Structure Conduct and Performance of

Kitui Local Maize Markets

by

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I, Felix Thairu Kariungi wish to declare that this
thesis is my original work and has not been
presented for a degree in any other University.

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This thesis has been submitted for examination with
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SUMMARY

Maize is a staple food among nearly all urban
and rural people in Kenya, and its effective demand
has been rising. Kenya has distinct ecological zones
which marks clearly surplus and deficit areas of maize
production. The distribution of maize within and
between these areas is effected by two marketing sub-
systems: the interregional subsystem which is controlled
by the Maize and Produce Board, and the intra-district
subsystem which is left to competitive market forces. It
has been reported by researchers and commissions of enquiry
that the overall maize marketing performs poorly, and some
of the indications are maize shortages and exploitative
consumer and producer prices. It has not been clear whether
controlled marketing has adverse effects on unregulated
local markets. For instance, it is likely that the maize
movement control shelves a deficit area from a surplus
area, especially during the glut season in the latter.

The present research was carried out in Kirinyaga
maize surplus area, and in Kitui deficit area. The main
objective of the study was to collect data and analyse the
structure, conduct and performance of Kitui local maize
market in relation to the interregional subsystem. Thus,
the role of the local markets was to be evaluated and the
degree of the market imperfection determined. The data

collected was on: quantities of maize moving through
Kitui, Tulia, and Kabati open-air markets, the M.P.B.,
and the shops; the price movements in the open-air
markets; the origin of maize traded; and the trans-
portation and storage costs. The actual data collection
was carried out in November and December 1975.

It was found out that the proportionate share of
maize received from Embu and Kirinyaga areas through the
M.P.B. was minimal and the illicit traders had a bigger
share. Both the local and interregional subsystems are
not integrated, while both have a considerable degree of
monopolistic competition. The retail maize prices were
fairly uniform. The producers received less than the
official price while the consumers at Kitui often paid
higher than the controlled prices. Thus, the middlemen
especially illicit traders, between the producer and
the consumer, got high profit margins which were unrelated
to the transfer cost.

For policy implication the author has recommended
that the Board should assume more active role of price
stabilization, the control of domestic maize marketing
to be relaxed so as to leave it to competitive market
forces of supply and demand.

CHAPTER 1

1. INTRODUCTION

    1.1. The General Problem

    Maize is a staple food among nearly all the rural
and urban Kenyan population in Kenya. The effective
demand for maize, especially for sifted maize meal, has
been rising mainly due to increase in population and the
low rate of substitution of maize with other food products
which have high income elasticities. (14, P.21).

    Kenya has distinct ecological zones which marks
clearly surplus and deficit areas of maize production.
(10). Nyanza Province, Western Kenya, Rift Valley and
Central Kenya are areas of high maize production. In these
areas, especially in the Rift Valley, maize is grown
commercially using modern agricultural inputs such as
hybrid seed, fertilizers, and modern machinery. On the
other hand, Northern-Eastern and Southern parts of Kenya
are marginal areas of maize production, and the demand for
maize is higher than local production levels almost
throughout the year. In these areas Katumani synthetic
maize is grown, and the other inputs apart from labour
are applied on a lesser scale, but since 1970 the drought
has been too severe for the synthetic maize to do well.
(13, p.5). Thus, the deficit areas and urban centres are
mainly supplied with maize from Western Kenya and Rift
Valley. During the glut season in Central Kenya,

especially in Kirinyaga, Embu and Meru, there is a
seasonal surplus of maize which is shipped to the
neighbouring deficit areas.

Kenya has two maize marketing subsystems: the
interregional subsystem which is controlled by the
Government through the Maize and Produce Board and the
intradistrict subsystem. The maize which is channeled
through the M.P.B. is mainly shipped between administrative
districts, and surplus and deficit areas. The intra-
district (local) subsystem is left to competitive market
forces, and it is carried out in open-air spaces in rural
trading centres and in shops. (3, p.5).

1.2. The Problem

1.2.1. Control of maize movements

The first argument for control of maize marketing
came out during the great depression. The main aim of the
control was to guarantee high domestic prices, mainly to
European farmers. (3, p.4). The African farmers were
assumed to be unresponsive to producer price changes,
hence the distribution of maize they produced was to be
controlled. (5, p.202). Some form of control was
initiated by enactment of the Marketing of Native Produce
Ordinance of 1935. (5, p.201). The Ordinance introduced
licensing of traders dealing with scheduled produce,
including maize, in Central Province, Coast Province, and
Nakuru District. During World War II, Kenya was to supply

maize for the war effort, and the maize control was
enforced through the Maize Control Board. (5, p.202).
The minimum satisfactory price was again to be guaranteed,
and a quota system was introduced giving preferences and
higher prices to maize produced by European farmers. The
maize produced by these farmers was to be channeled through
the Kenya Farmers Association (KFA), while the Maize
Control Board built stores for maize produced by African
farmers. (3, p.4).

After Kenya's political independence in 1963, the
maize movement control was maintained, but with different
objectives. The control at present is through the Maize
and Produce Board which is an agent of Kenya Government.
The Board's objectives are mainly to regulate production,
to control external and domestic maize marketing while
maintaining strategic minimum reserves, and to guarantee
minimum but satisfactory prices to consumers and maximum
satisfactory price to producers. (7, p.4). However, the
assumption that the large farms produce more of the
marketed maize still lingers on despite the fact that in
1964/65 season, 46% of marketed maize came from small scale
farms. (8, p.9)., Thus, many planners in Government still
assume that small farmers are not responsive to producer
prices. The M.P.B. has 30 depots at various places in the
country. (3, p.5). In the large scale farming areas,
formerly European farming areas, the producers sell maize

directly to the nearest M.P.B. depot, but in small scale
areas, the Board has appointed agents who buy maize from
farmers and deliver it to the M.P.B. stores. Distri-
bution of maize is controlled by movement permits which
are issued at the M.P.B. depots. Maize is transported
from depot to depot by the Board /using railway most of
                                by
the time.

The Government announces the basic buying price of
maize for the Board for seven different regions in Kenya.
Then, the various producer and retail prices are announced
by the Board. The influence of the Board on the local
market is officially supposed to be indirect, that is, it
should release supplies when local prices are high,
depressing them, and thereby protecting the consumers.
The Board is also supposed to buy maize at reasonably
higher prices to protect the producer. (7, 8). But in
practice it has been reported that private traders buy
maize from producers at prices lower than official ones,
and they smuggle the maize to the deficit areas where, at
times, they charge prices higher than official ones, thereby
making large profits which are not related to transfer
costs. The interregional maize prices are reported to
fluctuate erratically. There is evidence that the Board
has not been very successful in maintaining strategic
minimum reserves, and this has resulted in national maize
shortages. (12, p.1). Thus, the regulated and unregulated
maize marketing subsystems perform poorly. In order to get

a better idea about the extent of the inefficiencies
of the maize marketing in Kenya, this survey was launched.

1.2.2. The areas of the survey

The areas of study were Kirinyaga District which
is considered as a surplus area, and Kitui District which
is a deficit area. By studying the structure, conduct
and performance of Kutus market at Kirinyaga, and Kitui,
Tulia and Kabati markets at Kitui, both the interregional
and local maize marketing subsystems will be evaluated
and the degree of the imperfections of these systems will
be assessed. The author studied the markets in Kitui
District, while J.K. Ireri studied Kutus and Ithareini
markets.

The subsistence crops grown are cowpeas, bulrush
millet, finger millet, pigeon peas, cassava, bananas and
vegetables. (12, p.50). Thus, the main sources of income
are these crops and livestock which are transacted in a
small scale. The income per capital is very low, hence
the cash money outlay available to purchase even basic
food, like maize is small. Although, some of these crops
such as cowpeas, pigeon peas and millet resist drought
better than maize, the taste of maize has not changed
substantially.

The main maize crop is harvested in October and
November in Kirinyaga District. The M.P.B. has agents at
Kutus who started delivering maize to the M.P.B. store at

Figure 1. Map of Kenya showing the position of
Kabati, Tulia, Kitui and Kutus markets,
and principal roads.
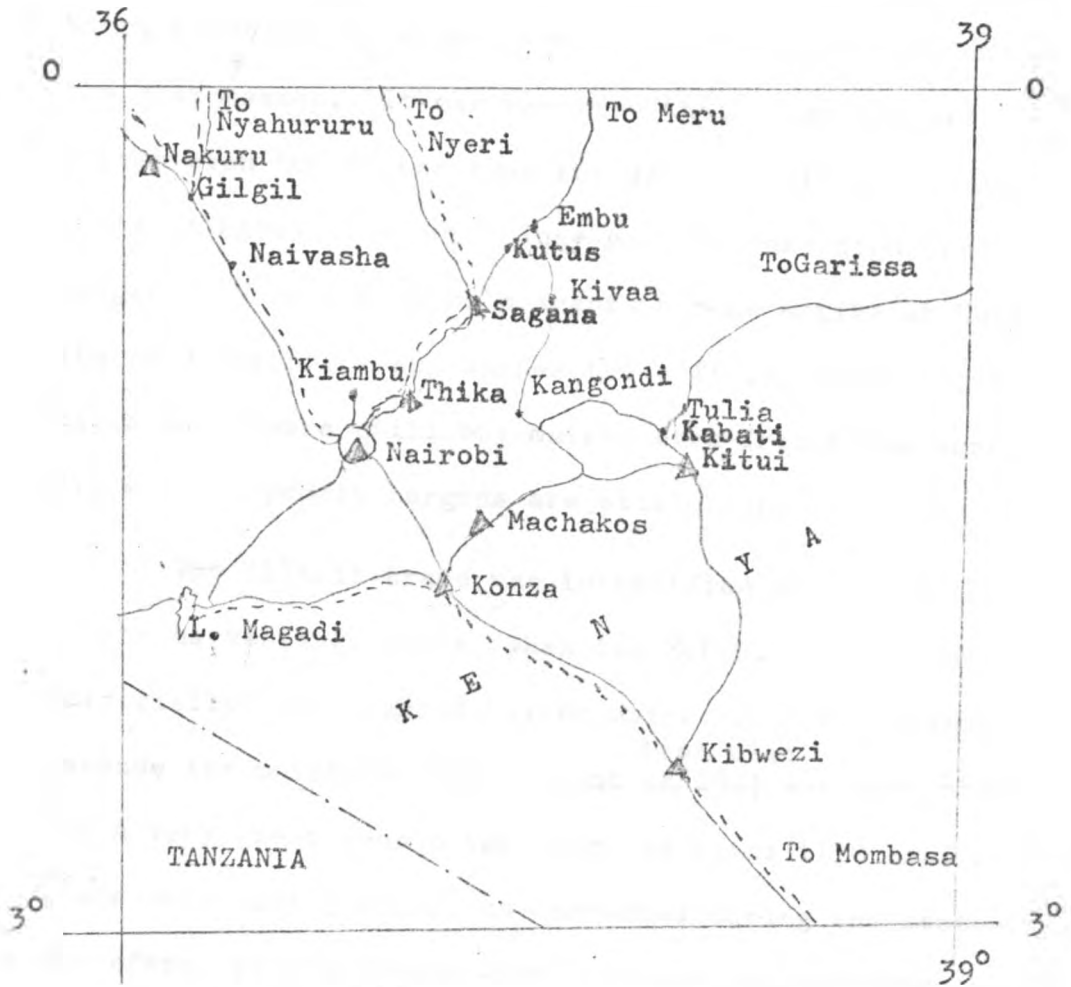
KEY

-.-.-.-.-.-Inter-territorial boundary

_____Main Roads

--------- Railway

△   M.P.B. Depots

Source: M.P.B. Files

SCALE: 1:300,000

Sagana at the end of October. But they usually start
buying maize from producers as early as end of September.
They pay lower than official price, store the maize and
deliver it to M.P.B. store later at the higher official
prices. The black marketeers may either buy maize from
producers at lower than official prices or from the M.P.B.
agents. These illicit traders ship the maize directly to
Kitui where they charge lower than official prices during
the glut season. It was reported that they charged
prices even 50% higher than the official prices in some
parts of Kitui District. They usually make high profit
margins. When the Board's agents become active at Kutus
the producer price approaches the official price but the
black marketeers still buy maize, even from these agents
since their profit margins are still high.

'The illicit trade was intensified at the beginning
of the harvesting season when the M.P.B. agents had
"officially" not started buying maize from the farmers,
because the moisture content must be/ less than 13%; and then, there
was a very great demand for maize in Kitui (150 kms. away)
where very little maize was harvested during the season.
Therefore, illicit trade with its good and bad consequences
was inevitable.

Thus, the interregional and intradistrict (local)
maize marketing subsystems do not fulfil the functions
they are intended to, by the Government planners. It is not

clear whether the interregional movement controls
affects adversely the overall maize marketing performance.
On the other hand, the vital role played by the intra-
district maize traded is not known. The case studies of
maize marketing in Kirinyaga surplus area and Kitui
dificit area will give some indication of the performance
of the two subsystems.

CHAPTER II

2. OBJECTIVES OF STUDY

2.1. Literature review

The control of maize marketing has been a
controversial issue throughout Kenya's economic history,
and the Government had realized it all along. The
Government appointed a commission of enquiry in 1943 to
look into the national maize shortage. (5, p.203). The
committee re-emphasized on the control of domestic maize
marketing, while guaranteeing satisfactory producer prices
mainly for European farms (5, p.203). Another commission
of enquiry was set up in 1966. It was to evaluate sound
maize distribution and production policy and also to
investigate on the maize scandal involving high authorities
in Government (11, p.2). The latest committee was the
parliamentary select committee of 1972. This committee
was composed of members of parliament and its main aim was
to investigate the national maize shortage of 1971 and
advise the Government on sound production, marketing and
pricing policy. (12, p.1). The Committee recommended to
the Government the improvement of maize production
storage and marketing, and emphasized the freeing of
internal maize marketing while the Board was to act as a
price stabilizer.

The information compiled by all these commissions
of enquiry on maize was obtained by interviewing people
in various positions in Government and private sector and
the recommendations by these commissions were not based
on any empirical analysis of maize marketing. Thus, the
improvement proposals were of general nature. Similarly,
none of the other authors of papers and books on grain
marketing in Kenya has carried out comprehensive analysis
of empirical data. However, J.K. Maitha analysed data
collected by the Ministry of Finance and Planning, at
Nairobi, from 1950-1969 by using Nerlove distribution
model. (6, p.188). He found out that the large scale Kenyan
wheat and maize farmers are highly responsive to producer
price changes and as a result he recommended the relaxing
of the present system of fixing producer prices. (6,p.188),
The relationship analysed was between maize production and
producer prices.

The grain marketing systems in Kenya, Sierra Leone,
and Nigeria have been studied by W.O. Jones (5, p.xi). He
looked at; the market chains, the traders' margins, and
the seasonality of price variations. In Kenya he
concentrated more on the maize than the beans, potatoes
and bananas, whereas in Sierra Leone he studied the
marketing systems of rice, palm oil, pea nuts, cassava,
roots and fufu. In Southern Nigeria, he analysed the
seasonal price variations between, rice, grain, cowpeas,
maize and yams, and various markets. Here, he studied

the seasonal prices and storage costs and intermarket
price correlations. In case of the grain marketing
systems analysed the following market imperfections are
salient: (a) lack of market intelligence especially with
respect to prices, (b) erratic seasonal prices changes
accompanied by lack of seasonal stocks stored by farmers
or traders, (c) occasional shortages of maize in Kenya.
However, he appraises that the markets have rare collusions,
easy entry and minimum cheating in Nigeria. (5,p.158)
In case of Government controlled maize market in Kenya, and
rice market in Sierra Leone, he concludes that the control
hampers private traders participating actively in the grain
marketing. (5, p.230)

The Maize and Produce Board in Kenya participated in
an experiment carried out within the Special Rural
Development Programme at Luanda and Mbale local maize markets
in Western Kenya. (2, p.8). The main objective of the survey
was to measure effects on rural retail markets of free maize
movements and advise the M.P.B. on sound maize distribution
policy. The study generated time series data on: the quantity
of maize moving through these markets, on the wholesale
country buying prices, on the number of wholesalers bringing
maize into the market, and the origin of maize moving through
these markets. The analysis was not comprehensive enough
to support the recommendations and it does not reveal the
structure and performance of local maize marketing
subsystems. The present survey of local markets in surplus

out
and deficit areas will be carried/a little bit further

to investigate the structure, conduct and performance

of the markets selected. At the same time the

interregional subsystems will be investigated. However,

time and financial constraints hindered the author to

collect data for more than 3 months.

2.2. Questions to be answered

The questions to be answered in this study will be

on structure, conduct and performance of the local maize

markets and to a lesser extent on interregional marketing

subsystems.

2.2.1. Structure:

(i) How much is the quantity of maize traded

by M.P.B. as compared to the quantity traded by private

traders?

The Maize and Produce Board is supposed to have a

stabilizing effect on the interregional and local maize

prices. If the share of the volume traded by M.P.B. is

small compared to the volume of maize moving through other

channels, especially the illegal marketing channels, then,

the impact of the Board on the local markets will be

minimal.

(ii) What is the degree of the monopolistic competition existing in the local maize markets of Kitui, Kabati and Tulia?

High concentration ratios of retailers in the open-air markets, and traders in other marketing channels may contribute to the monopolistic competition of the maize market by a few traders who may be in a position to influence the selling prices for their advantage thereby exploiting either the consumer or the producer.

(iii) What is the state of physical facilities available to M.P.B., its agents and other private traders? The state of market physical facilities mainly transportation and storage may hamper market arbitration between Kitui, Kabati, Tulia, and Kutus markets, and over the seasons.

2.2.2. Conduct

(i) If the Board's prices are to serve as a satisfactory minimum to the consumers and satisfactory maximum to the producer, then, how are the Board's prices in the markets selected arrived at?

(ii) How do the gross margins which the M.P.B. fixes for its agents affect the ultimate consumer? The procedure of fixing retailers' margins by the Board is rather rigid and it has been suggested that fixing retail margin for M.P.B. agents (retailers) gives them little room for various pricing strategies. Thus, these retailers engage

in black marketing where margins are not set rigidly.

(iii) What is the decision making process by
the management of M.P.B. in releasing maize supplies in
the deficit area?
The Board's decision at the local level should be guided
by the local market prices, if the Board is to participate
actively in the local maize trade, and thus stabilize local
maize prices.

2.2.3. Performance

(i) How do local and interregional maize prices
fluctuate temporarily?
It has been reported that the local maize are characterized
by high price fluctuations both in space and time.

(ii) What are the traders' margins? Do these
margins differ substantially from the transfer costs?
Since high price fluctuations can result in illicit trade,
margins must be fairly high to reward for risk taking.

(iii) What are the relationship between retail
prices in Kitui, Tulia and Kabati open-air markets, and
between wholesale selling price at Kutus and wholesale
buying prices at Kitui, Tulia and Kabati markets?
These relationships in the markets selected may indicate
the degree of pricing efficiency.

(iv) Are the traders and consumers aware of
the maize prices prevailing in the surplus area, and in
the markets selected in the deficit area? The state of
market intelligence, especially price information, is a
contributory factor to market performance.

(v) Does the state of standardization of
retailing units for maize in the markets selected hamper
in any way the degree of market performance?

CHAPTER III

3. METHODOLOGY

3.1. Hypotheses to be tested

The hypotheses to be tested are related to the questions to be answered in the study, and will mainly be based on structure, conduct, and performance of Kitui, Kabati, Tulia, and Kutus local maize markets.

3.1.1. Structure

(i) Although the M.P.B. supplies 20-30% of maize traded in Kitui, Kabati, and Tulia area, none of this maize originated in Kirinyaga, and Embu surplus areas. The analysis of the supply areas for the Kitui deficit area, and the share of the illicit traders in the maize trade will indicate the Board's role.

(ii) Kitui, Kabati, and Tulia local markets in the deficit area, and Kutus in the surplus area are not integrated. The main reason is the low degree of market transparency which is caused by inadequate physical facilities such as transportation and lack of satisfactory standardization of retailing units. The correlations values (r) between retail maize prices at Kitui, Tulia, and Kabati open-air markets and between wholesale prices at Kutus and the above three markets will indicate the degree of market integration in the area of study. The state of transportation facilities will be indicated by the nodes of transportation used by retailers and wholesalers.

3.1.2. Conduct

(i) Fixing the retail margin for M.P.B. customers, some of whom retail the maize later, forces them into black markets even when wholesale market prices are above M.P.B. ex-depot prices, thus making maize more expensive to the ultimate consumer. The retail margins are fixed for each of the eight regions in the country, and these margins are not related to transportation and handling costs. The analysis of the Board's pricing system at the local level including, the retailers margins will indicate the effects of the these margins on retail trade.

(ii) The local maize prices of the M.P.B. are arrived at an cost-plus basis and tends to ignore competitive market forces at the local level. This will be indicated by the above analysis of the Board's pricing system.

(iii) The decision making by the management of the Board at the local level on the timeliness of releasing maize supplies is not guided by local market conditions such as weekly price movements. The market price movements will be compared to the maize purchases at the M.P.B. Kitui depot for the same period.

3.1.3. Performance

(i) The local maize markets in Kitui District are characterized by high daily price fluctuations over time as compared to M.P.B. price which is constant. The daily market prices in Kitui, Kabati and Tulia open-air markets will be used to test the hypothesis, and price fluctuation/more than 20% will be considered to be high. /of

(ii) The traders' margins are fairly high in illicit trade to reward for risk taking. These margins will be taken as high if they differ substantially from transfer costs.

(iii) The local selected markets have low degree of pricing efficiency which is partially caused by non-uniformity of quantities of maize transacted using similar retailing units, and the relatively poor state of market intelligence.

3.2. Field data collection

The study was carried out in the three open-air markets of Kabati, Kitui (Kalundu) and Tulia, in the Maize and Produce Board depot at Kitui, with the interregional wholesalers who shipped maize from surplus area to deficit area, and with the shopkeepers who retailed maize in their shops.

The open-air markets are held on open air grounds which are usually round-fenced and have two gates.

Therefore, it was intended to post two enumerators at the market gates in the morning of each market day. The enumerators were: (a) to estimate the maize in-flow (b) to ask the retailers the origin of the maize, the expected retail price and the wholesale country buying price.

This information was to be obtained from everybody entering the market with maize for sale. The survey was to be carried out for a period of 3 months. In the middle of the day, the author had to get a simple random sample of buyers and sellers inside the market and interview each one of them to determine the actual price movement for each container size and the cost of transportation and storage. During the later half of the day, the enumerators were: (a) to record the produce outflow; (b) to ask the respondents where each was taking the maize and (c) to ask the mode of transportation one was to use. At the end of the day, the author was to estimate the quantity of maize remaining unsold and the volume of maize traded was to be determined for a particular market day. This type of information was to be collected in October, November, and December, 1975.

In case of shopkeepers the author was to select at least 5 traders in each of the 3 trading centres. These shopkeepers were to record information on proformas provided on: (a) storage costs of maize, (b) transport costs, (c) volume of maize traded per day, (d) the origin of

maize, (e) the buying price at origin, (f) the selling
price, (f) the destination of the maize, **(g) and the mode of**
transportation. The information was to be recorded daily
in October, November and December.

The author was to contact interregional wholesalers
who are usually illicit traders informally, and possibly
get similar information as above. He was also to record
information on weekly basis from the M.P.B. files at Kitui
depot. This information was on: (a) quantity of maize
traded, (b) the origin of maize, (c) the buying price at
origin and (d) the selling price at the depot. The
information was to be collected for the 3 months of study.

However, the proposed method of data collection was
revised during the actual operation, mainly because Kabati
and Tulia open/markets were not round-fenced, and Kitui /air
gates were very wide making it difficult to control the
incoming and outgoing crowds. Field data collection was
started in November since October was mainly used in
training enumerators. The market days at Kabati and Kitui are
Monday and Thursday, and Tuesday and Thursday at Tulia market.
The enumerators were inside the market at 8.00 a.m. and they
recorded the quantity of the maize which was taken inside
the market in bags and half-bags, as it was being poured from
the bags. Usually a retailer would have liked to know the
quantity of maize one had for the day and would determine it

by first pouring the maize into a debe[1] and then pouring
it on an empty bag spread infront of the retailer. The
enumerator then asked the retailer how much maize she had
and confirmed her estimate by observing how much she had
poured out using the debe. All these estimates were
recorded as quantity inflow.

The retailers sat in two rows which were about 5
metres wide and 20 metres long. They spread maize on empty
bags in heaps of about 300 kgs while they sat behind these
heaps. The retailers were regular, so that as the study
continued, they became acquainted with the enumerators. One
enumerator had about 10-15 retailers on both rows and he
walked up and down between these rows while collecting
information on transactions. Before peak hours of business,
the enumerators asked the retailers: (a) the origin of maize
(b) the buying price at origin (c) transportation costs.
The enumerators also weighed the quantity of maize to be
transacted using different retailing units. This data was
easily collected before the retailers became busy. The
retailing was started at around 10-12 noon, and the
enumerators recorded: (a) the actual amount of maize bought,
(b) the sales unit used, and, (c) the amount of money paid.

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[1] A debe is a package tin for vegetable edible oil, and
it usually contains 15 kgs of maize.

The amount of maize bought was recorded as quantity of
outflow. Any buyer who later resold the maize in the
same open-air market was noted. While the transactions
were taking place, the enumerator asked the buyer (consumer)
where she was taking the maize and the mode of transpor-
tation to be used. Kabati and Kitui markets were held on
the same market days hence the author travelled between the
two markets to supervise data collection. This type of
data was collected from November to December, 1975.

Towards the end of November, the retailers were
already used to enumerators and simple questionnaires were
completed by the enumerators with the help of retailers.
Each retailer supplied information on: (a) whether one
sells other products apart from maize, (b) the alternative
sources of maize supply, (c) the main marketing problems,
and (d) on the degree of interaction between retailers,
Government authorities and big traders.

In the middle of November the author selected 5
shopkeepers at Kitui town, 2 at Kabati, and 5 at Tulia.
All these traders except one at Kabati, one at Tulia, and
2 at Kitui were running ordinary shops where they retailed
maize and other products, while the rest were operating
stores in which they bought and sold grain, oil seeds and
sisal fibre. The author trained them on how to complete the
proformas. The main information sought here was on:

(a) storage costs, (b) transportation costs, (c) the origin
of maize, (d) the buying price at origin, (e) the quantity
of maize bought and sold each day, (f) where the maize was
sold and the prices paid by the buyers.

The author contacted these shopkeepers whenever he
was not working in the open-air markets. This exercise was
rather disappointing since only 3 shopkeepers at Kitui and
2 at Tulia were cooperative and continued supplying the data.
The author contacted the interregional wholesalers informally,
but no empirical data was obtained mainly due to fear of
exposing the illicit trade. The author also spent 2 days per
week in the Maize and Produce Board depot at Kitui recording
information on: (a) the daily quantities of maize received
and prices paid, (b) the quantity of maize distributed
daily, (c) the origin of maize received, (d) the destination
of the maize distributed, and (e) on the prices paid by
the buyers. This data was collected from October to
December, 1975.

The limitations of the above method of data
collection were:-

(i) During the peak period of business
transactions in the open-air markets, there were likely
to be more transactions than the enumerators could cope up
with, hence the quantity out-flow recorded was likely to be
an underestimate of the actual outflow;

(ii) on the other hand, the quantity of maize left unsold at the end of the market day was estimated by inspecting the amount of maize spread infront of the sellers and this was likely to have been underestimates of the actual quantity left unsold.

However, these limitations were minimized by working with weighted average figures. The estimation bias was reduced by the analysis indicated below:

(i) In the Appendix I, II and III, the quantity of maize not sold was taken out of the open-air market, and was recorded as inflow, in the next market day.

(ii) Appendix I, II and III gives the inflow and outflow of quantities of maize traded in the Tulia, Kabati, and Kitui open-air markets. As noted above, the recording of outflow and the quantity of maize left unsold at the end of market day, was likely to have been biased, while the recording of quantity inflow had the least bias, since the half bags, and the large bags were counted physically. The quantity of maize which remained unsold was calculated by getting the differences between inflow and outflow quantities by using the two methods was subtracted from the quantity inflow to obtain the quantity of maize traded which is indicated in the last columns of Appendix I, II and III. pages 72 to 74.

CHAPTER IV

4. STRUCTURE OF LOCAL AND INTERREGIONAL MAIZE MARKETS

4.1. Channels of distribution

The interregional and local channels of maize distribution in Kitui District are indicated in Figure 2. The extra district channels are constituted by the Maize and Produce Board and the extra-district traders. The local channels are mainly the open-air markets and the shops.

The supply areas of the maize traded in the three open-air markets of Tulia, Kabati and Kitui have been indicated in table 4.1. Embu District was the main supply area, supplying 61%, 55% and 35% of the maize traded in Tulia, Kabati, and Kitui respectively. In case of Tulia and Kabati, Kirinyaga was the second important supply area with 26% and 30% of the maize traded, (originating in Kirinyaga) while Kiambu was the second important supply area for Kitui open-air market. Since Kivaa is situated in a semi-arid area and it is on Kutus-Embu and Kitui trunk road, nearly all the maize transacted here originated from Kirinyaga and Embu. , Thus, Kirinyaga and Embu was the supply area for 77% to 95% of the maize traded in the 3 open-air markets.

4.1. <u>Supply areas for maize traded in the Tulia, Kabati, Kitui open-air markets and by the M.P.B. in Nov. and Dec., 1975</u>

Market Origin	Tulia		Kabati		Kitui		M.P.B. (Kitui)		Total
	kg	%	kg	%	kg	%	kg	%	kg
Embu	70,850	61	54,819	55	13,232	35	-	-	98,901
Kirinyaga	13,150	26	29,900	30	3,780	10	-	-	46,830
Kivaa[1]	3,540	7	9,967	10	4,536	12	-	-	18,043
Kiambu	-	-	-	-	9,830	26	-	-	9,830
Shimba Hills	-	-	-	-	3,781	10	-	-	3,781
Kibwezi (MPB)	-	-	-	-	-	-	657,600[2]	100	657,600
Other	3,035	6	4,984	5	2,646	7	-		10,665
Total	50,575	100	99,670	100	37,806	100	657,600	100	845,651

[1] Kivaa is within Machakos District and it is midway between Embu, Kirinyaga and Kitui
 Therefore, nearly all the maize transacted there originated at Embu, and Kirinyaga

[2] The figure includes famine relief maize.

 Source: Author's investigations

Figure 2. Marketing channels for maize in Kitui
District, Nov. and Dec., 1975
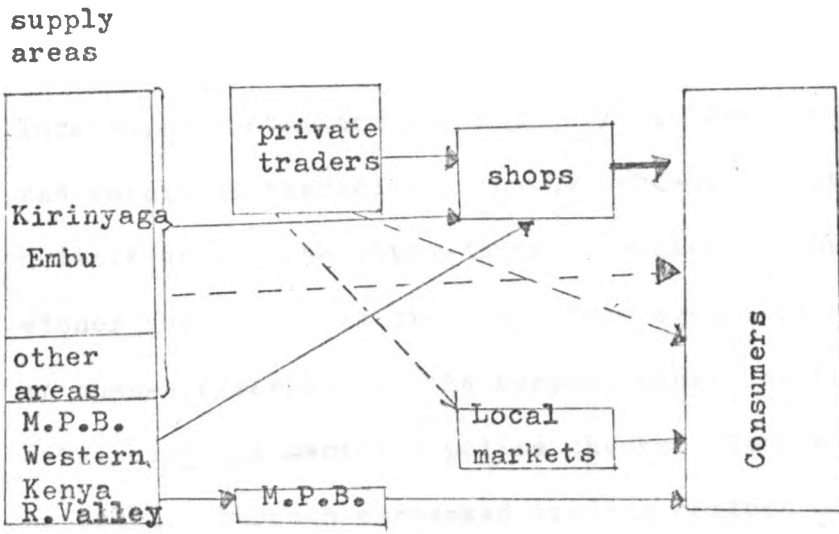
supply
areas

Source: Author's investigations

The M.P.B. depot at Kitui gets most of its maize
supply from Western Kenya and Rift Valley. But a portion
of its total supply comes from Kirinyaga and Embu areas.
All these supplies are shipped through Kibwezi to Kitui.
The shopkeepers and even retailers in the open-air
markets and consumers can buy maize directly from the
M.P.B. depot at Kitui.

The extra-district traders are either wholesalers
who transport maize from the surplus areas to Kitui, using
lorries, or retailers who buy maize in the surplus areas
and retail it themselves in the open-air markets in the
deficit area. The extra-district wholesaler buys maize from
either the producers directly, from agents of M.P.B. or
in open-air markets in the surplus area. He travels towards
Kitui District avoiding police checks. Inside the District,
he travels through earmarked trading centres selling the
maize. He could sell from one bag to the whole lorry load
and would continue with the journey until he had sold all
the maize. Occasionally, he would arrange with a
particular shopkeeper in a trading centre to ship him some
maize. At Tulia and Kabati markets they would arrive at
8-9 a.m. The retailers in the open-air markets would also
buy maize directly from the extra-district wholesalers.
The extra-district retailers bought maize either from the
farmers or in the open-air markets in the surplus areas.
They used buses to transport maize in half-bags so as to

avoid police checks. They retailed maize themselves in the open-air markets in Kitui District. The shopkeepers and retailers in the open-air markets obtained maize supplies from either the M.P.B. store, from the extra-district traders or from their own farms.

Thus the consumer could obtain maize supplies from the extra-district traders, from the M.P.B. store, from the shops or from the open-air markets.

4.2. Transportation and storage facilities

All the wholesalers who shipped maize to Kitui District from the neighbouring districts used lorries for transportation. But the retailers used either buses, lorries, or pick-ups (matatus).

The various modes of transportation used by retailers to move maize into the open-air markets studied, and by consumers to move the maize out of these markets are indicated in table 4.2. The commonest type of transport is the human transport. The consumers who buy maize from the open-air markets of less than two debes usually used this form of transport. In Tulia, Kabati and Kitui open-air markets 86%, 50% and 71% respectively of both retailers and consumers used human transport. The retailers who bought maize from extra-district traders carried maize from the lorries to the market grounds using either handcarts or wheelbarrows. About 47% of retailers and consumers used buses or lorries to transport maize to

and from Kabati market, mainly because Kabati was
relatively bigger market and the consumers usually
bought bigger loads (more than two debes). Furthermore
Kabati market is well situated on Nairobi-Kitui road and
Garissa-Nairobi road. Although 40% (see table 4.5) of
consumers and retailers in the open-air markets indicated
that transportation is a serious problem, the percentage
figures of modes of transport indicate that transportation
is a handicap (see table 4.2). The people who walk to
the markets cover distances of about 10 km and the buses
or pick-ups (matatus) are usually very crowded. During
the long rains, all roads in Kitui District, except
Nairobi-Kitui road are not easily passable by motor vehicles.

The extra-district traders stored maize for a day
or two at the place of origin and when a sizeable load
was assembled, they shipped the maize to Kitui District.
Here, they had no storage facilities as they sold maize
off the lorries. If these traders were to broaden their
activities and carry out market arbitration over the
seasons, then, they would face serious storage problems.
The shopkeepers at Kitui town complained of inadequate
storage, and in fact stacks of maize bags could be seen
outside their shops.

Table 4.2. <u>Frequency distribution of different modes of</u>
            <u>transportation used by retailers and consumers</u>
            <u>in Tulia, Kabati and Kitui local markets, in</u>
            <u>Nov. and Dec., 1975</u>

Mode of transport	Tulia		Kabati		Kitui		Total
	Nos[1]	%	Nos	%	Nos	%	Nos
Bus or Lorry	400	9	2,220	47	1,114	23	3,734
on back (human)	3,831	86	2,363	50	3,438	71	9,632
handcart or wheelbarrow	133	3	95	2	2,905	6	3,133
Donkey	89	2	47	1	-	-	136
	4,453	100	4,725	100	7,457	100	16,635

[1]Number of observations

Source: Author's investigations

4.3. <u>Concentratration ratio of</u> <u>retailers</u>
       <u>in Kitui, Kabati and Tulia open markets from</u>
       <u>Nov. to Dec., 1975</u>

In table 4.3. the market shares of retailers in
Tulia, Kabati and Kitui open-air markets in November and
December have been indicated. The average number of
retailers at Tulia were 33, at Kabati 43 and at Kitui 16.
However, the number of retailers varied from one market
day to the other. The average sales per retailer were 86

Table: 4.3. The market shares of maize retailers
in Kitui, Kabati and Tulia open-air
markets, November to December, 1975

Market	Tulia	Kabati	Kitui
Average No. of retailers	33	43	16
Average sales (kgs) per retailer per day	86	156	168
Sales of the biggest retailer (kgs) in Nov. and Dec., 1975	1620	1920	2400
Sales of smallest retailer (kgs) in Nov. and Dec., 1975	1	3	29
% Sales of 10% biggest retailers with more than 480kgs each in Nov. and Dec.	61	50	61
% Sales of 20% biggest retailers with more than 300 kgs each	81	57	85

Source: Author's investigations

4.4. Share of quantity of maize traded by M.P.B. in
Kitui, Kabati and Tulia zone in November and
December, 1975

In table 4.4. the quantity of maize traded by four
private traders, the quantity of maize distributed by M.P.B.
and retailers in the open-air markets at Kitui, Kabati and
Tulia, have been indicated.

kgs, 156 kgs and 168 kgs at Tulia, Kabati and Kitui, respectively. The sales of the smallest retailer were 1 kg, 3kgs and 29 kgs at Tulia, Kabati and Kitui respectively. The sales of the biggest retailer were 1620 kgs, 1920 kgs and 2400 kgs at Tulia, Kabati and Kitui respectively. The range between the smallest retailer and the biggest retailer was between 2399 kgs which is considerably high. About 10% of the biggest retailers had a share of 57-85% of the total volume traded in the three open-air markets selected. Thus, more than half of the volume traded was shared between 10% of the retailers. But there was no apparent monopoly or oligopoly in open-air market retail trade.

Table 4.4. Weekly quantities of maize traded by the shopkeepers, the M.P.B. and by retailers in Tulia, Kabati and Kitui open-air markets from November to December, 1975

(tons)

Trader / Week[1]	M.P.B. (Kitui)			Open-air markets			Trader A (Kitui)	Trader B (Tulia)	Trader C (Kitui)	Trader D (Kitui)	sub-total ex-cluding 2 & 4	3 as % of 12
	Relief	other[2] maize	Total	Tulia	Kabati	Kitui						
	2	3	4	5	6	7	8	9	10	11	12	13
1	34.5	26.8	61.8	7.9	9.2	4.4	21.6	-	36.5	3.0	109.4	23.7
2	.7	3.5	4.2	7.8	16.2	5.2	4.5	3.5	56.4	2.3	99.4	4.0
3	167.3	8.2	175.5	4.2	16.4	3.6	37.3	5.3	-	3.3	78.3	10.5
4	97.7	3.5	101.2	5.6	9.6	4.0	14.4	1.0	-	2.9	41.0	8.5
5	67.1	48.2	115.3	6.8	12.5	6.9	37.8	.8	-	2.6	115.6	41.7
6	118.4	28.9	147.3	5.7	12.9	6.0	25.2	.6	-	-	79.3	36.4
7	34.4	7.8	42.2	5.6	12.7	5.0	27.5	.8	-	-	59.4	13.2
8	0.5	10.2	10.6	7.0	10.2	2.7	13.1	.4	-	-	43.6	23.4
Total	520.6	137.1	657.6	50.6	99.7	7.8	181.5	12.4	92.9	14.1	626.1	22.0

[1] Week is Monday to Sunday

[2] "Other maize" is bought from M.P.B. store at Kitui by private traders and other institutions and will be taken as commercial maize.

Source: Author's investigations.

Throughout the study period, hardly any maize bought from M.P.B. store was observed being sold in the open-air markets; the maize from M.P.B. store was easily identified by insecticide applied at the store. The "relief maize" in the second column of table / 4.4 was distributed to starving families. The maize was paid for by the Government through the Ministry of Home Affairs. The "other maize" in the third column of the table was purchased from the Board's store by direct consumers, retailers at the shops and by institutions such as schools, prison, and the hospital. In the analysis, it is assumed that the "relief maize" has little effect on the local maize prices. Another assumption to this effect was that the families who received this maize had no cash income with which they could have bought maize from the local markets.

Therefore, the "other maize" will be assumed to have been competing in the local maize markets with maize from other sources of supply. Furthermore the author has estimated that 80% of relief maize was distributed outside the 40 sq. km zone within which the 3 markets are situated.

Columns 5, 6 and 7 in table 4.4. indicate the weekly maize traded in each of the markets Tulia, Kabati and Kitui open-air markets. Columns 8 to 11 indicate the quantities traded by the private traders who supplied information on their maize turnover. The sub-total column

Figure 3: Quantity of maize traded by M.P.B.

shopkeepers and other retailers in

Tulia, Kabati and Kitui open-air markets,

in Nov. and Dec., 1975
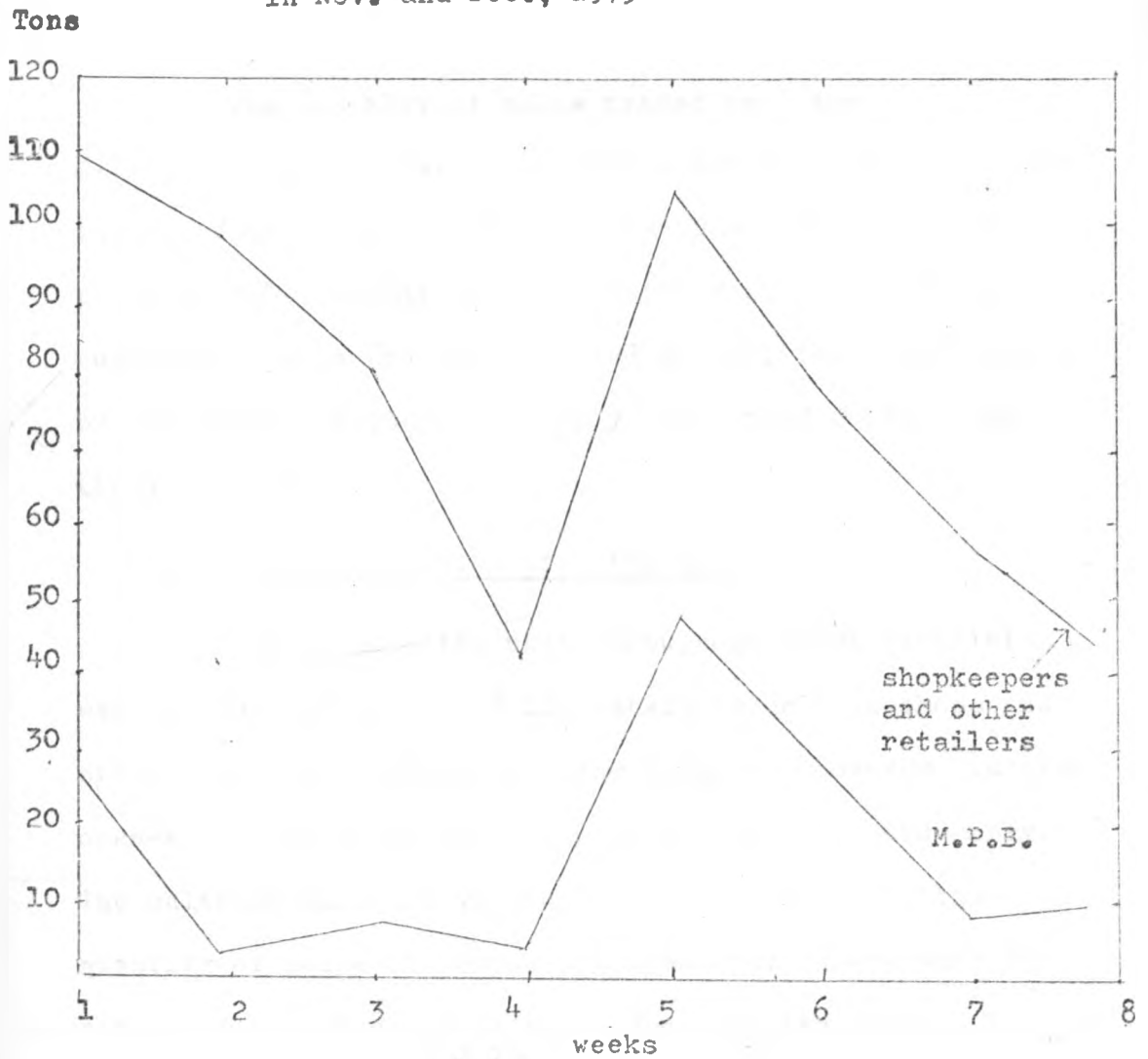
Source: table 4.4.

12, indicates the total quantity of maize traded by the
private traders (8 to 11), in the open-air markets
(5-7) and the 'other maize', while the last column, 13,
indicates the percent of 'other maize' to the sub-total
column 12.

The quantity of maize traded by   the
M.P.B. and by the shopkeepers and other retailers has been
indicated in Figure 3. The curves show some degree of
positive relationship between these quantities. Thus,
contrary to what has been assumed so far, the maize traded
by the M.P.B. responds to supply and demand factors at
the local level.

4.5. Standardization of sales units

The wholesaling unit throughout Kitui District
was the bag (90 kgs), and the retailing unit in shops and
stores was the standard weighing balance. However, in the
open-air markets the retailing units varied considerably.
The calabash (kasele) varied in size according to the
quantity of maize it was used to measure: there were 10
cents and shs. 1-4 calabashes. The capacity of shs. 1
calabash which was the most commonly used was about 1 kg.
If a consumer wanted to buy maize for shs. 10, the shs. 1
calabash was used to measure the maize which was poured
into shs. 3 or 4 calabash. Similarly the kimbo tin varied
according to the quantity of maize it could contain which

was transacted at a particular price. The 0.5 kg kimbo
tin was costing shs. 0.50 while the 1 kg tin costed shs.
1, and the 2 kgs tin costed shs. 2. The debe tins had all
sorts of funny shapes with most of them beaten inwards.
Therefore, their capacity varied between 13.5 to 15 kg.
In this study, a weighted average of 14.5 kg per debe has
been used. The price of the debe varied from hour to hour
and from one market day to the other, (see Appendix IV, V,
and VI). The retailing units are thus, fairly standardized.

4.6. Conditions of entry and exit in maize trade in Kitui, Kabati and Tulia open-air markets

Some of the factors that may have affected the conditions of entry and exit in the maize trade in the markets studied are indicated in tables 4.5 and 4.6. About 73% of the retailers in the three open-air markets were in business for less than one year, 10% for one to five years, and 17% for more than five years. Whereas 75% of the retailers sold other produce such as millet (24%), cowpeas (19%), cassava (14%), and other produce (18%), apart from maize. Thus, most of the retailers were seasonal, and not really specialized maize retailers. They moved in and out of the maize trade, most likely at break-even point, and switched to some other type of business.

About 42% of the retailers indicated that they had shortage of operating capital. Thus, they could not buy as much maize from the illicit traders as they would have liked to. Although the retailers may have got high gross margin per bag, they could not maximize on their turnover. Furthermore, finance and transportation problem were realized by 22%/ of the respondents, making finance problem to have affected about 66% of the retailers interviewed. The retailers did not think that storage was a problem,

Table 4.5. <u>Length of time the maize retailers in</u>

<u>Tulia, Kabati and Kitui open-air markets</u>

<u>were in business, in Nov., and Dec., 1975</u>

Length of time business:	Tulia	Kitui	Kabati	Total	
	No. of traders				%
(i) Less than 1 year	24	9	25	58	73
(ii) 1-5 years..	-	3	5	8	10
(iii) over 5 years..	2	3	9	14	14
Total No. of respondents	26	15	39	80	100

Source: Author's investigations

since very little maize was stored at friends' shops

There was minimal interference of the local
markets by the County Council apart from the market fee.
It was levied at the gates of the open-air markets for
each load taken into the market. The charges were shs 3
per bag per/ day and shs 2 per debe or equivalent load.
market

The extra-district (illicit traders) were affected adversely
by the control movements of maize. They had to avoid
police checks and if a trader was arrested with a full lorry
load of maize which would be confiscated by the police, the
money he would loose could easily put him out of business.

The agents of the M.P.B. were dissatisfied with
the method the Board was using in distributing maize. A
direct consumer could buy even one bag at the depot, thereby
undercutting the agents. Furthermore the fixing of
retailers margins by the M.P.B. was too rigid and the
retailers made losses if they adhered to these margins.
The problem was aggravated by inadequate price information
system; for instance 58% of the retailers in Kitui, Tulia,
and Kabati open-air markets did not know the prices
prevailing in each of the three markets. As a result,
although the appointed retailers are many, only a few of
them are active.

Table 4.6. General information on the retailers in
Tulia, Kabati and Kitui open-air markets
in Nov. and Dec., 1975

	Tulia	Kitui	Kabati	Total	
A. Sells other produce apart from maize		Nos			%
(i) Cowpeas	5	3	7	15	19
(ii) Cassava	3	2	6	11	14
(iii) Millet	9	3	7	19	24
(iv) Other(not specified)	4	4	7	15	18
B. Sells maize only	5	3	12	20	25
Total	26	15	39	80	100
C. With maize stored at home.	2	7	12	21	26
D. Aware of prices at:					
(i) Kirinyaga and Embu	-	2	8	10	12
(ii) Meru	1	-	2	3	4
(iii) Tulia, Kabati and Kitui	4	5	12	21	26
(iv) At neither	21	8	17	46	58
Total	26	15	39	80	100
E. Main retailing problems:					
(i) Finance.............	12	7	15	34	42
(ii) Transportation	3	3	4	10	13
(iii) Storage	-	-	2	2	3
(iv) Finance & Transportation	7	2	9	18	22
(v) Finance & Storage...	-	-	4	4	5
(vi) Transportation & storage	-	-	-	-	5
(vii) All	4	3	5	12	15
Total[1]	26	15	30	80	100

[1] The number of retailers in table 4.3 are averages
per market day whereas, the number of respondents
indicated above were in each of the three markets
on the day of the interview.

Source: Author's investigations

CHAPTER V

5. CONDUCT AND PERFORMANCE

5.1. General conduct

The retailers in the selected open-air markets came to the markets either singly or in groups. In Kitui open-air market, retailers came from Embu, Kiambu, Kirinyaga, from within Kitui District, and occasionally from Shimba Hills near Mombasa (see table 4.4.). The traders from Kiambu would come in one bus or lorry, and in most cases they knew each other. They usually prefered to retail their maize as soon as possible, and get the latest bus to take them to their home District where they would buy maize for the next market day. Similarly, retailers in Kabati and Tulia open-air markets came from Embu, Kirinyaga, Meru and within the District (see table 4.1.) and they behaved in a similar fashion as those at Kitui open-air market.

There were two regular retailers who came from within Kitui District, and operated at Kabati and Tulia open-air markets. On Mondays and Thursdays, they would be in Kabati market before 8.00 a.m. in the morning, and when a lorry arrived at the market with maize from Kirinyaga or Embu, they would buy as much maize as 20 bags each. They charged high prices in the morning, before 12.00 a.m.,

but later on they would lower the prices below any other retailer, after which the buyers would crowd around them, especially during the business peak period. They would use such tricks as calling a customer by name if one was known to them. By about 3.00-4.00 p.m. in the afternoon they would have sold all the maize they had.

Their strategy was to maximise on the turnover. On Tuesdays and Saturdays, they would travel to Tulia which is 11 km. away from Kabati and conduct their business in the open-air market in a similar fashion. They would never transport maize from one market to another. Although, the two retailers bought maize at higher prices than the retailers who came from the surplus areas, they incurred lower transfer costs. Thus despite the high concentration ratio of retailers, a considerable degree of competitiveness existed in these markets as a result of the behaviour of these groups of retailers who had different selling strategies.

In Tulia and Kabati, nearly all the shopkeepers sold maize mainly by retail. and there was no tendency for collusion noted among them. In Kitui, however, there were about 7 big businessmen who dealt with other lines of products apart from maize. All of them were agents of M.P.B, and they claimed to have been in business for over ten years.

Apparently more than half of the appointed agents were
not active as agents. They may have been driven out of
business by illicit traders who could get higher profit
margins than those allowed to M.P.B. agents; or they may
have lacked operating capital since all maize purchases
from the Board are made in cash.

The Maize and Produce Board staff at Kitui depot
are not aware of the local maize prices. A consumer or a
retailer who wants to buy more than one bag can do so at
the M.P.B. store. The M.P.B. as is indicated in Figure 3
follows the local market trends, rather than the Board
influencing these trends.

5.2. The Pricing and Margins

The regional price differentiation for maize in Kenya
is indicated in table 5.1. It can be observed that
although the transport allowances, the retail margins, and
the M.P.B. margins differ, the announced M.P.B. buying price
for grade I maize including bag was shs. 70.60, and the
retail price of maize sold per kg was shs. 90.00 in all the
regions. (1975)

The agent or the middleman between the M.P.B. depot
and the producer is paid shs 70.60. If the maize is
shipped from the Western Kenya to Kitui, the ex-depot price
at Kibwezi is shs 81.10 (see table 5.1.). The cost of
transport by road from Kibwezi to Kitui is shs. 6.50.

Table 5.1. Regional price differentiation for maize in Kenya 1975/76

(Kshs/bag)

Region	Nyanza Province	Western Kenya	Rift Valley North	Rift Valley South	Eastern Kenya	Nairobi and Central	Coast Province
PRODUCER PRICE (without bag)	57.85	59.50	58.15	57.50	57.88	60.50	56.85
Transp. allowance	4.80	2.65	4.50	5.15	4.77	2.15	5.80
Trader's commission	2.20	2.20	2.20	2.20	2.20	2.20	2.20
Empty bag	5.40	5.40	5.40	5.40	5.40	5.40	5.40
Insecticide grade differential	.55	.55	.55	.55	.55	.55	.55
Announced MPB buying price, grade 1 with bag	70.60	70.60	70.60	70.60	70.60	70.60	70.60
MPB margin(incl. railage)	7.15	7.15	7.15	8.10	10.50	10.05	12.05
Wholesale price ex-MPB	77.75	77.75	77.75	78.70	87.60[1]	80.65	84.85
Retail margin	1.95	1.95	1.95	2.00	2.15	2.15	2.20
Retail price, whole bag	79.70	79.70	79.70	80.70	83.25	82.80	84.85
Retail price, sold per kg.	90.00	90.00	90.00	90.00	90.00	90.00	90.00

[1] The ex-depot price at Kitui was shs 87.60. That is, the Kibwezi ex-depot price plus shs.6.50 for transportation.

Source: 7 & 8

Thus, the ex-depot wholesale price is shs 87.60. The
price differential for a shopkeeper who buys maize at
shs 81.10 and sells it at shs. 90.00 is shs 8.90 and for
a trader who buys maize at shs. 87.60 and retails it at
shs. 90 is only shs. 2.40. Thus, a trader who comes
outside Kitui town may make a loss by buying maize at shs.
87.60 and retailing it at shs. 90. On the other hand, if
a trader buys maize produced within Kitui District **he pays shs.**
70.60 per bag to the producer, and then retails the maize
at shs. 90, he gets a price differential of shs. 19.40.

Although, the official pricing system differentiates
broadly the wholesale and retail prices in Kenya, it is not
well formulated to discriminate against various areas within
a region or a district. In Kitui, it is difficult to get
a satisfactory formula for prices of maize supplied
through Kibwezi, Kitui and Thika M.P.B. depots, and from
other supply areas within and outside the District.

The actual producer price during the period of study
at Kutus market ranged from shs. 45.72 to shs. 61.02 per
bag (see table 5.5), including the price of the empty bag,
making a weighted average prices of shs. 53.77. Transport
on a hired lorry was shs. 10 per bag, the price of an
empty second-hand bag was shs. 3 making a total cost of shs.
13 per bag. The price paid to extra-district wholesalers
at Kitui town ranged from shs. 80 to shs. 87 (see table

5.4.) making a weighted average price of shs. 83.09
in November and December. The extra-district whole-
saler's gross margin was shs. 29.32, while M.P.B. gross
margin was shs. 16.80.

In Tulia (37 km from Kitui), and Kabati (26 km from
Kitui town), the retail price per bag sold in kg was shs
88 to 94 (see appendix VI & VII). Rationally, a retailer
at Kabati would not buy maize at shs. 87.60 at Kitui depot
and sell it at shs. 88 after transporting it for 37 kms.
Therefore, the maize sold at these two open-air markets
originated from sources other than M.P.B. depot at Kitui.
In Kitui open-air market the consumer price was shs. 95-114
(see appendix IV), whereas the official retail price was
shs. 90 (see table 5.1., p. 47). The prices at the
shops were between shs. 90-100 in November and December
1975. Similarly, the shopkeepers could not buy maize at
shs. 87.60 at the depot and sell it at shs. 90. In
appendix IV to IX, it can be seen that maize sold in kg
approached nearer the official price, whereas maize sold by
bag deviated somewhat from the official price. The
retailers were a bit more careful in using smaller retailing
units, while using bigger units obscured the exact
quantity of maize they are used to measure. Thus fixing
retail margins for M.P.B. customers may force retailers
into the black market even when wholesale prices are above

M.P.B. prices, hence, making maize more costly to the
consumers.

5.3. The hourly price movements

The hourly price movements at Tulia, Kabati
and Kitui open-air markets are indicated in appendix
IV, V and VI. The prices for the bigger retailing
units, the bag and the debe were generally slightly
higher in the morning hours, that is, before 12.00 noon.
The price stabilized between 1.00-3.00 p.m., after which
it fell slightly between 3.00-6.00 p.m. The markets were
over by 6.00 p.m. The prices of the other retailing
units, calabash and kimbo tins were constant.

5.4. Performance of local and interregional maize market sub-systems

5.4.1. The relationship between quantities of maize traded in Tulia, Kabati and Kitui open-air markets

The quantities of maize traded in Tulia in 18
market days, and in Kabati and Kitui for 15 market days
are shown in table 5.2 / and in Figure 4. Out of the 3
markets Kabati had the greatest quantity of maize traded
during the period of the survey. This market is centrally
situated on junction of Nairobi-Kitui road and Nairobi-
Garissa road, and since most of the maize shipped from the

Table 5.2. Quantity of maize traded in Tulia,

Kabati and Kitui open-air markets

in November and December, 1975

(kgs)

Day[1] / Market	Tulia	Kabati	Kitui
1	1,841	9,155	2,381
2	823	8,490	2,156
3	5,255	7,686	3,522
4	1,965	10,017	1,642
5	5,868	6,436	(1,419)
6	1,217	3,665	3,624
7	2,962	5,944	2,172
8	1,298	5,626	1,860
9	4,332	6,867	4,395
10	2,826	5,993	2,390
11	3,949	6,911	3,882
12	1,794	6,045	2,143
13	3,917	6,661	3,805
14	2,528	5,903	1,187
15	3,025	4,263	2,711
16	1,796	n.a.	n.a.
17	3,946	n.a.	n.a.
18	1,233	n.a.	n.a.
Total	50,575	99,670	37,806
Mean	2,805	6,639	2,593

[1] Day is a market day

  Market days in Tulia are Tuesday and Saturday

  In Kabati and Kitui " Monday and Thursday

Source: Appendix I, II and III

Kirinyaga and Embu surplus areas, Kabati market is the
first unloading point for the area. Tulia and Kitui
open air markets had almost the same quantities of maize
traded. Kitui town has more population than Tulia, but
the maize consumers have more alternative places, mainly
shops, where they can buy maize. However, for all the
three markets, each had a particular market day in a week
when the quantity of maize traded was higher. In Tulia
market, Saturdays had higher volume turnover than Tuesdays,
in Kabati market, Thursdays had higher turnover than
Mondays, and in Kitui market Thursdays had higher turnover
than Mondays. This movement does not correspond to the
movement of maize traded at Kutus, in the surplus area.
Here, the movement is irregular. This conforms to the
irregularity of illicit trade. In Kitui District, the
retailers in the open-air markets are direct consumers
who usually buy maize in small lots. Thus, most maize
was bought towards the end of the week after the
previously purchased provisions were depleted.

Figure 4 shows that the quantities of maize traded
vary considerably from one market day to the other. For
Kabati and Tulia markets, the quantities of maize traded
decreased over time, from mid-November towards the end of
December. This decline conforms with similar movement of
maize traded in Kutus market[2]. This behaviour adds some

[2]J.K. Ireri's investigations, 15.

Figure 4: Quantities of maize traded in Kabati, Tulia and
Kutus open-air markets in Nov. and Dec., 1975

kgs

Kabati

Tulia

Kitui

Market days
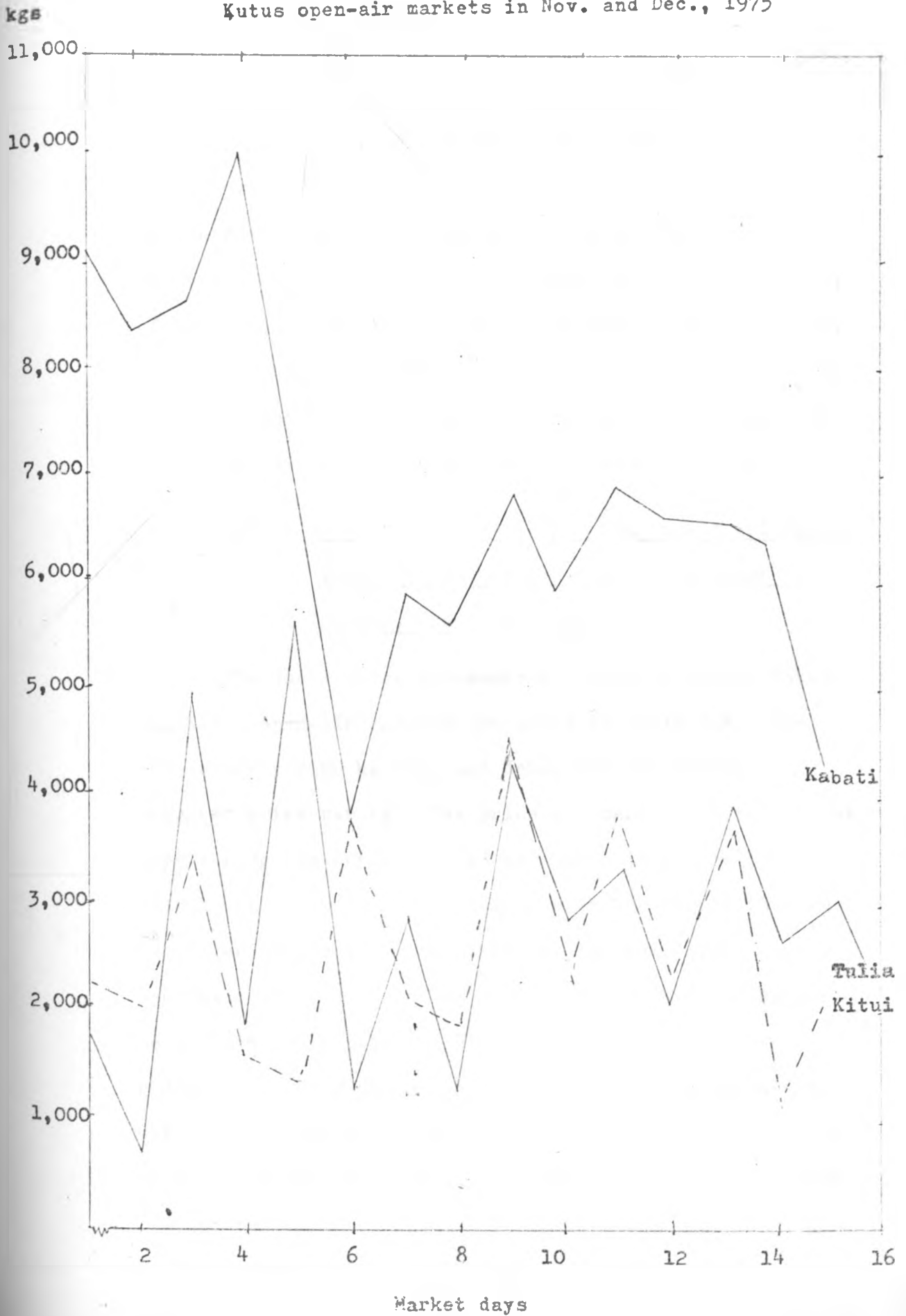
weight to the assumption that Kirinyaga is a surplus

area for a portion of quantity of maize demanded in

Kitui deficit area. The curves of the quantities of maize

traded in the 3 markets, in Figure 4, appear to be moving

together but with different amplitudes. This movement

indicates that there is some relationship, however small,

of the quantities of maize traded in Kitui markets. Thus,

since the sources of supply of the maize traded are nearly

the same, the movements of these quantities are dependent

on supply and demand factors in these local markets.

5.4.2. Relationship between retail maize prices in Tulia, Kabati, and Kitui open-air markets in Nov. and Dec., 1975

The daily price movements of maize in Tulia, Kabati

and Kitui open-air markets are shown in table 5.3. The

prices are per 90 kg bag, per debe, and the average

weighted price per kg. The price movements over the market

days during the survey period are shown in Figure 5. The

retail prices in Kitui open-air market are higher than in

Kabati and Tulia markets. This is expected, since Kabati

and Tulia are nearer the surplus area than Kitui. As can

be seen in table 5.3. and Figure 5, these prices were

generally uniform during the survey period, except Kitui,

which had higher retail prices on 3 market days. In 2 out

of the 3 market days in Kitui market, supply was far much

Table 5.3. Daily retail price movements of maize by various retailing units in Tulia, Kabati and Kitui open-air markets in November and December, 1975

Market Day	Kabati shs/bag	Kabati shs/debe	Kabati shs/kg	Tulia shs/bag	Tulia shs/debe	Tulia shs/kg	Kitui shs/bag	Kitui shs/debe	Kitui shs/kg
1	90.00	14.50	1.00	90.00	14.50	1.00	98.10	16.68	1.09
2	92.70	14.94	1.03	92.70	14.94	1.03	97.20	18.00	1.08
3	90.90	14.65	1.01	88.20	14.21	.98	94.50	17.11	1.05
4	90.00	14.21	1.00	90.00	14.50	1.00	99.00	17.26	1.10
5	88.20	14.21	.98	90.00	14.50	1.00	114.00	19.00	1.27
6	88.20	14.07	.98	91.80	14.79	1.02	94.50	18.27	1.05
7	90.90	14.07	1.01	89.10	14.36	.99	96.30	18.42	1.07
8	88.20	14.07	.98	93.60	15.08	1.04	96.30	17.11	1.07
9	87.30	14.07	.97	89.10	14.36	.99	98.10	17.26	1.09
10	89.10	14.36	.99	89.10	14.36	.99	94.50	16.39	1.05
11	88.20	14.07	.98	89.10	14.36	.99	108.90	17.00	1.21
12	88.20	14.07	.98	90.90	14.65	1.01	98.10	17.00	1.09
13	88.20	14.07	.98	89.10	14.36	.99	96.30	15.52	1.07
14	90.00	14.50	1.00	89.10	14.36	.99	102.60	17.00	1.14
15	91.80	14.94	1.02	90.90	14.65	1.01	95.40	16.53	1.06
16	n.a.	n.a.	n.a.	90.90	14.65	1.01	n.a	n.a.	n.a.
17	n.a.	n.a.	n.a.	90.90	14.65	1.01	n.a.	n.a.	n.a.
18	n.a.	n.a.	n.a.	90.90	14.65	1.01	n.a.	n.a.	n.a.

Source: Appendix tables: IV-IX

Figure 5:   Daily average retail prices in Tulia, Kabati
and Kitui open-air markets in Nov. and Dec.,
1975.
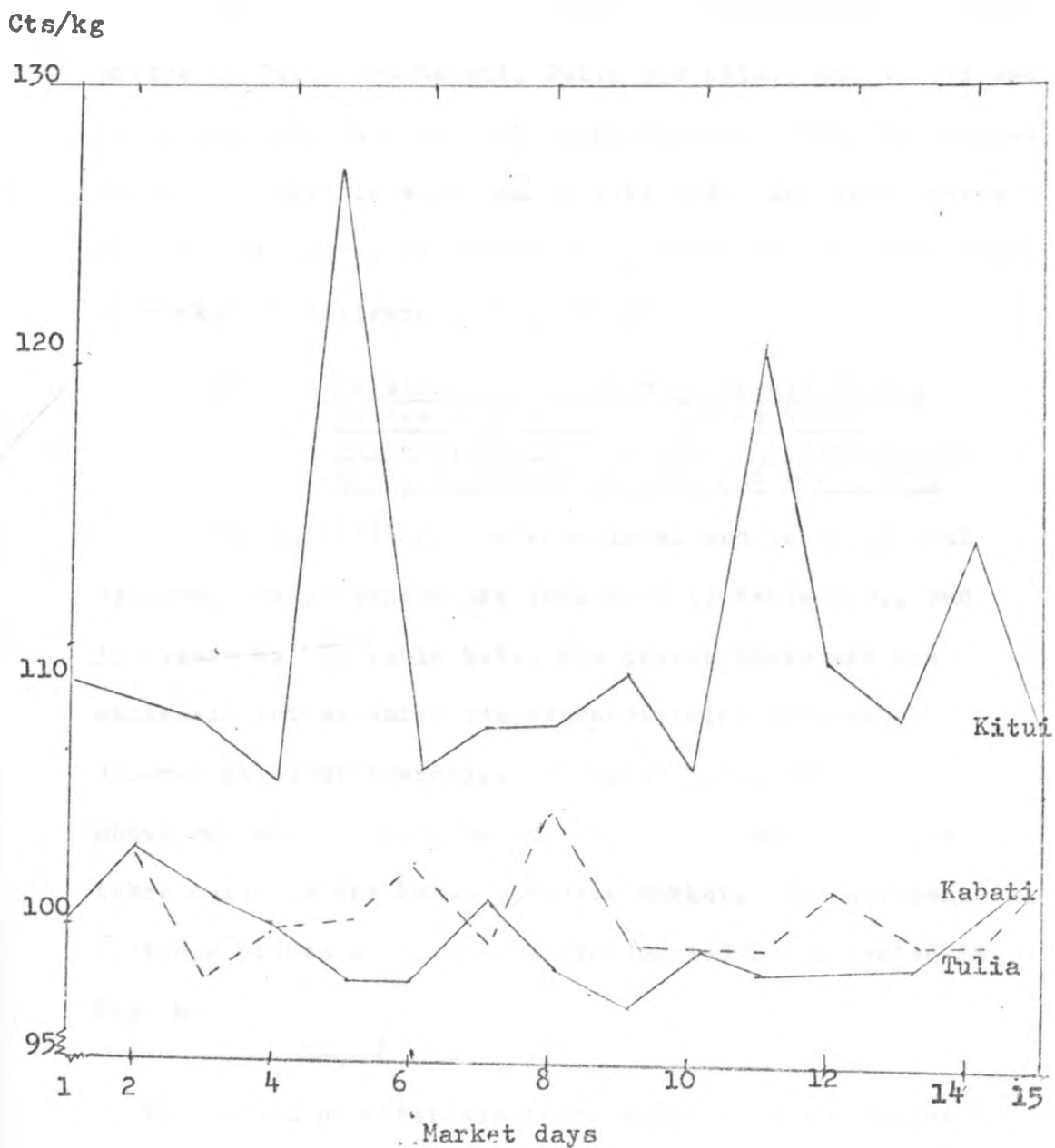
Source: table 5.5

less than demand: on one day there was rain and some
retailers did not come to the market, and on the other
the retailers from Kiambu did not attend the market
because of lack of transport.

The correlation[3] coefficients (r) between the retail
prices in Tulia and Kabati, Tulia and Kitui, and Kabati and
Kitui are -.2, -.2, and -.3 respectively. Thus, the degree
of local market integration is very low. The main causes
of this low degree of market integration are the poor state
of market intelligence and arbitration.

5.4.3. Relationship between wholesale buying prices at Tulia, Kabati and Kitui markets, and the wholesale buying prices at Kutus market in Nov. and Dec., 1975

The relationship between local and interregional
wholesale maize prices are indicated in table 5.5., and
in Figure 6. In table 5.4., the prices shown are the
wholesale prices which the extra-district wholesaler
charged at Kitui township. In table 5.5., the prices
shown are what a producer or a farmer is paid when she
takes maize to the Kutus open-air market. The movement
of these prices during the survey period is indicated in
Fig. 6.

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[3] The method of biwariate correlation of price series
of spatially separated markets is a widely used test
for market integration. See also Jones, W.O., Marketing
.Staple Food Crops in Tropical Africa, Ithaca, 1972.
page 122.

Table 5.4. Daily prices of maize paid by a shopkeeper
in Kitui township and M.P.B. selling price
in Nov., and Dec., 1975

(shs. per bag including bag)

Days of observation	Trader	M.P.B. selling price
1	80	87.60
2	80	"
3	80	"
4	82	"
5	83	"
6	83	"
7	83	"
8	82	"
9	82	"
10	82	"
11	82	"
12	82	"
13	82	"
14	82	"
15	83	"
16	85	"
17	85	"
18	85	"
19	85	"
20	85	"
21	85	"
22	86	"
23	87	"
Mean	83.09	87.60

Source: Author's investigations

Table 5.5. Daily Wholesale buying prices at
            Kutus open-air market in Oct., Nov.,
            and Dec., 1975

(Shs. per bag)

Day[1]	open-air market	M.P.B. buying price
1	45.72	60.50
2	47.16	"
3	45.63	"
4	50.75	"
5	48.83	"
6	48.94	"
7	52.22	"
8	55.78	"
9	57.29	"
10	57.32	"
11	54.00	"
12	57.35	"
13	57.41	"
14	57.47	"
15	61.02	"
16	59.64	"
17	57.60	"
Mean	45.72	60.50

[2] Market days at Kutus are Mondays and Thursdays

Source: Ireri I.K.'s investigations. (15).

It can be seen in Figure 6 that the actual producer
price at Kutus market was lower than the M.P.B. buying
price.

Figure 6. <u>Wholesale prices for maize traded by M.P.B.</u>

<u>and local traders in Kitui and Kutus, Oct-Dec.,</u>

<u>1975</u>

shs/bag
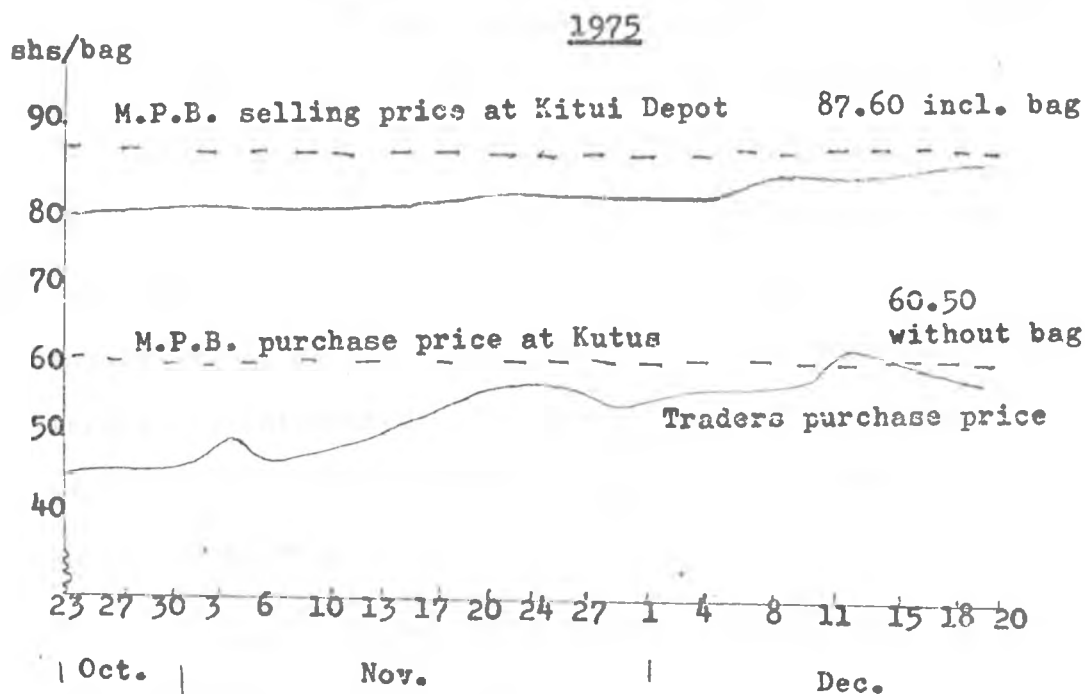
Source: tables: 5.5 and 5.6

The price was far much lower at the beginning of the survey
and rose towards the M.P.B. buying price at the end of the
survey. The Board's agents started buying maize in mid-
November since they buy maize less than 13% moisture content.
The extra-district wholesalers sold the maize at lower
than the ex-MPB depot price. They charged higher prices
at the end of the survey period. By the end of December
there was little maize being traded in Kutus market and

the Board's agents were fully operational. Thus, the
wholesale prices at Kutus and the 3 markets in Kitui
moved in the same direction.

The correlation coefficients (r) between Kutus
wholesale buying prices and wholesale buying prices at
Tulia, Kabati, and Kitui are 0.6, 0.4, and 0.8 respectively
indicating a higher degree of market integration at
wholesale level than at the retail level. Since, the same
extra-district traders who buy maize at Kutus also sell
the maize at the 3 markets, the correlation coefficients
should be nearer one if the local and interregional markets
were fully integrated. The above correlation values
indicate that the two market subsystems have some degree of
market imperfections.

The correlation coefficients between wholesale maize
buying prices at Tulia and Kabati, Kabati and Kitui, and
Tulia and Kitui are 0.4, 0.1, 0.6 respectively. Similarly,
these values are lower than would be expected since the
same traders move around these local markets selling maize.

5.4.4. Traders margins and transfer costs

The average producer price at Kutus open-air market
was shs. 53.77, (see table 5.5) per bag without the price
of bag, while the average price at Kitui township was shs.
83 (see table 5.4.) including the price of the bag.

The trader's expenditure and margin per bag was as follows:

producer price at Kutus ....shs 53.77

cost of second hand empty bag .... shs 3.00

transportation cost .... shs 10.00

wholesale price at Kitui town .... shs 83.09

gross margin .... shs 29.42

The expenses incurred by the M.P.B. in shipping maize from Kirinyaga to Kitui are as follows:

producer price at Kutus .... shs 60.50

cost of new empty bag .... shs 5.40

other costs, (see table 5.1. p.47) shs 16.80

M.P.B. selling price ehs 87.60

M.P.B. margin including railage shs 10.50

The private trader's gross margin includes interest on capital, his risk taking and other minor costs such as personal allowances. The trader's margin is 226% of the transportation cost plus empty bag and it is 280% of the M.P.B.'s gross margin. Thus, the private trader's gross margin is too excessive and has no relationship whatsoever with transfer costs.

CHAPTER VI

6.0. TESTING THE HYPOTHESES AND ANSWERING THE QUESTIONS
      RAISED

6.1. Structure

(i) The M.P.B. supplied 22% (see table 4.4. p. 34)
of the maize traded in the area of study, that is in
Kabati, Tulia, and Kitui area. Whereas this fits in the
20-30% share of the maize traded as stated in the
hypothesis, it does not necessary mean that the Board's
influence is minimal. But in table 4.1. it is indicated
that the maize traded by M.P.B. comes from Kibwezi, and
most of the maize received at Kibwezi comes from Western
Kenya and Rift Valley, (7 & 8). Therefore, the proportionate
share of maize received from Embu and Kirinyaga areas
through the M.P.B. is minimal, and as such the illicit
traders have a bigger share in this maize trade between
Kirinyaga and Embu, and Kitui Districts. Therefore the
Board's arbitration between these areas is minimal
compared to illicit traders.

(ii) The correlation coefficients between retail
prices in Tulia, Kitui and Kabati open-air markets and
between wholesale prices at Kabati, Tulia, Kitui, and
Kutus markets have been shown in sub-sections 5.4.2. and
5.4.3. to be low. But, the correlations between wholesale

prices are a bit higher, around 0.5. However, all these
correlations (r) values indicate that the interregional
and the local markets are not fully integrated. Whereas,
in table 4.2. p31 and 4.5. p. 40 the results indicate
that transportation and storage facilities are not adequate,
thus contributing to market disintegration. Lack of
satisfactory standardization of sales units, especially in
the open-air markets hampers : **pricing efficiency which**
contributes to low market integration.

(iii) It has been indicated in table 4.1. p.26
that 77-95% of maize traded in the 3 markets of Kitui,
Tulia, and Kabati comes from Kirinyaga and Embu Districts,
including maize traded at Kivaa market. And in the same
table it has been shown that the maize traded by M.P.B. in
the area mainly originated elsewhere. Therefore, the
illicit traders supply most of the maize traded in the area
of study. The concentration ratios of retailers and
wholesalers have been shown to be high. But the behaviour
of the retailers in the open-air markets is such that they
compete as groups. Similarly, the extra-district traders
after avoiding police checks usually prefer to sell what
they have as soon as possible, so as to maximize turnover
during this glut season. Therefore, there exists a
considerable degree of monopolistic competitiveness at all
channels of maize distribution.

6.2. Conduct

(i) It has been shown that (see subsection 4.6),
if a trader bought some maize from the M.P.B. depot at
Kitui, for shs. 87.60 per bag, and if he retails the maize
at shs. 90 he may make some loss. Therefore, the trader
will rationally buy maize anywhere and sell it at a price
for which he makes reasonable profit. Therefore, illicit
trade is encouraged and the price charged by these traders
may be as high as shs. 150 per bag, thereby making the maize
too costly to the consumer.

(ii) After examining table 5.1., it becomes clear
that the M.P.B. prices at the local level are arrived on a
cost-plus basis. They are calculated by somebody in an
office in Nairobi. This pricing system tends to ignore the
illegal movements of maize into Kitui District. As a result
the margins fixed for agents are unrealistic and only
encourages black marketing.

(iii) It was noted that M.P.B. management staff
at Kitui depot are not aware of the local maize prices, and
whoever goes into the store gets whatever he wants. One
buys maize from M.P.B. store because it is the only
convenient or cheaper source of supply. In any case. as
it is indicated in Figure 3, the M.P.B. follows market
trends rather than the Board influencing these trends.

Therefore, the decision making process by the management
of the Board at the local level, on the timeliness of
releasing maize supplies is not guided by the local market
conditions such as weekly price movements. Thus, the
Board plays a passive role rather than an active one.

6.3. Performance

(i) The retail maize prices at Tulia, Kabati and
Kitui open-air markets are indicated in table 5.3., and
Figure 5. The prices were fairly uniform over the
November and December months, but in case of Kitui market,
retail maize prices were relatively higher on two market
days. Therefore, these local markets are not characterized
by high retail price fluctuations as it was hypothesized.
The main reason could be the competitiveness of retail
maize trade during the glut season. However, the wholesale
maize buying prices at Kutus fluctuated somewhat over the
3 months of study. In Kutus, the price rose from shs. 45.72
to 61.02 (see table 5.5. p.58), and in Kitui the wholesale
buying price rose from shs. 80 to shs. 87 (see table 5.4.
p. 57).

(ii) In sub-section 5.2.4. the gross margin which
excludes transportation cost and the cost of the empty bag
for private traders in shs. 29.42. Considering that
handling costs maybe less than shs. 1 per bag, the reward
for risk taking is quite high. The M.P.B. margin including
railage is shs. 10.50, and the Board performs additional

functions of storage and standardization. The private
trader's gross margin is 280% of the M.P.B. margin.
The private trader's (illicit trader) margins differ
substantially from transfer costs, resulting in the
exploitation of the producer who gets lower prices, and
the consumer who sometimes pays high prices and gets
product of unspecified quality.

(iii) It has been indicated in table 4.6 that
26% of the retailers knew **something** . about prices
of similar retailing units in other local markets deficit
areas. The consumers were even worse in this respect.
Lack of proper standardization of retailing units **especially**
in the open-air markets hampered market transparency. For
instance, a consumer would pay shs. 1.27 for a kg of maize,
whereas in the shops, 20 metres away, she could pay shs.
1.10 for a kg of maize. Although the retailing units may
have appeared fairly standardized, there were differences
in quantities which a consumer could not detect easily.

CHAPTER VII

CONCLUSIONS AND RECOMMENDATIONS

7.1. Conclusion

The proportionate share of maize received from
Embu and Kirinyaga areas through the M.P.B. is minimal,
hence the illicit traders have a bigger share in this
trade between Kirinyaga, Embu and Kitui Districts.
Thus, the Board's arbitration between these areas is
minimal. As a result the producer prices at Kutus market
were lower than the M.P.B. buying price; similarly the
wholesale buying price in Kitui was lower than the M.P.B.
selling price. The Board's pricing system at the local
level is not based on the local price movements of maize.
In fact the Board's staff were not aware of maize prices
prevailing in various regions. Although, the Board incure
more transportation costs than the illicit trader, it
performs additional functions such as storage over the
seasons, standardization and preservation of the maize in
hygienic conditions which minimizes losses considerably.
Thus, the Board's margin is less exploitive   to the
consumer and the producer.

The local open-air markets in Kitui are
characterized by uniformity of retail prices during the
glut season in the neigbouring surplus areas. During this

period there is enough supply to cope up with demand.
The illicit traders ship large amounts of maize which
logically depresses the prices. In this respect, it can
be argued that the illicit trade performs a beneficial
marketing function to the Kitui consumer. The local
maize markets are fairly competitive especially during
the glut season in the surplus areas. The interregional
and local wholesale prices fluctuated somewhat during
the survey period. The degree of competitiveness in these
channels is lower than in the former, mainly because
whoever manages to avoid police checks would like to make
as much profit as possible. It was reported that there
are high price fluctuations mainly at wholesale level, over
the seasons.

The correlation coefficients (r) between both
retail and wholesale prices in the markets studied were
less than 0.5. Thus, there is low local and interregional
market integration. This is understandable since there
was low degree of market transparency due mainly to poor
intelligence. The physical handling facilities, the
storage and transportation were poor, and this contributed
to market disintegration.

Obviously, the illicit traders have good chances
of making huge profit margins, and they did, during the
period of study.

7.2. Recommendations

The Maize and Produce Board should start maize price recording system, especially in the main local markets. The costs of maize production in small scale farming areas should be studied. Then, the formulation of domestic maize prices will be guided by the maize price movements in the local and regional markets. The small scale farmers who are also the main consumers of maize should not be ignored, as in the past, in the maize price formulation.

The control of maize movements, which in any case is not strictly enforced, should be relaxed and the Board's role will be mainly price **stabilization**, maintenance of strategic reserves, and export trade. The Government will, then, announce the ceiling and the floor prices, and the Board's activities will influence the price within the range. When the price movements in the local markets have been investigated and reported regularly, the releasing of maize from M.P.B. stores will be guided by the local prices. The private traders and the farmers should be encouraged to store maize by proper price formulation which will cover storage costs.

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Appendix I: <u>Inflow, outflow and maize traded in Tulia open-air market on each</u>

<u>market day from 1st Nov. to 29th Dec., 1975</u>

(kgs)

Date	Recorded inflow	Recorded outflow	Quantity not sold			Total quantity traded
			Calculated	Recorded	Average	
1.11.75	1,929	1,827	102	73	88	1,841
4.11.75	851	811	40	15	28	823
8.11.75	6,339	5,005	1,334	834	1,084	5,255
11.11.75	2,815	1,493	1,322	378	850	1,965
15.11.75	6,159	5,808	350	230	290	5,868
18.11.75	1,376	1,233	143	176	159	1,217
22.11.75	3,730	2,469	1,261	274	768	2,962
25.11.75	2,078	1,208	870	689	780	1,298
29.11.75	5,856	3,386	2,470	577	1,524	4,332
2.12.75	3,553	2,408	1,145	309	727	2,826
6.12.75	4,194	3,865	329	160	245	3,949
9.12.75	1,972	1,714	258	99	178	1,794
13.12.75	4,869	3,667	1,202	702	952	3,917
16.12.75	3,658	1,753	1,905	355	1,130	2,528
20.12.75	3,462	3,218	244	629	437	3,025
23.12.75	2,218	1,821	399	448	422	1,796
27.12.75	4,694	3,843	851	646	748	3,946
29.12.75	1,527	1,080	447	141	294	1,233
Total	61,280	46,609	14,672	6,735	10,704	50,575

Source: Author's investigations

Appendix II: Inflow, outflow and maize traded in Kitui open-air market

on each market day from 3rd Nov. to 22nd Dec., 1975

(kgs)

Date	Recorded inflow	Recorded outflow	Quantity not sold			Quantity traded
			Calculated	recorded	average	
3.11.75	2,574	2,445	129	257	193	2,281
6.11.75	3,073	1,620	1,453	382	917	2,156
10.11.75	4,512	3,116	1,396	385	990	3,522
13.11.75	2,366	1,617	700	749	724	1,642
17.11.75	(2,638)[1]	---	---	---	---	(1,419)[1]
20.11.75	4,753	2,938	1,815	443	1,129	3,624
24.11.75	4,511	1,741	2,833	1,972	2,402	2,172
27.11.75	2,652	1,768	884	700	792	1,860
1.12.75	4,901	4,390	511	501	506	4,395
4.12.75	3,899	2,111	1,788	1,230	1,509	2,390
8.12.75	4,992	3,280	1,712	508	1,110	3,882
11.12.75	4,265	1,875	1,390	855	1,122	2,143
15.12.75	4,572	3,337	1,235	299	767	3,805
18.12.75	1,514	1,012	502	151	327	1,187
22.12.75	5,970	2,288	3,682	2,835	3,259	2,711
Total	53,554	33,538	20,030	11,467	15,748	37,806

Source: Author's investigations

[1] It rained on this day, hence the recording was interrupted. The quantity recorded for that day has been excluded from the total figures.

Appendix III: Inflow, outflow and maize traded in Kabati open-air market

on each market day, from 6th Nov. to 29th Dec., 1975

(kgs)

Date	Quantity inflow	Quantity outflow	Quantity not sold			Quantity traded
			Calculated	Recorded	Average	
6.11.75	9,918	9,719	199	1,327	763	9,155
10.11.75	9,265	8,339	926	625	775	8,490
13.11.75	11,632	6,923	4,709	3,183	3,946	7,686
17.11.75	11,479	10,141	1,338	1,586	1,462	10,017
20.11.75	7,723	6,569	1,154	1,420	1,287	6,436
24.11.75	6,526	3,570	2,955	2,766	2,861	3,665
27.11.75	8,705	4,381	4,324	1,197	2,761	5,944
1.12.75	6,121	5,322	799	181	495	5,626
4.12.75	7,266	7,195	-71[1]	869	399	6,867
8.12.75	6,624	6,102	522	741	631	5,993
11.12.75	8,506	5,842	2,664	526	1,595	6,911
15.12.75	7,880	5,299	2,581	1,090	1,835	6,045
18.12.75	7,935	5,652	2,283	255	1,269	6,666
22.12.75	7,344	5,027	2,317	565	1,441	5,903
29.12.75	4,776	4,691	85	941	513	4,263
Total	121,700	84,631	26,786	17,272	22,030	99,670

Source: Author's investigations

[1] The negative may have been obtained by double-recording by the enumerators.

Appendix IV: Hourly price movements of maize at Kitui open-air market

(Shs per sales unit)

Makt day	Sales unit	9-10 a.m.	10-11 a.m.	11-12 a.m.	12-1 p.m.	1-2 p.m.	2-3 p.m.	3-4 p.m.	4-5 p.m.	5-6 p.m.	Average 9-6 p.m.
1	A	-	95.00	-	-	-	-	-	-	-	95.00
	B	17.17	17.60	17.55	17.33	17.42	17.00	17.75	17.53	17.00	17.35
2	A	-	-	-	-	-	-	95.00	-	-	95.00
	B	-	18.00	18.00	18.00	17.88	18.00	18.00	18.00	17.80	17.95
3	B	17.00	17.00	17.20	17.14	17.00	17.20	17.13	16.69	16.00	16.93
4	B	-	19.00	17.00	17.36	17.18	17.43	17.33	17.20	17.26	17.47
5	B	20.00	19.00	19.17	18.50	19.63	-	-	-	-	19.26
6	B	-	19.16	19.00	18.83	18.10	18.40	18.00	18.00	18.83	18.54
7	B	19.00	18.86	18.75	18.00	18.75	17.35	17.75	17.50	17.40	18.15
8	B	17.00	17.00	17.28	17.00	17.20	17.00	17.36	17.00	17.00	17.09
9	B	-	17.07	17.35	17.21	17.55	17.00	17.21	15.91	15.90	16.90

(Shs per sales unit)

Makt day	Sales unit	9-10 a.m.	10.11 a.m.	11-12 a.m.	12-1 p.m.	1-2 p.m.	2-3 p.m.	3-4 p.m.	4-5 p.m.	5-6 p.m.	Average 9-6 p.m.
10	B	-	16.31	16.50	16.54	16.31	16.50	16.31	16.29	16.34	16.39
11	B	17.00	17.00	17.00	16.90	16.92	17.00	16.91	17.00	17.00	16.97
12	B	16.78	17.00	16.96	17.00	17.00	17.00	17.00	16.96	16.97	16.96
13	A	-	86.00	-	-	96.00	-	-	-	-	91.00
13	B	16.80	16.50	16.25	16.25	16.78	16.10	16.00	16.00	16.10	16.31
14	B	17.00	17.00	17.00	16.95	16.97	17.00	17.00	17.00	16.98	16.99
15	A	102.00	-	-	-	-	-	-	-	-	102.00
15	B	16.00	16.00	16.42	16.71	16.75	16.50	16.32	16.41	16.51	16.40
16	B	18.00	17.90	17.88	17.92	17.61	17.00	17.60	17.59	17.41	17.66

A is 90 kg bag

B is a debe (14.5 kg)

<u>Source:</u> Author's investigations

Appendix V: Hourly price movements of maize at Tulia open-air market

(Shs per sales unit)

Makt day	Sales unit	9-10 a.m.	10-11 a.m.	11-12 a.m.	12-1 p.m.	1-2 p.m.	2-3 p.m.	3-4 p.m.	4-5 p.m.	5-6 p.m.	Average 9-6 p.m.
1	A	-	-	-	100.00	-	-	-	90.00	90.00	93.33
	B	-	15.00	14.00	14.53	14.50	14.23	14.50	14.67	14.75	14.52
2	B	-	-	15.00	-	-	15.00	15.50	15.50	-	15.25
3	B	-	13.64	14.27	14.22	13.92	13.94	14.48	13.08	11.60	13.64
4	B	-	15.00	15.00	15.00	15.00	15.00	14.00	13.90	14.53	14.68
5	B	14.80	14.00	14.00	14.17	14.90	14.71	14.75	14.75	14.64	14.51
6	B	-	-	15.00	15.00	15.13	15.00	15.00	15.00	15.00	15.02
7	B	-	14.67	14.33	14.31	13.18	15.00	14.30	14.23	14.25	14.28
8	A	-	-	84.00	-	-	-	95.00	-	-	89.50
	B	-	-	15.00	15.00	15.00	14.53	14.00	14.50	14.21	14.86
9	A	-	-	-	-	100.00	95.00	95.00	-	-	96.67
	B	-	14.00	14.00	14.00	14.00	14.00	14.00	14.00	14.00	13.94

(Shs. per sales unit)

Makt day	Sales unit	9-10 a.m.	10-11 a.m.	11-12 a.m.	12-1 p.m.	1-2 p.m.	2-3 p.m.	3-4 p.m.	4-5 p.m.	5-6 p.m.	Average 9-6 p.m.
10	A	-	-	-	-	-	-	-	98.00		98.00
	B	-	-	-	-	14.00	14.00	14.00	14.00	14.00	14.00
11	B	-	14.53	14.60	14.25	14.27	14.19	14.32	14.00	14.00	14.27
12	A	-	-	-	-	-	89.00	-	90.00	-	89.50
	B	-	-	14.50	15.00	15.00	15.00	14.00	15.00	15.00	14.78
13	A	-	-	-	-	88.50	89.00	-	-	-	88.75
	B	-	14.00	14.75	14.44	14.39	14.29	14.10	14.10	14.13	14.28
14	B	-	-	14.13	14.67	14.25	14.21	-	14.00	14.00	14.21
15	A	-	-	-	100.00	-	-	-	105.00	110.00	105.00
	B	-	-	15.00	14.44	15.00	14.00	14.33	14.30	14.63	14.53
16	A	-	-	-	-	90.00	-	-	100.00	-	95.00
	B	14.00	14.75	14.87	14.50	14.50	14.28	14.58	14.89	14.25	14.51
17	A	-	-	-	-	-	105.00	-	-	-	105.00
	B	-	14.50	14.75	14.73	14.82	14.79	15.00	14.13	15.00	14.72
18	B	-	-	-	15.00	15.00	15.00	15.00	14.50	-	14.90

A is 90 kg bag.   B is a debe (14.5 kg).

<u>Source:</u>   Author's investigations

Appendix VI: Hourly price movement of maize at Kabati open-air market

(Shs. per sales unit)

Makt day	Sales unit	9-10 a.m.	10-11 a.m.	11-12 a.m.	12-1 p.m.	1-2 p.m.	2-3 p.m.	3-4 p.m.	4-5 p.m.	5-6 p.m.	Average 9-6 p.m.
1	A	-	96.67	-	-	-	87.33	-	-	85.00	89.67
	B	-	14.65	14.25	14.84	14.61	14.60	14.00	14.37	14.11	14.43
2	B	14.54	14.75	15.00	15.00	15.00	14.89	14.80	15.00	14.80	14.86
3	A	-	-	-	-	-	-	92.00	-	-	92.00
	B	-	14.12	15.00	14.65	15.00	14.90	14.00	14.06	14.00	14.46
4	B	-	-	14.75	14.08	14.36	14.17	14.09	14.08	14.25	14.25
5	B	-	-	14.75	14.08	14.54	14.04	14.13	14.00	14.67	14.27
6	A	-	-	-	-	-	-	100.00	-	-	100.00
	B	-	-	14.22	14.00	14.13	14.13	14.00	14.00	14.00	14.07
7	A	-	-	-	-	-	100.00	-	-	-	100.00
	B	-	14.57	14.00	14.23	14.00	14.00	13.81	14.00	14.00	14.08
8	A	-	101.00	-	-	-	-	-	-	-	101.00
	B	-	14.22	-	14.57	14.00	14.00	14.00	14.00	14.00	14.11
9	A	-	88.00	-	-	85.00	-	85.00	-	-	86.00
	B	-	14.19	14.00	14.00	14.00	14.00	14.00	14.00	14.00	14.00

(Shs. per sales unit)

Mak day	Sales unit	9-10 a.m.	10-11 a.m.	11-12 a.m.	12-1 p.m.	1-2 p.m.	2-3 p.m.	3-4 p.m.	4-5 p.m.	5-6 p.m.	Average 9-6 p.m.
10	A	-	-	-	-	-	-	93.00	-	90.00	91.50
	B	-	14.00	14.07	14.46	14.48	14.09	14.35	14.24	14.31	14.24
11	A	-	-	94.00	-	-	-	-	-	-	94.00
	B -	-	14.00	14.00	14.00	14.00	14.00	14.00	14.00	14.00	14.00
12	A	-	-	-	-	-	-	110.00	-	-	110.00
	B	-	14.50	14.61	14.00	14.00	14.00	14.00	14.00	14.00	14.14
13	A	-	-	105.00	-	-	95.00	-	-	-	100.00
	B	-	14.44	14.36	14.00	14.00	14.00	14.00	14.00	14.00	14.00
14	A	-	-	-	-	-	-	-	100.00	-	100.00
	B	-	-	14.75	14.80	14.48	14.30	14.32	14.22	14.50	14.48
15	A	-	-	-	-	-	-	90.00	-	-	90.00
	B	-	15.00	14.86	15.00	14.86	15.00	14.80	14.32	14.73	14.82

A is 90kg bag,   B is a debe of 14.5 kgs.

Source: Author's investigations

Appendix VII: Daily price movements of maize in Tulia open-air market

Mak t day	Sales unit	Average price 9-6 p.m.	Average price 12-4 p.m.	Calculated turnover 9-6 p.m.	Turnover value	Average representative price	Consumer price
		shs/kg	shs/kg	kgs	shs	shs/kg	shs/bag
1	A	1.04	1.00	225	225.00	-	-
	B	1.00	1.00	1349	1349.00	1.00	1.00
	C	1.00	1.00	492	492.00		
2	B	1.06	1.06	377	399.62	1.03	92.70
	C	1.00	1.00	446	446.00		
3	B	.94	.96	3263	3132.48	.98	88.20
	C	1.00	1.00	1992	1992.00		
4	B	1.01	1.00	711	711.00	1.00	90.00
	C	1.00	1.00	1254	254.00		
5	B	1.00	1.02	1436	1464.72	1.00	90.00
	C	1.00	1.00	4432	4432.00		
6	B	1.04	1.04	624	648.96	1.02	91.80
	C	1.00	1.00	593	593.00		
7	B	.98	.98	1363	1335.74	.99	89.10
	C	1.00	1.00	1599	1599.00		

Makt day	Sales unit	Average price 9-6 p.m.	Average price 12-4 p.m.	Calculated turnover 9-6 p.m.	Turnover value	Average representative price	Consumer price
		shs/kg	shs/kg	kgs	shs	shs/kg	shs/bag
8	A	.99	1.05	270	283.50	1.04	93.60
	B	- 1.02	1.00	537	537.00		
	C	1.00	1.00	491	491.00		
9	A	1.08	1.08	270	291.60	.99	89.10
	B	.96	.96	1871	1796.16		
	C	1.00	1.00	2191	2191.00		
10	A	1.09	1.09	90	98.00	.99	89.10
	B	.97	.97	1204	1167.88		
	C	1.00	1.00	1532	1532.00		
11	B	.98	.99	2712	2684.88	.99	89.10
	C	1.00	1.00	1237	1237.00		
12	A	.99	.99	180	178.20	1.01	90.90
	B	1.02	1.02	754	769.08		
	C	1.00	1.00	860	860.00		
13	A	.99	.99	270	267.30	.99	89.10
	B	.98	.98	2132	2089.36		
	C	1.00	1.00	1515	1515.00		

Makt day	Sales unit	Average price 9-6 p.m	Average price 12-4 p.m.	Calculated turnover 9-6 p.m.	Turnover value	Average representative price	Consumer price
		shs/kg	shs/kg	kgs	shs	shs/kg	shs/bag
14	B	.98	.98	682	668.36	.99	89.10
	C	1.00	1.00	1846	1846.00		
15	A	1.17	1.17	180	210.60		
	B	1.00	.99	1131	1119.69	1.01	90.90
	C	1.00	1.00	1714	1714.00		
16	A	1.06	1.06	180	190.80		
	B	1.00	1.00	580	580.00	1.01	90.90
	C	1.00	1.00	1036	1036.00		
17	A	1.17	1.17	90	105.00		
	B	1.02	1.01	1755	1772.55	1.01	90.90
	C	1.00	1.00	2101	2101.00		
18	B	1.03	1.03	522	537.66	1.01	90.90
	C	1.00	1.00	711	711.00		

A is 90 kg bag,

B is 14.5 kg debe

C is Kimbo tin and calabash

<u>Source</u>: Author's investigations.

Makt day	Sales unit	Average price 9-6 p.m.	Average price 12-4 p.m.	Calculated turnover 9-6 p.m.	Turnover value	Average representative price	Consumer price
		shs/kg	shs/kg	kgs	shs	shs/kg	shs/bag
1	A	1.00	.97	810	785.70		
	B	1.00	1.00	7572	7572.00	1.00	90.00
	C	1.00	1.00	773	773.00		
2.	B	1.02	1.03	7250	7467.50	1.03	92.70
	C	1.00	1.00	1240	1240.00		
3	A	1.02	1.02	180	183.60		
	B	1.00	1.01	6269	6331.69	1.01	90.90
	C	1.00	1.00	1237	1237.00		
4	B	.98	.98	9915	9716.70	1.00	90.00
	C	1.00	1.00	902	902.00		
5	B	.98	.98	5413	5504.74	.98	88.20
	C	1.00	1.00	1023	1023.00		
6	A	1.11	1.11	180	199.80		
	B	.97	.97	2522	2446.34	.98	88.20
	C	1.00	1.00	963	963.00		
7	A	1.11	1.11	180	199.80		
	B	.97	.97	4870	4772.60	1.01	90.90
	C	1.00	1.00	1164	1164.00		

Appendix VIII: Daily price movements of maize in Kabati open-air market in Nov. and Dec., 1975

Mark. day	Sales unit	Average price 9-6 p.m.	Average price 12-4 p.m.	Calculated turnover 9-6 p.m.	Turnover value	Average representative price	Consumer price
		shs/kgs	shs/kgs	kgs	shs	shs/kgs	shs/bag
8	A	1.12	-	90	100.80	.98	88.20
	B	.97	.97	4377	4245.65		
	C	1.00	1.00	1164	1164.00		
9	A	.96	.94	270	233.80	.97	87.30
	B	.97	.97	5546	5379.62		
	C	1.00	1.00	980	980		
10	A	1.02	1.03	270	278.10	.99	89.10
	B	.98	.99	4687	4640.13		
	C	1.00	1.00	1036	1036		
11	A	1.04	-	90	93.60	.98	88.20
	B	.97	.97	5879	5702.63		
	C	1.00	1.00	942	942.00		
12	A	-	1.22	90	110	.98	88.20
	B	.97	.97	5032	4882.01		
	C	1.00	1.00	992	922.00		
13	A	1.17	1.06	360	381.60	.98	88.20
	B	.97	.97	5293	5134.21		
	C	1.00	1.00	1008	1008.00		

Appendix VIII: Daily price movements of maize in Kabati open-air market in Nov. and Dec., 1975

Makt day	Sales unit	Average price 9-6 p.m.	Average price 12-4 p.m.	Calculated turnover 9-6 p.m.	Turnover value	Average representative price	Consumer price
		shs/kgs	shs/kgs	kgs	shs	shs/kgs	shs/bag
14	A B C	1.11 1.00 1.00	- 1.00 1.00	180 3799 1924	199.80 3799.00 1924.00	1.00	90.00
15	A B C	- 1.02 1.00	1.00 1.03 1.00	m 90 2771 1402	90.00 2854.13 1402.00	1.02	91.80

Source: Author's investigations

Appendix IX: Daily price movements of maize in Kitui open-air market in Nov. and Dec., 1975

Makt day	Sales Unit	Average price 9-6 p.m.	Average price 12-4 p.m.	Calculated turnover 9-6 p.m.	Turnover value	Average representative price	Consumer price
		shs/kgs	shs/kgs	kgs	shs	shs/kgs	shs/bag
1	A	1.05	–	90	95.00	1.09	98.10
	B	1.20	1.15	841	967.15		
	C	1.00	1.00	1540	1540.00		
2	A	–	1.05	90	95.00	1.08	97.20
	B	1.24	1.24	653	809.72		
	C	1.00	1.00	1414	1414.00		
3	B	1.17	1.18	885	1044.30	1.05	94.50
	C	1.00	1.00	2637	2637.00		
4	B	1.20	1.19	841	1000.79	1.10	99.00
	C	1.00	1.00	801	801.00		
5	B	1.33	1.31	580	759.90	1.27	114.30
	C	1.00	1.00	839	839.00		
6	B	1.29	1.26	740	932.40	1.05	94.50
	C	1.00	1.00	2884	2884.00		
7	B	1.25	1.27	566	718.82	1.07	96.30
	C	1.00	1.00	1606	1606.00		

Makt day	Sales unit	Average price 9-6 p.m.	Average price 12-4 p.m.	Calculated turnover 9-6 p.m.	Turnover value	Average representative price	Consumer price
		shs/kg	shs/kg	kgs	shs	shs/kg	shs/bag
8	B	1.18	1.18	740	873.20	1.07	96.30
	C	1.00	1.00	1120	1120.00		
9	B	1.17	1.19	2190	2606.10	1.09	98.10
	C	1.00	1.00	2205	2205.00		
10	B	1.13	1.13	986	1114.18	1.05	94.50
	C	1.00	1.00	1404	1404.00		
11	B	1.17	1.17	1914	2239.38	1.21	108.90
	C	1.00	1.00	1968	1968.00		
12	B	1.13	1.17	1073	1255.41	1.09	98.10
	C	1.00	1.00	1070	1070.00		
13	A	1.01	1.07	360	385.20	1.07	96.30
	B	1.12	1.12	2030	2273.60		
	C	1.00	1.00	1415	1415.00		
14	B	1.13	1.17	995	1164.15	1.14	102.60
	C	1.00	1.00	202	202.00		
15	A	1.13	-	90	102.00	1.06	95.40
	B	1.13	1.14	1131	1289.34		
	C	1.00	1.00	1526	1526.00		

A is 90 kg bag,   B is 14.5 kg debe,   C is the medium calabash and kimbo tin.

Source: Author's investigations

Appendix X: Recorded capacities[1] of retailing units

in Tulia open-air market in Nov. and

Dec., 1975

(kgs)

	Debe	Medium calabash	Medium kimbo
4.11.75	14.5	0.75	-
8.11.75	14.5	1.0	1.0
11.11.75	14.0	1.0	1.0
15.11.75	14.4	.95	1.0
18.11.75	15.0	1.05	1.0
22.11.75	14.5	1.0	1.0
25.11.75	14.5	1.06	1.0
29.11.75	15.0	1.0	1.0
2.12.75	14.5	1.0	1.0
6.12.75	14.5	1.0	1.0
9.12.75	13.5	1.03	1.0
13.12.75	14.5	1.0	1.0
16.12.75	15.0	1.04	1.0
20.12.75	14.5	1.0	1.0
23.12.75	14.5	1.0	1.0
27.12.75	14.3	1.0	1.0
30.12.75	14.5	1.0	1.0
Average	14.5	1.0	1.0

[1] About 5-10 weighings were carried out on each
market day, for each sales unit.

Source: Author's investigations

Appendix XI: Recorded capacities of sales unit in

Kitui and Kabati open-air markets in

Nov. and Dec.. 1975

	Debe		Medium calabash		Medium kimbo	
	Kitui	Kabati	Kitui	Kabati	Kitui	Kabati
1.11.75	14.5	-	1.0	.90	1.0	1.0
6.11.75	14.0	14.5	1.0	.95	1.0	1.0
10.11.75	14.5	14.5	1.0	.83	1.0	1.0
13.11.75	15.0	13.5	.95	1.01	1.0	.96
17.11.75	14.0	15.0	1.0	1.0	1.0	1.0
20.11.75	14.5	14.5	1.0	1.0	1.0	1.0
24.11.75	14.5	14.5	.90	1.0	1.0	1.0
27.11.75	14.0	14.5	.9	1.2	1.0	1.0
1.12.75	14.6	14.5	1.0	1.0	1.0	1.0
4.12.75	15.0	14.7	1.2	1.05	1.05	1.0
11.12.75	14.5	15.0	1.0	1.0	1.0	1.0
15.12.75	14.75	14.5	1.1	1.0	.95	1.0
22.12.75	14.5	14.5	1.0	1.05	1.0	1.0
29.12.75	14.5	14.5	1.0	1.0	1.0	1.0
Average	14.5	14.5	1.0	1.0	1.0	1.0

Source: Author's investigations

[1] See footnotes on page 89

Appendix XII: UNIVERSITY OF NAIROBI

DEPARTMENT OF AGRICULTURAL ECONOMICS

Questionnaire to investigate the "Structure, Conduct
and Performance of Kitui Local Maize Market.

Open-Fenced Market

1. What produce do you usually sell, apart from maize?

    (a)   Cow peas ....

    (b)   Cassava ....

    (c)   Bulrush millet ....

    (d)   Pigeon peas ....

    (e)   Others ....

2. Do you have any other maize stored at home (if Yes,
    specify the amount)

    Yes ....

    No ....

3. Why do you choose to sell in the open-fenced market
    rather than to MPB?

4. Are you aware of the maize prices charged for the same
    quantity being sold at:

    (a)   Kirinyaga ....

    (b)   Meru/Embu* ....

    (c)   Tulia/Kabati/Kitui* ....

5. What are your main problems?

    (a)   Finance ....

    (b)   Lack of transportation ....

    (c)   Lack of storage ....

    (d)   Finance and transport ....

    (e)   Finance and storage ....

    (f)   Transport and storage ....

6. How long have you been in business?

    (a)   Less than 1 year ....

    (b)   1-5 years ....

    (c)   Over 5 years ....

             *Delete the market not applicable.

Appendix XIII: UNIVERSITY OF NAIROBI

IRERI/KARIUNGI

MARKET ....DATE ....

ENUMERATOR ....PAGE NO ....

MAIZE: INFLOW INTO THE OPEN-FENCED MARKET

TIME	9-10	10-11	11-12	12-1	1-2	2-3	3-4	4-5	5-6	6-7

No.	Quantity	Origin	Transport	Cost of transport	Buying price	Quantity in kg

Appendix XIV: UNIVERSITY OF NAIROBI

IRERI/KARIUNGI

MARKET ....DATE ....

MAIZE: OUTFLOW FROM THE OPEN-FENCED MARKET

TIME:

9-10	10-11	11-12	12-1	1-2	2-3	3-4	4-5	5-6	6-7

No.	Quantity	Price	Destination	Mode of trans-port	Quantity in kg.	Calcu-lated price in kg

Appendix XV: UNIVERSITY OF NAIROBI

IRERI/KARIUNGI

MARKET ....DATE ....

RECORDED CAPACITIES OF SALES UNITS

TIME	Sales Units					
9-10						
10-11						
11-12						
12-1						
1-2						
2-3						
3-4						
4-5						
5-6						

Appendix XVI: UNIVERSITY OF NAIROBI

IRERI/KARIUNGI

MARKET ....DATE ....

CALCULATED MAIZE PRICES PER KG.

TIME	SALES UNITS					
9-10						
10-11						
11-12						
12-1						
1-2						
2-3						
3-4						
4-5						
5-6						

Appendix XVII: <u>UNIVERSITY OF NAIROBI</u>

IRERI/KARIUNGI

MARKET .... DATE ....

MPB AGENT ....OR NON-AGENT ....

MAIZE: <u>INFLOW INTO THE NON-FENCED MARKET</u>

Date	Quantity	Origin	Price paid	Mode of Transporta-tion	Transport costs

Appendix XVIII   UNIVERSITY OF NAIROBI

IRERI/KARIUNGI

MARKET ....DATE ....

MPB AGENT ....OR NON-AGENT ....

MAIZE: OUTFLOW IN THE NON-FENCED MARKETS

Date	Quantity	Destination	Price	Mode of transport	Cost of transport

Appendix XIX: UNIVERSITY OF NAIROBI

IRERI/KARIUNGI

MAIZE: RECEIVED SUPPLIES BY M.P.B.

Date	Quantity	Origin: loading place	Mode of trans- portation	Trans. costs	Quantity for Relief

Appendix XX: UNIVERSITY OF NAIROBI

IRERI/KARIUNGI

MAIZE: DISTRIBUTED SUPPLIES BY M.P.B.

Date	Name of buyer	Quantity	Price	Mode of transport	Desti-nation