profit is positive and forms a large proportion of the marketing margin. This was used to test the second hypothesis that price mark-ups in the transfer of maize from rural to urban centres are not accounted for by the transfer costs.

In the transfer of maize from rural to urban centres, the traders' transfer costs for one kilogram of maize per trip were taken to be:- the sum of the costs of loading and unloading of maize, toll charges or District Administrator's (DA's) fees, market gate fees, bribes to traffic police, administrative costs like labour and trader's personal expenses during maize transportation and the opportunity cost of capital used¹. Since most traders were being refunded their gunny bags by the buyers,

¹ In some districts, the road toll charges were collected by "Resistance Councils" for development of the area in which the produce passed. The fee was on commercial vehicles and this was referred to as D.A's fees.

and the loss in value of a gunny bag during transportation was negligible, this component was excluded from the calculations of transfer costs. Returns to risk and management could not be accurately estimated and it was found safer to leave it in the profit component. The share of profit in the marketing margin was assumed unjustified if it formed a great proportion of the marketing margin.

An estimate for the opportunity cost of capital used in the maize was obtained by assuming that the trader could lend out the money if he could not take the risk himself. The estimate for this that was adopted was the prevailing commercial bank interest rate on commercial loans. This stood at 50 per cent per annum in April 1989. On average, a trader could buy and sell the maize within one week (as observed in the pretest survey and confirmed in the actual survey). The interest was then calculated on the money used to buy and transfer one kilogram of maize within one week.

Transport cost was calculated by asking the trader how much he had paid on the hired vehicles for one trip. For owned vehicles, the transport cost was calculated for one week and this was divided by the number of trips per week. The costs included were licence and other costs like insurance and inspections; administrative costs like watchmen's wages; wages and salaries for driver and turnboys; repair and maintenance of both minor and major nature; overhaul of engine and gearbox; depreciation cost where the value of the cost of a new similar vehicle less its scrap value was divided by the period of the vehicle service; and the cost of tyres, calculated as the cost of a new tyre divided

by the period of time it is in use. Lastly, fuel and oil costs per trip were also converted to costs per Kg of maize. The data obtained from the respondents was used together with information obtained from Uganda Motors who are vehicle dealers. Apart from marketing margin analysis, market integration was used in the assessment of pricing efficiency.

2. Market Integration

The study of market integration used both correlation and regression analyses. Correlation analysis was used to determine whether spatially separated markets were integrated price-wise and the regression method was used to test the third hypothesis that prices offered to maize sellers in the rural areas and possibly to farmers, is not completely influenced by the urban selling price. Both methods are described below.

(a) Correlation Analysis

To assess the extent of market integration, correlation coefficients were calculated between maize prices in the various markets. The correlation model states that if two variables are correlated, then their joint distribution is assumed to be a bivariate normal distribution. It is referred to as 'bivariate' because it makes the assumption that each of the variables are random (Wonnacott and Wonnacott, 1979). The correlation coefficient "r" used was the Pearson product-moment correlation coefficient r , manually calculated as shown below¹:

¹ The Pearson product-moment correlation coefficient can be obtained from the Statistical Programme for Social Sciences, SPSS, computer package.

If the price of maize in one market is A and B in another market, and letting $a = A - \bar{A}$ where \bar{A} is the mean of A values, and $b = B - \bar{B}$ where \bar{B} is the mean of B values, then the correlation coefficient "r" is given by:

$$r = \frac{\sum ab}{\sqrt{\sum a^2 \sum b^2}} \quad \text{or} \quad r = \frac{\sum AB - \sum A \sum B / N}{\sqrt{[\sum A^2 - (\sum A)^2 / N] [\sum B^2 - (\sum B)^2 / N]}}$$

The Statistical Programme for Social Sciences, SPSS, Computer package which can more conveniently handle bulky data was preferred to the manual calculation of "r".

If $r = -1$, this indicates that the price movement in one market decreases proportionately with price increases in another market, and if $r = 1$, this indicates that the prices in one market increases directly with the price increase in the other market. When $r = 0$, this indicates that there is no relationship between the prices in the two markets. Thus, a correlation coefficient approaching zero whether positive or negative would indicate very low correlation between the variables. Interpretation of the degree of the correlation coefficient depends on the specific environment and the results that are expected. Different sample sizes at various levels of significance have differing values of "r" at which they are judged to be statistically significant. For a bivariate population, at 5 per cent level of significance, the sample correlation coefficient of 0.4 or more for a sample size of 25 or more is considered to be statistically significant (i.e there is a relationship between the two variables under study) (Wonnacott and Wonnacott, 1979 pp.158-161). Different researchers therefore utilize different values of "r" to judge the degree of

correlation depending on the specific environment and problem under investigation. Maritim (1982) and Hays (1975) considered correlation coefficients of 0.9 or more as 'high', and those 0.7 or more as 'satisfactory'. In this study the same criterion was used. Correlation coefficients of weekly mean prices in the selected centres were calculated. This was used to determine whether markets in the different centres were integrated or not.

Caution should however be made that two variables may have a high correlation when there is no cause and effect relationship. For example, there might be an increase in money circulation in an economy and in population. There is no cause and effect relationship as the two variables may be due to a third factor like time, and such correlation is referred to as nonsense or spurious correlation. Thus, in assessing the degree of correlation, one must have prior information on whether the two variables are actually related.

Theoretically, high value of the correlation coefficient should be associated with low marketing margins. If these two conditions exists, they may be partly used to lead to the conclusion that the marketing system is efficient. Raju (1980) however contains that:

- (i) high values of "r" or low profit margins may not necessarily indicate efficiency in marketing as high values of "r" may be due to traders colluding between two markets enabling them to get high margins (Op. cit p.11).
- (ii) two markets may show low price correlations despite the fact that traders may be efficiently operating at

minimum margins in both markets (Op. cit p. 11) and (iii) marketing margins may be higher in some markets which are well integrated price-wise, only because the infrastructure like distances from the market yard to traders' premises require additional movement and thereby higher costs (Op. cit p.11). Thus, for a complete picture of efficiency of the markets, these two measures should be jointly employed.

(b) Regression Analysis Model

To further analyse the extent of market integration, the hypothesis that prices offered to maize sellers, and possibly to farmers, is not completely influenced by the urban selling price, a regression of buying price on selling price was done. The regression model shows how the variables are linearly related. If maize buying price (Y) depends on maize selling price (X), then we can write this as $Y = f(X)$ or Y is a function of X. In a real world situation X may not be able to fully explain the changes in Y and an error term is usually used, giving the general simple regression equation as:-

$$Y_i = \alpha + \beta X_i + e_i$$

where e_i is the i^{th} error term associated with Y_i . For a particular sample, a regression fitted is expressed as $Y = \hat{\alpha} + \hat{\beta} X$. To estimate α and β the ordinary least squares method was used under the assumption that the error terms are independent random variables with mean zero and definite variance (equal to the population variance). The regression model assumes that Y is a

random variable (Wonnacott and Wonnacott, 1979). The higher the sample size, the more reliable is the estimated value of the regression coefficient implying that the statistics for all the centres aggregated may be more meaningful than individual ones.

If β is not statistically equal to zero in the relation $Y = \alpha + \beta x$, then a relationship exists between X and Y. To test if $\beta = 0$ then either a t test, a correlation coefficient test for ρ (the population correlation coefficient) or an 'F' test may be used. The F, t and ρ tests are all alternative ways of testing the null hypothesis that $\beta = 0$ (Wonnacott and Wonnacott, 1979). The t test is preferable if a confidence interval is required. Avoiding the restrictive ρ test which requires that the two variables under study be random, then either the t test or the F test can be used¹. F test was adopted as it also gives a direct indication of the proportion of explained variance relative to the unexplained variance. F value is calculated as the value of variance explained by regression divided by unexplained variance (Wonnacott and Wonnacott, 1979 p.166). The test level that would allow us to reject the null hypothesis and conclude that a relation exists (or $\beta \neq 0$) is called "the probability-value" or "observed level of significance". It will thus be deemed that a relationship exists between maize buying price and maize selling price, if the calculated 'F' value is greater than the significant F (Op.cit pp.435-437).

¹ t and F tests are equivalent because the t statistic is related to F (with 1 degree of freedom in the numerator) by $t^2 = F$ (Wonnacott and Wonnacott p. 166).

This regression is further supported by the coefficient of determination, r^2 (the correlation coefficient squared). The coefficient of determination gives the degree of how best the data fit the regression. It gives the proportion of the variation in the maize buying price explained or attributed to the variation in the selling price. For a competitive market situation where selling price and buying prices are highly related, high values of r^2 (approaching 1) and with F greater than significant F would indicate that traders do pass price changes at the consumer end, on to the rural sellers. If they are not doing this, then they are apportioning themselves this extra money. This would suggest that they are earning excess profits as changes in selling prices would not be greatly influencing buying price.

This would be used to test the third hypothesis that prices offered to maize sellers in the rural areas and possibly to farmers is not completely influenced by the urban selling price. All these methods were used to assess the level of competitiveness and marketing efficiency.

CONCLUSION

This chapter has presented the methods used to collect the data and the methodologies used in analysing the data. Primary data was collected by enumerators in both the maize supply areas and maize market outlets. A total of 220 respondents were

interviewed. The methods used in assessing both competition and efficiency in maize marketing utilized elements of market structure, conduct and performance. In assessing market structure maize market concentration, the conditions of entry and market transparency were used. Market conduct approaches used were the methods employed by marketing intermediaries in determining prices at which to buy or sell and the strategies and tactics used as traders competed for maize. Market performance methods used were relative technical and pricing efficiencies.

CHAPTER FOUR

FEATURES OF MAIZE MARKETING IN UGANDA

This chapter describes the organization of the maize marketing system as maize is transferred from the rural areas to final consumption points in urban centres. It also describes the mode of transport and their associated costs and finally, the storage activities.

4.1 THE MAIZE MARKETING SYSTEM

Introduction

In Uganda, the maize produced in different districts is moved from the rural supplying areas to urban consumption points by the marketing intermediaries, namely: the Produce Marketing Board, the private traders and to some extent the primary co-operative societies.

The maize volume that enters the marketing system is the total maize produced less retentions at the farm level for seed, home consumption and wastage. Maize retention at farm levels vary from district to district. The estimates of regional marketed maize and trade deficit are shown in table 4.1.

TABLE 4.1 ESTIMATED REGIONAL MARKETED MAIZE AND TRADE DEFICIT IN UGANDA, 1986/87 AND 1987/88

ZONE	1986/87						1987/88					
	AREA (000HA)	PRODUCTION (000 MT)	SEED REQUIRE- MENT (000MT)	CONSUMP- TION (000 MT)	LOSS AT PRIMARY MARKETING @ 3.5% (000 MT)	SURPLUS/ DEFICIT (000 MT)	AREA (000HA)	PRODUCT- ION (000MT)	SEED REQUIRE- MENT (000 MT)	CONSUMP- TION (000 MT)	LOSS AT PRIMARY MARKETING @ 3.5% (000 MT)	SURPLUS/ DEFICIT (000 MT)
BUSOGA/BUKEDI	65.0	78.0	1.6	54.5	2.7	+19.2	83.0	124.5	2.1	67.4	4.5	+50.5
BUGISU/SEBEI	31.1	37.3	0.8	19.3	1.3	+15.9	40.0	60.0	1.0	23.8	2.1	+33.1
TESO	8.5	10.2	0.2	19.9	-	-9.9	11.0	16.5	0.3	24.5	-	- 8.3
KARAMOJA	5.8	6.9	0.1	6.7	-	-	7.0	10.5	0.2	10.3	-	-
LANGO/ACHOLI	43.8	52.5	1.1	40.4	1.8	+9.2	55.6	83.5	1.4	49.9	2.9	+29.3
WESTNILE/WADI	22.6	27.1	0.6	28.5	-	-2.0	29.0	43.5	0.7	35.2	1.5	+ 6.1
BUNYORO/TORO	27.0	32.5	0.7	16.8	1.1	+13.9	34.3	51.4	0.9	20.7	1.8	+28.0
ANKOLE/KIGEZI	19.8	23.8	0.5	45.2	-	-21.9	25.0	37.5	0.6	55.8	-	-18.9
BUGANDA	59.4	71.3	1.5	33.9	2.5	+33.4	75.0	112.5	1.9	41.9	3.9	+64.8
TOTAL	283.0	339.6	7.1	268.0	9.4	+55.0	360.0	540.0	9.1	345.4	16.4	+168.7

KEY - = NEGLIGIBLE

HA = HECTARES

ASSUMPTION : (i) SEED RATE @ 25 KG/HA

(ii) CONSUMPTION ESTIMATES ON BASIS OF PER CAPITA CONSUMPTION AND POPULATION ADJUSTED TO REGIONAL CONSUMPTION PATTERN

(iii) TOTAL CONSUMPTION FIGURES INCLUDE ESTIMATES FOR JINJA AND KAMPALA

From the above table, it can be seen that some zones like Kigezi are deficit areas while those like Buganda, Bukedi or Busoga are surplus areas. This surplus is sold in urban areas or exported to either the neighbouring countries like Sudan, Rwanda and Tanzania or to the countries with which the Uganda Government has concluded barter trade protocols, namely, Yugoslavia and North Korea.

The farmer has the option of selling the maize to the PMB buying centres and depots, to stores established by traders deep in the countryside, to district trading centres, to local posho mills, to rural open markets or traders who come to his premises. The farmer's decision on where to sell the maize is based on many factors. These include: the amount to be sold, the availability of 'free' time to involve himself in the maize transfer to the destination points, the transport facilities at his disposal and whether the prices at the points of sale are favourable or not.

There are two maize marketing sub-systems, namely the one dominated by the private traders and the other, by the PMB. These subsystems interact in that the private traders may sell maize to the PMB and vice versa. The PMB and private traders can also buy maize from the co-operative societies. A description of the PMB and the private traders marketing subsystems is given below:

4.1.1 .The Produce Marketing Board Marketing Subsystem

Before the establishment of the Produce Marketing Board, food crops in Uganda were being marketed by private traders. The

Produce Marketing Board was established in 1968 but started its operations in 1970. It was established with the aim of promoting commercialization of the food sector by providing ready market outlets for produce and to regulate the marketing of crops (Businge, 1988).

The crops that were to be handled by PMB were mainly maize, beans, finger millet, sorghum, groundnuts, soya-beans, simsim and to a small extent castor seed, chillis, sunflower seed, green grams and a few other crops. The Board was to be a self-accounting organization under the umbrella of the Ministry of Co-operatives and Marketing.

Originally, the Primary Co-operative Societies were to act as the primary collection points and agents of the PMB. This system however ran into difficulties, because as reported by Businge (1988):

- (i) the PMB was unable to penetrate the rural areas and pay for or collect produce on schedule owing to lack of transport and personnel.
- (ii) the primary co-operative societies which were supposed to act as collecting points were ill equipped to perform this function.
- (iii) with inflation of 1970s, the PMB statutory prices became irrelevant. Farmers found it more lucrative to sell their produce to private traders who could not only penetrate remote areas but more significantly, could also pay the farmers cash for their produce

(Businge, 1988). The government then found it necessary to decontrol prices in 1977. Maize could thus be handled by the private traders, the cooperative societies or the PMB. ✓

In August, 1988 the Government re-introduced marketing controls in the marketing of beans, maize, simsim, soya beans and groundnuts. The PMB was given the sole monopoly of both the internal trade and export of these crops. However, due to the Government's inability to address itself to the problems that led to the decontrol of 1977, this was found unworkable and soon after the government reversed this condition to allow the private buyers to freely buy from farmers and sell to markets of their own choice within the country. They had, however, to be licenced (Businge, 1988).

The condition of the PMB's external trade monopoly was also later relaxed so that private traders could export the produce after being cleared by the PMB.

The PMB Structure and Marketing Operations

Between 1982 and 1988, the PMB handled varying proportions of the total maize produced in the country. It ranged from the minimum of 4.2 per cent in 1985/86 to a maximum of 14.4 per cent in 1983/84. This averaged 10 per cent of the total maize production in the country for the period 1982-1988 (Table 4.2). Of the total marketed production of 168700 m.t. in 1987/88, the PMB handled 69409 m.t. as indicated in table 4.2. This gave

the proportion handled by the PMB as 41 per cent of the total marketed production while the rest was handled by other traders (Tables 4.1 and 4.2).

TABLE 4.2: PRODUCE MARKETING BOARD MAIZE PURCHASE AND SALES IN UGANDA, 1982/83 - 1987/88

YEAR	TOTAL PRODUCTION '000 m.t.	PURCHASE BY PMB '000 m.t.	PERCENTAGE OF TOTAL PRODUCTION	INTERNAL SALES '000m.t	EXPORT '000m.t
1982/83	403	21.292	5.3	20.000	1.292
83/84	347	50.023	14.4	28.508	17.126
84/85	312	40.784	13.1	23.230	18.030
85/86	349	14.784	4.2	16.750	N.A
86/87	359	31.883	8.9	23.641	0.537
87/88	540	69.409	12.8	40.415	N.A

N/B: Internal sales are to local private millers, urban wholesalers, Government Ministries like Defence and rehabilitation, etc.

N.A: Not available

SOURCE: PMB, STATISTICS DEPARTMENT, KAMPALA, MARCH 1989.

It can thus be observed that the PMB plays a significant role in the marketing of maize within the country. However, the volume of exports was erratic and depended on the PMB's ability to purchase enough of the produce within the country to satisfy local obligations. It was observed that in 1988, for example, the PMB failed to fulfill her barter trade obligation to North Korea (Table 4.3). The Board failed to fulfill this obligation because the local maize sellers were not willing to supply the maize to the PMB as it was offering lower prices than the open market ones.

TABLE 4.3: PMB BARTER TRADE OBLIGATIONS OF WHITE MAIZE 1986-88

YEAR	QUANTITY m.t.	COUNTRY	WHETHER FULFILLED
1986	2300	YUGOSLAVIA	YES
1987	1800	YUGOSLAVIA	YES
1988	24764	NORTH KOREA	NO

SOURCE: PMB, STATISTICS DEPARTMENT, KAMPALA, FEBRUARY, 1989

To fulfill her purchasing and selling activities, the PMB operates at four different levels of buying and/or selling. These are: the Buying Centres, the seasonal and temporary buying centres, the regional depots and the central depots. A brief description of each of these is given below

(a) The PMB Buying Centres

There are 10 PMB Buying Centres in Uganda with storage capacities ranging from 200-2000 m.t. per centre, (Table 4.4 and Figure 2).

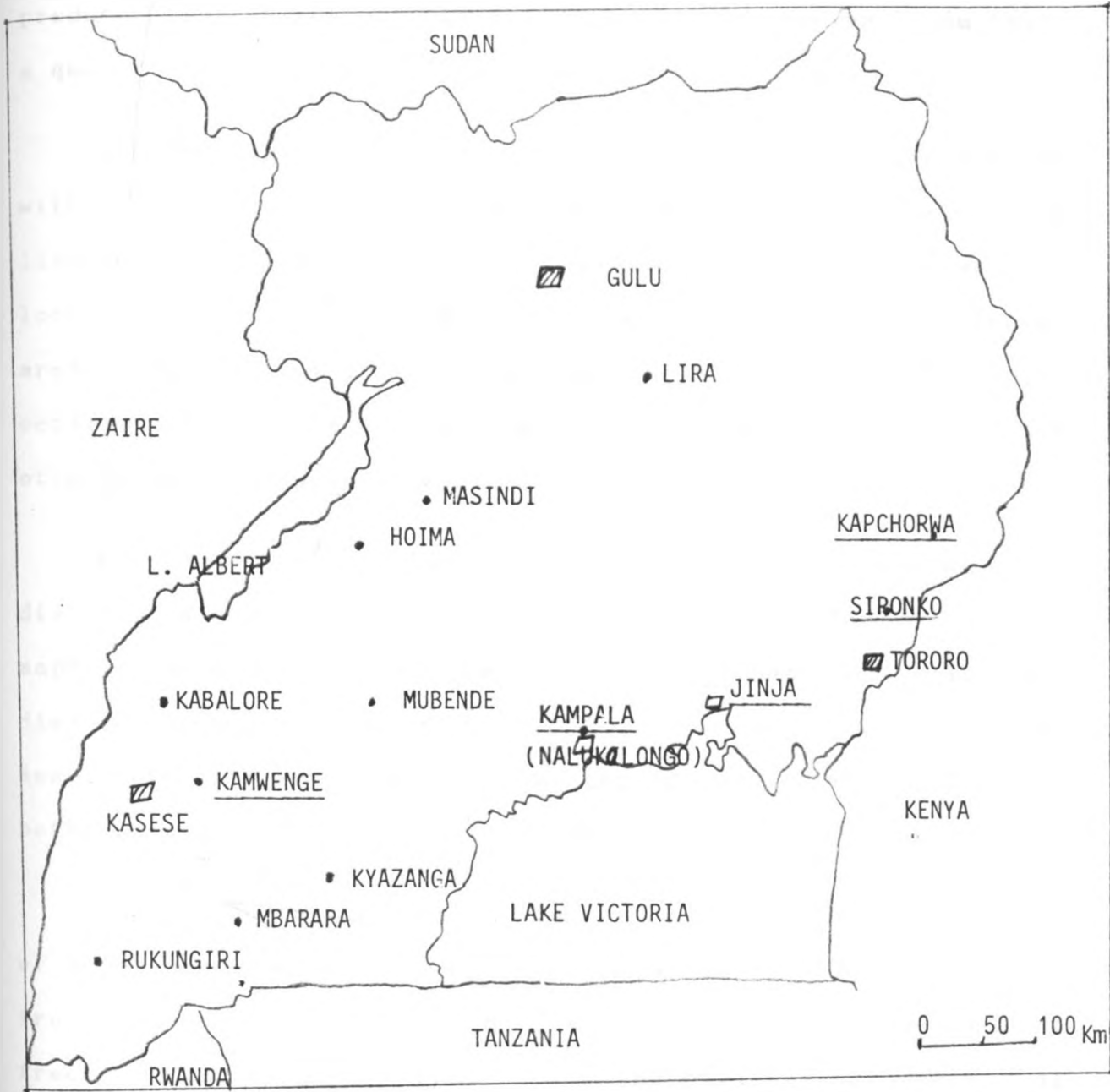
TABLE 4.4: PMB BUYING CENTRES AND DEPOTS IN UGANDA AND THEIR STORAGE CAPACITIES, 1989

PROVINCE	DISTRICT	LOCATED AT	DESIGNATION	STORAGE CAPACITY, '000 M.T
CENTRAL	KAMPALA	NALUKOLONGO	CENTRAL DEPOT	18.0
	MUBENDE	MUBENDE	BUYING CENTRE	0.3
	RAKAI	KYAZANGA	BUYING CENTRE	0.5
WESTERN	KASESE	KASESE	REGIONAL DEPOT	6.0
	KABALORE	KABALORE	BUYING CENTRE	0.5
	KABALORE	KAMWENGE	BUYING CENTRE	0.5
	HOIMA	HOIMA	" "	0.2
	MASINDI	MASINDI	" "	1.5
	MBARARA	MBARARA	" "	2.0
	RUKUNGIRI	RUKUNGIRI	" "	0.3
EASTERN	JINJA	JINJA	CENTRAL DEPOT	10.0
	TORORO	TORORO	REGIONAL DEPOT	18.0
	MBALE	SIRONKO	BUYING CENTRE	0.7
	KAPCHORWA	KAPCHORWA	" "	0.3
NORTHERN	GULU/LIRA ¹	GULU/LIRA	REGIONAL DEPOT	6.0

N/R ¹ - LIRA IS TEMPORARILY CLOSED BECAUSE OF ANTI-GOVERNMENT REBEL ACTIVITIES

SOURCE: PMB, STATISTICS DEPARTMENT, KAMPALA, MARCH 1989

FIGURE 2: MAP OF UGANDA SHOWING THE PMB BUYING CENTRES AND DEPOTS, 1989



- KEY:
- Central Depots
 - ▨ Regional Depots
 - Buying Centres

JINJA Surveyed Centres

The location of a Buying Centre is based on the criteria of the district having surplus produce and the place being a district trading centre or town for ease of communication with the regional or central depots.

Each Buying Centre has a Branch Manager who oversees the produce transactions. It is also supposed to have an accountant, a quality controller, weighing scales and gunny bags.

The PMB used to appoint agents to supply its Buying Centres with produce. The agents were primary co-operative societies and licenced private traders. The licence is to protect him against local administration and police. Each agent was given a selected area of operation but could also operate stores in rural trading centres, district towns or countryside stores in other areas other than his "operational zone".

The number of appointed agents in each Buying Centre or district depended on the size and the estimated volume of marketable surplus. The number of registered agents in most districts ranged from about 5 to 25. Currently however, the Board buys from any seller who manages to bring the maize without bothering to find out if he is a PMB agent or licenced.

The PMB Buying Centres play a significant role in the buying of maize particularly during harvest season when they buy maize from farmers. This however has its limitations in that the PMB frequently runs out of funds during the peak buying season. It is estimated that only 31 per cent of the total marketed maize in the country passes through the PMB Buying Centres (PMB).

(b) The Seasonal and Temporary buying centres

The PMB also operates seasonal buying centres. They are used only during harvest season and then closed down. These centres are Kigumba (in Masindi), Kitchwamba and Rwimi (in Kabalore) and Kiboga (in Luwero).

There are also on-spot purchases which take place in some other districts when the PMB gets information that these centres have plenty of produce but with few or no private traders. The venue and date of when the PMB will come to buy the produce are announced through the news media. These centres are Ibanda, Mpigi, Kamuli, Rakai, Bushenyi, Kagadi, Mityana, Iganga and Apac. Maize from these temporary centres is transferred to regional or central depots.

(c) The PMB Regional Depots

Regional depots are set up in areas with surplus produce and act as assembling points for all the maize and other produce bought by the various PMB buying centres in their vicinity. The regional depots have large warehouses. There are 3 regional depots, namely, Tororo with a storage capacity of 18000 m.t., Kasese with a storage capacity of 6000 m.t. and temporarily Gulu, with a storage capacity of 6000 m.t (Table 4.4). Gulu was being used (in 1989) as a regional depot because the regional depot at Lira could not be used due to rebel activities in Lira district. At these depots, maize in bags is normally weighed, fumigated and kept in stores. Some private traders and primary co-operative societies also sell maize to regional depots.

It is estimated that about 7 per cent of the total marketed maize is sold directly to regional or central depots by rural-urban market traders (Figure 3). Regional depots are headed by Regional Depot Managers who oversee the transactions of the depot. They also have other facilities like those of the PMB Buying Centres used in the purchasing of maize like weighing scales and gunny bags, among others. It is only at regional and central depots that maize is supposed to be sold.

(d) The PMB Central Depot

The PMB has two central depots - one at Nalukolongo in Kampala and the other one in Jinja with storage capacities of 18000 m.t. and 10,000 m.t. respectively (Table 4.2). These depots may buy from any maize seller especially during periods of scarcity but heavily rely on PMB Buying Centre and regional depot maize transfers.

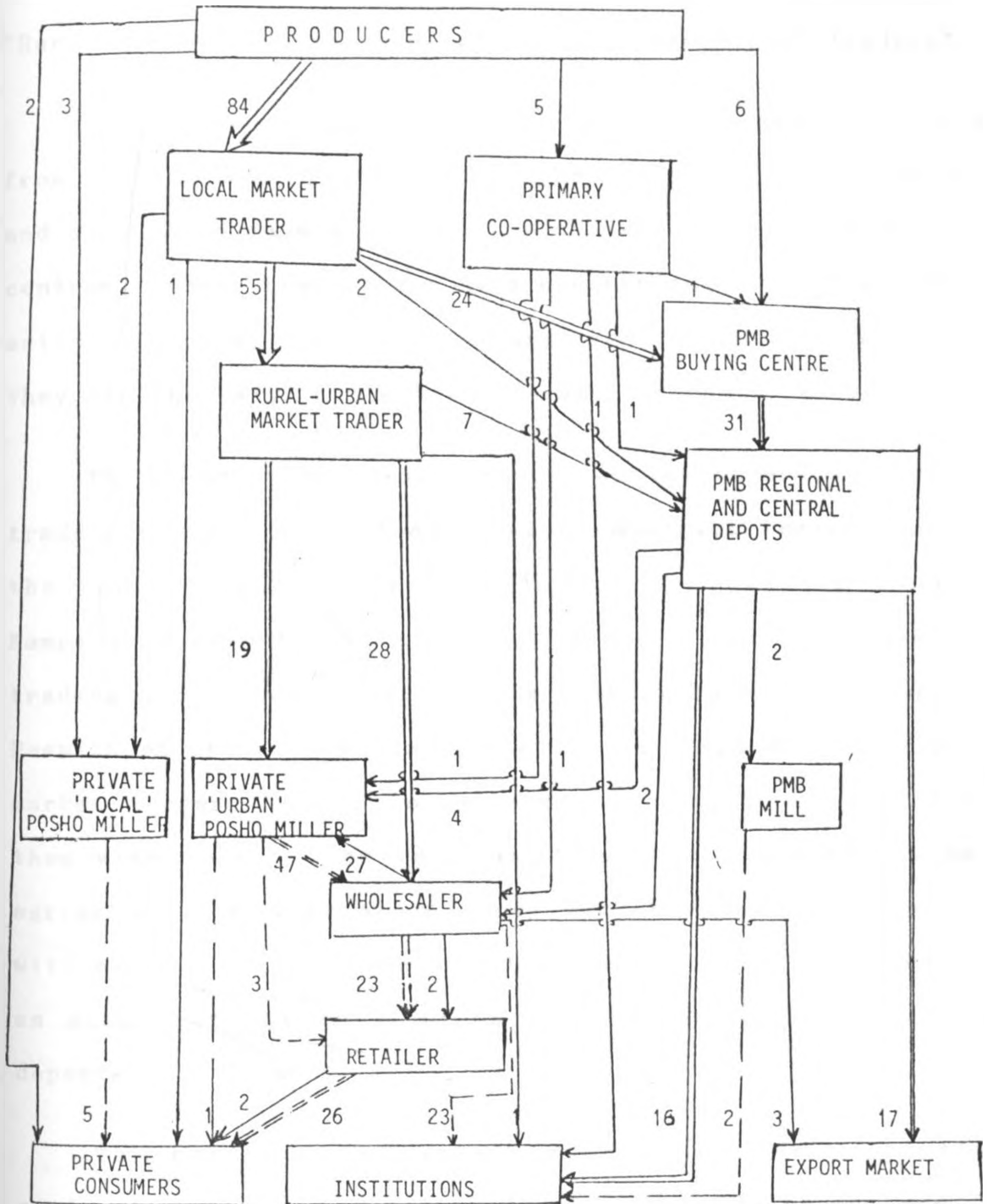
The PMB Head Office in Kampala has to sanction any internal sales by the central and regional depots. Priority is given to the country's barter trade obligations (Table 4.5) and Government Ministries like Internal Affairs, Defence and Rehabilitation, among others. The PMB may use her only two mills, one in Jinja and the other one in Kawempe, to mill for customers who may require maize flour. This however is done on a minor scale.

TABLE 4.5: UGANDA GOVERNMENT BARTER TRADE PROTOCOLS, 1988/89

COUNTRY	COMMODITY	QUANTITY (M.T)
YUGOSLAVIA	SOYA BEANS	600
NORTH KOREA	MAIZE	24,764
CUBA	BEANS	5,000

SOURCE: PMB, STATISTICS DEPARTMENT, KAMPALA, MARCH 1989

FIGURE 3: MAIZE MARKETING CHANNELS IN UGANDA - 1989
(Figures in % of Estimated marketed Maize)



N/B: 1. ———> MAJOR MAIZE GRAIN MOVEMENT 2. ———> MINOR MAIZE GRAIN MOVEMENT
 3. ———> MAJOR MAIZE FLOUR MOVEMENT 4. - - -> MINOR MAIZE FLOUR MOVEMENT
 5. MAIZE LOSS IN MILLING AND TRANSPORTATION IS NEGLECTED
 6. MARKET TRADERS INVOLVE BOTH "PRIVATE" TRADERS AND PMB APPOINTED AGENTS

SOURCE: TABLES 1.2, 1.5 and 4.1 and OWN ESTIMATION.

4.1.2 Private Traders Marketing Subsystem

This marketing subsystem has two types of traders: the "Rural Market Traders" and the "Rural-Urban Market Traders".

The rural market traders are those traders who buy maize from either farmers, the rural open markets or roadside markets and sell it to consumers or other traders in the district trading centres. These traders may also operate countryside stores where maize is bought and later transferred to the trading centres. They are the major outlets for farmers' marketed maize.

The rural-urban market traders on the other hand, are those traders who buy maize from rural or district trading centres or the countryside and sell it to major consuming towns like Kampala, Jinja, Mbale or Tororo. These traders comprise private traders and to a small extent the primary co-operative societies. Results of the survey showed that 94 per cent of the rural-urban market traders had no formal arrangements on who should supply them with maize. The remaining 6 per cent had made some oral agreement with some other rural market traders to supply them with maize. It was however found that in most cases, these acted as agents of the rural-urban traders on whom they at times depended for finance.

The rural-urban market traders sell maize to the PMB regional or central depots only when the PMB prices are "good" but otherwise, they mostly sell to urban grain wholesalers, urban posho mills or institutions. Results showed that about 10 per

cent of these traders at times have tenders with some institutions, though this group and the remaining 90 per cent have to constantly look for customers. Normally, the maize sold to institutions like schools and hospitals is first milled.

In Kampala, it was observed during the survey that maize was brought to the Railway Yard Depot by train or lorries. For those who could not get market directly, they paid Ushs.50 per bag as temporary-storage charge until they managed to organise buyers, or the depot manager helped them get buyers, at a commission. It was observed that these traders sold the maize to the World Food Programme which was supplying the maize to Southern Sudan as relief, to hospitals and schools, to Ministry of Defence, to urban posho mills and to wholesalers.

4.1.3 The Final Consumption

Maize in Uganda's urban areas is mainly consumed as maize meal. The maize is milled by posho mills which then sell the maize flour to the final consumer through wholesalers and retailers. There are two types of posho mills in Uganda - the 'Local' Hammer Mills which mill grade 3 maize flour and the 'Urban' Posho Mills that mill grade 1,2 and 3. Grade 3 is obtained when maize is milled without hulling, while with grade 1 and 2, it is dehulled and depending on the quality of milling, grade 1 or 2 is obtained. At Maganjo Posho Mill in Kawempe, for example, it was observed that after hulling, the maize is crushed into large and small granules. The large granules are separated

from the smaller ones and are further milled to obtain grade 1. The smaller granules are milled to obtain grade 2. Grade 1 is the most expensive. Grade 1 maize flour is sold in 2,5,10 or 20 kg paper bags or packed into 50 or 90 kg nylon bags. Taking an example of Maganjo maize flour on 22nd March, 1989, grade 1 maize meal cost Ushs.140 per kg while grade 2 cost Ushs.100 per kg. The maize flour in bags is normally opened for customers to inspect mainly at some of the mills, retail shops or open air markets. Private consumers get most of their supplies from retail markets though a few others buy directly from local posho mills, urban posho mills or farmers (Figure 3).

The institutions obtain their maize from urban wholesalers, rural-urban market private traders and the PMB regional or central depots. Maize is exported by the PMB to countries having barter trade arrangements with Uganda but private traders, on fulfilling the PMB export conditions, may also be cleared to export maize to neighbouring countries. To clear an intending exporter, the PMB has to satisfy itself that:

- (i) the maize quality is acceptable
- (ii) the price the trader is receiving is not low and
- (iii) the export deal will not cause famine in the country.

Each consignment has to be cleared separately. The PMB gives a clearance letter to the intending exporter to take to the Ministry of Commerce for licencing.

4.2 Maize Transport

The transport and communications sector plays a key role in a country's marketing system. In recognition of its strategic role in the economy, the Uganda Government has placed a very high priority on its rehabilitation and development during the 1988/89 - 1991/92 plan period (Uganda, 1988, p.67). Among the aims of the government in rehabilitating this sector are, (Uganda, 1988 p. 67):

- (i) to make available more commercial vehicles (pickups, trucks and buses) and railway wagons by purchases and repair of the existing ones as well as providing bicycles to primary producers.
- (ii) to continue the transfer of long distance freight traffic from road to rail.
- (iii) to rehabilitate the main trunk roads, rural feeder roads, railway line and waterways as well as air services.
- (iv) to strengthen and restructure institutions in this sector and train the personnel so as to enhance the internal capacity to maintain the existing infrastructure and,
- (v) to improve the postal and telecommunications facilities in order to minimise the need for physical movements.

The government's plan in the 1988/89 Financial Year was to spend 30 per cent of the government budget on this sector. Currently, major road rehabilitation is underway!

A brief description of the modes of maize transport in the rural areas and rural-urban link is given below.

4.2.1 Modes of Transport

In the rural areas of Uganda, maize is transported by different modes. In the survey carried out in the Kamwenge and Kapchorwa centres, it was found that lorries, pickups, tractors and donkeys were used to transport the maize in the rural market trade. The tractors were the most frequently used mode of transport with 55 per cent of the maize traders transporting their maize using them. This was followed by pickups which accounted for 39 per cent of rural transport.

TABLE 4.6 : PROPORTION OF TRADERS USING VARIOUS MODES OF TRANSPORT IN THE RURAL CENTRES OF KAMWENGE AND KAPCHORWA, MARCH-MAY 1989

CENTRE	MODE OF TRANSPORT				
	LORRY	PICKUP	TRACTOR	OTHER	TOTAL
	%	%	%	%	%
KAPCHORWA	0	0	80	20	100
KAMWENGE	3	45	52	0	100
TOTAL	3	39	55	3	100

KEY : OTHER - DONKEY

SOURCE : SURVEY RESULTS

In the rural-urban link, lorry transport was the most important. It accounted for 42 per cent of the means of transport used by respondents (Table 4.7). Maize from rural trading centres or the countryside is brought to urban centres mainly using lorries especially if the volume to be carried is

large and the distances are long. Next in importance was the train which ferried maize on the Kasese - Kamwenge - Kampala route. The railway line transport, though relatively cheaper, is not as 'flexible' as road transport. Twenty per cent of the respondents however were transporting maize from rural to urban areas using rail transport and 17 per cent of the respondents, tractor transport. This was mainly used in rough terrain and muddy roads especially in Kapchorwa where 46 per cent of the respondents reported using it. In Sironko, 61 per cent of the respondents also used tractors. Overall, 11 per cent of the respondents used pickups.

TABLE 4.7: DISTRIBUTION OF RURAL-URBAN MODES OF TRANSPORT IN THE SIX CENTRES IN UGANDA, MARCH-MAY, 1989

CENTRE	MODE OF TRANSPORT								TOTAL
	LORRY	PICKUP	TRACTOR	TRAIN	TRAIN COMBINED WITH:			OTHER	
	%	%	%	%	LORRY	PICKUP	TRACTOR	%	%
1. KAMPALA RAILWAY YARD DEPOT	36	0	0	64	0	0	0	0	100
2. KAWEMPE	100	0	0	0	0	0	0	0	100
3. KAMWENGE	-	-	-	22	6	39	33	0	100
4. KAPCHORWA	25	29	46	0	0	0	0	0	100
5. SIRONKO	9	30	61	0	0	0	0	0	100
6. JINJA	71	21	0	0	0	0	0	8	100
TOTAL	42	11	17	20	1	4	4	1	100

KEY: OTHER: MEANS BICYCLE
 - = NOT USED

SOURCE: SURVEY RESULTS

It is thus apparent that for rural-urban transport or long distances, the lorry or train (where it is available) are the commonly used means of transport while the pickup or tractor as means of transport are mainly used in short distances.

The guiding principle on long distance mode of transport is the fact that bulk haulage reduces costs per tonne-kilometre. This is discussed below.

4.2.2 Transport Costs

The transport costs will normally depend on the mode of transport, the road conditions, fuel availability and forces of demand and supply, among others. The cheapest hired mode of transport depending on whether it is available, will be preferred.

A comparison of hiring costs for different modes of transport for each centre was carried out and the results tabulated (Table 4.8).

TABLE 4.8: COMPARISON OF HIRING COSTS PER 100KG BAG/KM FOR DIFFERENT MODES OF TRANSPORT IN THE SIX SELECTED CENTRES IN UGANDA, MARCH-MAY 1989

CENTRE	COSTS PER BAG PER KILOMETRE			DISTANCE TO MAIZE SOURCE		UCTU CHARGES FOR 8m.t. BENZ LORRY FOR THE AV. DISTANCE (USHS)
	LORRY	PICK-UP	TRACTOR	AV.	MAX.	
	MEAN COST (USHS)	MEAN COST (USHS)	MEAN COST (USHS)	(KM)	(KM)	
RURAL MARKETS						
1. KAMWENGE	100	64.4	78.8	6.1	16	41.0
2. KAPCHORWA	-	-	35.7	8.9	17	-
RURAL-URBAN LINK						
1. KAMPALA RAILWAY YARD DEPOT	4.6	-	-	277.2	378	6.1
2. KAWEMPE	4.4	-	-	160.0	331	4.5
3. KAPCHORWA	26	25.8	35.7	51.9	60	9.7
4. SIRONKO	26.7	31.0	28.9	40.0	57	9.7
5. JINJA	9.8	17.0	-	36.4	64	6.3

KEY : N = NUMBER OF VEHICLES

UCTU= UGANDA CO-OPERATIVE TRANSPORT UNION

AV = AVERAGE

SOURCE: 1. COLUMNS 1-5: SURVEY RESULTS

2. COLUMN 6: ADAPTED FROM UCTU CIRCULAR NO. OPS/2/E OF 1988

In Kamwenge rural transport, the pickup was the most economical means of transport used with charges of Ushs.64.40 per bag/km. For the rural-urban link, only figures for the lorry were available for Kampala Railway Yard depot and Kawempe and so they could not be compared with the costs for the pickup and tractor. In Jinja it was found that it was cheaper to use the lorry than the pickup. The cost of ferrying one bag of maize for one kilometre was Ushs.9.80 by lorry while it was Ushs.17.00 by pickup.

Caution should however be exercised when interpreting the cost/bag/km figures, as this is subject to the distance the vehicle moves and road conditions. In Kapchorwa, it was observed that the vehicle owner could charge Ushs.400/bag for a distance of between 2 - 6km. If the respondent states that he bought the produce from a distance of 4km, this would give the cost of Ushs.100/bag/km. If on the other hand he had bought it from distances of 2km and 6km, this would give Ushs.200/bag/km and Ushs.67/bag/km respectively! Further, if the vehicle owner thinks the road is bad, he may raise the charge to say Ushs.600 for a distance of 2 to 6km, giving the rate per km for distances of 2km, 4km and 6km as Ushs.300, Ushs.150 and Ushs.100 respectively! It should be noted that the maize catchment zone for a particular centre is subject to maximum distance from which one can buy the maize. Thus, to be able to meaningfully compare the hiring cost for the different modes of transport, it was assumed that the vehicle (lorry, pickup and tractor), on average brought maize to a particular centre from the same distance.

Train charges are fixed by the Uganda Railways Headquarters. Due to the high inflation rate in the country, the rate for Kamwenge-Kampala route, which had been fixed at Ushs.851 per 100kg maize bag (or an average of Ushs.3.095 per 100kg/km) on 22nd August, 1988 was increased to Ushs.979 per 100kg maize bag (or Ushs.3.56 per 100kg/km on April 21st, 1989)¹.

¹ Kamwenge-Kampala route is 275km

Comparing this with the least transport cost of Ushs.4.40 for the lorry at Kawempe shows that the train is the least expensive but has the disadvantage of being confined to particular routes only.

For comparison purposes, the Uganda Co-operative Transport Union, UCTU, charges have been added to table 4.8. It is evident that the UCTU charges tend to be lower than those of the privately owned lorries only for short distances. For long distances, the private lorry owners seem to charge less than the UCTU.

4.3 MAIZE STORAGE

4.3.1 Traders' Storage Facilities

Storage has the important function of bridging the gap between two harvest seasons. Farmers normally store maize produced at the farm level so that they can sell the maize when financial needs arise or they can use it for home consumption.

When a trader buys maize, he stores it as he arranges for its sale or transportation to other higher-paying centres. He may also store the maize to sell it at a higher price later.

Maize is stored at the traders' stores in the trading centres from where it is transferred to urban centres. Maize storage also takes place at the urban wholesale level, at the posho mills, PMB buying centres and depots.

Mean storage capacities were calculated for the rural market traders and the rural-urban market traders (Table 4.9).

TABLE 4.9: MEAN STORAGE CAPACITIES FOR RURAL MARKET TRADERS AND RURAL-URBAN MARKET TRADERS IN THE SELECTED CENTRES IN UGANDA, MARCH-MAY 1989

	MEAN CAPACITY (M.T)	CV %	OBSERVED MINIMUM CAPACITY (M.T)	OBSERVED MAXIMUM CAPACITY (M.T)
RURAL MARKET TRADER	26.9	49	3	60
RURAL-URBAN MARKET TRADERS	113.1	1524	4	3400

N/B: C.V = COEFFICIENT OF VARIATION

SOURCE: SURVEY RESULTS

It was found that the rural-urban market traders operate far larger stores than the rural market traders. This was probably due to the higher capital possessed by the rural-urban traders than the rural market traders enabling them to hire or build larger stores (Table 4.9). It is also evident from the small coefficient of variation value that the rural market traders' stores were generally of the same capacity while the rural-urban market traders had divergent store capacities. This was probably due to the differences in the capital possessed by these rural-urban market traders. This could be a source of inequality among the traders that would affect their degree of competition:

4.3.2 Storage period

The period of maize storage by the traders was very short. Out of the 220 respondents, only 185 of them were involved in maize storage. Most of them (53 per cent) stored maize for less than two weeks (Table 4.10).

In Kawempe, 83 per cent of these traders kept maize for less than one week. This is because traders found it more paying to go upcountry, buy the maize, come and sell it to the posho mills than storing it for long. It can be observed that 86 per cent of the traders stored maize for less than 1 month and, only 1 per cent of them stored maize for over 3 months (Table 4.10).

TABLE 4.10: MAIZE STORAGE PERIOD BY TRADERS IN THE SIX CENTRES IN UGANDA, MARCH-MAY 1989

(% OF RESPONDENTS)

CENTRE	STORE PERIOD IN DAYS													
	1-7		8-14		15-30		31-90		OVER 3 MONTHS		NO RESPONSE		TOTAL	
	NO.	%	NO.	%	NO.	%	NO.	%	NO.	%	NO.	%	NO.	%
KAMPALA R.Y DEPOT	9	20	14	32	17	39	3	7	0	0	1	2	44	100
KAWEMPE	19	83	2	9	1	4	0	0	1	4	0	0	23	100
KAMMENGE PMB	4	14	2	7	18	64	4	14	0	0	0	0	28	100
PRIVATE	3	13	5	21	12	50	4	17	0	0	0	0	24	100
KAPCHORWA PMB	3	60	2	40	0	40	0	0	0	0	0	0	5	100
PRIVATE	0	0	7	24	9	31	9	31	1	3	3	10	29	100
SIRONKO	7	30	14	61	2	9	0	0	0	0	0	0	23	100
JINJA	6	67	1	11	2	22	0	0	0	0	0	0	9	100
OVERALL	51	28	47	25	61	33	20	11	2	1	4	2	185	100

KEY - R.Y. = RAILWAY YARD

SOURCE : SURVEY RESULTS

Out of 220 traders, 183 gave answers as to why they kept maize for a certain period of time. It was found that of those who kept maize for one to seven days, 45 per cent were looking for market and 24 per cent were accumulating to get enough to sell (Table 4.11). Of those who kept maize for a period of 8 to 14 days, 40 per cent were looking for market while 32 per cent were trying to accumulate enough before selling it. However,

among those keeping the maize for 15 to 30 days, 36 per cent were waiting to sell when prices went up and 26 per cent still accumulating enough quantity for sale. Ninety per cent of those keeping maize for 30 to 90 days were waiting to sell when prices went up.

TABLE 4.11: TRADERS' REASONS FOR DURATION OF STORAGE OF MAIZE IN UGANDA, MARCH-MAY 1989

(% OF RESPONDENTS WHO REPORTED DURATION OF MAIZE STORAGE)

LENGTH OF STORAGE (DAYS)	REASONS FOR DURATION OF STORAGE												TOTAL		
	LOOKING FOR MARKET	ACCUM. ENOUGH	SELLING WHEN PRICE UP	LOOKING FOR TRANSPORT	LOOKING FOR MARKET AND TRANSPORT	ACCUM. ENOUGH AND LOOKING FOR TRANSPORT	STORE FOR OR WAIT FOR CUSTOMERS	ACCUM. ENOUGH WAITING FOR PRICE RISE	NO RESPO-NSE						
	NO. %	NO. %	NO. %	NO. %	NO. %	NO. %	NO. %	NO. %	NO. %	NO. %	NO. %	NO. %	NO. %	NO. %	NO. %
1-7	23 45	12 24	0 0	6 12	0 0	1 2	1 2	0 0	8 16	51 100					
8-14	19 40	15 32	7 15	1 2	1 2	1 2	0 0	0 0	3 6	47 100					
15-30	9 15	16 26	22 36	2 3	0 0	0 0	2 3	3 5	7 11	61 100					
31-90	0 0	1 5	18 90	0 0	0 0	0 0	1 5	0 0	0 0	20 100					
OVER 90	1 50	0 0	1 50	0 0	0 0	0 0	0 0	0 0	0 0	2 100					

KEY: ACCUM. = ACCUMULATING

SOURCE: SURVEY RESULTS.

During times of maize scarcity, traders may take long to buy the required amount of maize. To reduce the transport costs per unit weight, the traders may store the maize as they continue to buy maize until they have assembled enough of it. This is particularly true of traders operating from the stores in the countryside or trading centres.

4.3.3 Storage Costs

Storage costs for a marketing intermediary will here refer to the costs he incurs in storing a given quantity of maize for a particular length of time. The storage costs in our case will be calculated for the cost of storing one bag of maize estimated at 100 kg, for a period of one month.

It was revealed that the storage cost incurred by the traders were rent and the loss in value of the gunny bags used in storing the maize. Very few traders were using fumigants and so this component was not included. A trader with a bag of maize has two options: he can either sell the maize immediately or store it for a period of time, so as to sell at a higher price when the maize supply has probably fallen causing prices to rise. A trader who decides to store the produce would like to sell it at a price that covers his cost of storage. It was thus necessary to estimate two other costs that the trader will have to consider when deciding to store maize. These are the opportunity cost of capital used to buy one bag of maize and the grain losses. The results were tabulated in table 4.12 below and a description of how each of these components was calculated is also given.

TABLE 4.12 MEAN MONTHLY STORAGE COSTS AMONG THE TRADERS IN THE SIX CENTRES IN UGANDA, MARCH-MAY, 1989

(AVERAGE MONTHLY COSTS)

CENTRE	PRICE PER BAG	RENT	GUMMI BAG DEPRECIATION		GRAIN LOSSES IN: KG/BAG PER MONTH		OPPORTUNITY COST OF CAPITAL FOR ONE BAG AT 2.21% PER MONTH		MONTHLY STORAGE COST				
	USHS.	USHS.	%	USHS.	%	USHS.	%	USHS.	%	USHS.	%		
KAMPALA R.Y. DEPOT	8100	35.97 (24)	8	100.00	21	1.87 (30)	151.20	32	179.01	38	466.18	4.66	100
KAMWENGE	8100	20.30 (10)	5	100.00	24	1.44 (15)	116.64	28	179.01	43	415.95	4.16	100
KAMWENGE (PHB AGENTS)	6440	32.84 (28)	8	100.00	22	2.80 (28)	180.32	40	142.32	31	455.48	4.55	100
KAMWENGE (PRIVATE TRADERS)	6440	31.80 (23)	8	100.00	24	2.20 (22)	141.68	34	142.32	34	415.80	4.16	100
KAPCHORWA (PHB AGENTS)	4280	17.70 (5)	6	100.00	34	2.00 (5)	85.60	29	94.59	32	297.89	2.99	100
KAPCHORWA (PRIVATE TRADERS)	4280	27.70 (29)	8	100.00	27	3.33 (29)	142.67	39	94.59	26	364.96	3.65	100
SIRONKO	6970	35.96 (23)	9	100.00	26	1.42 (22)	98.57	25	154.04	40	388.57	3.89	100
JIMJA	8140	37.80 (17)	8	100.00	20	2.13 (7)	173.65	35	179.89	37	491.34	4.91	100
OVERALL	6594	31.90 (159)	7	100.00	23	2.26 (158)	149.02	35	145.73	34	426.65	4.27	100

- M/B :
1. CALCULATIONS ARE BASED ON THE NUMBER THAT RESPONDED GIVEN IN BRACKETS
 2. SOME PERCENTAGES DO NOT ADD UP TO 100 DUE TO ROUNDING
 3. R.Y. - RAILWAY YARD

SOURCE : SURVEY RESULTS

(a) Rent: The rent was calculated from respondents' answers to the questions on the amount of rent paid per month (or imputed rent for owned store) and labour costs on the store. This was divided by the number of bags handled for a month, to give the mean rent per bag per month for each centre. The lowest mean rent registered per bag per month was Ushs.17.70 at Kapchorwa and the highest was Ushs.37.80 at Jinja (Table 4.12). Rent accounted for 7 per cent of the total storage costs, although there was variation from one region to another (Table 4.12).

(b) Gunny Bags: Estimation of gunny bag depreciation was a bit difficult. Depreciation costs are normally calculated on capital goods. The capital goods are expected to be used for more than once as their physical "bodies" are not completely consumed in providing the service or production required, but rather loses its value (depreciates) over repeated use. A gunny bag being used in storage can serve for a long period depending on how it is handled. Some maize traders reported that it could last for over five (5) years under good storage. It could also get torn if it is mishandled. Some stores may be poorly constructed enabling water to sip in the store. This would make the gunny bag last for a shorter period. If on the other hand, a second hand gunny bag full of maize is dropped down, it could end up bursting! Thus the usual depreciation method of dividing the cost of the gunny bag by the number of years/months it is expected to be in use may not accurately reflect the depreciation cost in storage. An alternative approach, which still has some weaknesses but is thought to better reflect the reality, was

adopted and is explained below. Survey results have shown that 86 per cent of the traders stored maize for one month or less. It was also observed that a new gunny bag costs, on average Ushs.400 while a used one costs Ushs.300. The difference of Ushs.100 is thus taken to be an approximation of the loss in value of a new gunny bag used in storage for a month. Table 4.12 shows that gunny bag accounted for 23 per cent of the storage costs.

(c) Opportunity cost of Capital: Calculation of the cost of capital used would require that one knows the alternative foregone by the trader and the income that would accrue to him from such an activity. A simplifying assumption used was that the trader could put his money in the bank to earn interest. The bank interest rate on savings deposits was 30 per cent per annum (or 2.21 per cent per month using compound interest formula). This was therefore adopted and used to calculate opportunity cost of buying one bag of maize and storing it for one month. We also assumed prices to be constant during the month. The interest on capital used in buying a 100kg bag and keeping it for one month averaged Ushs.145.73 or 34 per cent of the total storage costs (Table 4.12).

(d) Grain Losses: During storage period, grain losses may occur as a result of either rain, spillage within the stores, vermin and loss of moisture for the undried maize leading to grain weight loss and shrinkage. The costs of grain loss during storage were taken as the value, in monetary terms of grain lost from the time the trader brought maize to the store and the time it was sold.

To determine the grain loss cost, traders were first asked if they incur any grain losses at all and the causes of these losses. ✓

Of the traders interviewed, 81 per cent reported some grain loss while 9 per cent reported virtually no loss and 10 per cent gave no response.

It is possible however that minor losses could occur but traders considered them insignificant.

Asked about the main cause of grain loss, 32 per cent of the 177 traders who responded attributed it mainly to shrinkage as a result of moisture loss, 25 per cent of them attributed it to spillage, 22 per cent attributed it on insect pest and 18 per cent blamed it on rodents (rats) (Table 4.13)¹.

¹ Rats are normally grouped as pests but the categorization of insect and rodent pests was meant to investigate the relative importance of rats as pests, as this was thought to be a major pest.

TABLE 4.13: PROPORTION OF TRADERS ATTRIBUTING MAIN MAIZE GRAIN LOSSES TO DIFFERENT AGENTS IN THE SIX CENTRES IN UGANDA, MARCH-MAY 1989

(% OF RESPONDENTS WHO REPORTED GRAIN LOSS)

CENTRE	LOSS AGENT										TOTAL	
	RODENTS		INSECT PESTS		RAIN		DRYING/ SHRINKAGE		SPILLAGE		NO	%
	NO	%	NO	%	NO	%	NO	%	NO	%	NO	%
1. KAMPALA R. Y. DEPOT	2	6	4	6	0	0	28	85	0	0	33	100
2. KAWEMPE	1	5	4	19	1	5	15	71	0	0	21	100
3. KAMWENGE (PMB)	10	36	9	32	0	0	7	25	2	7	28	100
4. KAMWENGE (PRIVATE)	12	48	3	12	2	8	4	16	4	16	25	100
5. KAPCHORWA (PMB)	0	0	3	60	0	0	0	0	2	40	5	100
6. KAPCHORWA (PRIVATE)	0	0	3	10	3	10	0	0	23	80	29	100
7. SIRONKO	2	8	12	50	0	0	1	4	9	38	24	100
8. JINJA	4	33	2	17	0	0	2	17	4	33	12	100
OVERALL	32	18	38	22	6	3	57	32	44	25	177	100

SOURCE : SURVEY RESULTS

It should be noted that to reduce storage loss due to rain, traders try to use properly constructed stores to prevent rain leaking into the stores. They may reduce the shrinkage risk due to moisture loss by ensuring that the maize bought is dry. They may control spillage during storage by packaging the maize in bags. Some traders try to reduce the problem of rodents by using rat-traps.

To prevent maize grain loss due to weevils, fumigants are used. Analysis of fumigant use was carried out. It was found that only 16 per cent of the traders used fumigants. The commonly used fumigant was Malathion.

As the number of traders reporting use of fumigants is negligible, this is likely to lead to maize getting spoiled due to weevils.

Traders were then asked to estimate the grain loss per bag per month due to the grain-loss agents since they could not accurately state the loss due to each of the grain-loss agents. The grain loss averaged 2.26 kg/bag/month (Table 4.12). There were variations between the centres with Sironko reporting the least loss of 1.42 kg/bag/month and Kapchorwa reporting the highest of 3.33 kg/bag/month (Table 4.12). The value of the grain loss, was Ushs.149.02/bag/month (Table 4.12). There were variations in the value of the grain loss between centres. PMB agents at Kapchorwa had the lowest value of grain loss of Ushs.85.60 and Kamwenge PMB agents reported the highest value of Ushs.180.32. Maize grain loss accounted for 35 per cent of the total storage costs.

(e) Total Storage cost: The total storage cost for one bag of maize for one month was obtained by adding the monthly cost of rent, gunny bag depreciation, opportunity cost of capital for one bag of maize, and the amount of grain losses per bag per month. This gave the cost of Ushs.426.65/bag/month. Dividing this by

100 gave Ushs.4.27 as the storage cost of 1kg/month (Table 4.12). However, there were variations between the selected centres ranging from the lowest of Ushs.2.99/kg/month in Kapchorwa (PMB agents) to the highest of Ushs.4.91/kg/month in Jinja.

Therefore traders involved in storage can only benefit from storage operations if the rise in price of maize within one month covers these storage costs. Traders however, seemed to prefer increasing their incomes through high turnover rate than speculating in price rises.

CONCLUSION

Marketed maize from the producer reaches the final consumer through the Produce Marketing Board or private traders. The primary co-operative societies also help in ferrying some maize from producers to urban posho mills, wholesalers or the PMB

The PMB handles about 41 per cent of the marketed maize while the rest is handled by the private traders and co-operative societies. Maize is transported from the rural selling points to urban consumption centres using the train, the lorry, the pickup or the tractor. Bicycles, donkeys or human beings are rarely used and where this is so, it is mainly from the farmers to rural collecting points where vehicles come for the produce. Of the lorry, the pickup and the tractor; the pickup means of transport tends to be the cheapest for short distances while the lorry means of transport was the cheapest and the most frequently used in long distance haulage. The train rates were cheaper than any

of the three other modes of transport but was only confined to certain routes (Kasese-Kampala). The tractor mode of transport was most frequently used in Sironko and Kapchorwa areas mainly due to rough and muddy roads. Most traders stored maize for short periods with 86 per cent of them storing maize for one month or less. This was mainly because most traders just stored the maize as they were looking for market or accumulating enough for sale.

The storage costs incurred in the storing of one bag of maize for one month are rent, opportunity cost of capital, amount of maize grain losses and the loss in value of the gunny bag used. It was further observed that fumigants were rarely used by traders as most of them never kept maize for a long period of time.

CHAPTER FIVE

ANALYSIS OF THE STRUCTURE, CONDUCT AND PERFORMANCE OF THE MAIZE MARKETING SYSTEM

This chapter assesses the maize market structure, conduct and performance. The first section assesses market structure by analysing the extent of inequality in the maize trade and identifies the possible factors that have been thought to strategically influence the nature of competition and pricing within the market. The aspects that have been deemed to be able to influence market conduct and performance and are therefore dealt with are the degree of market concentration, the condition of entry and the degree of market transparency. The second section of this chapter looks at market conduct in terms of the pricing methods used by the marketing intermediaries. It also identifies and examines factors guiding the traders on where to buy the maize from or sell it to and the reaction to established or new entrant traders. The third section assesses the effects market structure and conduct have on market performance attributes of relative technical and pricing efficiencies.

5.1 THE MAIZE MARKET STRUCTURE

In order to assess the maize market structure, the first part of this section analyses the nature of market concentration. The second part explains the concentration pattern by describing the condition of entry in the maize trade and testing the hypothesis that there are substantial barriers to entry in the maize trade. The third part of this section investigates the market information flow within the market.

5.1.1 MAIZE MARKET CONCENTRATION

Analysis of the degree of concentration was carried out for the rural market and rural-urban market traders. Market concentration was measured by the percentage of maize handled by the largest first 4 and 8 traders and the largest first 5 and 10 per cent of the traders. Lorenz curves and gini coefficients were also used. The gini coefficients were calculated using both the Andic and Peacock (1961) formula and the graphical approach. These two methods gave the same gini coefficient values. The percentages, gini coefficients and Lorenz curves are, respectively, presented in table 5.1, table 5.2 and figures 4 to 12.

TABLE 5.1: TRADERS' MAIZE MARKET CONTROL USING THE FIRST BIGGEST 4 AND 8 TRADERS, AND THE FIRST BIGGEST 5% AND 10% OF THE TRADERS IN THE SIX CENTRES IN UGANDA, MARCH-MAY, 1989

(% OF VOLUME HANDLED)

TYPE OF TRADERS	CENTRE	THE LARGEST			
		1ST 4 TRADERS	1ST 8 TRADERS	1ST 5% OF THE TRADERS	1ST 10% OF THE TRADERS
RURAL MARKET TRADERS	1. KWG	52	68	30	50
	2. KAP	-	-	7	15
RURAL-URBAN MARKET TRADERS	3. KLA. R.Y DEPOT	28	44	18	30
	4. KWP	27	43	15	25
	5. KWG	57	78	18	40
	6. KAP	27	46	12	21
	7. SIRONKO	40	57	13	22
	8. JINJA	82	-	33	49
OVERALL		12	20	23	36

KEY: KWG = KAMWENGE
 KAP = KAPCHORWA
 KLA R.Y = KAMPALA RAILWAY YARD
 - = NUMBER OF TRADERS TOO SMALL TO WARRANT MEANINGFUL ANALYSIS

SOURCE: APPENDICES 8 TO 16 AND FIGURES 4 TO 12

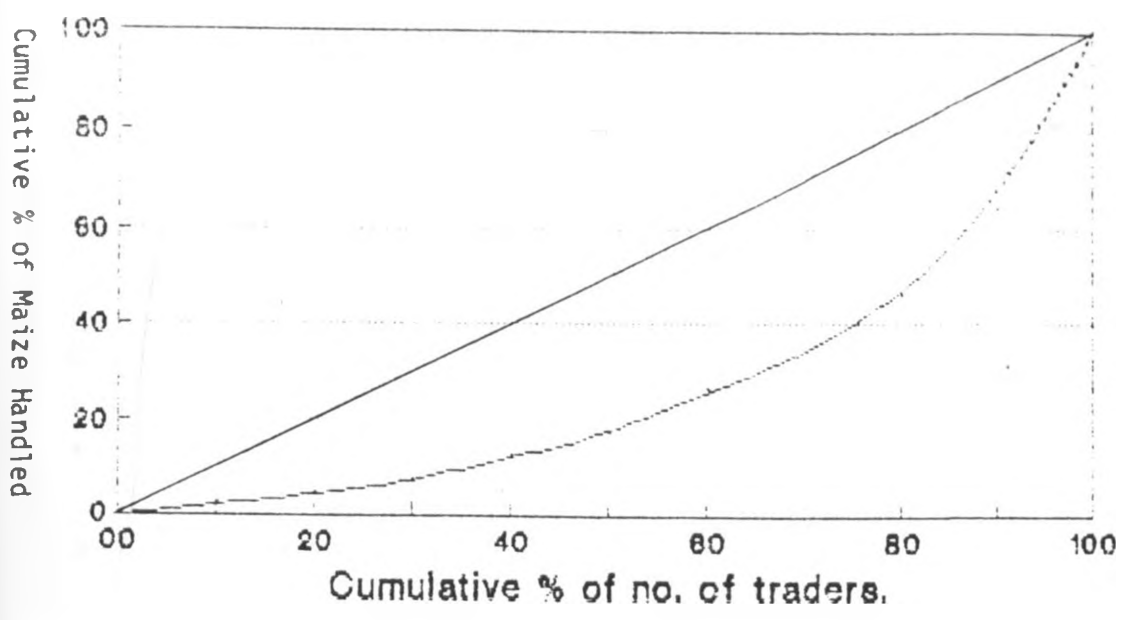
TABLE 5.2: GINI COEFFICIENTS FOR MAIZE HANDLED BY TRADERS IN THE SIX CENTRES IN UGANDA, MARCH-MAY, 1989

TYPE OF TRADERS	CENTRE	GINI COEFFICIENT
RURAL MARKET TRADERS	KAMWENGE	0.57
	KAPCHORWA	0.14
RURAL-URBAN MARKET TRADERS	KAMPALA R.Y DEPOT	0.43
	KAWEMPE	0.30
	KAMWENGE	0.49
	KAPCHORWA	0.28
	SIRONKO	0.31
	JINJA	0.63
OVERALL		0.47

SOURCE: APPENDICES 8 TO 16 AND FIGURES 4 TO 12

Fig. 4 : THE LORENZ CONCENTRATION CURVE

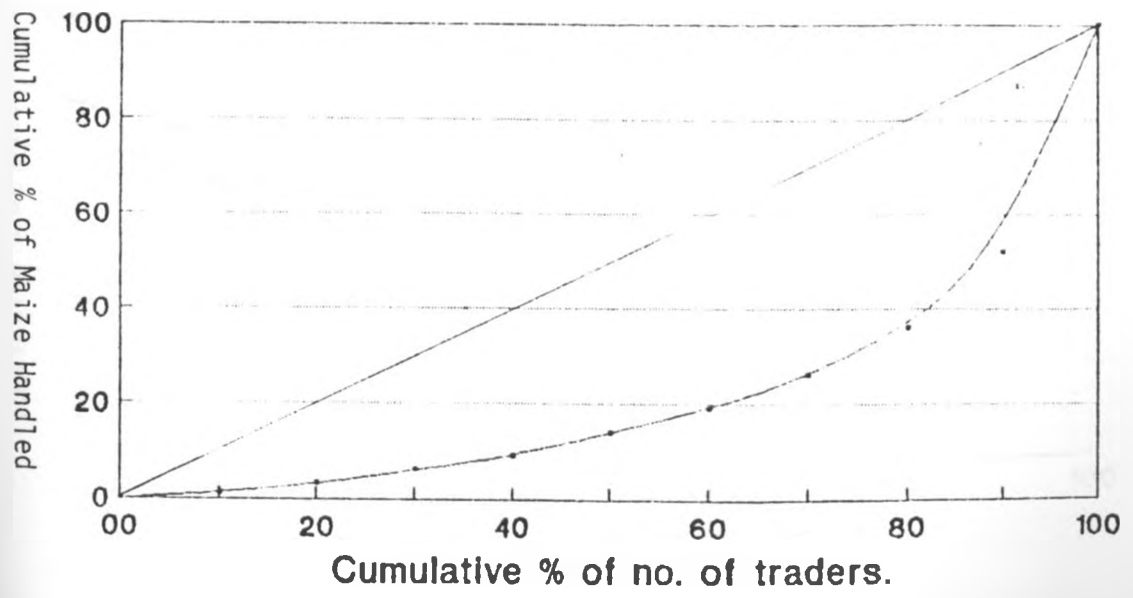
For Maize Handled by ALL Traders Surveyed in Uganda, March-May 1989.



Source: Appendix 16

Fig.5 : THE LORENZ CONCENTRATION CURVE

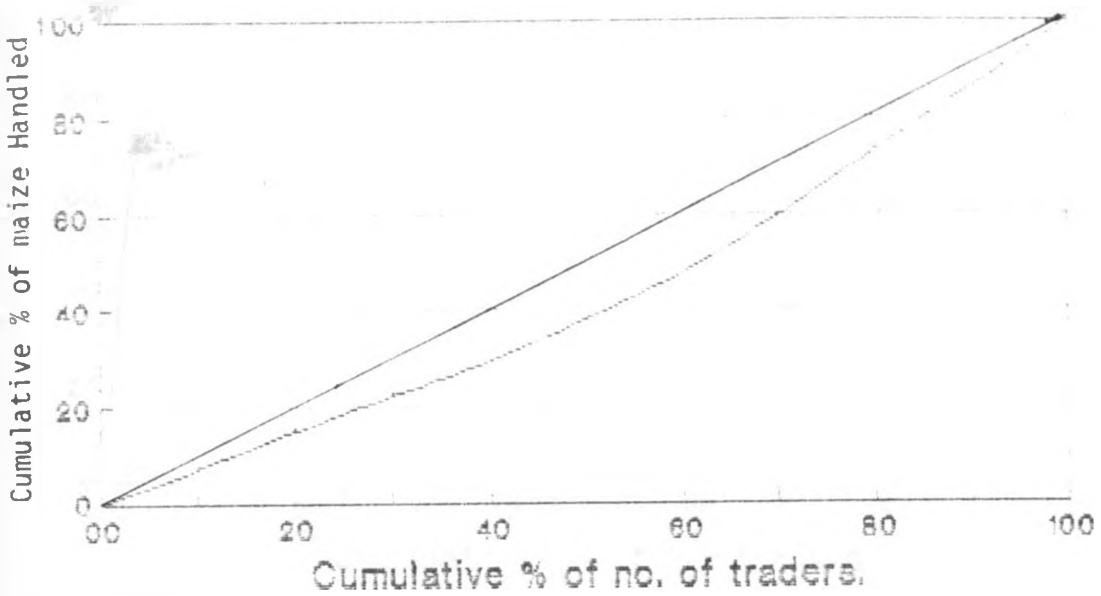
For Maize handled by Kamwenge Rural Market Traders, March-May 1989



Source: Appendix 10

Fig. 6 : THE LORENZ CONCENTRATION CURVE

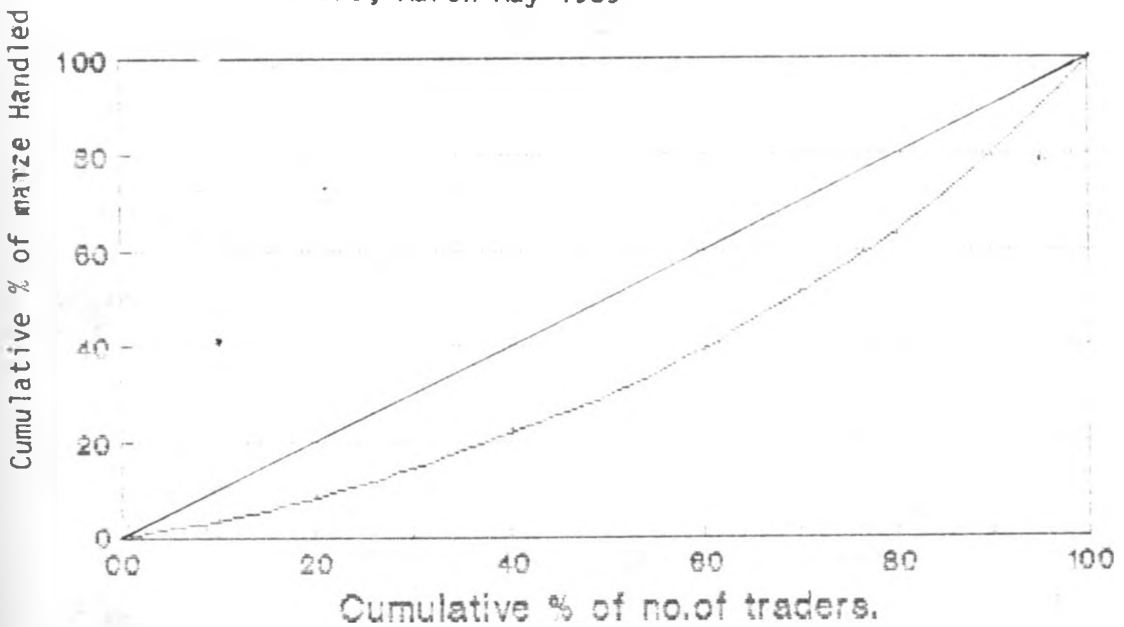
For Maize Handled by Kapchorwa Rural Market Traders, March-May, 1989



Source: Appendix 12

Fig.7 : THE LORENZ CONCENTRATION CURVE

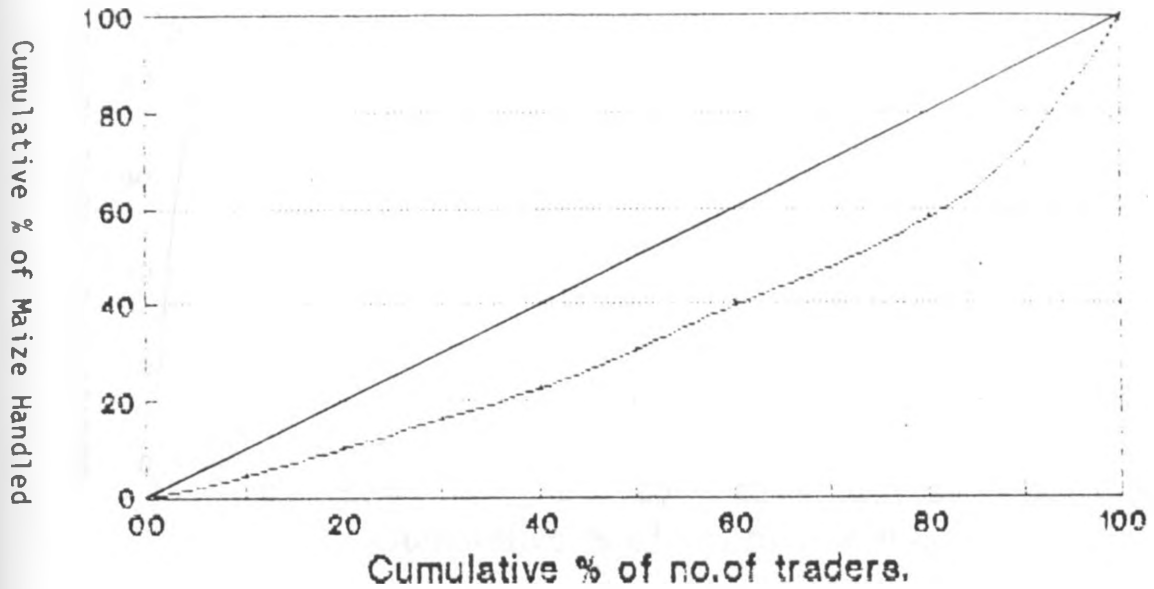
For Maize Handled by Kapchorwa Rural-Urban Market Traders, March-May 1989



Source: Appendix 13

Fig. 8 THE LORENZ CONCENTRATION CURVE

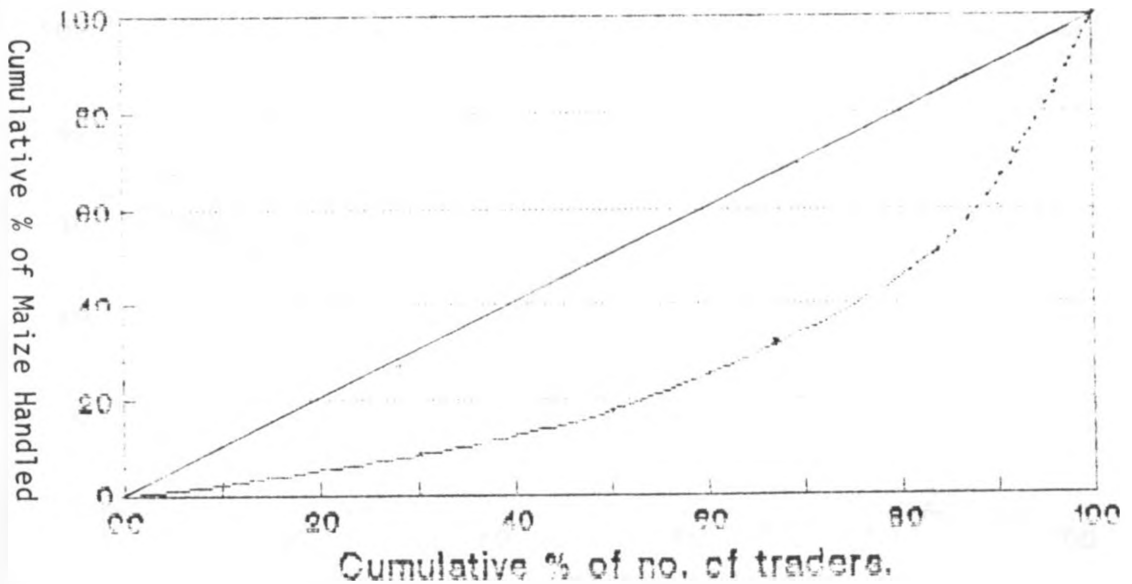
For Maize Handled by Sironko Rural-Urban Market Traders, March-May 1989



Source: Appendix 14

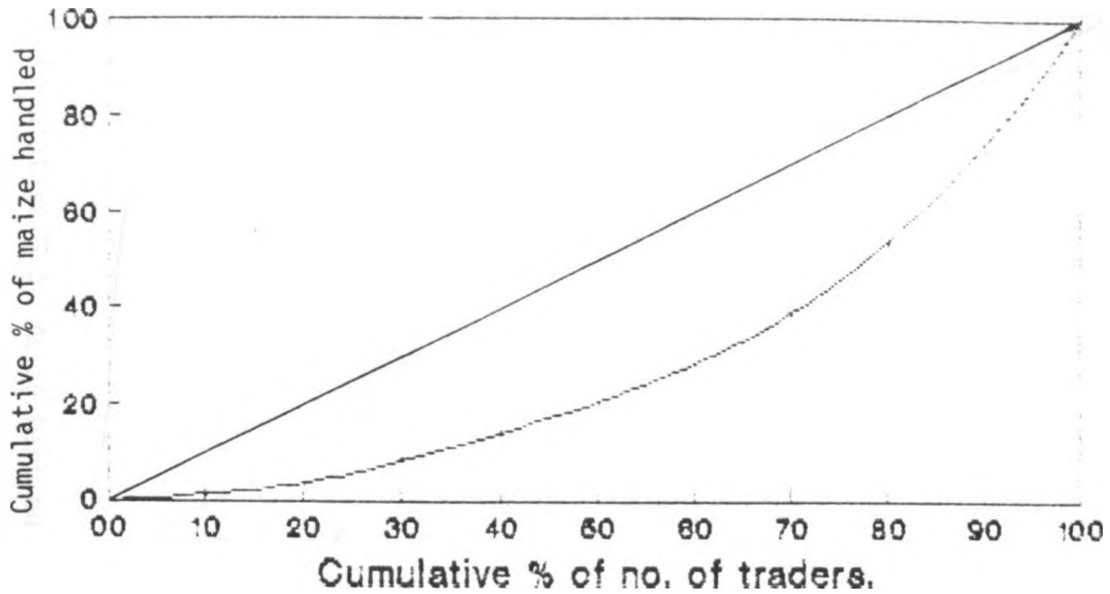
Fig. 9 : THE LORENZ CONCENTRATION CURVE

For Maize Handled by Kamwenge Rural-Urban Market Traders, March-May 1989



Source: Appendix 11

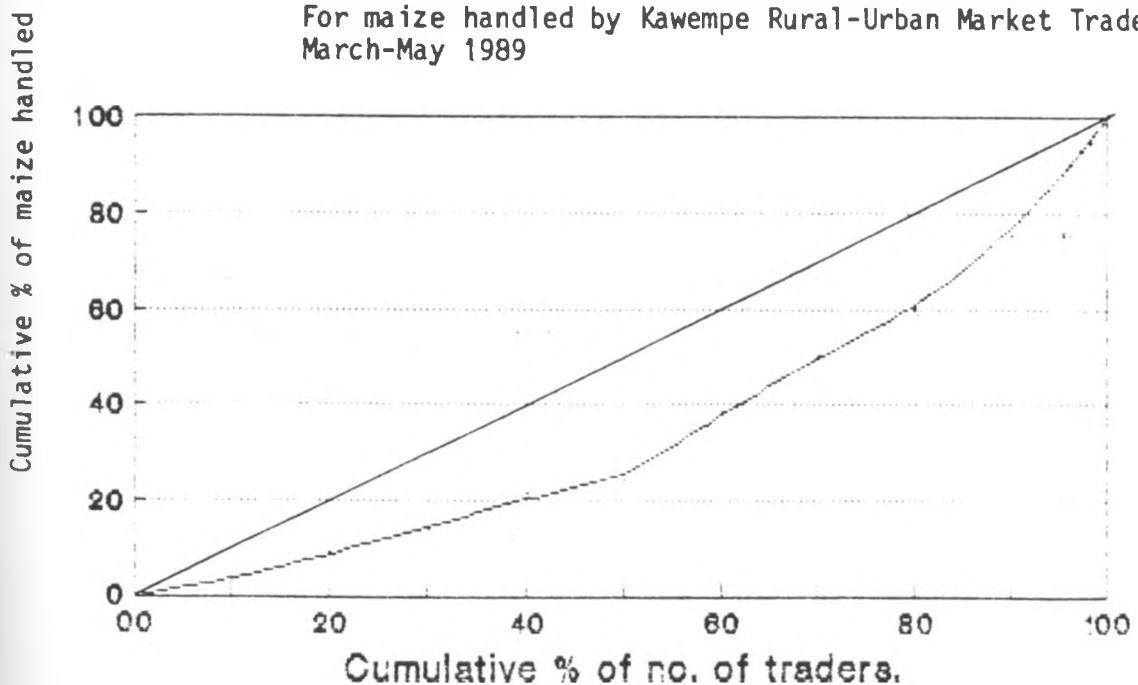
FIG. 10 THE LORENZ CONCENTRATION CURVE
For Maize Handled by Kampala Railway Yard Depot
Rural-Urban Market Traders, March-May 1989



Source: Appendix 8

FIG 11 : THE LORENZ CONCENTRATION CURVE

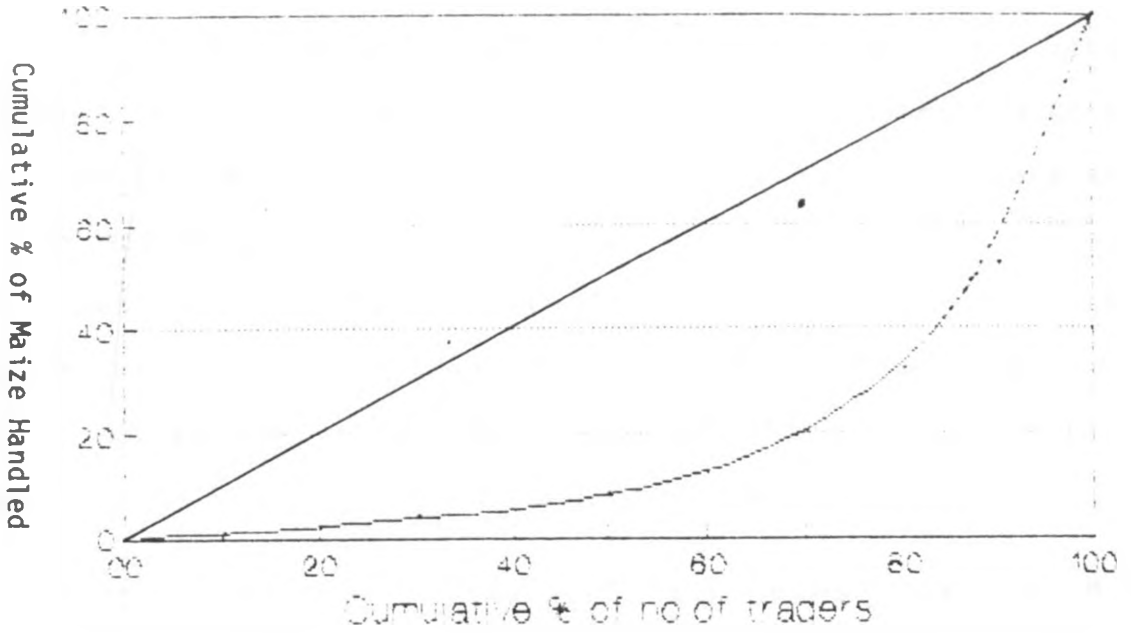
For maize handled by Kawempe Rural-Urban Market Traders,
March-May 1989



Source: Appendix 9

Fig.12 : THE LORENZ CONCENTRATION CURVE

For Maize Handled by Jinja Rural-Urban Market Traders, March-May 1989



Source: Appendix 15

Results showed that in most cases, the maize tended to be slightly concentrated in a few hands (Table 5.1). Of the 220 respondents, only 200 reported the volumes they handled. Of these, the first 4 largest traders controlled 12 per cent of the maize handled while the first 8 largest traders controlled 20 per cent of the maize. It is also observed that the first largest 5 per cent and 10 per cent of the traders controlled 23 per cent and 36 per cent of the handled maize respectively. This indicates a "low grade" oligopoly (Bain 1968). The overall gini coefficient of 0.47 also indicated a slightly high level of inequality in maize control (Table 5.2 and Figure 4).

For the rural areas, Kamwenge's gini coefficient of 0.57 indicated that the commodity was concentrated in relatively few hands (Fig. 5). In fact, out of 35 traders, the 4 largest traders handled 52 per cent of the commodity (Table 5.1). This implies that there could be market imperfections in the rural market enabling a few big traders the monopoly of the maize. This issue is further taken up when analysing barriers to entry. In Kapchorwa rural market trade however, the gini coefficient of 0.14 indicates an approach towards equality (Table 5.2 and Figure 6). However, the rural market traders were few as most of the traders were involved not only in the ferrying of the maize from the countryside but also in taking it to Sironko and other towns like Mbale and Tororo.

In the rural-urban traders, Kapchorwa traders show a distribution approaching equality with a gini coefficient of 0.28 with the first 4 largest traders out of 29 controlling only 27

per cent of the maize handled (Table 5.2 and Figure 7). This shows that quite a large number of traders with the capability to compete in buying and selling the maize, exist in Kapchorwa. In Sironko the first 4 largest traders out of 23 controlled 40 per cent of the maize handled (Table 5.1 and figure 8). The gini coefficient of 0.31, though low, indicates a higher inequality than in Kapchorwa rural-urban maize trade. This again shows that there is ample competition in the market but there could be other factors leading to the marketing system being less than a perfect market.

In Kamwenge rural-urban trade, out of the 18 traders the first 4 and 8 largest traders controlled 57 per cent and 78 per cent of the maize handled respectively. Using the first largest 5 per cent and 10 per cent of the traders, concentration ratio gave 18 per cent and 40 per cent respectively. This coupled with a gini coefficient of 0.49 indicated a "high moderate" concentration and thus existence of inequalities in the maize trade (Table 5.1 and Figure 9).

At Kampala Railway Yard depot, the largest 4 and 8 of the traders out of 44, controlled 28 per cent and 44 per cent of the commodity respectively. The biggest 5 per cent and 10 per cent controlled 18 per cent and 30 per cent of the commodity respectively (Table 5.1 and Figure 10). This indicated a generally low grade of oligopoly.

In Kawempe, out of the 34 traders, the largest 5 per cent and 10 per cent of them controlled only 15 per cent and 25 per cent of the commodity respectively. The gini coefficient was

0.30. This indicated a low level of concentration (Table 5.1 and Figure 11). The highest market inequality was in Jinja with a gini coefficient of 0.63 for traders ferrying maize from the countryside or trading centres to Jinja (Table 5.2 and Figure 12).

Bain (1968) points out that as seller concentration becomes higher, there is an increased tendency for traders to come to an agreement on joint profit-maximising policies and away from independent antagonistic policies. Conversely, as seller concentration becomes lower, independent actions tend progressively to undermine joint profit maximising policies. These results thus show that there is lack of competitiveness in the maize market. This could be attributed to conditions of entry in the maize market trade.

5.1.2 CONDITION OF ENTRY IN THE MARKET

In this section, major problems facing private traders involved in the maize trade were identified and the hypothesis that, there are substantial barriers to entry in the maize trade was tested. The entry barriers investigated were: managerial knowhow, legal constraints, capital requirements and availability of physical facilities.

5.1.2.1 MANAGERIAL KNOWHOW

Managerial knowhow was examined using formal education and business experience.

(a) Formal Education

Survey results showed that, most of the traders in the centres considered, had formal education. Sixty per cent had secondary or higher education, only 2 per cent had no formal education and 30 per cent had primary education, while 1 per cent gave no response. Since the majority of the traders (96 per cent) have at least primary education which is considered satisfactory for this trade, it appears that formal education does not constitute a barrier to enter the maize trade.

(b) Business Experience

Business experience may guide a businessman in decision making based on accumulated practical knowledge. It was found that the majority of the traders (58 per cent.) had been in business for between 2 and 5 years (Table 5.3).

TABLE 5.3: BUSINESS EXPERIENCE IN COMPLETED YEARS FOR MAIZE TRADERS IN THE SIX CENTRES IN UGANDA, 1989

	TIME IN COMPLETED YEARS										TOTAL	
	< 1		1-2		3-4		5-8		>8		NO	%
	NO	%	NO	%	NO	%	NO	%	NO	%		
1. KAMPALA RAILWAY YARD DEPOT	3	7	3	7	30	67	3	13	3	7	45	100
2. KAWEMPE	3	8	5	14	21	57	7	19	1	3	37	100
3. KAMWENGE	1	2	1	2	34	61	15	27	5	9	56	100
4. KAPCHORWA	0	0	9	20	22	65	3	9	0	0	34	100
5. SIRONKO	2	8	2	8	13	52	4	16	4	16	25	100
6. JINJA	5	22	2	9	7	30	4	17	5	22	23	100
OVERALL	14	6	22	10	127	58	39	18	18	8	220	100

SOURCE: SURVEY RESULTS

For traders staying in business for more than 8 years, Jinja had the highest proportion with 22 per cent, while Kapchorwa had zero per cent. The reason was that Jinja traders tended to be large-scale traders with others having or supplying the posho mills. Sixty five per cent of the Kapchorwa traders had been in business for 2 to 4 years. This is the zone that seemed to have high competition. Business experience however, did not seem to be a major leverage over the competitors since most traders could easily know what was involved in the trade within a short time due to the nature of the trade.

5.1.2.2 LEGAL RESTRAINTS

Obtaining a licence and restrictions on the areas of operation were analysed to determine whether these constituted barriers to enter the industry.

(a) Licencing

Small scale traders find it difficult to obtain a trading licence. Businessmen in Uganda are required by Law to obtain a trading licence. To avoid corruption in the assessment of income tax payment, the Uganda Government requires that this only be granted by the Ministry of Commerce after the businessman has paid income tax of Ushs.250,000 for one year. Maize traders were also required to pay Ushs.10,000 for one year as licence fee. It

was revealed that most of the traders operated without a licence and there were no constant law enforcers to apprehend such traders. Other traders were operating under their friends' licences at a small commission. Only 42 per cent of all traders had licences; 18 per cent had no licences, 38 per cent used a 'friend's' licence and 2 per cent did not require a licence as these were parastatal organizations (Table 5.4)

TABLE 5.4: MAIZE TRADERS WITH LICENCE IN THE SIX CENTRES IN UGANDA, MARCH-MAY 1989

	OWNING LICENCE									
	YES		NO		USED A FRIEND'S		OTHER		TOTAL	
	NO	%	NO	%	NO	%	NO	%	NO	%
KAMPALA RAILWAY YARD DEPOT	20	44	13	29	12	27	0	0	45	100
KAWEMPE	26	70	6	16	2	5	3	8	37	100
KAMWENGE (PMB AGENTS)	17	59	6	21	6	20	0	0	29	100
KAMWENGE (PRIVATE)	6	22	7	26	14	52	0	0	27	100
KAPCHORWA (PMB)	5	100	0	0	0	0	0	0	5	100
KAPCHORWA (PRIVATE)	1	3	0	0	28	97	0	0	29	100
SIRONKO	8	32	1	4	16	64	0	0	25	100
JINJA	9	39	8	35	5	22	1	4	23	100
OVERALL	92	42	41	18	83	38	4	2	220	100

KEY: OTHER = MAINLY PARASTATAL ORGANIZATIONS

SOURCE: SURVEY RESULTS

A close look at table 5.4 shows that only 3 per cent of Kapchorwa private traders owned licences and 97 per cent operated under other people's licences or just illegally. In Kamwenge, only 35 per cent of the rural market traders had licences while with the rural-urban market traders, 50 per cent of them had licences. In Kawempe, however, 70 per cent of the traders had licences while at the Kampala Railway Yard depot, 44 per cent had licences.

Asked why these traders never obtained licences, the majority of them claimed it was too expensive. It seems lack of a licence acts as a barrier to traders as they suffer from psychological fears of being arrested by the authorities any time. Besides, these traders' survival in business depends on their ability to pay the occasional bribes (section 5.3.2) and still be able to realise profits.

(b) Restrictions on Area of Operation

An inquiry into whether traders were confined to particular areas of operation was done. Ninety nine per cent of the respondents indicated no restriction on area of operation (Table 5.5). A trader is thus free to operate anywhere in the country so long, as he pays road tolls or fees in the new area of operation. It appears that restriction on area of operation does not constitute a barrier to entry.

TABLE 5.5: MAIZE TRADERS HAVING RESTRICTIONS ON AREA OF OPERATION IN THE SIX CENTRES IN UGANDA, MARCH MAY 1989

	RESTRICTION ON AREA OF OPERATION						✓
	PROBLEM		NOT A PROBLEM		TOTAL		
	NO	%	NO	%	NO	%	
KAMPALA RAILWAY YARD DEPOT	2	4	43	96	45	100	
KAWEMPE	0	0	37	100	37	100	
KAMWENGE (PMB AGENTS)	0	0	29	100	29	100	
KAMWENGE (PRIVATE)	0	0	27	100	27	100	
KAPCHORWA (PMB)	0	0	5	100	29	100	
KAPCHORWA (PRIVATE)	0	0	29	100	29	100	
SIRONKO	0	0	25	100	25	100	
JINJA	0	0	23	100	23	100	
OVERALL	2	1	218	99	220	100	

SOURCE: SURVEY RESULTS

5.1.2.3 CAPITAL REQUIREMENT

Aspects of capital requirement considered in this section include initial capital, traders accessibility to credit from banking institutions, other sources of finance and the state of business ownership.

The total amount of money required by a trader to start the buying and selling operations was investigated to determine whether this constituted a barrier to entry to the maize trade.

Since the traders started at different times and bearing in mind Uganda's high rate of inflation, the amount the traders started with was converted to April 1989 Uganda Shillings equivalent in order to form a solid basis for comparison (See Appendix 6).

The mean starting capital was Ushs.309,000¹ with a coefficient of variation², C.V., of 277 per cent (Table 5.6). This indicates that the initial capital is unevenly distributed among traders. This is further evidenced by the wide initial capital range where the minimum and maximum starting capitals were Ushs.4,000 and Ushs.30 million respectively.

Table 5.6: AVERAGE INITIAL CAPITAL IN THE SIX CENTRES IN UGANDA, APRIL 1989 USHS EQUIVALENT

CENTRE	INITIAL CAPITAL CONVERTED TO APRIL 1989 EQUIVALENT				
	MINIMUM '000 Ush.	MEAN '000 Ush.	MAXIMUM '000 Ush.	STANDARD DEVIATION	C.V
RURAL KAMWENGE (PMB)	36	1602	30000	3155	197
MARKET KAMWENGE, (PRIVATE)	4	608	5247	1441	237
TRADERS KAPCHORWA	28	1202	4545	1911	159
RURAL KLA R.Y.D.	5	435	3125	74	17
URBAN KAWEMPE	14	1860	13200	3012	162
TRADERS KAMWENGE (PMB)	20	340	1563	527	155
KAMWENGE (PRIVATE)	5	1373	10493	3433	250
KAPCHORWA	178	2934	10493	2054	70
SIRONKO	10	2473	15000	3017	122
JINJA	4	2867	30000	7684	268
OVERALL	4	309	30000	856	277

KEY : KLA RYD KAMPALA RAILWAY YARD DEPOT
C. V. = COEFFICIENT OF VARIATION

SOURCE: SURVEY RESULTS

¹ 1US\$ = Ushs.550 using the April 1989 open market rate

² C.V. was calculated as the the sample estimate for population standard deviation divided by the sample mean and expressed as percentage

To investigate the capital distribution further, traders were grouped according to initial capital status (Table 5.7).

TABLE 5.7: CLASSIFICATION OF RURAL AND RURAL-URBAN MARKET TRADERS ACCORDING TO CAPITAL USED TO START THE BUSINESS IN THE SIX CENTRES IN UGANDA, APRIL 1989.

		INITIAL CAPITAL (USHS)															
		LESS THAN 25,000		25,000-150,000		150,000-250,000		250,000-500,000		500,000-1,000,000		MORE THAN 1,000,000		NO RESPONSE		TOTAL	
		NO	%	NO	%	NO	%	NO	%	NO	%	NO	%	NO	%	NO	%
RURAL MARKET TRADERS	1. KAMWENGE (PMB)	0	0	3	17	4	22	2	11	2	11	4	22	3	17	18	100
	2. KAMWENGE (PRIVATE)	3	18	8	47	2	12	0	0	1	6	2	12	1	6	17	100
	3. KAPCHORWA (PMB/ PRIVATE)	0	0	2	40	1	20	0	0	0	0	2	40	0	0	5	100
RURAL-URBAN TRADERS	1. KAMPALA RAILWAY YARD DEPOT	10	22	15	33	2	4	6	13	5	11	6	13	1	2	45	100
	2. KAMWENGE	2	5	1	3	7	19	6	16	5	14	10	27	6	16	37	100
	3. KAMWENGE PMB	1	9	5	45	2	18	0	0	1	9	2	18	0	0	11	100
	4. KAMWENGE (PRIVATE)	2	20	2	20	2	20	1	10	0	0	2	20	1	10	10	100
	5. KAPCHORWA	1	3	0	0	1	3	2	7	1	3	23	79	1	3	29	100
	6. SIRONKO	1	4	1	4	1	4	1	4	3	12	17	68	1	4	25	100
	7. JINJA	3	13	5	21	2	8	0	0	0	0	4	17	9	42	23	100
TOTAL		23	10	42	19	24	11	18	8	18	8	72	33	23	11	220	100

SOURCE: SURVEY RESULTS

From table 5.7, 56 per cent of the traders started with less than Ushs.1 million¹ and 33 per cent with 1 million shillings or more. About 29 per cent of the traders started with Ushs.150,000 (US\$273) or less! This implies that capital requirement to enter the maize trade was not a major inhibitor but large amounts of capital were a prerequisite for more larger scale operations and could thus act as a means by which traders would compete with each other by trying to handle more volume of the grain.

¹ This was equivalent to US\$1,818

A further enquiry into whether traders have access to credit from banking institutions and sources of their finance was looked into. It was found that 79 per cent of the traders had problems in getting credit or loans from financial institutions. The remaining 21 per cent who never reported it as a problem said they had not tried as they did not hope to get it. There were however no loans being given out by the Uganda Commercial Bank to maize traders as the Government was mainly interested in giving credit to farmers. The traders thus had to raise their own capital through other means.

Asked about their source of capital to start the maize trade, 73 per cent of the traders reported that the source of capital was their own savings while 4 per cent got a loan from banks (Table 5.8). This seems to suggest that some traders could have got loans under pretext of other investments like agricultural production and diverted it to maize trade. Generally traders had to rely on their own capital for entering the maize trade.

TABLE 5.8: CLASSIFICATION OF TRADERS ACCORDING TO THEIR SOURCE OF CAPITAL TO START MAIZE TRADE IN THE SIX CENTRES IN UGANDA, MARCH-APRIL, 1989

CENTRE	OWN SAVINGS		LOAN FROM FRIENDS		LOAN FROM BANK		LOAN FROM FAMILY		OWN SAVINGS & BANK		FARMERS		OTHERS		TOTAL	
	NO	%	NO	%	NO	%	NO	%	NO	%	NO	%	NO	%	NO	%
1. KAMPALA RAILWAY YARD DEPOT	30	67	2	4	1	2	7	16	5	11	0	0	0	0	45	100
2. KAWEMPE	22	59	2	5	1	3	5	14	1	3	6	16	0	0	37	100
3. KAMWENGE	53	95	1	2	2	3	0	0	0	0	0	0	0	0	56	100
4. KAPCHORWA	33	97	0	0	0	0	0	0	0	0	1	3	0	0	34	100
5. SIRONKO	14	56	1	4	3	12	0	0	1	4	5	20	1	4	25	100
6. JINJA	9	39	5	22	1	4	0	0	0	0	6	26	2	9	23	100
TOTAL	161	73	11	5	8	4	12	5	7	3	18	8	3	1	220	100

KEY: OTHER - INCLUDE TRADER SELLING OFF HIS LAND E.G. IN SIRONKO, 'CHRISTIAN FELLOWSHIP' ORGANIZATION IN JINJA

SOURCE: SURVEY RESULTS

To further analyse the above issue, traders' state of business ownership was investigated. It was observed that 75 per cent of the traders personally owned their business while 14 per cent were in partnership (Table 5.9).

TABLE 5.9: CLASSIFICATION OF TRADERS BY STATE OF OWNERSHIP OF BUSINESS IN THE SIX CENTRES IN UGANDA, MARCH-MAY 1989

CENTRE	PERSONAL		PARTNERSHIP		COOP SOCIETY		MILLING CO.		PARASTATAL		NO RESPONSE		TOTAL	
	NO	%	NO	%	NO	%	NO	%	NO	%	NO	%	NO	%
1. KAMPALA RAILWAY YARD DEPOT	30	67	11	24	4	9	0	0	0	0	0	0	45	100
2. KAWEMPE	19	51	8	22	0	0	0	0	1	3	9	24	37	100
3. KAMWENGE	54	96	1	2	1	2	0	0	0	0	0	0	56	100
4. KAPCHORWA	32	94	2	6	0	0	0	0	0	0	0	0	34	100
5. SIRONKO	20	80	5	20	0	0	0	0	0	0	0	0	25	100
6. JINJA	10	43	4	17	4	17	4	17	1	4	0	0	23	100
TOTAL	165	75	31	14	9	4	4	2	2	1	2	1	220	100

KEY: COOP = CO-OPERATIVE

SOURCE: SURVEY RESULTS

Caution should be exercised in interpreting the proportion of traders under partnership. In order to raise capital for income tax, a few of traders would jointly pay the income tax and get licence under the name of one of the members. Each of them would then use this licence. The trader would claim that he is in 'partnership' with the owner of the licence. Thus, some of those traders in partnership could be classified under personal ownership. Only 4 per cent of the traders were under co-operative societies.

5.1.2.4 AVAILABILITY OF TRANSPORT, STORAGE AND OTHER FACILITIES

(a) Transport

Transport is an important element in connecting the producer to the final consumer. The nature of physical road infrastructure and vehicle problems were analysed.

Road conditions and vehicle availability were examined and results tabulated in table 5.10.

TABLE 5.10: TRANSPORT PROBLEMS FACED BY MAIZE TRADERS IN THE SIX CENTRES IN UGANDA, MARCH-MAY 1989

CENTRE	ROAD CONDITION						VEHICLE AVAILABILITY					
	A PROBLEM		NOT A PROBLEM		TOTAL		A PROBLEM		NOT A PROBLEM		TOTAL	
	NO	%	NO	%	NO	%	NO	%	NO	%	NO	%
KAMPALA RAILWAY YARD DEPOT	10	22	35	78	45	100	14	31	31	69	45	100
KAWEMPE	4	11	33	89	37	100	5	14	32	86	37	100
KAWWENGE	14	41	20	59	34	100	21	62	13	38	34	100
(TOTAL)	8	36	14	64	22	100	14	64	8	36	22	100
	22	39	34	61	56	100	35	63	21	37	56	100
KAPCHORWA PMB	1	20	4	80	5	100	4	80	1	20	5	100
KAPCHORWA (PRIVATE)	21	97	1	3	29	100	1	3	28	97	29	100
SIRONKO	24	96	1	4	25	100	4	16	21	84	25	100
JINJA	3	13	20	87	23	100	5	22	18	78	23	100
OVERALL	92	42	128	58	220	100	68	31	152	69	220	100

SOURCE : SURVEY RESULTS

In Kawwenge rural market, 41 per cent of the traders reported bad roads (Table 5.10). The problem in Kapchorwa was even worse. In Kapchorwa, 97 per cent of the private traders reported bad roads, while in Sironko, 96 per cent of the traders

reported the same problem. The rural roads in Kapchorwa and Kapchorwa-Sironko route are very poor especially during rains and at times donkeys have to be used in Kapchorwa. This explains why tractors were mostly used in this area. Analysis of vehicle problem showed that most traders never complained of vehicle availability but of cost. Sixty nine per cent of the traders reported no problem of vehicle availability (Table 5.10).

For those traders who had vehicle problems in transporting their maize, 41 per cent complained of transport cost being very expensive when hiring (Table 5.11). Only 15 per cent reported that vehicles were not easily available.

TABLE 5.11: TYPE OF VEHICLE PROBLEM FACED BY MAIZE TRADERS IN THE SIX CENTRES IN UGANDA, MARCH-MAY 1989

CENTRE	NOT EASILY AVAILABLE		TOO EXPENSIVE		NOT EASILY AVAILABLE & EXPENSIVE		LATENESS OR DERAILING		OTHER		TOTAL		
	No	%	No	%	No	%	No	%	No	%	No	%	
KAMPALA R. Y. DEPOT	2	13	4	26	5	36	3	21	0	0	14	100	
KAWEMPE	1	25	3	75	0	0	0	0	0	0	4	100	
KAWENGE	PMB	0	0	8	53	3	20	1	7	3	20	15	100
	PRIVATE	3	13	11	48	3	13	0	0	6	26	23	100
	TOTAL	3	8	19	50	6	16	1	3	9	24	38	100
KAPCHORWA	PMB	-	-	-	-	-	-	-	-	4	100	4	100
	PRIVATE	-	-	-	-	-	-	-	-	-	0	100	
	TOTAL	-	-	-	-	-	-	-	-	4	100	4	100
SIRONKO	1	25	1	25	0	0	0	0	2	50	4	100	
JINJA	3	75	1	25	0	0	0	0	0	0	4	100	
OVERALL	10	15	28	41	11	16	4	6	15	22	68	100	

Key Other: eg Difficult to be allocated a Bogie (Train Wagon) until one bribes like in Kawenge, or Vehicles getting stuck like in Kapchorwa or Sironko

- = Nil

SOURCE: SURVEY RESULTS

An inquiry into whether traders used hired or their own vehicles shows that 84 per cent of them use hired vehicles, 6 per cent use their own vehicles and 10 per cent mainly bought and sold maize at their premises.

Most traders hired the vehicles from the trading centres or towns in which they sold the maize. Seventy five of the traders hired vehicles from the areas in which they sold maize. Two per cent of them hired the vehicles from the Uganda Cooperative Transport Union, a transport body charged with hiring out heavy commercial vehicles for both internal and external movement of goods, 11 per cent hired train wagons from the Uganda Railway Headquarters mainly on the Kasese-Kampala line, 7 per cent of them hired vehicles from the maize source areas while the remaining 5 per cent gave no response (Table 5.12).

The traders in Jinja and Sironko however hired vehicles from the maize source areas. The traders had knowledge of vehicle availability in the maize-source areas. A trader goes and buys maize and after he has assembled enough consignment for a lorry load, he hires a vehicle from the trading centre in which he had bought the maize. This is done for cases where the trader first goes to assemble maize for several days.

TABLE 5.12: SOURCE OF VEHICLES HIRED BY THE MAIZE TRADERS IN THE SIX CENTRES IN UGANDA, MARCH-MAY 1989

CENTRE	MAIZE SOURCE AREA		MAIZE MARKET AREA		U.C.T.U.		UGANDA RAILWAYS		NO RESPONSE		TOTAL	
	NO	%	NO	%	NO	%	NO	%	NO	%	NO	%
KAMPALA RAILWAY YARD DEPOT	1	2	30	50	1	2	24	40	4	6	60	100
KANEMPE	0	0	28	88	4	12	0	0	0	0	32	100
KANWENGE PHB	0	0	26	84	0	0	0	0	5	16	31	100
PRIVATE	0	0	28	90	0	0	1	3	2	7	31	100
KAPCHORWA PHB	0	0	6	100	0	0	0	0	0	0	6	100
PRIVATE	1	3	38	97	0	0	0	0	0	0	39	100
SIROWKO	11	48	12	52	0	0	0	0	0	0	23	100
JINJA	4	31	9	69	0	0	0	0	0	0	13	100
OVERALL	17	7	117	75	5	2	25	11	11	5	235	100

M/B 1. VEHICLE CONSIDERATION INCLUDE THOSE OF TRADER WHO CAME MORE THAN ONCE DURING THE SURVEY PERIOD
 2. UCTU = UGANDA CO-OPERATIVE TRANSPORT UNION

SOURCE: SURVEY RESULTS

Another aspect of the problem investigated is the decisions pertaining to the area or vehicle owner to hire from. If it is found that the trader hired the vehicle because it was the only means or source available, then it would imply the trader had no option. Survey results however, showed that 81 per cent of the traders hired the vehicle from the maize source area because it was the only means available, and 19 per cent said it was because of being the cheapest alternative (Table 5.13).

TABLE 5.13: DETERMINANTS OF TRADERS' CHOICE OF SOURCE OF VEHICLE USED IN MAIZE TRANSPORTATION IN THE SIX CENTRES IN UGANDA, MARCH-MAY 1989

CENTRE	SOURCE OF VEHICLE	REASONS WHY CHOSEN				TOTAL	
		ONLY MEANS AVAILABLE		CHEAPEST SOURCE		NO	%
		NO	%	NO	%		
1. KAMPALA R.Y. DEPOT	Within The Source Area	-	-	-	-	-	-
	Market Area	4	18	18	82	22	100
	U.C.T.U.	0	0	1	100	1	100
2. KAWENPE	Railway HQs	5	26	14	74	19	100
	Within The Source Area	1	100	0	0	1	100
	Market Area	4	14	24	86	28	100
3. KAMWENGE	U.C.T.U.	0	0	4	100	4	100
	Within The Source Area	-	-	-	-	-	-
	Market Area	17	71	7	29	24	100
4. KAPCHORWA	Within The Source Area	1	100	0	0	1	100
	Market Area	9	27	24	73	33	100
5. SIRONKO	Within The Source Area	9	90	1	10	10	100
	Market Area	9	75	3	25	12	100
6. JINJA	Within The Source Area	2	50	2	50	4	100
	Market Area	4	50	4	50	8	100
OVERALL	Within The Source Area	13	81	3	19	16	100
	Market Area	47	45	70	55	127	100
	U.C.T.U.	0	0	5	100	5	100
	Railway HQs	5	26	14	74	19	100

KEY :1. U.T.C.U. = UGANDA CO-OPERATIVE TRANSPORT UNION
 2. R.Y. = RAILWAY YARD
 3. - = NIL

SOURCE: SURVEY RESULTS

Of the traders hiring vehicles from the market area, the majority, 55 per cent, said this was because it was the cheapest means. For the 5 traders who hired vehicles from UCTU, all of them reported that this was because it was the cheapest source. Most traders thus preferred hiring vehicles from 'lorry parks' in towns where they could easily get the vehicles though in most cases at a slightly higher rate than the UCTU's (see table 4.8).

It would thus seem that most traders hire vehicles from particular areas after considering hiring charges and accessibility. There was no restriction on where one could hire vehicle from. The maize traders normally negotiate with the owner of the vehicle and on agreeing on the terms, the trader is given the vehicle and the driver to carry the maize. Therefore, transport vehicles' availability is not a major constraint. It could thus not be used by traders as a competitive tool against fellow traders. However, hiring of a lorry required a large amount of money which could act as a constraint to some small-scale traders intending to get involved in the transportation of maize.

(b) Maize Storage

Another problem faced by marketing intermediaries is that of maize storage. Since a study into storage problems and facilities would need an entire research of its own, the intention here is to briefly outline the main maize storage

problems in Uganda. Firstly, the problem area investigated in the study was to establish whether the traders face any problems in storage and secondly to examine the nature of this problem.

Traders were asked whether they faced any problems in maize storage and the results are tabulated in table 5.14

TABLE 5.14: CLASSIFICATION OF TRADERS ACCORDING TO WHETHER THEY FACE ANY MAIZE STORAGE PROBLEM IN THE SIX CENTRES IN UGANDA, MARCH-MAY, 1989

CENTRE	STORE HAS A PROBLEM		HAS NO STORAGE PROBLEM		NO STORE AVAILABLE		TOTAL	
	NO	%	NO	%	NO	%	NO	%
KAMPALA R.Y								
DEPOT	7	16	37	82	1	2	45	100
KAWEMPE	2	5	34	92	1	3	37	100
KAPCHORWA	7	21	27	79	0	0	34	100
SIRONKO	1	4	24	96	0	0	25	100
JINJA	2	9	21	91	0	0	23	100
TOTAL	54	25	161	73	5	2	220	100

NOTE: R.Y = RAILWAY YARD

SOURCE : SURVEY RESULTS

It was observed that 73 per cent of the traders reported that they had no problem in storage. Ninety six per cent of the traders in Sironko reported that they had no storage problem. This is because most of them either have stores in Sironko or go to Kapchorwa to buy maize from the store owners and transport the maize to buyers either in Sironko, Mbale or Tororo without bothering to store it.

The hardest hit area was Kamwenge with only 32 per cent of the traders reporting no storage problem. This is because these traders have to buy the maize from the rural areas, store it and later sell it to rural-urban market traders from Kampala. They may also arrange to transport the maize to Kampala if they have the transport means and find it more profitable to transport it there themselves. For the traders at Kampala Railway Yard depot, 82 per cent of them reported no storage problem. In Kawempe and Jinja, the proportion of the traders who reported no storage problem was 92 per cent and 91 per cent respectively.

The characteristics of a good store have been given by Boxall et al (1978). They point out that a good store should afford maximum possible protection against insect, rodent, and bird pests; allow adequate ventilation, yet be capable of being made reasonably airtight for fumigation, afford protection against excessive moisture content and temperature favourable for insect and mould development. The store should also give protection against fire and theft; allow facilities for inspecting grain and facilitate cleansing of the store, and raised to avoid water sipping into the store.

Of the 54 traders who had store problems, 46 per cent of them reported that the stores were poorly constructed and thus could not store the produce for long, 34 per cent of them reported that the stores were very expensive when hiring while a further 20 per cent of them complained that the stores were too small (Table 5.15).

TABLE 5.15: NATURE OF STORE PROBLEM IN SIX CENTRES IN UGANDA MARCH-MAY, 1989

CENTRE	NATURE OF MAIN PROBLEM							
	POOR QUALITY CONSTRUCTION		TOO EXPENSIVE WHEN HIRING		STORE TOO SMALL		TOTAL	
	No	%	No	%	No	%	No	%
1. KAMPALA RAILWAY YARD DEPOT	2	29	5	71	0	0	7	100
2. KAWEMPE	0	0	2	100	0	0	2	100
3. KAMWENGE	22	63	11	31	2	6	35	100
4. KAPCHORWA	1	14	0	0	6	86	7	100
5. SIRONKO	0	0	0	0	1	100	1	100
6. JINJA	0	0	0	0	2	100	2	100
TOTAL	25	46	18	34	11	20	54	100

SOURCE: SURVEY RESULTS

In Kapchorwa, 86 per cent of the respondents complained that the stores were too small. In Kamwenge, 63 per cent of the respondents complained that the stores were of poor quality, and for those bringing maize to Kampala Railway Yard, 71 per cent of them complained of stores being too expensive (Table 5.15).

It would thus seem that the major problem was the quality of the store. The stores used by most traders were simply buildings with cemented or uncemented floor and iron sheet roofing just like on ordinary human habitation room which falls short of the specifications of a good store. A few traders had managed to put logs of timber on the floor to prevent direct contact of the sacks with the floor but these types of stores were few. Others simply heaped the maize sacks on the verandah or outside the store (if the store was full) and covered the sacks with tarpaulin.

This shows that if traders are to benefit from storage through future price rises and maintaining the quality of maize traded, their storage facilities have to be improved. The traders with better storage facilities have an advantage over those without and this may be a contributing factor in determining competition among traders. This, of course, assumes that the buyers will always prefer high quality maize to poor quality one, and storage period is relatively long.

(c) Other Constraints

Availability of other facilitating equipment investigated included gunny bags and weighing scales.

For the maize trader to operate smoothly, he must have enough gunny bags. An inquiry into the availability of gunny bags showed that this problem varied between centres (Table 5.16).

TABLE 5.16: GUNNY BAG PROBLEM FACED BY MAIZE TRADERS IN THE SIX CENTRES IN UGANDA, MARCH-MAY 1989

CENTRE	GUNNY BAGS AVAILABILITY					
	A Problem		Not A Problem		Total	
	No	%	No	%	No	%
KAMPALA RAILWAY YARD DEPOT	10	22	35	78	45	100
KAWEMPE	4	11	33	89	37	100
KAMWENGE PMB	12	4	17	59	29	100
KAMWENGE PRT	10	37	17	63	27	100
KAPCHORWA PMB	1	20	4	80	5	100
KAPCHORWA PRT	21	97	1	3	22	100
SIRONKO	24	96	1	4	25	100
JINJA	3	13	20	87	23	100
OVERALL	92	42	128	58	220	100

KEY: PRT - PRIVATE

SOURCE: SURVEY RESULTS

In Sironko, 96 per cent of the traders reported that gunny bags were not easily available. This problem was also reported in Kapchorwa with 97 per cent of the traders listing it as a major problem. In Kamwenge, 37 per cent of the private traders were having a problem in getting gunny bags. The gunny bag problem seemed to be concentrated in the rural areas. For the traders selling their maize in urban centres, the gunny bag problem was minimal. Twenty two per cent of the respondents at Kampala Railway Yard depot and 13 per cent of Jinja traders reported a problem in getting gunny bags.

Another facilitating factor was that of the weighing scales. Results showed that weighing scales do not seem to be a problem at all as 98 per cent of the traders reported that they had no problem with it.

In order to gauge the most pressing problems of the marketing intermediaries, the respondents were required to state what they felt needed improvement. Results showed that 80 per cent of the respondents suggested credit finance, 48 per cent recommended for improvement on roads, 18 per cent suggested getting loans to buy commercial lorries, 9 per cent recommended that farmers be provided with farm implements and inputs such as fertilizers, 6 per cent recommended for the reduction of income tax, 5 per cent suggested that gunny bags be made available, 4 per cent recommended for store construction finance and 3 per cent recommended for faster payment and constant review of prices by the PMB (Table 5.17). This would also imply that the most pressing need is capital availability. The state of roads also seems a major problem.

TABLE 5.17 TRADERS SUGGESTIONS ON IMPROVEMENT OF MAIZE MARKETING IN UGANDA, 1989

CENTRE	SUGGESTION												TOTAL
	CREDIT FINANCE	PMB TO PAY FASTER & CONSTANT REVIEW OF PRICES	IMPROVE BAD ROADS	LORRY LOANS	LOAN FOR OPERATIONAL EXPENSES	FARMERS BE GIVEN IMPLEMENTS & INPUTS	STORE CONSTRUCTION FINANCE	RESTRICTION ON UNLICENCED TRADERS	AVAIL GUNNY BAGS	GOVERNMENT TO REDUCE INCOME TAX	GOVERNMENT TO SUPPLY FUNGICIDES	PMB TO SELL TO MILLERS IN LEAN SEASONS	
1. KAMPALA R.Y DEPOT	41 (91)	0 (0)	30 (67)	13 (29)	6 (13)	1 (2)	4 (9)	0 (0)	2 (4)	0 (0)	0 (0)	1 (2)	45 (100)
2. KAMEHPE	29 (78)	0 (0)	18 (49)	14 (38)	0 (0)	1 (3)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	37 (100)
3. KAMWENGE	52 (90)	3 (5)	32 (55)	12 (21)	0 (0)	17 (29)	3 (5)	1 (2)	8 (14)	1 (2)	2 (3)	0 (0)	58 (100)
4. KAPCHORWA	27 (79)	4 (12)	19 (56)	1 (3)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	7 (21)	0 (0)	0 (0)	34 (100)
5. SIRONKO	15 (60)	0 (0)	5 (20)	0 (0)	0 (0)	0 (0)	2 (8)	0 (0)	1 (4)	4 (16)	1 (4)	0 (0)	25 (100)
6. JINJA	13 (54)	1 (4)	3 (13)	0 (0)	0 (0)	1 (4)	0 (0)	0 (0)	1 (4)	1 (4)	0 (0)	1 (4)	23 (100)
TOTAL	177 (80)	7 (3)	107 (48)	40 (18)	6 (3)	20 (9)	9 (4)	1 (1)	12 (5)	13 (6)	3 (1)	2 (1)	220 (100)

KEY: 1) BRACKETED FIGURES ARE THE PERCENTAGES

2) R.Y = RAILWAY YARD

SOURCE: SURVEY RESULTS

5.1.2.5 Hypothesis Testing

The first hypothesis which postulated that there are substantial barriers to entry in the maize trade was tested by looking at the above findings related to existing barriers. It has been observed that there are inequalities in the amount of maize handled by the selected traders. This was firstly due to capital requirement in the marketing of maize. Most traders found the income tax of Ushs.250,000 and the capital to buy and transfer the maize, at optimal levels, quite high. It has been further revealed that there were virtually no credit facilities being extended to these traders. Those who operated without a licence had at times either to pay bribes to traffic police or tried to use a friend's licence. This, not only had a negative psychological effect on these small traders, but also required that these traders be able to pay these bribes and still make profitable sales volumes. Poor road conditions acted as an inhibiting factor to vehicle availability as vehicle owners charged high rates for vehicle hiring or feared to put their vehicles on bad roads. Related to capital limitation is the fact that most traders had poorly constructed or small stores. From this information, it is concluded that there are substantial barriers to entry in the maize trade.

5.1.3 MARKET TRANSPARENCY

Important elements of market transparency considered were whether the market participants were aware of their competitors' source of supply and their buying prices; their competitors' market outlets and the prices fetched in these markets.

Asked whether the traders knew their competitors' source of maize supply, most traders reported that they were aware. Ninety two per cent of the respondents were aware of their competitors' source of maize supply (Table 5.18). The decision of where to buy is therefore likely to be guided by knowledge of possible alternative sources.

TABLE 5.18: PROPORTION OF TRADERS AWARE OF THEIR COMPETITORS' MAIZE SOURCE OF SUPPLY AREAS IN THE SIX CENTRES IN UGANDA, MARCH-MAY 1989

CENTRE	AWARE		NOT AWARE		TOTAL	
	NO	%	NO	%	NO	%
RURAL MARKET TRADERS						
1. KAMWENGE	31	86	4	14	35	100
2. KAPCHORWA	4	80	1	20	5	100
RURAL-URBAN TRADERS						
1. KAMPALA R.Y. DEPOT	40	89	5	11	45	100
2. KAWEMPE	34	92	3	8	37	100
3. KAMWENGE	20	95	1	5	21	100
4. KAPCHORWA	27	93	2	7	29	100
5. SIRONKO	23	92	2	8	25	100
6. JINJA	23	100	0	0	23	100
TOTAL	202	92	18	8	220	100

KEY: R.Y = RAILWAY YARD
SOURCE: SURVEY RESULTS

Further, 81 per cent of the traders reported that they were aware of their competitors' buying prices (Table 5.19). The Kamwenge rural market traders however had the least knowledge of their competitors' buying prices with 69 per cent of them being aware of their competitors' buying prices. This is because the countryside farmers and store owners sold at varying prices.

However, since most traders were aware of their competitors' buying prices, traders were likely to make informed decisions on what prices to offer to the sellers.

TABLE 5.19: PROPORTION OF TRADERS AWARE OF THEIR COMPETITORS' MAIZE BUYING PRICES IN THE SIX CENTRES IN UGANDA, MARCH-MAY 1989

(No. AND % OF RESPONDENTS)

CENTRE	AWARE		NOT AWARE		TOTAL	
	NO	%	NO	%	NO	%
RURAL MARKET TRADERS						
1. KAMWENGE	24	69	11	31	35	100
2. KAPCHORWA	4	80	1	20	5	100
RURAL-URBAN TRADERS						
1. KAMPALA R.Y. DEPOT	37	82	8	18	45	100
2. KAWEMPE	28	76	9	24	37	100
3. KAMWENGE	16	76	5	24	21	100
4. KAPCHORWA	27	93	2	7	29	100
5. SIRONKO	20	80	5	20	25	100
6. JINJA	22	96	1	4	23	100
TOTAL	178	81	42	19	220	100

KEY: R.Y = RAILWAY YARD

SOURCE: SURVEY RESULTS

Asked about their competitors' market outlet, 86 per cent of the traders reported that they knew their competitor's market outlets (Table 5.20). The rural market traders seemed relatively disadvantaged. In the Kamwenge rural market, only 77 per cent of them claimed to be knowing their competitors' market outlets and 23 per cent of them seemed not to be aware of the market outlets for those traders taking the maize to urban areas. In the rural-urban link, most traders knew their competitors' market outlets

as they met other traders from different areas at the urban selling points and discussed the existing and other possible market outlets.

TABLE 5.20: PROPORTION OF TRADERS AWARE OF THEIR COMPETITORS' MAIZE MARKET OUTLETS IN THE SIX CENTRES IN UGANDA, MARCH-MAY 1989
(No. AND % OF RESPONDENTS)

CENTRE	AWARE		NOT AWARE		NO RESPONSE		TOTAL	
	NO	%	NO	%	NO	%	NO	%
RURAL MARKET TRADERS								
1. KAMWENGE	27	77	8	23	0	0	35	100
2. KAPCHORWA	4	80	1	20	0	0	5	100
RURAL-URBAN TRADERS								
1. KAMPALA R.Y. DEPOT	41	91	4	9	0	0	45	100
2. KAWEMPE	32	86	4	11	1	3	37	100
3. KAMWENGE	17	81	4	19	0	0	21	100
4. KAPCHORWA	26	90	2	7	1	3	29	100
5. SIRONKO	22	88	3	12	0	0	25	100
6. JINJA	20	87	3	13	0	0	23	100
TOTAL	189	86	29	13	2	1	220	100

KEY: R.Y = RAILWAY YARD

SOURCE: SURVEY RESULTS

On the issue of the traders being aware of their competitors' selling prices, 75 per cent of them answered in affirmative. It was observed that 77 per cent and 80 per cent of the rural market traders in Kamwenge and Kapchorwa were aware of their competitors' selling prices respectively. Ninety per cent of Kamwenge traders in the rural-urban link knew their competitors' selling prices (Table 5.21). This is because most of them brought their maize by train to Kampala and could easily discuss price possibilities at different points in the town.

In Jinja, 96 per cent of the traders claimed to be aware of their competitors' selling price because most of them sold the maize in Jinja town and there were only a few selling points which the trader could easily visit when trying to sell his maize.

However, traders in Kawempe, who brought maize from different parts of the country, did not have good access to their competitors' activities. Only 51 per cent of them were aware of their competitors' selling price. This is because a trader would bring maize and find the other competitors having sold their maize (to the posho mills say) and gone away. The information on prices would thus be obtained from the buyer say, posho mill owner or any other wholesaler.

TABLE 5.21: PROPORTION OF TRADERS AWARE OF THEIR COMPETITORS' MAIZE SELLING PRICES IN THE SIX CENTRES IN UGANDA, MARCH-MAY 1989
(No. AND % OF RESPONDENTS)

CENTRE	AWARE		NOT AWARE		NO RESPONSE		TOTAL	
	NO	%	NO	%	NO	%	NO	%
RURAL MARKET TRADERS								
1. KAMWENGE	27	77	8	23	0	0	35	100
2. KAPCHORWA	4	80	1	20	0	0	5	100
RURAL-URBAN TRADERS								
1. KAMPALA R.Y. DEPOT	35	78	10	22	0	0	45	100
2. KAWEMPE	19	51	17	46	1	3	37	100
3. KAMWENGE	19	90	2	10	0	0	21	100
4. KAPCHORWA	21	72	7	24	1	3	29	100
5. SIRONKO	18	72	7	28	0	0	25	100
6. JINJA	22	96	1	4	0	0	23	100
TOTAL	165	75	53	24	2	1	220	100

KEY: R.Y = RAILWAY YARD
SOURCE: SURVEY RESULTS

On the issue of how the traders obtained information on their competitors, 75 per cent of the traders reported that they hold regular informal meetings to discuss prices and price changes, 14 per cent of them got information from those they sell to or buy from, 4 per cent got it by personal observation, while 4 per cent said they do not seek any information and 3 per cent found it hard to obtain.

Therefore, most traders had knowledge of their competitors' market outlets and possible selling prices. A relatively high informal market information seem to flow among the traders. This could also act as a means of collusive arrangement depending on the relative number of the traders.

5.2 THE MAIZE MARKET CONDUCT

This section analyses the maize grain pricing methods used by the PMB. It also deals with the private traders' pricing methods for the maize grain and flour. It further identifies factors guiding PMB and the private traders on where to buy the maize from or sell it to, and the reaction to established or new entrant traders.

5.2.1 MARKET CONDUCT OF THE PRODUCE MARKETING BOARD

Analysis of the PMB market conduct involved investigations into the setting of buying and selling prices, the reasons guiding the PMB on whom to buy the maize from and the predatory or exclusionary tactics if any, used against private traders as it competes for the maize it purchases.

5.2.1.1 Price Setting by the PMB

The PMB sets its prices after considering the Government minimum producer price. To this price, is added the transfer cost to arrive at the PMB buying price as shown below.

(a) Official Producer Price Setting

Every financial year, the Government announces the minimum producer price. The 1988/89 minimum producer price announced was Ushs.15/kg of dry maize. The producer price is determined as shown in table 5.22.

TABLE 5.22: COST COMPONENTS OF MAIZE MINIMUM PRODUCERS PRICE IN UGANDA, 1988/89

(COST/HECTARE)

ITEM	PHYSICAL	COST (USHS)
1. LAND CLEARING/SLASHING	20 MD	886
2. LAND PREPARATION	40 MD	1773
3. SEED @ USHS.15/KG	30 KG	450
4. PLANTING SEEDS	5 MD	222
5. WEEDING/THINNING	80 MD	3545
6. HARVESTING	25 MD	1108
7. POST HARVESTING/THRASHING	20 MD	886
8. TRANSPORTATION/MARKETING @ 34.67/BAG	12 BAGS	416
9. DEPRECIATION OF EQUIPMENT		409
10. GUNNY BAGS @ USHS.147.67/TWO SEASONS	12 BAGS	886
TOTAL	190 MD	10.581
11. PRICE CONTINGENCY @ 50%		5.291
12. TOTAL COST OF PRODUCTION		15.872
13. AVERAGE YIELD	1200 KG	
14. COST OF PRODUCTION/KG WITHOUT MARGIN		13
15. COST OF PRODUCTION/KG WITH 20% MARGIN		16
PRODUCER PRICE ADJUSTED		15

NB: THE COST COLUMN HAS BEEN DERIVED FROM THE 1986/87 FIGURES IN BANK OF UGANDA AGRICULTURAL SECRETARIAT. MAY-JULY, 1988 P.35 BY DIVIDING BY 14.6667

M.D. = MAN DAYS

SOURCE: BANK OF UGANDA AGRICULTURAL SECRETARIAT, MAY-JULY 1988 P.35

Data collected by the Bank of Uganda Agricultural Secretariat Staff is adjusted with data from the Ministry of Agriculture and Forestry. The basic cost of production figures are adjusted for price contingency (50 per cent) and inflation (100 per cent incremental inflation in the following year) (ROUAS Oct. 1988, p.20).

The total cost of production per hectare is divided by the yield per hectare to give the cost per kg. This was Ushs.13 in 1988/89. Then 20 per cent profit margin is allowed to give Ushs.15.60 which is rounded to 16.

This figure is adjusted after taking the following factors into consideration: - (i) world price trends for maize, (ii) prompt payment to farmers, (iii) future upward price adjustments to cater for inflation, (iv) prevailing wholesale and retail prices and, (v) prices in neighbouring maize importing countries like Rwanda, Tanzania and Sudan.

The minimum producer price of Ushs.15 was obtained by the downward adjustment of cost of production of Ushs.16. This was arrived at by considering that there was a declining trend in world prices for maize, that the farmers were to be paid promptly and the maize prices would be raised by 100 per cent the following year to cater for inflation.

It should be noted that in April 1989, the black market exchange was between Ush.550 and 650 per US dollar while the official exchange rate that had been used was Ushs.200 per US dollar.

This means that any calculation based on the official exchange rate with the Uganda shilling over-valued will not only fail to achieve the objective of encouraging the producer but will adversely affect him as local costs of production will be far higher than the minimum producer price. The results would be that the farmers would not sell the produce to the official, PMB channel. If the black market exchange rate is used then producer price would definitely be higher not only than the official minimum producer price but also higher than the price determined by the supply and demand forces. This would achieve the government objective of boosting production if the markets are guaranteed. This would however adversely affect the consumer as he would be paying a price higher than the costs of production and delivery of goods to him.

A further critical appraisal of the formula used in determining the minimum producer price shows that this formula has major shortfalls. Firstly, the arbitrary fixing of the financial costs of man-hours at a uniform rate in the whole country is unrealistic since some areas have more expensive labour costs than others. Secondly, while the logic of using man-hours per activity item to give a rough guide to the estimate of labour and costs involved is plausible, it does not necessarily reflect the actual costs incurred in the country where inflation is rampant and different zones may have different cost structures. Thirdly, the adjustment of the cost of production price with a 100 per cent inflation allowance for the

following year means that the question of inflation is wrongly handled. It would imply a possibility of the commodity being bought at a higher price in real terms at the beginning of the 'inflation-adjusted year' than the price at the end of that year. Farmers would thus sell the produce to the official channel initially and would later in the year divert their produce to other buyers when inflation bites deeper as the year progresses.

To illustrate the irrelevance of the Government minimum producer price, it is important to note that, as of March-May 1989 during the survey period, the Ushs.15/kg minimum producer price was still in force (eight months after it had been announced!). This had virtually no meaning for the farmer as he was already selling his maize at the farm-gate at between Ushs.30 and Ushs.35 per kilogram.

A reasonable alternative is to periodically adjust the minimum producer price using the consumer price index (possibly the Middle Income Consumer Price Index). This then could be announced as frequently as possible say monthly or quarterly depending on whether the inflation rate is high or not.

(b) The PMB Price Setting

In March 1989 when the survey started, the PMB Buying Centre price was Ushs.35. The regional and central depot buying prices and issue prices are shown in table 5.23.

TABLE 5.23: PMB BUYING AND SELLING PRICE AT DIFFERENT CHANNEL LEVELS IN UGANDA, 1988-89

DATE	CHANNEL LEVEL				
	BUYING PRICE			SELLING PRICE	
	BUYING CENTRE	REGIONAL DEPOT	CENTRAL DEPOT	REGIONAL OR UNPROCESSED MAIZE	CENTRAL DEPOTS PROCESSED MAIZE
W.E.F. 14/11/88	35	40	45	57	64
W.E.F. 17/3/89	45	50	60	75	85

NOTE: 'Processed maize' refers to maize which has been cleaned by removing all the dirt and spoiled maize, by PMB cleaning equipment

W.E.F.= With Effect From

SOURCE: PMB STATISTICS DEPARTMENT

The PMB calculates the Buying Centre price by assuming that the minimum producer price is the price at which PMB agents buy the produce from the farmer. The PMB agents' 'Fixed Costs' (transport and overhead), financial charges and other variable costs and his profit margin are added to his buying price to arrive at the PMB Buying Centre price (Table 5.24).

TABLE 5.24: COST COMPONENTS IN THE DETERMINATION OF PMB BUYING CENTRE PROCUREMENT PRICE FOR DRY MAIZE, 1988/89

PMB AGENTS COST PER KG		AMOUNT (USHS/KG)
1. MINIMUM PRODUCER PRICE	=	15.00
2. PRIMARY PROCUREMENT COST		
- WEIGHING COST AT USHS.20/BAG	- 0.20	
- CARRYING COST (MANUAL, CYCLE, CART, ETC) AT USHS.120/BAG	- 1.20	1.74
- OTHER COSTS	- 0.34	
3. SECONDARY HANDLING COSTS: AGENTS STORE TO PMB BUYING CENTRE		
- RERAGGING AT 100 USHS/BAG	- 1.00	
- LOADING AT USHS 25/BAG	- 0.25	= 1.25
4. TRANSPORT COST: FROM TRADERS' COUNTRYSIDE STORES AND RURAL MARKETS TO PMB BUYING CENTRE (FOR 7 M.T. LORRY)		= 8.59
5. STORAGE COST		= 0.22
6. LOSSES AND WASTAGE		
- REDUCTION IN MOISTURE CONTENT ESTIMATED AT	1.5% OF (1)	
- SPILLAGE ESTIMATED AT	1.0% OF (1)	
- UNSEEN LOSSES ESTIMATED AT	1.0% of (1)	

	3.5% of (1)	= 0.53
7. CROP FINANCE COSTS		= 3.15
8. OVERHEAD COST OF AGENTS		= 1.19
9. TOTAL COST (2) TO (8)		= 15.48
10. PROFIT - 20% of (9)		= 3.10
PMB BUYING CENTRE PRICE = (1) + (9) + (10)		= 33.58
SAY		= 35

SOURCE: PMB AND BANK OF UGANDA AGRICULTURAL SECRETARIAT (OCTOBER, 1988)

A critical appraisal of table 5.24 shows that this method of fixing the PMB Buying Centre prices also lack the inflation rate aspect which would allow the price to vary with the rate of inflation. Further, by using similar transport costs of Ushs.8.59 for any part of the country, road condition and vehicle availability differences in the country are neglected. This implies that the PMB agents get divergent profit margins depending on their transfer costs which are not compensated by the PMB if say an agent incurs more than the stated amount. The fixing of the PMB agent's profit margin to 20 per cent of marketing costs may restrict either the agent's or the Board's profitability as this should be allowed to vary to enable the Board to adjust to changing market conditions.

PMB issue prices are determined by adding up the Buying Centre price, the fixed costs including transportation between depots, packaging, financial and other variable costs and its profit margin. The prices are fixed for a period of time and may be altered by the PMB when it feels that the prices have become too low. Table 5.25 shows that issue prices were altered after 4 months as the prices fixed earlier had been made irrelevant by the high rate of inflation. Table 5.25 below shows how the issue prices are arrived at.

It is evident from table 5.25 that the PMB selling price are determined without consideration of the private traders' prices. If demand and supply forces cause a rise in prices, this would only be beneficial to the private traders as the PMB would not immediately raise its price accordingly. The PMB could for example periodically adjust the buying and selling prices using the Middle Income Consumer Price Index. The prices could then be announced monthly or quarterly depending on whether prices in the parallel market have changed appreciably. This may however require the PMB to start recording prices (say on weekly or monthly basis in both the maize supply areas and consumption points.

The PMB performed very well during the initial period (from 14th November, 1988) up to January 1989. By February 1989, private traders controlled most of the maize due to their prices being higher than the PMB price of Ushs.35 per kg at the Buying Centres. This prompted the PMB to increase its buying price from Ushs.35 per kg to Ushs.45 on 17th March 1989.

In Kapchorwa and Kamwenge it was observed that after the new price was announced, farmers who came to the PMB with maize were initially turned away due to lack of cash by the PMB but this was soon corrected and the farmers, some private traders (including the PMB Appointed Agents) started bringing maize in large quantities! Just before the PMB's new price, Kamwenge and Kapchorwa trading centre prices ranged between Ushs.37 - 40. After the PMB's price increase, the private traders raised the

price to Ushs.45 and above at the trading centres, and in the villages, the price rose from Ushs.30 - 35 to Ushs.35 - 45. This again kicked the PMB out of business especially in Kamwenge as maize shortage began to be apparent. This sparked off a spiral rise in price both in the villages, in rural collecting centres and in the main consuming towns of Kampala, Jinja and Mbale (Sironko). By the end of the research in mid May, 1989, a kilogram of dry maize in the countryside areas of Kamwenge had reached Ushs.80, and Ushs.100 in Kampala within a period of only two months! (Appendix 19).

It should be noted that until then, (Mid May, 1989), the PMB Buying Centre price still stood at Ushs.45 and its selling price at Ushs.75! This meant that not only could the PMB find it difficult to get suppliers of maize, but had also to content with rationing of whatever little maize it had. This is further confirmed by the low storage capacity utilization of the PMB.

5.2.1.2 PMB Conduct in Buying and Selling Operations

During the harvest season, the PMB will first buy maize from appointed agents. During the offseason, it will buy from any supplier. The amount of maize bought in any year depends on:-
(i) the working capital at its disposal, (ii) the existing

market prospects in the internal and export trade, (iii) the level of activity of the private traders and (iv) the level of the country's maize output.

The critical factor in deciding the quantity of maize bought by the PMB is its working capital as most of the purchases have to be done in cash if it is to compete with the private traders.

Appendix 17 shows that PMB's working capital in October 1988 was Ushs.596,805,627. This was equivalent to US\$1,193,611 (if the then open market exchange rate of US\$1 = Ushs.500 is used, and US\$2,984,028 if the official exchange rate of US\$1 = Ushs.200 is used). With this little working capital at its disposal (since it has to not only buy maize, beans, simsim, soya beans and groundnuts, but has to meet other administrative and produce transfer cost), the PMB finds it difficult to pay cash to the suppliers during harvest season.

The PMB has also to meet the government's barter trade obligations, sell maize to internal institutions like schools, hospital, the Ministries of Defence and Rehabilitation among others. There thus exists demand for PMB's maize if only it could meet this demand.

5.2.1.3 The PMB's Reaction to Involvement of Private Traders in Maize Trade

The only weapon used by the PMB against its competitors (the private traders) is the price increase. This is done in the hope that the higher price will attract sellers away from the private

traders. This is not an effective method of out-competing the private traders as they also in turn increase their prices.

5.2.2 MARKET CONDUCT OF THE PRIVATE TRADERS

The private traders' market conduct involved investigations into the traders' price setting policies in the buying and selling of maize, the decision on where to buy the maize from and the market outlet and lastly, the traders' reaction against established and potential market participants.

5.2.2.1 Price Setting in the Maize Buying and Selling

(a) Maize Grain Pricing:

It was revealed that traders in the rural market trade, who normally have contact with each other, meet to discuss what price to offer to the producers at the farm gate level, countryside stores and the rural trading centres. Normally, they collude in influencing the rural trading centre price. If an area is in the vicinity of a PMB Buying Centre, the traders offer a price that is just above the PMB buying price. Here the PMB price acts as a floor ceiling price when the Board has cash to buy the maize. The traders in the rural trading centres then sell the maize to rural-urban market traders who ferry the maize to urban consuming centres or they may themselves take it to urban centres.

The selling price in the rural collecting centres is arrived at through negotiation between the rural-urban market traders and

the rural market traders. The rural-urban market trader moves from traders' store to store in the rural collecting centres negotiating for a fair deal. Once he is convinced of the minimum price in the area, bearing in mind the transfer costs to be met and the average price in the urban centre, He decides to buy.

In the urban centres, each individual trader looks for his own market such as posho mills, ministries like Defence and Rehabilitation, hospitals, schools or other wholesalers, and sells to the highest bidder.

On the question of how private traders come to determine the price they sell at, 80 per cent of the traders reported that they come to an "agreement" with the buyer (Table 5.26).

TABLE 5.26: METHODS OF FIXING PRICES BY MARKETING INTERMEDIARIES IN THE SIX CENTRES IN UGANDA, MARCH-MAY 1989

CENTRE	FIXED BY PMB		FIXED BY SELLER (RESPO- DENT)		FIXED BY BUYER		AGREE WITH BUYER		NO RESP- NSE		TOTAL	
	NO	%	NO.	%	NO	%	NO	%	NO	%	NO	%
KAMPALA RAILWAY YARD DEPOT	0	0	0	0	0	0	44	98	1	2	45	100
KAWEMPE	0	0	4	11	2	5	30	81	1	3	37	100
KAWENGE, PMB	11	38	0	0	0	0	18	62	0	0	29	100
PRIVATE	0	0	0	0	0	0	27	100	0	0	27	100
SUR TOTAL	11	20	0	0	0	0	45	80	0	0	56	100
KAPCHORWA	5	15	0	0	0	0	27	79	1	3	34	100
SIRONKO	1	4	0	0	0	0	24	96	0	0	25	100
JINJA	0	0	11	48	5	22	6	26	1	4	23	100
OVERALL	17	8	15	7	8	3	176	80	4	2	220	100

SOURCE : SURVEY RESULTS

However, as has already been observed, traders normally meet to discuss the prices in the buying and selling areas. The term 'coming to an agreement' may be taken to mean that there is some negotiation before selling takes place. But since the sellers are disaggregated and have no information of the whole marketing system especially at the consumer end, the rural maize seller may be disadvantaged in this "coming to an agreement". This shows there is low market information flow within the marketing system. To further confirm this, this issue is later analysed in the chapter to determine whether the buying prices in the supply areas are completely influenced by the selling prices in the urban areas.

As there was no major grain quality difference, the main sales promotion effort traders used was to personally contact buyers so as to sell the maize quickly and go back to buy more.

It has already been revealed in section 5.1.3 that, 75 per cent of the traders discuss the prices they buy and sell at. This implies that traders in a centre collude in setting the price to buy from producers or other rural market traders. In selling, they also collude in determining what prices to sell at. Survey results showed that 82 per cent of the traders sold their maize at the same price like their competitors, 4 per cent sold below others' prices, only 1 per cent sold above their competitors' price while 13 per cent of the traders reported some price flexibility depending on the negotiating acumen of the two parties.

A discussion of maize price setting in Uganda would be incomplete without mentioning the maize flour pricing. A brief description of this is given below.

(b) Maize Flour Pricing

There are two major types of marketing intermediaries dealing in maize flour trade - the posho mill owners and traders who buy maize grain, take it to posho mills for milling and then sell the flour.

Due to lack of reliable data obtained, only millers' costs in Jinja seemed more reliable and were accordingly used.

For the seven selected millers in Jinja, the milling costs ranged from Ushs.5 to 7 per kilogram of maize grain. To determine whether this charge was justified, milling costs were analysed. Data on machine costs was depreciated using straight line method on 15 years. The milling cost per kg was Ushs.3.3 (Table 5.27).

TABLE 5.27: MILLING COSTS OF MILLERS IN JINJA, MARCH-MAY 1989
(USHS/KG)

COST COMPONENT	AMOUNT (USHS)
- MACHINE DEPRECIATION COSTS	0.0214
- OVERHEAD COSTS	3.1250
- RENT	0.1042
- INCOME TAX	0.0434
- LICENCE	0.0017
TOTAL	3.2957

SOURCE: DATA OBTAINED FROM MILLERS IN JINJA

This showed that the millers were not only able to cover the cost but earn profit. These millers had an organization through which they could meet and fix the milling price. Prices of maize flour varied according to quality differences brought about by milling techniques. However, there did not seem to be much variation in maize flour sold by the different millers (Appendix 18). For traders milling the grain before sale, the formula used was "the cost of 2kg of maize is equated to the price of 1kg of grade 1 maize flour".

Evaluating the fairness of this formula was done as follows. Information from the posho millers showed that 1kg of maize grain gave 0.6kg of grade 1 maize meal, 0.35kg of bran and 0.05kg of dust. If we take an example in Jinja where maize grain was selling at Ushs.70 per kg and the milling charge was Ushs.7 per kg, the total cost will be Ushs.77. If it is assumed that: the opportunity cost of capital is the bank interest rate on commercial loans which stood at 50 per cent p.a. and that a trader buys maize, mills it and sells the maize flour within a week and the inflation effect of one week is negligible, then the cost of capital used is Ushs.0.80. The total cost of buying and milling one kilogram of maize (within one week) will be Ushs.77.8.

In Jinja, maize bran cost Ushs.25/kg. Then the maize flour and bran obtained from 1kg of maize grain will sell at Ushs.92.75. This gives a profit rate of 19 per cent on cost. This low rate of profit shows that such pricing is both fair and probably competitive.

5.2.2.2. Private Trader Conduct in Determining Source of Produce

Analysis of the traders' conduct in deciding where to buy from showed that 37 per cent of them were mainly guided by the areas having a lot of produce and 27 per cent of them by the area being the cheapest source (Table 5.28). It would thus seem that both price and availability of produce are the major determinants of where the traders buy from. About 1 per cent reported being influenced by the quality of the produce.

TABLE 5.28: FACTORS THAT INFLUENCE TRADERS IN DECIDING WHERE TO BUY MAIZE FROM IN THE SIX CENTRES IN UGANDA, MARCH-MAY 1989

CENTRE		MAINLY INDUCED BY:														TOTAL	
		CHEAPEST SOURCE		USUAL PLACE OF OPERATION		PLENTY OF PRODUCE		HOME AREA		LACK OF CAPITAL TO GO FAR		GOOD QUALITY MAIZE		NO RESPONSE			
		NO	%	NO	%	NO	%	NO	%	NO	%	NO	%	NO	%		
RURAL MARKET TRADERS	KAMWENGE PMB	3	17	0	0	10	55	0	0	1	6	0	0	4	22	18	100
	KAMWENGE PRT	5	29	3	18	7	41	0	0	1	6	0	0	1	6	17	100
SUBTOTAL		8	23	3	8	17	49	-	-	2	6	0	0	5	14	35	100
RURAL MARKET TRADERS	KAMWENGE PMB	1	9	1	9	7	64	0	0	0	0	2	18	0	0	11	100
	KAMWENGE PRT	1	10	1	10	7	70	1	10	0	0	0	0	0	0	10	100
	KAMPALA R.Y. DEPOT	5	11	1	2	14	31	25	56	0	0	0	0	0	0	45	100
	KAWENGE	9	24	1	3	7	19	15	40	0	0	0	0	5	5	37	100
	KAP. PMB	1	20	1	20	3	60	0	0	0	0	0	0	0	0	5	100
	KAP. PRT	6	21	0	0	22	76	1	3	0	0	0	0	0	0	29	100
	SIRONKO	21	84	2	8	2	8	0	0	0	0	0	0	0	0	25	100
JINJA	8	35	4	17	3	13	1	4	1	4	0	0	6	26	23	100	
SUBTOTAL		52	28	11	6	65	35	43	23	1	1	2	1	11	6	185	100
GRAND TOTAL		60	27	14	6	82	37	43	20	3	1	2	1	16	7	220	100

KEY: PRT = PRIVATE
RY = RAILWAY YARD
KAP = KAPCHURWA

SOURCE: SURVEY RESULTS

This implies that quality is almost uniform and can thus not be used as a differential aspect in competition. Maize in Uganda is normally white maize. Any maize that has less than 5 per cent coloured maize is accepted as white maize. If maize brought by a seller is moulded, it is rejected. If the maize has stones or dust or weeviled, or has some moisture, it may be bought at a discount. However, this problem (during the survey) was minimal as most of the maize had been harvested in December, 1988.

The traders were rational in deciding where to buy from as they were guided by produce availability and to some extent, price. However, as the traders seemed to have an influence on buying price the most important factor was the areas having plenty of produce since most traders increased their business activity through higher turnover rate.

5.2.2.3 Private Traders' Conduct in Determining Market Outlet

Traders will sell in more than one market depending on what type of marketing intermediary they are. It was observed that, the majority of the rural market traders sell their maize in one market (Table 5.29). In Kamwenge and Kapchorwa, 79 per cent and 100 per cent of the rural market traders respectively sold their maize in one market. The majority (66 per cent) of the rural-urban market traders also sold their maize mainly in one market while a further 20 per cent in one other town. The traders in Sironko and Kapchorwa were selling in one other town. This is because prices in Mbale and Tororo were higher than in Sironko and Kapchorwa; so traders took advantage of this to ferry maize to these two towns.

Traders selling maize in Kamwenge could also take it to Kampala if they found price differences between Kampala and Kamwenge allowed a good margin if transfer costs are considered.

Overall, most traders (69 per cent) sell in one market and 20 per cent in one other town. Seven per cent of the traders sold maize in two or more towns showing that traders tend to be localised to particular markets.

TABLE 5.29: NUMBER OF OTHER MARKET OUTLETS FOR TRADERS IN THE SIX CENTRES IN UGANDA, MARCH-MAY 1989

CENTRE	NUMBER OF MARKETS										TOTAL		
	ONLY ONE PLACE		1 OTHER TOWN		2 OTHER TOWNS		3 OR MORE OTHER TOWNS		NO RESPONSE		NO	%	
	NO	%	NO	%	NO	%	NO	%	NO	%			
RURAL MARKET TRADERS KAMWENGE	27	79	7	21	0	0	0	0	0	0	0	34	100
KAPCHORWA	5	100	0	0	0	0	0	0	0	0	0	5	100
SUBTOTAL	32	82	7	18	0	0	0	0	0	0	0	39	100
RURAL URBAN TRADERS KAMPALA R.Y. DEPOT	43	96	0	0	0	0	0	0	2	4	45	100	
KAWEMPE	30	81	1	3	3	8	0	0	3	8	37	100	
KAMWENGE	10	45	10	45	2	9	0	0	0	0	22	100	
KAPCHORWA	8	28	14	48	7	24	0	0	0	0	29	100	
SIROMBO	8	32	12	48	5	12	0	0	2	8	25	100	
JINJA	20	87	0	0	0	0	1	4	2	9	23	100	
SUB-TOTAL	119	66	37	20	15	8	1	1	9	5	181	100	
GRAND TOTAL	151	69	44	20	15	7	1	1	9	4	220	100	

SOURCE : SURVEY RESULTS

It may be noted that, as of April 1989, traders intending to export maize still had to get a clearance letter from the PMB (on fulfilling the conditions for clearance earlier stated) to take to the Ministry of Commerce for licencing. Some traders interviewed said that the PMB clearance procedure was lengthy and unnecessary.

5.2.2.4 Reaction to New Entrants

It was found that most traders (apart from millers in Jinja), do not mind other traders entering the business as indicated by the fact that 94 per cent of the traders did not mind other traders entering the business.

Of the 6 per cent who did mind, 54 per cent of them did nothing to stop the new entrants. The remaining 46 per cent reacted by opening up new stores or venturing into new centres to compete with them in the purchasing of maize.

The millers in Jinja complained that the number of mills was rising and stood at about 60 posho mills. They seem to be scared of this as it is likely to erode their oligopolistic power. It may be concluded that there are no predatory or exclusionary tactics practiced or used by traders against established or potential entrant traders.

5.3 MAIZE MARKET PERFORMANCE

The first part of this section analyses relative technical efficiency using grain losses, transport costs and vehicle and storage capacity utilization. The second section analyses spatial pricing efficiency and tests the hypothesis that price mark-ups in the transfer of traded maize are not accounted for by the transfer costs. Further, markets are examined to determine whether they are connected and lastly the hypothesis that "prices offered to maize sellers in the rural areas are not completely influenced by the urban maize selling prices" is tested.

5.3.1 Relative Technical Efficiency in Maize Trade

Relative technical efficiency in maize trade was analysed by looking at maize wastage and spoilage, then at the cost per bag/km for the various mode of transport and at capacity utilization in maize transportation and storage

5.3.1.1 Relative Technical Efficiency as Measured by Maize Grain Loss

Maize wastage and spoilage was analysed by examining the amount of maize grain lost through rodent and insect pests, shrinkage, rain, spillage, and other aspects of grain loss like rotting, breakage and moulding. The overall quantity of maize lost due to all the grain loss agents by each trader was estimated and expressed in both quantity and value terms. Section 4.3.3 indicated that there was grain loss of 2.26kg per 100kg bag per month which was valued at Ushs.149.02, with

variations in the different centres. This loss could have been reduced through use of fumigants, rat traps and good quality stores. For traders who were involved in storage, there was marketing inefficiencies due to lack of good storage practices. This could be improved through construction or hiring of better stores and use of fumigants.

5.3.1.2 Relative Technical Efficiency in Maize Transportation

For maize to reach the ultimate consumer, it must be moved from the producer (or source area) to the consumer in the time and space required. Freight charges which may also depend on the mode of transport are of paramount importance to both the producer and/or the consumer as the trader who, transports the maize will pass the costs on to the consumer or pay the producer (or seller) low prices. Most traders used hired means of transport. A comparison of transport costs per bag/km for the lorry, pickup and the tractor was done in chapter 4 (Table 4.8). It was found that for long distances, the lorry was more technically efficient than both the pickup and the tractor in terms of cost per bag/km.

Another tool used in measuring relative technical efficiency was vehicle capacity utilization. It was observed that most vehicles had a capacity utilization of more than 100 per cent (Table 5.30). This was because some vehicles carried more load than their stated capacity.

TABLE 5.30: VEHICLE CAPACITY UTILIZATION IN MAIZE TRANSPORTATION
IN THE SIX CENTRES IN UGANDA, MARCH-MAY, 1989
(PERCENTAGE)

CENTRE		LORRY	PICKUP	TRACTOR
1.	KAMPALA : MEAN C.U.	108	-	-
	R.Y. : C.V.	11	-	-
	N	(16)	-	-
2.	KAWEMPE : MEAN C.U.	105	-	-
	C.V.	13		
	N	(35)		
3.	KAMWENGE: MEAN C.U.	93	100	98
	C.V.	8	0	12
	N	(3)	(23)	(27)
4.	KAPCHORWA MEAN C.U.	83	80	84
	C.V.	20	10	16
	N	(10)	(12)	(21)
5.	SIRONKO MEAN C.U.	100	86	78
	C.V.	0	14	14
	N	(2)	(7)	(14)
6.	JINJA MEAN C.U.	111	95	-
	C.V.	17	19	-
	N	(8)	(5)	-
TOTAL	MEAN C.U.	103	92	88
	C.V.	14	10	14
	N	(73)	(47)	(62)

KEY: - NO VEHICLE AVAILABLE
C.U. = CAPACITY UTILIZATION
C.V. = COEFFICIENT OF VARIATION
N = NUMBER OF VEHICLES IN BRACKETS
R.Y. = RAILWAY YARD

SOURCE: SURVEY RESULTS

The above table shows that the mean capacity utilization was highest for lorries (103 per cent). In the rural-urban link, the lorry seemed to be overutilized with Jinja, Kampala Railway Yard and Kawempe having over 100 per cent capacity utilization. In Kapchorwa and Kamwenge rural areas, bad roads could not allow the traders to overload the vehicles. Tractor capacity utilization was least in Sironko because Kapchorwa-Sironko route was very bad thus not allowing the traders to overload. Although overutilization of the vehicle reduces traders' transport costs per unit weight of load, it is both risky and indicates a possibility of a shortage of vehicles. It may also imply increased repair and maintenance costs for those using their own vehicles. This may partly explain the reason for the bribes indicated in table 5.32 where some of the traders bribed the authorities to be allowed to proceed with overloaded vehicles.

It may thus be concluded that vehicles are optimally utilized and any high unit costs that may be observed will not be due to vehicle under-utilization. This however does not necessarily imply efficiency in transportation.

5.3.1.3 Relative Technical Efficiency in Maize Storage

Relative technical efficiency in maize storage was also measured using storage capacity utilization. Due to lack of time series data for both the PMB and the private traders and the researcher's limited time and finance, it was not possible to carry out a long period storage capacity utilization appraisal.

A hundred per cent capacity utilization is not expected because most private traders' stores are only used as transit points for produce. Table 4.10 showed that the majority of the traders (86 per cent) store maize for less than one month.

A brief description of the private traders and the PMB storage capacity utilization is given below.

Traders' storage capacity utilization was found to be 49 per cent between March and May 1989 (Appendix 5). The highest recorded capacity utilization for centres was 185 per cent for Kamwenge PMB agents and the lowest was 18 per cent for Kampala. The high percentage for Kamwenge PMB agents was a result of one trader - a PMB agent - having many maize bags outside as the store had been filled. The sacks were covered with tarpaulin waiting for shipment to Kampala for sale. A brief look at the PMB storage capacity utilization showed that most stores were under-utilized. It was found that only 14 per cent of the PMB storage capacity was utilized in the month of April 1989 (Table 5.31). This indicates poor technical efficiency in the Board's storage operations. The reasons for the poor capacity utilization could have been its low prices relative to the prices that were being offered by the private traders. Another possible reason was its lack of enough operating capital which was closely related to the Board's policy of selling on credit to the government ministries of Defence and Rehabilitation. It was revealed that these ministries take long to pay the Board.

TABLE 5.31: PMB STOCK POSITION AND CAPACITY UTILIZATION ON
12/4/89 AND 21/4/89

DATE	COMMODITY	QUANTITY HELD (MT)	CAPACITY (M.T)	CAPACITY UTILIZATION (%)
12/4/89	MAIZE	1,609		
	BEANS	5,862		
	SOYA BEANS	2,344		
	GROUNDNUTS & SIMSIM	255		
		10,070	73000	13.8
21/4/89	MAIZE	1,985		
	BEANS	5,779.1		
	SOYA BEANS	2,657		
	GROUNDNUTS & SIMSIM	154.4		
		10,575.5	73000	14.5

SOURCE: PMB STATISTICS DEPARTMENT

5.3.2 RELATIVE PRICING EFFICIENCY

Relative pricing efficiency was assessed using gross (or marketing) margin and market integration.

5.3.2.1 Marketing Margin in the Maize Trade and Hypothesis Testing

By marketing margin or price mark-up, we shall only refer to the difference between a trader's maize selling price and buying price.

Due to lack of time and data, it was not possible to carry out marketing margin analysis from the producer up to the final consumer. Instead, marketing margin analysis was done for traders involved in the ferrying of maize from rural areas to rural trading centres and urban centres.

It was observed that mean operating profit in all centres was greater than zero (Table 5.32). The profit was expressed as a percentage of the marketing margin (Table 5.32). The profit rate varied from centre to centre. For the rural market traders, this ranged from the lowest of 20 per cent for Kamwenge private traders to 62 per cent for the Kapchorwa private traders (Table 5.32). For the rural-urban market traders, it ranged from the lowest of 34 per cent for Kapchorwa traders to the highest of 56 per cent for Kawempe traders. This high profit was probably due to the existence of barriers to entry in the maize trade, especially capital and poor market information flow to both the rural maize sellers and the urban maize buyers which made arbitration difficult.

Table 5.32 TRANSFER COSTS AND MARGINS FOR THE TRADERS INVOLVED IN THE FERRYING OF MAIZE GRAIN IN THE SIX CENTRES IN UGANDA, MARCH-MAY 1969

		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)
		MEAN TRANS- PORT COST (USHS)	MEAN LOADING CHARGES (USHS)	MEAN UNLOADING CHARGES (USHS)	MEAN TOTAL CHARGES OR D.A.'S FEES (USHS)	MEAN MARKET GATE FEES (USHS)	MEAN BRIBES (USHS)	MEAN OTHER ADM. COSTS (USHS)	MEAN TRANSFER COSTS (USHS)	MEAN BUYING PRICE (USHS)	MEAN SELLING PRICE (USHS)	MEAN MARKET FERRYING MARGIN (USHS)	TOTAL COST (USHS)	OPPOR- TUNITY COST OF CAPITAL (USHS)	MEAN MARKET FERRYING COSTS (USHS)	MEAN PROFIT (USHS)	MEAN PROFIT AS % OF MAR- KETING MARGIN
TOTAL	KAMPUNGA (PRT)	5 3750	4500	4700	-	5500	-	0250	4.88	42.90	50.58	7.79	47.78	0.50	5.38	2.41	31
MARKET	KAMPUNGA (PRT)	5 4565	4591	4591	-	1 7520	-	-	6.09	45.07	52.17	8.30	49.16	0.51	6.60	1.7	20
TRADERS	KATIKORMA	1 0070	3000	3000	-	-	-	-	2.27	32.00	39.00	7.00	34.27	0.36	2.63	4.31	62
TOTAL	KAMPALA R.Y. DEPOT	9 6818	5583	5500	0.5692	5982	0.0313	0.0167	12.06	46.53	67.37	20.84	58.59	0.61	12.67	8.17	39
MARKET	KAMPUNGA (PRT)	4 9100	4363	4188	1.4500	1000	0.0735	0.9400	8.30	45.80	63.86	20.06	52.10	0.54	8.84	11.22	56
TRADERS	KAMPUNGA (PRT)	8 9279	5214	5214	-	1.0357	-	0.0643	11.07	44.64	65.23	20.62	55.71	0.58	11.65	8.97	44
	KAMPUNGA (PRT)	9 3540	5500	5500	-	1.1000	-	-	11.55	46.80	68.70	21.90	58.35	0.61	12.16	9.74	44
	KATIKORMA	11 8460	4769	5105	0.8848	-	0.900	-	13.654	34.38	55.87	21.49	48.03	0.50	14.15	7.34	54
	STROMBO	10 7417	4778	6259	0.800	-	0.667	-	12.560	47.10	63.96	22.15	59.66	0.62	13.18	8.97	40
	ITIGA	4 5330	4167	4167	-	6667	-	-	7.167	54.00	65.00	11.00	59.83	0.62	6.45	4.55	41

- N/B:-
- 1) D.A. - DISTRICT ADMINISTRATOR
 - 2) R.Y. - RAILWAY YARD
 - 3) MKT - MARKET
 - 4) PRT - PRIVATE
 - 5) - NOT INCURRED/STATED
 - 6) OTHER ADM - ADMINISTRATIVE INCLUDING TRADERS PERSONAL EXPENSES

SOURCE - SURVEY RESULTS

Hypothesis Testing

The second hypothesis postulated that the price mark-ups in the transfer of traded maize are not accounted for by the transfer costs. The fact that traders earned 'profits' far in excess of zero shows that the price mark-ups were not fully explained by the transfer costs. In fact the profit formed a large proportion of the price mark-ups with some centres like Kapchorwa showing this profit to be 62 per cent of the price mark-ups. The least observed profit as a percentage of the marketing margin was 20 per cent for the private traders in Kamwenge rural market trade. The hypothesis that price mark-ups are not accounted for by the transfer costs is accordingly accepted. We may therefore conclude that there is spatial pricing inefficiency in the Uganda maize marketing system.

The fact that the profit accounted for a high percentage of the marketing margin in all centres is an indication of lack of effective competition. Thus, traders' marketing margins far exceed transfer costs. This has the effect of increasing the consumer price unnecessarily. Other traders are theoretically supposed to take advantage of the high profit rates to enter the maize trade if competition exists.

This may mean that traders are able to collude in influencing prices both at the selling and buying levels. To investigate whether the markets are connected and whether prices at the selling end influence the traders' buying prices, market integration was investigated.

5.3.2.2. Market Integration

For a complete picture of efficiency of the markets, Raju (1980) points out marketing margin analysis should be complemented by correlation analysis. This was because of the possible limitations that may be associated with only using correlation analysis mentioned in methodology chapter, section 3.2.3.2.2.

Market integration was first investigated by use of correlation coefficients to determine whether the markets were connected. This was supplemented with an inquiry into whether selling prices greatly influence the trader's buying prices using regression analysis.

(a) Correlation Analysis

The extent of market integration between the eight centres was carried out by computing bivariate correlation coefficients over the 9 weeks this survey was being conducted. Due to limited time of the survey, it was not possible to obtain moving average figures for each week and so an estimate of weekly mean price was calculated and centred on Wednesday for each week. The weekly mean prices are shown in figure 13 and the correlation coefficients between the centres are indicated in table 5.33. It was observed that the prices in the centres were highly correlated (Table 5.33). All centres had correlation coefficients greater than 0.8387 except for Kapchorwa town and Kamwenge (trading centre) and between Kampala and Jinja where the value "r" ranged between 0.6393 and 0.6950 (Table 5.33).

TABLE 5.33: WEEKLY PRICE CORRELATION BETWEEN 8 AREAS IN UGANDA FOR THE PERIOD OF MARCH TO MAY, 1989

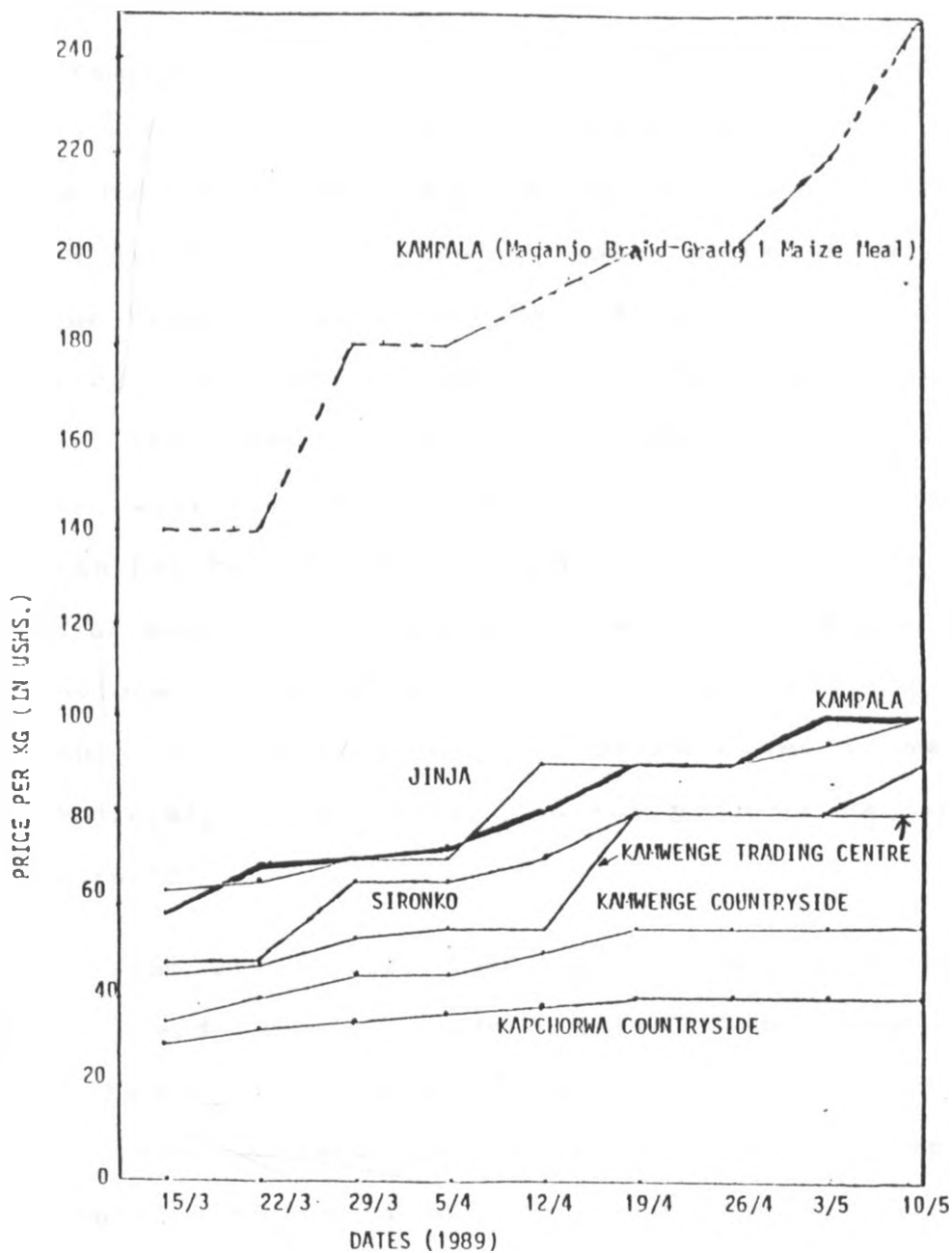
	KAMWENGE (COUNTRY- SIDE)	KAMWENGE (TRADING CENTRE)	KAMPALA (TOWN)	JINJA (COUNTRY- SIDE)	JINJA (TOWN)	KAPCHORWA (COUNTRY- SIDE)	KAPCHORWA (TOWN)	SIRONKO (TOWN)
KAMWENGE (COUNTRYSIDE)	1	XX .9239	XX .9506	XX .9526	XX .9389	XX .9844	X .8189	XX .9625
KAMWENGE (TRADING CENTRE)		1	XX .9524	XX .9903	XX .8926	XX .8839	.6393	XX .9342
KAMPALA (TOWN)			1	XX .9544	XX .9540	XX .9220	.6746	XX .9377
JINJA (COUNTRYSIDE)				1	XX .8998	XX .9270	.6941	XX .9391
JINJA (TOWN)					1	XX .9025	.6950	XX .9345
KAPCHORWA (COUNTRYSIDE)						1	X .8566	XX .9469
KAPCHORWA (TOWN)							1	XX .8387
SIRONKO (TOWN)								1

KEY : 1- TAILED SIGNIFICANCE; X -0.01 XX - 0.001

SOURCE : SURVEY RESULTS (FROM WEEKLY MEAN PRICES IN APPENDIX 20)

Taking the correlation coefficient of 0.7 or greater as a "satisfactory" indication of the markets being connected, it is revealed that 86 per cent of the areas were satisfactorily related price-wise (had "r" values of greater than 0.7). This is further confirmed by observing the graphical presentation in figure 13 where an increase in the price of maize

Figure 13 : Graph of Mean Weekly Maize Grain Prices in the Six Centres in Uganda, March - May, 1989.



Notes:

1. The mean weekly price for maize flour has been inserted for comparison with maize grain, maize flour price is represented by the Maganjo Brand, one of the maize meals on the market in Uganda (Appendix 18).
2. ----- Maize Flour
3. _____ Maize Grain

grain say, in Kampala is followed by an increase in the price of grain in the maize source area of Kamwenge (both in the rural areas and trading centre). However, an increase in maize grain in Kampala is not immediately followed by an increase in the price of flour. For example, the price of maize grain increased from Ushs.58 to Ushs.68 per kilogram between 15th March, 1989 and 22nd March, 1989 but the wholesale price of say, Maganjo maize flour brand remained at Ushs. 140 per kilogram during the same period. However, a week later, the price rose to Ushs.180. Thus, the general trend is that the prices of maize flour and grain will ultimately move in the same direction as the maize which had been stocked/bought earlier gets exhausted (milled and/or sold) and the new maize bought at a higher price than the previous one makes the millers raise their flour prices. It should be noted that not all price rises in maize flour are immediately reflected back to the producer as can be seen from figure 13.

From 29th April, 1989, price rises in Sironko (for maize grain) and Kampala (grade 1 maize flour) were not immediately matched by a corresponding rise in countryside prices in Kapchorwa and Kamwenge. There is always a time lag between changes in prices in consuming and supplying areas. This could also be a result of other factors like physical and financial constraints that enable the marketing intermediaries to act in a collusive manner. This could also explain the high profits due to the "less than perfect market conditions" of entry in the maize trade.

(b) Regression Analysis and Hypothesis Testing

To further analyse the extent of market integration, the third hypothesis that postulated that prices offered to maize sellers in the rural areas and possibly to farmers is not completely influenced by the urban maize selling prices, was tested. To test this hypothesis, a regression analysis of maize buying price on the maize selling price was done. Results showed that the urban maize selling price had little influence on the rural maize prices (Table 5.34).

TABLE 5.34: REGRESSION OF MAIZE BUYING PRICE ON SELLING PRICE IN THE SIX CENTRES IN UGANDA, MARCH TO MAY 1989 PRICES

CENTRE	$\hat{\alpha}$	d.f.	$\hat{\beta}$	r^2	F	SIGN F
KAMPALA RAILWAY YARD DEPOT	-13.1	55	.886	0.7934*	211.23	0.0000
KAWEMPE	54.9	26	.124	0.0056	0.1460	0.7049
KAMWENGE (PMB)	24.0	30	.342	0.2726	11.24	0.0022
KAMWENGE (PRIVATE)	26.7	31	.318	0.0568	1.866	0.1817
KAPCHORWA (PMB)	10.5	3	.569	0.9603*	72.6	0.0034
KAPCHORWA (PRIVATE)	20.3	37	.252	0.4973	36.6	0.0000
SIRONKO	34	25	.120	0.0057	0.1443	0.7073
JINJA	32	9	.130	0.0113	0.1029	0.7557
OVERALL	16.9	216	.424	0.3345	102.00	0.0000

KEY: D.F = DEGREES OF FREEDOM

SIGN = SIGNIFICANT

* = BUYING PRICES ARE HIGHLY EXPLAINED BY SELLING PRICES FOR THESE TWO CENTRES

SOURCE: SURVEY RESULTS

The overall regression equation is given as:

Equation	Y	=	16.9	+	0.424X
Standard Error			(2.608)		(0.042)
	R ²	=	0.3345,	F	= 102.00

The "F" test and values of "r²" were used to support each other in testing this hypothesis.

The "F" test criterion has been explained in section 3.2.3.2.2 of chapter three. The "F" statistic showed that the buying prices in the maize source areas and the selling prices were only related for Kampala Railway Yard depot, Kamwenge and Kapchorwa. However, the buying prices in the maize source areas for Kawempe, Sironko and for Jinja were not related to the selling prices.

High values of the coefficient of determination "r²" were obtained for only two centres namely, Kampala Railway Yard depot and Kapchorwa (for PMB agents) (Table 5.34). Results showed that 79.3 per cent of the maize buying prices in Kampala maize-source areas were explained by the Kampala selling prices and 96 per cent of the buying prices in Kapchorwa (PMB) countryside, which had a very small sample and hence unrepresentative results, were explained by Kapchorwa selling prices (Table 5.34). The rest of the centres had "r²" values of less than 0.5. The proportion of the buying prices explained by the selling prices was 0.6 per cent, 27.3 per cent, 5.7 per cent, 49.7 per cent, 0.6 per cent

and 1.1 per cent for Kawempe, Kamwenge (PMB agents), Kamwenge (private traders), Kapchorwa (private), Sironko and Jinja respectively. Overall, only 33.5 per cent of the variations in buying price were explained by the variations in the selling price.

Apart from Kampala Railway Yard and Kapchorwa (PMB) market traders, less than 50 per cent of the variation in buying prices were explained by the variations in selling prices in the rest of the centres. This also held true for all the centres together. It is evident that the influence of selling prices on rural maize source prices is minimal. Therefore the hypothesis that prices offered to maize sellers in the rural areas and possibly to farmers, are not completely influenced by the urban maize selling prices is accordingly accepted. This may also be the cause of the high profits observed earlier. It may also be noted that prices aimed at increasing farmers' prices by increasing the urban market prices may not always be helpful to the farmers.

CONCLUSION

In maize market structure assessment, market concentration revealed that the volume of maize handled was concentrated in relatively few hands. Ten per cent of the traders controlled 36 per cent of the maize traded. The gini coefficient of 0.47 indicated that the level of inequality is slightly high. This shows that there is lack of competitiveness in the market. The

lowest gini coefficient of 0.14 was observed in Kapchorwa rural market trade and the highest gini coefficient of 0.63 observed in Jinja indicating variations in levels of inequality in the centres surveyed. The observed levels of inequality were mainly attributed to capital requirement in the maize trade. Traders were required to pay first Ushs.250,000 income tax before a one year licence was issued. Limited operating capital to purchase produce acted as a constraint in determining the volume of maize a trader handled; and as credit facilities from banking institutions were virtually absent, most traders relied on their own sources of finance. Most traders used hired commercial vehicles which were easily available for transporting the maize, but they still complained of hiring charges. Poor roads, especially in the muddy and hilly areas, made effective competition difficult.

Other problems faced by some traders were either lack of storage space or poor quality of stores. Gunny bags were not easily available. Forty two per cent of the traders complained that gunny bags were not easily available, while 98 per cent of the traders had weighing scales. From the foregoing summary, the hypothesis that there are substantial barriers to entry in the maize trade was accepted.

With respect to market information flow within the marketing system, most traders seemed to be aware of their competitors' prevailing maize sources, buying prices, maize market outlets and selling prices. This high market information flow among traders

without a corresponding information flow to both consumers and sellers (mainly farmers) could lead to collusive actions by traders.

In maize market conduct it was revealed that the Produce Marketing Board sets its buying price at its buying centres, regional and central depots. It bases its buying prices on the official Minimum Producer Price announced by the Government to which it adds the costs of transferring the produce from the farmers' premises to its Buying Centres. Prices at the PMB regional and central depots are based on the PMB's own transfer costs. These prices are fixed over a period of time for the whole country. The PMB raises its buying price when it finds that it is not getting any suppliers due to the private traders' price being higher than its own. The private traders in turn raise their buying prices if maize is in scarcity leading to a spiral rise in prices. The PMB has both internal markets and external markets. The external markets are with countries which the government has concluded barter trade protocols.

The private traders on the other hand tend to discuss among themselves the prices they normally offer to the sellers in the maize source areas and to buyers in the maize consumption areas. There is a very small price range within which traders may bargain. However, most of them tend to buy and sell the produce at the same price if the market is one. In maize flour pricing, some posho mill owners had an organization which set milling prices. For traders taking the maize for milling and selling the

maize flour, results showed that the pricing fairly reflected the marketing costs, with traders earning about 19 per cent profit to cover both their managerial and risk costs. There were no coercive or predatory tactics practiced by traders against established or potential entrant traders. Each rural-urban market trader would try to get buyers in the urban consumption points but generally tended to sell at the same price. The rural-urban market traders competed among themselves by trying to get buyers quickly so that after selling the maize, these traders could go for more maize from the rural areas. Information on pricing seemed to be confined to the marketing intermediaries as they were able to manipulate prices both in the maize source areas and the urban centres.

With respect to maize market performance, it was revealed that the PMB storage facilities were not optimally used, as only 14 per cent of these facilities was being used in April 1989. The private traders on the other hand, utilized about 49 per cent of their stores during the survey period. Vehicles were optimally used and in some cases they were overloaded. Analysis of the private traders involved in the transfer of maize from rural to urban centres revealed that the price mark-ups were not accounted for by the transfer costs. Some traders earned profits of up to 62 per cent of the price mark-ups - a high proportion indeed! This indicated poor spatial pricing. This was partly due to lack of Government control of prices, to the existence of barriers to entry in the maize trade which reduced competition and to the existence of collusive arrangements by the traders.

Analysis of market integration showed that most markets were integrated price-wise as traders were able to collude in influencing buying prices in the rural area and the the selling prices in the urban areas.

It was further revealed that the prices offered to sellers and possibly to farmers, were not greatly determined by the selling prices in the urban areas. This is because traders tended to apportion themselves a greater share of the increased consumer price as evidenced by the low influence selling prices in urban areas have on buying prices in the rural areas and the high profit accruing to the traders. It is therefore concluded that market imperfections exist in the Uganda maize marketing system.

CHAPTER SIX

SUMMARY AND POLICY RECOMMENDATIONS

6.1 SUMMARY

In this study, our main objective was to analyse the nature and extent of market imperfections existing in the Uganda maize marketing system. Special attention was to be given to the assessment of the market structure, conduct and performance in the transfer of the produce from rural maize source areas to urban consumption points. This study was undertaken between the months of March and May 1989 and revealed the following points:

Firstly, that the main urban areas of Kampala and Jinja obtained maize from the districts of Kasese, Kabalore, Mbarara, Rakai, Masindi, Kamuli, Iganga, Tororo, Mbale and Kapchorwa. The major buyers were the urban posho mills, Uganda Grain Milling Corporation, Urban wholesalers, World Food Programme, Ministry of Defence and schools. The PMB handles about 41 per cent of the marketed production while the remaining 59 per cent is handled by the private traders.

Secondly, that the volume of the maize traded was concentrated in relatively few hands. A few large traders controlled a slightly bigger share of the traded maize. The major determining factor was the capital required by the traders. As there were virtually no credit facilities, personal cash sources provided the means of a trader's competition. This implied lack of competitiveness in the maize trade.

Thirdly, that where the rail transport was not available, the lorry was the most commonly used mode of transport for long distances. This was because the lorry is more technically efficient than the tractor or pickup in terms of low costs per bag/km. The tractor and pickup were mainly used either in hilly and muddy roads or for rural market trade where short distances are involved. It was observed that most traders (84 per cent) used hired vehicles: 6 per cent used their own vehicles and the rest (10 per cent) operated from their premises.

Fourthly, that the PMB uses formula of "cost-plus" method to determine its buying prices. These pan-seasonal and pan-territorial prices are made irrelevant by the high rate of inflation and the PMB Buying Centres' proximity to consumption points or an agent's distance from the PMB Buying Centre. The PMB prices become too low relative to the open market prices being offered by the private traders. When the PMB rises its buying price, the private traders increase theirs above that of the PMB to get maize. In this way, despite the fact that the Board fails to get enough maize, it achieves the objectives of guaranteeing minimum level prices for the farmers and encourages maize production. However, this is done at the expense of the PMB marketing operations. The private traders' maize sales promotional activities are to personally search for buyers and/or tenders including going to other towns so as to sell the maize quickly and go to purchase more maize.

Fifthly, that PMR storage facilities are not optimally utilized. During the April survey, only about 14 per cent of its storage capacity was in use. The private traders, on the other hand, utilized about 49 per cent of their stores during the survey period despite the fact that most of them keep maize for less than one month before selling it. This partly explains why most traders do not use fumigants. Twenty-five per cent of the traders complained of lack of storage facilities. Of these traders, 46 per cent had stores that were poorly constructed, 34 per cent complained of stores being too expensive when hiring, while 20 per cent had too small stores. With respect to gunny bags, 42 per cent of the traders pointed out that the gunny bags were not easily available.

Sixthly, that the private traders involved in the transfer of maize made profits far in excess of the transfer costs. This shows that the marketing margins were much more than accounted for by the transfer costs. This was attributed to both the existence of barriers to entry in the maize trade that made market arbitration difficult and the poor market information flow in the marketing system.

Lastly, though the markets were integrated price-wise with 86 per cent of the areas having correlation coefficients of greater than 0.7, it was found that this was due to traders' collusive tactics in manipulating buying and selling prices in these markets to their advantage. It was observed that the

buying prices were not necessarily being explained by the selling prices as indicated in most centres by low values of the coefficient of determination of less than 0.5. The traders' profits had the effect of either unnecessarily raising the consumer prices or affecting the seller, and possibly the farmer, in form of low prices received. The highest pricing inefficiencies were observed in Kapchorwa rural market where the excess profits accounted for 62 per cent of the marketing margin. All these observations show that there are marketing imperfections in the maize marketing system in Uganda.

6.2 POLICY RECOMMENDATIONS

Based on the findings of this study, the following recommendations are suggested for the improvement of the maize marketing system in Uganda:

Firstly, the Government could encourage the bank sector to finance produce (maize) trade and remove unnecessarily export conditions given to private traders intending to export maize.

Secondly, the Government should improve roads, especially in the muddy and hilly areas of Kapchorwa and other areas to enable transfer of produce.

Thirdly, the PMB should constantly review buying (and selling) prices in accordance with supply and demand conditions as this would eliminate the effect inflation has on PMB

pricing formula. It could, for example, periodically adjust the buying and selling prices using the Middle Income Consumer Price Index. The prices could then be announced periodically say, monthly or quarterly depending on whether prices in the parallel market have appreciably changed. It could, in the alternative, allow market forces to operate in determining its buying prices except at harvest time in an area where it could declare a floor ceiling price above which it can purchase the produce. This would achieve the objective of encouraging farmers and at the same time keep the Board getting the maize supplies it requires.

Fourthly, the PMB should use its storage facilities to maintain strategic reserves for the country. It could then put the maize on the market during the lean seasons and in so doing, benefit from the increased prices resulting from the shortage.

Fifthly, since most traders have too small or poorly constructed stores, the PMB could offer cleaning and storage services to the private traders when these facilities are not being optimally utilized.

Sixthly, there is need for creation or renewal of a dynamic market intelligence division to collect market information, disseminate it through the news media for different centres or districts so that producers, marketing intermediaries and consumers are aware of daily prices in all centres.

Based on personal observation and discussion with the various marketing intermediaries, the following recommendations are further suggested:

Firstly, there is need to research on the economics of on-farm grain storage in Uganda. This would not only reveal the problems faced by producers in maize storage, but also what type of storage practices and hence, possible policy actions to be taken to alleviate such problems if they exist.

Secondly, the efficiency of produce marketing by the PMB should be thoroughly researched on.

Lastly, the Produce Marketing Board could compete in maize milling to diversify its sources of income.

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APPENDICES

APPENDIX A 1 A: FORM A

QUESTIONNAIRE

CONFIDENTIAL

MAIZE MARKETING IN UGANDA

Date of Interview 1989

date of Editing Supervisor's

Initials

Enumerators Name and signature

SECTION A: IDENTIFICATION*

A1. Name of Venue

A2. Code and Name of marketing Intermediary/.....

A3. Type of marketing intermediary: Tick the correct box

01 PMB agent 02 Private trader 03 other (specify).....

SECTION B: PROBLEMS ENCOUNTERED IN YOUR BUSINSS: Put ✓ for

'yes' and X for 'no' and a brief explanation.

BI. None availability of:

(a) gunny bags

.....

(b) transport

.....

(c) Credit/Loan

.....

(d) Storage

.....

* If respondent has earlier been interviewed, use Form B

- B2. Poor quality of maize due to:
 - a) Moisture content
 -
 - b) Weevils
 -
 - c) Other (specify)
- B3A Do you own a licence?
- B3B Main Problem encountered in Obtaining a Licence
-
- B4 Low prices offered by buyer
- B5. Lack of market outlet
- B6. Weighting
- B7. Lack of maize supply.....
- B8. Area of operation restrictions
- B9. Other (specify)
-

Do you transport this maize here?

1. Yes 2. No

If yes go to C1, otherwise go to C9.

SECTION C: TRANSPORT:

C1. Mode of transport (Specify, type) e.g LORRY - TATA

BENZ

ISUZU

TOYOTA

C1. Lorry 02 Pick up 03 Other (specify)

C2. Vehicle capacity/tonnagemodel..... Reg.No.....

C3. Number of maize bags on vehicle

and other goods

C4. Number of trips per week/month

C5. Is vehicle hired or owned? 1. HIRED 2. OWNED

3. NO RESPONSE

IF HIRED, GO TO C7, IF OWNED, GO TO C6

C6. VEHICLE EXPENSES Amount(Ushs)

1. "Fixed" costs

(a) Licence p.a.

(b) Adminstrative costs like
watchman p.m.
Other (Specify)

(c) Wages p.m. Driver(s)

Turnboy 1.....

2.....

3.....

(d) Repair & Maintenance p.m. Major

Minor

- (e) Overhaul of engine & gear box
after years or Km.....
- (f) New Tyres (afterKm)
and retreads (after Km) ✓
- (g) Depreciation (1) current estimate of cost of vehicle
Ushs.....
(2) Expected No. of useful years

2. Fuel costs

- (i) Diesel per trip of km: Ushs.....
- OR Petrol per trip of km: Ushs.....
- (ii) Oil per trip of km: Ushs.....

- C7. a) Where did you hire the vehicle from?
.....
- b) Why did you choose this source?
.....
- c) What is the total hire charge for this trip?
(of Km)?
- d) Do you normally face any problem in hiring vehicles
(specify type of vehicle)?

O1 YES O2 NO EXPLAIN

C8. Other marketing Costs

- a) Loading charges, if different from use of turnboy(s)
in C6.
- b) Unloading charges, if differnt from use of turnboy(s)
in C6
- c) Toll charges

d) Others (e.g. bribes etc)

C9. Where did you buy this maize from?

District Village or County

Distance (KM)

C10. What induced you to buy from there?

C11.1 What type of arrangements do you have to ensure you get maize from your suppliers?

1 None 2 Agree on quantity 3 Other (specify)

C11.2 How do you pay for the maize you buy?

1. Cash on delivery 2. Credit 3. Contract(Specify)
4. Waysheet 5. Other (specify)

C12. Buying price per kg

SECTION D: STORAGE:

D1. Do you store any maize?

O1 Yes O2 No Why?

D1.1 If answer to D1 is No, GO TO D10, otherwise GO TO D2.

D2. How long do you store maize before selling it?
and why?.....
.....

D3. What is your storage capacity bags

D3.1 Maize stored now, bags

D3.2 Other crops (i)
(ii)
(iii) Rest

D4. Do you use any fumigants? 1. Yes 2. No. 3. Rarely
 D4.1 Which fumigants do you use?

Name	quantity	price	used on how many bags?	duration when it remains effective (months)
1
2
3

D5. Are the storage facilities owned or rented?

01 Rented 02 Owned

D6. If rented GO TO D7 otherwise,

How much would you be willing to pay for this store if you were renting it from somebody else? Ushs.....: GO TO D8

D7. How much rent do you pay per month? Ushs.....

D8. Labour charges p.m. on store maintenance Ushs.....

D10. (a) What is the cost of a gunny bag? Ushs.....

(b) How long does it last? Years Months.....

OR How many times do you use the same bag?

D11. Do you experience any loss of grain due to

01 Rodents 02 Weevils 03 Rain

04 Drying/shrinkage of grain?

Indicate the major one by circling it, and how much the loss is per bag per month(in kg).

D17. Can you please recall your buying and selling prices per bag for each of these months*.

	1989					1988						
Month	Mar.	Feb	Jan	Dec.	Nov.	Oct.	Sept.	Aug	Jul	Jun	May	Apr
Selling												
Buying												

SECTION E : NATURE OF PRICING AND COMPETITION

E1. How long have you been in this business? Yrs....months

E2. Is the business personal or you share with others?

Explain

E3. Have you ever attended any course in line with your business?

Yes No If No GO TO E4

Otherwise, GO TO E3. I.

E3.I. Dates of training

Dates	Type of training	offered by (body)
.....
.....
.....

E4. Highest level of education attained:

None Primary(specify) class Secondary(specify) class Post Secondary

Other (specify)

* Some of the months may be left out if the respondent can not easily remember the prices.

E5. How much money did you start this business with?.....
How much would be required now to start a similar
business?.....

E5. Where did you get the money from?

01 Own savings

02 Loan (specify where from)

03 Other (specify)

E6. Do you know the sources of supplies of other business
competitors and their buying prices?
...../.....

E7. Do you know where these competitors sell their maize and
prices fetched? (mention 4 major towns)

YES/NO	PLACE	PRICE
.....
.....
.....

E8. How do you obtain information on your competitors?
.....

E9. Do you mind if other people entered this business?

1. YES 2. NO IF NO, GO TO E10 and

If yes, what do you do in such a case?
.....

E10.1 Do you have any arrangements to sell to your customers?.....

Explain

E10.2 How are you normally paid?

1. Contract basis 2. Cash on delivery

3. Other (specify)

E11. Are you aware of the prices before coming to the market?

YES NO

E11.1 If no, how do you determine which market to take your maize to?.....

E12. How do you determine the price to sell at?

- 1. Fixed by PMB 2. Fixed by Buyer
- 3. Agree with buyer 4. Fixed by seller (respondent)
- 5. Other (specify)

E13 What is your selling price per Kg? Ushs.....

E14 Which other places do you normally sell your maize to and why?

.....
.....
.....

E15. How does your price compare with that of your competitors?

- 1. Below
- 2. Same as
- 3. Above
- 4. 1,2 or 3 their price

E15. 1 Can you explain why?

SECTION F:

F1. How would you like your business to be improved?

.....
.....

THANK YOU VERY MUCH FOR YOUR TIME AND COOPERATION.

Any general/special observations by Enumerator.

.....
.....

APPENDIX A1B: FORM B- 'REPEATED' TRADERS QUESTIONNAIRE

* If the Respondent has earlier been interviewed use this form.

DATE OF INTERVIEW 1989

DATE OF EDITING Sup's Initials

Enumerator's Name & Signature.....

M1. NAME OF VENUE

M2. Code and Name of marketing intermediary/.....

M3. Type of marketing intermediary: Tick the correct box

PMB agent Private Trader Other (specify)

N1. Number of maize bags on vehicle
and other goods

N2. Where did you buy this maize from?
District County Distance(KM).....

N3. How much did you pay for the maize? a kg

N4. Is vehicle hired or owned? HIRED OWNED
If vehicle is hired GO TO N5, otherwise GO TO N6

N5. a) Where did you hire the vehicle from?
b) What is the total charge for this trip (of..... km)
..... Ushs.

N6. Other marketing costs
- Diesel per week or per km
- Petrol per week or per km
- Oil or other (specify) or per km
- Loading charges unloading charges
- Tollmarket gate bribes
- Other (specify)

- P1. What is your selling price per kg?Ushs.
- P2. How does your price compare with that of your competitors?
below same as above my price
Why?
- P3. Any special observation by Enumerator

-END-

APPENDIX 1: AREA PLANTED AND PRODUCTION OF MAIN STAPLE FOODS IN UGANDA 1980-1987

YEAR	PLANTAIN		CEREALS		ROOT CROPS		
	BANANAS	FINGER MILLET	MAIZE	SORGHUM	SWEET POTATES	IRISH POTATOES	CASSAVA
AREA PLANTED ('000 Hectares)							
1980	1,173	279	258	167	231	24	302
1981	1,180	300	260	170	350	25	310
1982	1,199	330	285	200	372	28	331
1983	1,209	341	295	207	457	30	372
1984	1,209	332	347	206	387	17	401
1985	1,210	300	289	190	359	25	300
1986 (REVISED)	1,210	342	322	207	407	19	362
1987 (ESTIMATED)	1,214	295	279	185	362	24	313
PRODUCTION ('000 m.t.)							
1980	5,699	459	286	299	1,200	166	2,072
1981	5,900	480	342	320	1,300	175	3,000
1982	6,596	528	393	358	1,487	196	3,127
1983	6,647	545	413	407	1,843	223	3,239
1984	6,461	223	281	164	1,791	78	1,881
1985	6,655	480	343	310	1,524	168	2,700
1986 (REVISED)	6,660	350	286	280	1,865	98	1,871
1987 (ESTIMATED)	6,726	471	330	286	1,522	168	2,819

SOURCE : EXTRACTED FROM UGANDA: BACKGROUND TO THE BUDGET 1988/89

APPENDIX 2: ESTIMATED MARKETED PRODUCTION OF VARIOUS COMMODITIES IN UGANDA'S DISTRICTS, 1966/67

DISTRICTS	CROPS						
	MAT(1000) H.T.	BEANS(1000) H.T.	C/NUTS(1000) H.T.	S/BEANS (1000) H.T.	S/SIM(1000) H.T.	MILLET(1000) H.T.	SORGHUM(1000) H.T.
MPARADA	2,002	1,157	656	5		2,207	761
BUSHEMVI	1,304	907	731	7		2,049	470
RUKWINDI	117	149	17	2		634	632
KAFAROLE	2,071	987	999	246		1,124	
KASESE	931	352	77	79	5	115	29
HACCPA	600	6,000	400	96		257	232
RAFAI	420	1,239	210	16		96	89
BUCHEDE	6,951	2,562	987	4,205	7	257	159
HOIRA	1,874	709	406	40	20	1,381	446
HASIBBI	2,430	570	413	5	275	2,019	189
ITRA	4,500	1,200	1,600	10	2,400	6,300	4,500
APAC	4,000	1,000	720	20	1,500	5,460	3,750
JINJA	1,900	731	86	138	5	886	4
IGANDA	20,000	2,000	1,000	1,685	60	3,000	200
SOROTT	400	449	750		70	250	1,260
KOMI	2,400	96	250		30	3,906	2,016
WPAI	5,400	3,500	60	180		750	64
KAPONGOLA	0,000	1,900	60			120	20
TORORO	10,000	400	3,000	750	60	7,000	2,040
KAMP I	5,000	700	500	2,400	40	2,100	278
ETIOPH	1,776	1,155	670		569	2,715	1,374
OHU	1,027	1,371	709		105	2,930	1,345
AKWA	2,140	1,273	971	9	652	1,825	1,341
NEEBI	1,015	602	499	10	668	1,079	982
HOYO	376	122	46	1	102	287	161
LOTIDA	824	30	39		350	480	1,134
HOOTO	1,170	160	42	1		109	994
KABALE	2,155	1,487	66			185	3,197
BUNDIBUGO	693	878	68	16	17	121	10
HUKWU	723	986	266	11		255	174
WITOI	546	873	205	17		132	156
LOWERO	225	235	131	9		115	86
TOTAL	95,368	35,966	16,505	9,078	7,301	51,739	28,924

- NOTE:
1. PURCHASES ARE ASSUMED TO CONSTITUTE 10% OF THE TOTAL PRODUCTION. (MAT AND PMB ASSUMPTION)
 2. SOURCES OF THE DATA ARE BOTH MINISTRY OF AGRICULTURE AND DISTRICT AGRICULTURE OFFICERS.

SOURCE : PMB

Appendix 3: Kampala Cost of Living Index Middle-Income Group (April, 1981=100)

		Food	Drink & Tobacco	Fuel & Transport	Clothing	Other Consumer Goods	Other Manufact. Goods	Weighted Average Index	% change on previous year	% change on previous month	
Weights		41	17	6	10	14	10	2	100		
Monthly											
1986	Jan	1586.3	958.4	2229.4	1834.7	1343.4	1047.6	1829.2	1460.0	129.6	42.0
	Feb	1426.0	720.5	2229.4	1834.7	1343.4	974.2	1829.2	1346.5	105.3	-7.8
	Mar	1494.4	929.3	2242.9	1834.7	1608.4	1112.2	2127.0	1467.7	123.1	9.0
	Apr	1655.8	850.4	2236.5	1834.7	1618.5	1284.9	2606.7	1548.3	116.9	5.5
	May	1826.9	813.6	2260.1	1834.7	1777.2	1394.9	2597.7	1646.7	123.6	6.4
	Jun	2198.8	1263.3	2256.5	1834.7	1905.3	1457.6	2727.8	1902.2	153.1	15.5
	Jul	1804.8	1101.3	2275.1	1834.7	1918.5	1640.8	2738.1	1734.6	126.4	-8.8
	Aug	1845.4	1596.7	2706.3	2957.0	1997.1	2008.1	2969.5	2025.9	137.6	16.8
	Sep	2231.2	1648.1	4525.5	2957.0	2181.5	2037.5	4225.0	2355.9	172.0	16.3
	Oct	2671.4	1734.5	4522.7	2957.0	3235.8	2069.3	5258.3	2722.3	217.5	15.6
	Nov	2841.5	1693.6	4559.8	2957.0	9945.6	1965.3	5095.8	3715.0	298.2	38.4
	Dec	4655.1	2285.3	4735.5	3917.0	10031.6	2193.9	4704.5	4690.8	356.4	26.3
1987	Jan	4511.9	2508.1	4615.5	3917.0	10665.6	3451.2	5693.4	4897.1	235.4	4.4
	Feb	4841.3	2273.8	4745.2	4020.3	10867.3	3602.8	7837.5	5096.7	278.5	4.1
	Mar	4890.1	2780.8	4846.1	4020.3	10604.6	4330.3	6450.0	5217.1	255.5	2.4
	Apr	5937.0	3005.8	4777.7	4020.3	13804.3	4645.6	7800.0	6187.0	299.6	18.6
	May	6793.7	4404.2	6703.4	4728.3	18112.4	5810.9	6583.4	7657.7	365.0	23.8
	Jun	5111.5	2891.7	6594.9	4728.3	17742.0	3666.1	5166.7	6409.6	237.0	-16.3
	Jul	6035.2	3650.0	6580.6	4728.3	17623.5	3844.5	5166.7	6917.6	298.8	7.9
	Aug	6123.9	3575.0	6313.9	4700.0	17623.5	4335.5	4700.0	6962.2	243.7	0.6
	Sep	7492.9	4358.3	23456.8	4821.6	18985.7	4554.5	4666.7	8909.4	278.2	28.0
	Oct	7700.0	4600.0	23463.3	4821.6	18729.9	4787.9	6500.0	9060.1	232.8	1.7
	Nov	10286.6	4600.0	23741.8	4821.6	19355.9	7185.6	6800.0	10464.6	181.8	15.5
	Dec	12117.7	7100.0	23772.5	4821.6	23467.0	8039.4	7000.0	12313.1	162.5	17.7
1988	Jan	11948.2	8350.0	24453.7	6821.6	28251.6	9614.2	11000.0	13604.3	177.8	10.5
	Feb	13451.1	6100.0	25695.1	6821.6	28981.0	10692.9	11666.7	14135.8	177.4	3.9
	Mar	14000.4	6733.3	24782.2	6821.6	26783.7	12347.4	9000.0	14218.4	172.5	0.6
	Apr	14654.3	5775.0	24782.2	6821.6	35661.2	12063.3	9500.0	15548.0	151.3	9.4
	May	17863.7	5925.0	26457.9	6821.6	43750.4	12063.3	9500.0	18122.4	136.7	16.6
Average Prices											
1982	169.0	118.3	185.4	326.9	347.9	143.8	218.9	200.7	-	-	
1983	239.8	128.9	303.4	445.7	331.8	145.5	245.6	248.9	24.1	-	
1984	321.4	170.0	822.5	599.7	407.8	185.6	231.4	349.8	40.5	-	
1985	877.8	422.9	1577.8	1019.5	720.4	457.3	642.6	787.9	125.2	-	
1986	2186.5	1299.6	3065.0	2382.3	3242.2	1598.9	3225.7	2217.8	181.5	-	
1987*	6820.1	3812.3	11634.5	4512.4	16465.1	4854.5	6172.0	7507.7	238.5	-	
End of Year Prices											
1981	124.2	104.9	120.1	245.2	330.5	124.8	200.3	163.2	-	-	
1982	199.3	123.3	267.7	320.1	354.7	150.2	232.9	220.1	34.8	-	
1983	259.4	124.5	385.0	506.0	331.1	143.5	240.0	266.7	21.2	-	
1984	522.6	270.3	1669.7	688.7	546.3	275.7	253.4	538.4	101.9	-	
1985	1254.4	500.6	1135.5	1154.7	1135.5	636.6	1110.5	1027.8	90.9	-	
1986	4655.1	2285.3	4735.5	3917.0	10031.6	2193.9	4704.5	4690.8	356.4	-	
1987*	12117.7	7100.0	23772.5	4821.6	23467.0	8039.4	7000.0	12313.1	162.5	-	

* From May 1987, prices in New Uganda shillings; for these indices new prices were multiplied by 100.

SOURCE: Bank of Uganda

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APPENDIX 4 : PMB PROPOSED LOCATION OF BUYING CENTRES
AND THEIR STORAGE CAPACITIES, 1988

PROPOSED BUYING CENTRES	NUMBER	STORAGE CAPACITY '000 M.T.
KAMWENGE		6.0
SIRONKO		6.0
MUBENDE/MISOZI		3.0
KIGUMBA		3.0
SUB-TOTAL	4	18.0
MBARARA		
KABALORE		
KAMULI		
KUMI		
LIRU		
MITYANA		
KIBOGA		
SUB-TOTAL	7	21.0
KYOTERA		
MUKONO		
KITGUM		
NEBBI		
ARUA		
MOYO		
IBANDA-BISHESHE		
HOIMA		
KABALE		
MASINDI		
KAGADI		
KI BIIBI		
BUSHENYI/KIGU ETC		
SUB-TOTAL	17	25.5
RUKUNGIRI	1	3.0
TOTAL	29	67.5

SOURCE : BANK OF UGANDA AGRICULTURAL SECRETARIAT MAY-JULY 1988

APPENDIX 5 : TRADERS' STORAGE CAPACITY UTILIZATION IN THE SIX CENTRES IN UGANDA, MARCH-MAY 1989

CENTRE		MEAN CAPACITY (M.T)	MEAN UTILIZATION (M.T)	CU %
RURAL MARKET				
KWG	PMB	32.5	10.2	31
	PRT	20.1	4.4	22
	TOT	26.9	7.6	28
RURAL-URBAN LINK				
KLA	PMB	30.0	0	0
R.Y	PRT	45.7	8.6	19
DEPOT	OTHER	50.0	7.2	14
	TOT	45.9	29.0	18
KWP				
	PMB	300.0	-	0
	PRT	131.6	13.2	10
	OTHER	1867.0	1344.0	72
	TOT	388.0	203.7	52
KWG				
	PMB	58.6	108.4	185
	PRT	27.8	9.3	33
	TOT	43.9	139.0	139
KAP				
	PMB	16.0	1.0	6
	PRT	18.6	4.9	26
	TOT	18.2	4.3	24
SIRONKO				
		23.0	4.8	21
JIN				
	PMB	55.0	9.5	17
	PRT	112.0	23.3	21
	TOT	96.0	19.6	20
SUB-TOT				
	PMB	57.9	57.1	99
	PRT	51.7	9.0	18
	OTHER	731.4	508.5	70
	TOT	90.36	44.1	49

- KEY :
- 1) CU = CAPACITY UTILIZATION
 - 2) KWP = KAWEMPE
 - 3) KWG = KAMWENGELIZATION
 - 4) KLA R.Y. = KAMPALA RAILWAY YARD
 - 5) KAP = KAPCHORWA
 - 6) JIN = JINJA
 - 7) TOT = TOTAL
 - 8) PRT = PRIVATE TRADER NOW-PMB AGENTS
 - 9) PMB = PMB AGENTS
 - 10) OTHER - INCLUDE CORPORTATIONS LIKE UGANDA GRAIN MILLING CORPORATION ETC.

SOURCE : OWN SURVEY

APPENDIX 6: CURRENCY ADJUSTMENT INDEX FOR THE YEARS 1989-99

The April 1985 prices for most goods in the country were approximately equivalent to the April 1989 prices. To reduce the currency's high nominal value caused by a high rate of inflation, the Government, in May, 1987, exchanged the old currency with new Uganda shillings which was about a hundred times less in nominal value. Thus, a person with old currency Ushs.1000 was expected to get new currency Ushs.10; but the government imposed a 30 per cent tax so that a person would actually get Ushs.7. However, due to the high rate of inflation, prices soared again.

Using April, 1985 index as 100, the other years' indices were adjusted using the weighted average index in appendix 3 to give the indices below. Each value of initial capital stated by respondents was adjusted by multiplying by these indices.

Number of years before April 1989	Index
0.5 - < 1	5.0684
1 - < 2	10.4932
2 - < 3	0.1049
3 - < 4	0.3559
4 - < 5	1.0000
5 - < 6	2.2727
6 - < 7	3.1250
7 - < 8	4.0000
8 - < 9	7.6923
9 or more	10.0000

APPENDIX 7: PROPORTION OF TRADERS USING FUMIGANTS IN THE SIX CENTRES IN UGANDA, MARCH-MAY, 1980

CENTRE	USING FUMIGANTS							
	YES NO	%	NO NO	%	NR NO	%	TOTAL NO	%
KAMPALA R.Y. DEPOT	15	33	19	42	11	24	45	100
KAWEMPE	5	14	13	35	19	51	37	100
KAMWENGE PMB	4	14	8	28	17	58	29	100
PRIVATE	2	7	7	26	18	67	27	100
TOTAL	6	11	15	27	35	62	56	100
KAPCHORWA PMB	1	20	4	80	0	0	5	100
PRIVATE	2	7	27	93	0	0	29	100
TOTAL	3	9	31	91	0	0	34	100
SIRONKO	3	12	21	84	1	4	25	100
JINJA	3	13	9	39	11	48	23	100
TOTAL	35	16	108	49	77	35	220	100

KEY - R.Y. - RAILWAY YARD

SOURCE : SURVEY RESULTS

APPENDIX 8: DISTRIBUTION OF MAIZE HANDLED BY TRADERS AT KAMPALA RAILWAY YARD DEPOT BETWEEN MARCH AND MAY, 1989. (CUMULATIVE PERCENTAGE)

NO OF TRADERS	CUMULATIVE % OF TRADERS	CUMULATIVE VOLUME HANDLED(MT)	CUMULATIVE % OF VOLUME HANDLED
4	9.1	56	0.9
5	11.4	84	1.4
10	22.7	275	4.6
15	34.1	585	9.8
20	45.5	993	16.7
25	56.8	1501	25.3
30	68.2	2163	36.4
35	79.5	3101	52.2
40	90.9	4271	71.9
42	95.5	4859	81.8
44	100	5939	100

SOURCE : SURVEY RESULTS

APPENDIX 9: DISTRIBUTION OF MAIZE HANDLED BY TRADERS AT KAWEMPE
BETWEEN MARCH AND MAY, 1989.
(CUMULATIVE PERCENTAGE)

TRADER	CUMULATIVE % OF NO. OF TRADERS	VOLUME OF MAIZE HANDLED(MT)	CUMULATIVE VOLUME (M.T)	CUMULATIVE PERCENTAGE
1	2.9	32	32	0.8
2	5.9	56	88	2.3
3	8.8	56	144	3.8
4	11.8	56	200	5.3
5	14.7	56	256	6.8
6	17.6	56	312	8.2
7	20.6	56	368	9.7
8	23.5	58	426	11.3
9	26.5	60	486	12.9
10	29.4	60	546	14.4
11	32.4	60	606	16
12	35.3	60	666	17.7
13	38.2	78	744	19.7
14	41.2	80	824	21.8
15	44.1	80	904	23.9
16	47.1	80	984	26.1
17	50	80	1064	28.2
18	52.9	104	1168	31
19	55.9	112	1280	34
20	58.8	120	1400	37.1
21	61.8	120	1520	40.3
22	64.7	120	1640	43.5
23	67.6	120	1760	46.7
24	70.6	120	1880	49.9
25	73.5	120	2000	53
26	76.5	132	2132	56.5
27	79.4	160	2292	60.8
28	82.4	160	2452	65
29	85.3	160	2612	69.3
30	88.2	160	2772	73.5
31	91.2	160	2932	77.7
32	94.1	200	3132	83
33	97.1	240	3372	89.4
34	100	400	3772	100

SOURCE: SURVEY RESULTS

APPENDIX 10: DISTRIBUTION OF MAIZE HANDLED BY RURAL MARKET TRADERS IN KAMWENGE BETWEEN MARCH AND MAY 1989. (CUMULATIVE PERCENTAGE)

TRADER	CUMULATIVE % OF NO. OF TRADERS	VOLUME OF MAIZE HANDLED(MT)	CUMULATIVE VOLUME (M.T)	CUMULATIVE PERCENTAGE
1	2.9	4	4	0.2
2	5.7	8	12	0.5
3	8.6	8	20	0.8
4	11.4	16	36	1.5
5	14.3	16	52	2.2
6	17.1	16	68	2.8
7	20	16	84	3.5
8	22.9	16	100	4.1
9	25.7	16	116	4.8
10	28.6	16	132	5.5
11	31.4	20	152	6.3
12	34.3	24	176	7.3
13	37.1	24	200	8.3
14	40	24	224	9.3
15	42.9	24	248	10.3
16	45.7	28	276	11.4
17	48.6	32	308	12.7
18	51.4	32	340	14.1
19	54.3	36	376	15.6
20	57.1	40	416	17.2
21	60	40	456	19.9
22	62.9	40	496	20.5
23	65.7	48	544	22.5
24	68.6	48	592	24.5
25	71.4	64	656	27.2
26	74.2	64	720	29.8
27	77.1	64	784	32.5
28	80	64	848	35.1
29	82.9	100	948	39.2
30	85.7	100	1048	43.4
31	88.6	120	1168	48.3
32	91.4	128	1296	53.6
33	94.3	320	1616	69.9
34	97.1	400	2016	83.4
35	100	400	2416	100

SOURCE : SURVEY RESULTS

APPENDIX 11 : DISTRIBUTION OF MAIZE HANDLED BY RURAL URBAN
MARKET TRADERS IN KAMWENGE BETWEEN MARCH AND
MAY 1989

(CUMULATIVE PERCENTAGE)

TRADER	CUMULATIVE % OF NO. OF TRADERS	VOLUME OF MAIZE HANDLED(MT)	CUMULATIVE VOLUME (M.T)	CUMULATIVE PERCENTAGE
1	5.6	16	16	1.2
2	11.1	16	32	2.3
3	16.7	20	52	3.8
4	22.2	20	72	5.3
5	27.8	24	96	7.0
6	33.3	24	120	8.8
7	38.9	32	152	11.1
8	44.4	40	192	14.0
9	50	40	232	17.0
10	55.6	64	296	21.6
11	61.1	64	360	26.3
12	66.7	68	428	31.3
13	72.2	80	508	37.1
14	77.8	80	588	43
15	83.3	80	668	48.8
16	88.9	80	748	54.7
17	94.4	300	1048	76.0
18	100	320	1368	100

SOURCE : SURVEY RESULTS

APPENDIX 12: DISTRIBUTION OF MAIZE HANDLED BY RURAL
MARKET TRADERS IN KAPCHORWA (PMB AGENTS)
BETWEEN MARCH AND MAY 1989

(CUMULATIVE PERCENTAGE)

TRADER	CUMULATIVE % OF NO. OF TRADERS	VOLUME OF MAIZE HANDLED(MT)	CUMULATIVE VOLUME (M.T)	CUMULATIVE PERCENTAGE
1	20	40	40	14.7
2	40	40	80	29.4
3	60	88	120	47.1
4	80	72	200	73.5
5	100	72	272	100

SOURCE : SURVEY RESULTS

APPENDIX 13: DISTRIBUTION OF MAIZE HANDLED BY RURAL-URBAN MARKET
TRADERS IN KAPCHORWA BETWEEN MARCH AND MAY 1989.

(CUMULATIVE PERCENTAGE)

TRADER	CUMULATIVE % OF NO. OF TRADERS	VOLUME OF MAIZE HANDLED(MT)	CUMULATIVE VOLUME (M.T)	CUMULATIVE PERCENTAGE
1	3.4	16	16	1
2	6.9	16	32	2
3	10.3	24	56	3.4
4	13.8	28	84	5.2
5	17.2	29	113	6.9
6	20.7	31	144	8.8
7	24.1	32	176	10.8
8	27.6	32	208	12.8
9	31.0	36	244	15
10	34.5	40	284	17.4
11	41.2	40	367	19.9
12	37.9	43	368	22.5
13	44.8	45	412	25.3
14	48.3	46	458	28.1
15	51.7	48	506	31
16	55.2	50	556	34.1
17	58.6	60	616	37.8
18	62.1	60	676	41.4
19	65.5	64	740	45.4
20	69.0	72	812	49.8
21	73.4	73	884	54.2
22	75.9	72	956	58.6
23	79.3	80	1036	63.5
24	82.8	80	1116	68.4
25	86.2	82	1198	73.4
26	89.7	86	1284	78.7
27	93.1	108	1392	85.3
28	96.6	120	1512	92.6
29	100	120	1632	100

SOURCE : SURVEY RESULTS

APPENDIX 14: DISTRIBUTION OF MAIZE HANDLED BY RURAL-URBAN MARKET
TRADERS IN SIRONKO BETWEEN MARCH AND MAY 1989.

(CUMULATIVE PERCENTAGE)

TRADER	CUMULATIVE % OF NO. OF TRADERS	VOLUME OF MAIZE HANDLED(MT)	CUMULATIVE VOLUME (M.T)	CUMULATIVE PERCENTAGE
1	4.3	16	16	1.6
2	8.7	17	33	3.3
3	13.0	20	53	5.3
4	17.4	24	77	7.8
5	21.7	29	106	10.7
6	26.1	29	135	13.6
7	30.4	29	164	16.5
8	34.8	30	194	19.5
9	39.1	30	224	22.6
10	43.5	30	254	25.6
11	47.8	30	284	28.6
12	52.2	37	321	32.3
13	56.5	37	358	36
14	60.9	37	395	39.8
15	65.2	37	432	43.5
16	69.6	40	472	47.5
17	73.9	40	512	51.6
18	78.3	40	552	55.6
19	82.6	45	597	60.1
20	87	48	645	65
21	91.3	48	693	69.8
22	95.7	100	793	79.9
23	100	200	993	100

SOURCE : SURVEY RESULTS

APPENDIX 15: DISTRIBUTION OF MAIZE HANDLED BY RURAL -URBAN
MARKET TRADERS IN JINJA BETWEEN MARCH AND MAY
1989.

(CUMULATIVE PERCENTAGE)

TRADER	CUMULATIVE % OF NO. OF TRADERS	VOLUME OF MAIZE HANDLED(MT)	CUMULATIVE VOLUME (M.T)	CUMULATIVE PERCENTAGE
1	8.3	0.26	0.26	0.02
2	16.7	15	15	1.2
3	25.0	16	31	2.4
4	33.3	20	51	4
5	41.7	24	75	5.8
6	50.0	40	115	8.9
7	58.3	40	155	12
8	66.7	80	235	18.2
9	75.0	95	330	25.6
10	83.3	160	490	38
11	91.7	240	730	56.6
12	100	560	1290	100

SOURCE : SURVEY RESULTS

APPENDIX 16: DISTRIBUTION OF MAIZE HANDLED BY TRADERS IN THE SIX CENTRES IN UGANDA BETWEEN MARCH AND MAY 1989.

(CUMULATIVE PERCENTAGE)

TRADER	CUMULATIVE % OF NO. OF TRADERS	CUMULATIVE VOLUME HANDLED(MT)	CUMULATIVE PERCENTAGE
10	5	99	0.6
20	10	259	1.5
30	15	464	2.6
40	20	716	4
50	25	1014	5.7
60	30	1342	7.6
70	35	1730	9.8
80	40	2135	12.1
90	45	2609	14.8
100	50	3173	17.9
110	55	3785	21.4
120	60	4459	25.2
130	65	5241	29.6
140	70	6051	34.2
150	75	7024	39.3
160	80	8204	46.4
170	85	9506	53.8
180	90	11250	63.6
190	95	13602	76.9
200	100	17682	100

SOURCE : SURVEY RESULTS

APPENDIX 17: PMB WORKING CAPITAL STATEMENT AS AT 31-10-1988

	<u>SEPTEMBER</u>	<u>OCTOBER</u>
Current Assets:		
Bank Balances at Upcountry Stations	111,000,000/=	26,550,000/=
Bank Balances		700,228/=
Stock	281,292,984/=	258,068,430/=
Other Debtors	548,600/=	412,300/=
Prepayments	30,900,000/=	105,741,500/=
Unbilled Sales(Approx)-see note	207,459,437/=	-
Billed Crop Debtors	721,872,101/=	996,150,178/=
	<u>1,353,073,122/=</u>	<u>1,387,622,636/=</u>
Liabilities:		
Crop Creditors	75,000,000/=	62,866,101/=
Bank Overdraft	96,255,100/=	109,018,908/=
Customs Duty on Gunny bags payable	70,000,000/=	
Bank of Uganda Export advance	166,300,000/=	160,300,000/=
Revolving Fund	445,000,000/=	445,000,000/=
Coffee Marketing Board	632,000/=	632,000/=
Uganda Railways Corporation	13,000,000/=	13,000,000/=
	<u>866,187,100/=</u>	<u>790,817,009/=</u>
NET WORKING CAPITAL	<u>486,886,022/=</u>	<u>596,805,627/=</u>

Footnotes:

- a) Liquidity Ratio: 1:1.75
- b) Quick Ratio: 1:1.43

SOURCE : PMB

APPENDIX 19 : MAIZE FLOUR PRICES FOR VARIOUS MILLERS IN KAMPALA, MARCH- MAY 1989.

(USHS/KG)

D A T E S

MAIZE MILLER	15-3-89		22-3-89		29-3-89		5-4-89		12-4-89		19-4-89		26-4-89		3-5-89		10-5-89	
	W/S	R	W/S	R	W/S	R	W/S	R	W/S	R	W/S	R	W/S	R	W/S	R	W/S	R
MAGANJO	140	180	140	180	180	200	180	200	190	220	200	240	200	250	220	250	250	280
KIMANYA	135	160	135	160	150	180	150	180	160	200	170	220	170	230	200	240	220	250
KITINTALE	130	150	130	150	150	180	150	180	160	200	170	220	170	230	200	240	220	250
DRUM	-	180	-	180	170	190	170	190	160	200	180	230	180	240	210	240	230	270
UGANDA GRAIN MILLERS	125	135	125	135	130	145	130	145	150	170	150	180	150	200	150	220	150	250
MEAN MAIZE GRAIN PRICE	58.4		68.2		70		72		80		90		90		100		100	

KEY : W/S - WHOLESALE

R - RETAIL

SOURCE : SURVEY RESULTS

APPENDIX 10: MEAN WEEKLY MAIZE PRICES IN THE SIX CENTRES IN
UGANDA FROM MARCH-MAY 1989

(USHS/KG)

MIDWEEK 1989	KWG COUN- TRY SIDE	KWG T.C.	KLA TOWN	JINJA COUNTRY- SIDE	JINJA TOWN	KAP COUNTRY- SIDE	KAP T.C.	SIRONKO
15/3/89	35	45	58	52	63	30	35	47
22/3/89	40	47	68	55	65	33	35	48
29/3/89	45	53	70	60	70	35	45	65
5/4/89	45	55	72	65	70	37	45	65
12/4/89	50	55	80	65	90	38	45	70
19/4/89	55	80	90	85	90	40	45	80
26/4/89	55	80	90	85	90	40	45	80
3/5/89	55	80	100	85	95	40	45	80
10/5/89	55	80	100	85	100	40	45	90

KEY : T.C. - TRADING CENTRE

KAP - KAPCHORWA

KLA - KAMPALA

KWG - KAMWENGE

SOURCE : SURVEY RESULTS