MAIZE MARKETING IN TANGA REGION, TANZANIA, WITH SPECIAL REFERENCE TO ILLICIT TRADING

by

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I, Zachariah Abraham Nyiti hereby declare that this thesis is my original work and has not been presented for a degree in any other University

Signed _____

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We declare that this thesis has been submitted for examination with our approval as University supervisors

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ABSTRACT

Authorized marketing of maize, the main staple food in Tanzania, is performed through a 'one channel' market system. Between 1963 and 1973 the above market channel consisted of primary co-operative societies, co-operative unions and the National Agricultural Products Board (N.A.P.B.). Subsequently the Board has been superseded by the National Milling Corporation (N.M.C.), and the co-operative unions ceased to have any direct role in maize marketing.

Producer prices were, until July 1973, determined by the Government after the marketing costs of the various agencies had been calculated. Because of the method adopted in price determination, producer prices varied from area to area depending on the relative efficiency of the local marketing institutions. A system of uniform pan-territorial producer price was introduced in 1973.

The marketing of maize through the above so-called official channel system has been unsatisfactory in several respects, including high operating costs per unit and poor marketing services. Not surprisingly, a high proportion of the marketed crop does not go through the official channel but through private and unauthorized traders. Most of the blame for the inefficiency of the 'one channel' system has been placed on the 'Co-operative Movement.' In response to the above criticisms, the co-operative unions' participation in maize marketing was terminated in 1974.

This study is an attempt to determine the benefits which producers and consumers can derive from the 'shortened' market chain. The rationale for the existence of illicit maize trade is examined.

The study was conducted in Tanga, one of the principal maize producing regions in Tanzania. Primary data were obtained from random samples of 10 farmers from each of 8 selected primary co-operative societies and from officials of these co-operative societies. Other sources of primary information included informal personal interviews with officials of Ministry of Agriculture, the National Milling Corporation and Tanga Region Co-operative Union.

The marketing margin, cost structure and quality of marketing services, are all examined during the period immediately before and after co-operative unions ceased to be part of the marketing chain. Causes of illicit maize marketing are also investigated.

The study shows that a wide range of physical marketing problems experienced by farmers has led to illicit trading. The study also reveals that marketing services provided by private traders have been far better than those provided in the official channel. This has been the major inducement for farmers to sell to private traders. The official price of maize relative to that of other crops, is also seen to have an effect on quantities of maize channeled through the official market system. Terminating co-operative unions from maize trade is found to have an effect of reducing the marketing margin. Another finding of the study is that ever since primary co-operative societies and the N.M.C. became the only authorized maize dealers several major improvements in marketing services have been made. The improved services include collection, speed of produce purchase and payment, and an increase in the number of buying posts.

The study reveals, however, that while efficiency in maize marketing is rising, there is room for further improvement. There is a need to improve institutional marketing facilities such as storage and transportation. The study also shows that further reduction in the marketing margin can be effected if shrinkage losses are reduced. The answer here seems to be one of creating quality competition to stimulate farmers to practice more careful sorting and grading before sale.

Decentralization of primary co-operatives through operation of buying posts should be approached more cautiously. The setting up of buying posts, it is suggested, should be based on strict viability criteria covering sufficient volumes of throughput. Whenever possible, buying posts should be amalgamated to increase throughput and decrease marketing costs.

The survey showed that provided that the above improvements in the official marketing system prevail, farmers are much less willing to participate in illicit maize trading.

CHAPTER I

INTRODUCTION

1. General

Late developing countries such as Tanzania are characterized by marketing problems e.g. inadequate market information, poor transportation, including farm-to-market roads; shortage of suitable market outlets; product spoilage and, lastly, poor grading standards.

Marketing systems are almost continually being changed by external pressures. Among other factors politico-economic forces such as those geared towards central planning of the economy in comparison with the encouragement of private investment within a relatively free economy, may considerably influence the development of a marketing system. Marketing activities assume an important role in co-ordinating and stimulating economic activities as a country's development increases (19, p.1).

An effective marketing system should stimulate production and consumption, create employment to absorb the rapidly growing population, and lastly bring about higher incomes among farmers. Such a system is, therefore, of benefit to the whole economy and particularly to producers and consumers. Marketing should thus be viewed as an active element in development. Marketing should also be regarded as a dynamic force which facilitates technological change and more productive institutional arrangements for organizing and co-ordinating economic activities. For example as production increases and an exportable surplus accumulates, the surplus should be such that it can compete effectively in

price, quality and service with similar products in foreign markets. A pre-requisite for the achievement of the above goal is the availability of suitable processing and storage facilities and skilled manpower.

2. The problem and objectives of the study

A 'one-channel' marketing system for most agricultural products in Tanzania was introduced in 1963 and until July, 1973 consisted of the producer, primary co-operative society, co-operative union and the National Agricultural Products Board (N.A.P.B) (11, p.152; 27, p.11). The introduction of this single channel created a number of problems which were aggravated by the granting, to primary co-operative societies, of a purchasing monopoly over first purchases from farmers (27, p1; 18, p.163).

The 'price spread' in respective of maize, between the producer and consumer is alleged to be unnecessarily wide, mainly due to high marketing costs. Indeed one observer regards the maize marketing costs in Tanzania before 1973, as the highest in the world (22, p.139). High costs are borne directly by the consumers in the form of higher prices and by farmers in receiving prices lower than what they might have been.

Time and again, there have been allegations that illicit transactions in maize and other food crops are so important that supplies by-passing the legal commercial channel are very substantial indeed (10, p.64, 23 p3). Strictly speaking therefore, the term 'one-channel' marketing system is highly misleading because it applies only to a small proportion of the maize marketed. In addition,

maize marketing in Tanzania is characterized by problems such as poor distribution system, inadequate storage facilities, crop losses and insufficiency of milling facilities (31, pp. 23-27, 10, p. 31).

The original objectives of the above channel system included ensuring a minimum and fair price to producers and a maximum and fair price to consumers; minimizing the price differential between the producer and consumer; and, keeping marketing costs as low as possible (22, p. 139). A comparison of the objectives outlined above and the problems experienced by the market system is a clear indication that the system failed in several respects.

In an attempt to alleviate the above problems, and increase marketing efficiency, the Government, in July 1973, terminated the involvement of co-operative unions in marketing of maize (27, p. 11). This meant that primary co-operative societies were made direct suppliers to the National Milling Corporation (N.M.C.) which superseded the N.A.P.B. Thus the N.M.C. is now responsible for purchasing maize direct from primary co-operative societies and processing it into flour for the home market. N.M.C. is also charged with the responsibility for home distribution and for all imports and exports of unprocessed maize.

The objectives of this study are :-

(i) to determine whether or not the post-1973 (current) marketing arrangements have any effect on the marketing margin;

(ii) to attempt to find out the rationale for the existence of illicit maize transactions;

(iii) to identify possible areas of the marketing system where improvements can be made;

(iv) to find out whether the current marketing system is able to offer improved marketing services;

(v) to find out whether or not the market system will induce farmers to sell more maize through the legal commercial channel and hence check the incidence of illicit transactions.

To highlight some problems pertaining to maize marketing, answers to some basic questions ought to be sought. Such a question as (i) 'Will the current maize marketing system be of benefit to the farmer and consumer?' is certainly of great importance in the study. Another question for which the study will seek for an answer is (ii) 'Will the present system be more efficient in so far as marketing services are concerned?'. There would really be no need to alter the existing pattern of maize marketing and create a more or less different system if services are not going to be improved subsequently. Other questions to be answered include:

(iii) What are the factors which control the quantities of maize passing through the legal commercial channel?

(iv) What are the factors which bring about illicit transactions in maize?

(v) What are the outlets for maize sold illegally?

and

(vi) Are primary co-operative societies experiencing economies of scale?

Answers to such questions will be of benefit to agricultural policy makers, producers, consumers and indeed the whole economy, since it is only through the identification of problems that improvements can be sought.

3. Area of the study

The area covered in the study is shown in Figures I and II and includes six districts, namely Muheza, Korogwe, Lushoto, Tanga, Handeni and Pangani, which together constitute Tanga Region. Handeni district is the major maize producing area and was therefore selected for farm interviews.

Selection of Tanga Region as area of study is based on two main reasons. Firstly, because it is one of the largest main producing areas[1] and, secondly, because the region is one where the administrative, agricultural and commercial organizations were able and willing to furnish data and other assistance with socio-economic and agricultural studies.

The Tanga Integrated Rural Development Programme (TIRDEP) organization had already assembled considerable statistical and other material, and having seen the important need for a study like the present one, was prepared to provide some technical assistance.

The main climatic form is warm and wet. In the Western Plateau of Handeni District a hot and dry climate predominates whereas in the highland areas there is a temperate climate (25, p. 26).

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[1] Appendix IV

There are usually two rainy seasons: the short rains - between October and January - and the long rains - between mid-March and May. The average annual rainfall is 1100 m m.to 1400 m.m along the coast, declining to about 600 mm. in the drier areas of Handeni District (25, pp.26-27).

Of great importance to agriculture is the rainfall probability. Much of the Region lies within the zone of 20% per annum rainfall probability (25, pp.28-29). The weather dictates the timing of planting, harvesting and hence marketing of maize. Generally speaking, planting takes place between February and April. Harvesting is carried out during July and August and, soon afterwards, marketing commences.

TABLE I

SELECTED CHARACTERISTICS OF TANGA REGION

District	AREA				POPULATION			Average annual rain fall (m m. per year)
	District area (Sq.km.)	Type of farm organization ('000s ha)			Estimated total 1975 ('000s)	Density (per sq km.)	Proportion living within 5 k m. of a road (%)[2]	
		Estates	Privately owned	Ujamaa Villages				
Handeni	13,210	6.3	33.6	130.9	178	13	42	875
Lushoto	3,497	6.3	31.6	4.3	271	77	66	1,101
Korogwe	3,750	58.8	34.4	27.0	167	44	59	1,097
Muheza	4,922	53.7	21.1	37.1	231	47	73	1,332
Pangani	1,424	6.3	4.3	7.7	36	25	92	1,231
Tanga[1]			-	-	89	-	-	1,356

Source: (25, pp 24-58)

[1] Urban Area Only.

[2] (25, Graph 7)

Note:

- means not applicable

Table I summarizes the more important characteristics of Tanga Region. The table shows that there are three main types of land tenure: estates (mainly sisal), private farms and Ujamaa Villages (U.Vs.)[2]. Up to 1973, more than 90% of the private farms had an area of between 0.50 and 1.99 ha (25, p.60). Of special relevance to the study are the U.Vs. among some of which farm interviews were undertaken. In Handeni district the U.Vs. occupied about 77% (54,000 ha) of the land under cultivation during the period ended 1973 (25, p 58). Experience has shown that farmers in areas of relatively limited cash crop production are keen to join in U.Vs. since by exploiting economies of scale they enable cash crops to be grown on communal farms (25, p.63).

The table also shows that farmers, mainly live alongside or within 5 km of roads. The re-settling of people in these areas of easy accessibility is in accordance with Government policy of ensuring that the people can easily be supplied with amenities such as hospitals, schools, social services, water, production and marketing facilities.

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[2] In Tanzania, Ujamaa (Communal) Villages are the basic units of production and marketing. Each household has a private farm cultivated by family labour during extra-communal working hours.

FIGURE 1: POSITION OF TANGA REGION IN TANZANIA

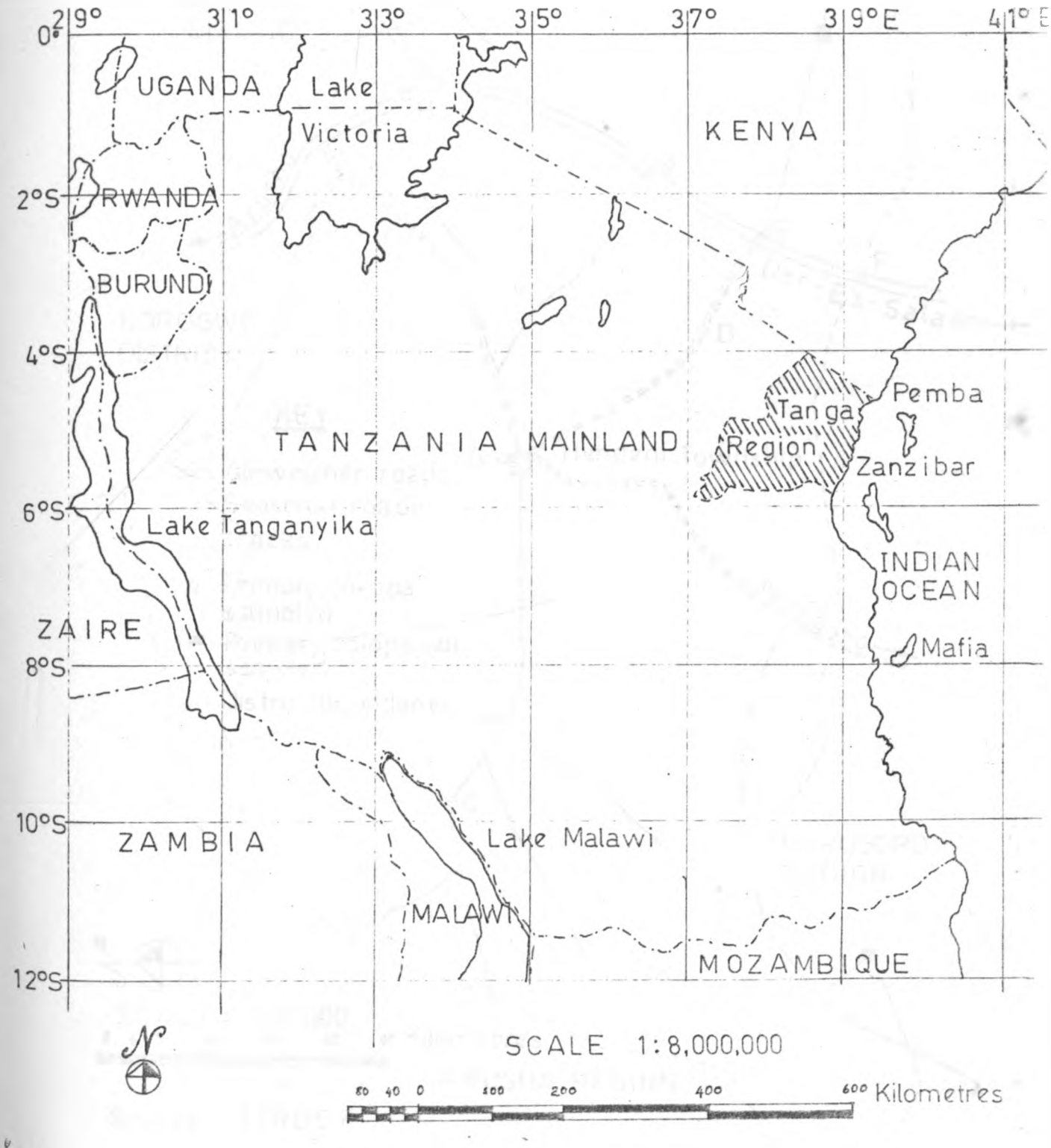
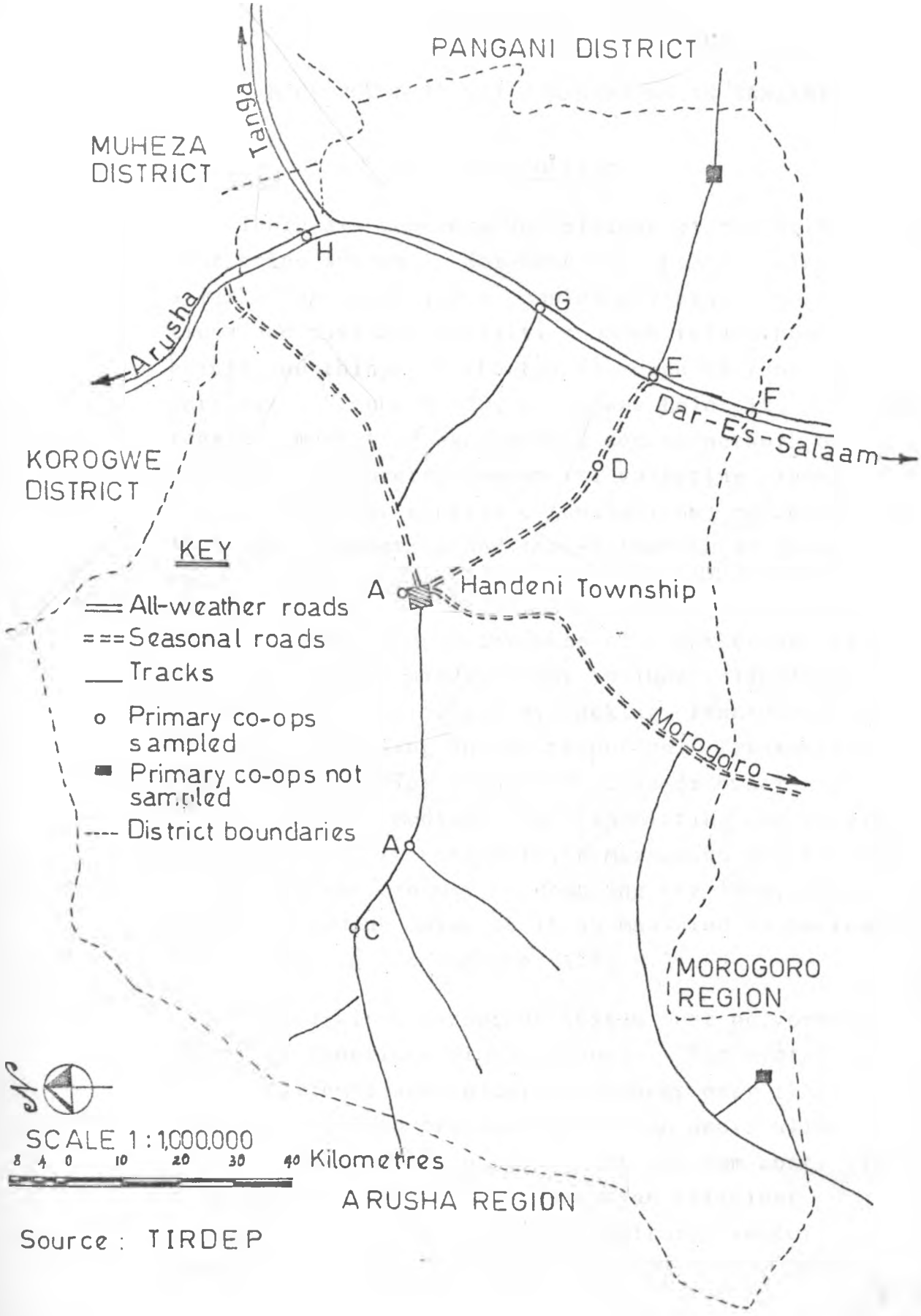


FIGURE II : MAP OF HANDENI DISTRICT SHOWING THE SAMPLED PRIMARY CO-OPERATIVE SOCIETIES



Source : TIRDEP

CHAPTER II

BACKGROUND TO MAIZE MARKETING IN TANZANIA

1. Introduction

There are numerous definitions of the term 'marketing system'. Sorensen (21, p.56) defines a marketing system as a complex pattern of institutions and physical facilities which relate human beings and things in the transferance of goods and services. Schubert (20, p.39) and Lele (12, p.56-60) regard a marketing system as a social network of elements (producers, consumers, marketing organizations and market control organisations) concerned with the transaction and transformation of goods in space, time and form.

Transformation activities of a marketing system for agricultural products may include collecting, sorting and classification, packing, transportation, storage, processing and distribution. Transaction activities call for change of title or ownership through a price medium. In transmitting commodities from producers to consumers, a marketing system adds utility to the product by changing the form, place and time, adding value to it as measured by increased convenience to the consumer (36, p.7).

An efficient marketing system must perform a number of functions simultaneously. The system must distribute agricultural products over time, space and form to processors and consumers alike. Distribution must be performed at minimum cost. In addition, the system must foster an efficient resource allocation in the agricultural sector through transmitting price signals over the entire

market organization.

Agricultural markets are frequently susceptible to seasonal price fluctuations. These fluctuations generate uncertainties which in turn affect farmers in their allocative decisions (14, p.93). The degree to which a market system can perform the above functions effectively will depend very much on the availability and quality of physical infrastructures such as storage, transport and marketing facilities, financing institutions and managerial and marketing expertise.

Adequate storage facilities enable buffer stocks to be operated efficiently. Likewise, adequate market intelligence, a challenging task to marketing personnel, enables the reliable prediction of domestic supplies and demand. Fluctuations in supply are largely a result of the inelastic demand and elastic nature of supply curves characteristic of agricultural crops. In addition, 'incidentals' or uncontrollable factors such as weather, can exert a considerable influence on agricultural output.

Market organization obviously is an important factor in market performance. In a competitive market, free entry into trade, market information and adequate mobility are necessary requirements for distribution efficiency (12, p. 58). Decision making in a competitive market is governed mainly by profit motive and efficiency is defined by profit maximization. Market prices are taken to be accurate signals guiding producer and consumer decisions (2, p.49).

Under state-controlled market systems, such as those prevailing in Tanzania and other socialist-oriented developing countries[3], cost minimization is one of the goals.

This minimization in cost will largely depend on how well the market organization is conceived and how efficiently it is administered. Such a system is designed to stabilize prices during and between seasons so as to create an incentive to increase agricultural output (12, p. 59).

Generally speaking therefore, a marketing system includes both the tangible physical relationships and the intangible social relationships involved.

That a marketing system adds utility and value to a product as it is channelled from producers to consumers was noted earlier. Marketing efficiency may, however, be described as being a complex issue since neither the added utility nor the services provided are precisely quantifiable. Nevertheless increased efficiency in the marketing of food crops will contribute to the solution of persistent farm price-income support and other agricultural adjustment programs and also bring about social benefits to the whole economy.

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[3]Countries where G.D.P. per caput was below U.S. $1,000 p.a. in 1970 were generally classified as developing (6).

2. General problems of the maize industry

2.1. Production

The widespread popularity of maize among East African farmers is mainly due to favourable weather conditions and the crop's high tolerance to disease and pest damage (1, p. 124). In Tanzania, as in other parts of East Africa, production comes mainly from small-scale farmers whose husbandry practices are very poor as reflected by low yields of 670 kg./ha (1, p. 134). Yields in neighbouring Kenya are higher and average 1100 to 1350 kg./ha (1, p. 134). Often in Tanzania, planting and weeding operations are performed too late. Other factors which contribute to low yields include lack of farmer innovativeness for the adoption of high yielding seed varieties and insufficient use of fertilizers and pesticides. The poor nature of technology also contributes to the low yields.

2.2. Marketing

Some developments in maize marketing such as the ever-increasing marketing margin and the steep increase in the cost of transportation, are problems of serious concern. The producer - consumer price differential has increased by more than 100% at current prices from 1963 to 1975 whereas this has not been the case for other crops such as cotton and coffee. The marketing margin for cotton increased by about 70% from 1963 (70 cts/kg) to 1971 (119 cts/kg.) (17, p. 38). That of coffee increased from 72 cts/kg. to 109 cts/kg. i.e. by about 51% during the same period (17).

Normally farm product prices reflect end use values i.e. retail price less marketing costs and profits. Hence an increase in marketing costs will not only increase consumer prices and hence consumer burden, but also raise farm-retail price spreads. An increase in marketing costs must also reduce the farmer's share of consumer food expenditure. Such an increase will also reduce farm product prices and, consequently, farm incomes.

Barriers to entry into trades such as maize have been postulated by Moyer and Hollander (16, p. 6) as possible hypotheses to explain the malfunctioning of a marketing system. Soaring profits and prices may result from these trade restrictions and the volume of trade may be reduced to the extent that a dampening effect on production may result. With the above circumstances, if trade is being administered by state-owned agencies as in Tanzania, shortages can occur even in years of good harvest owing to inefficiency. Farmers and traders can thus feel compelled to by-pass the legal marketing channel through unauthorized transactions. In recent years, the volume of illicitly marketed maize has often been substantial (22, p.10; 10, pp.38-39). For instance, during 1972/73 crop season, no maize whatsoever was sold through the legal commercial channel in Tanga Region[4].

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[4]Personal communication with Regional Agricultural Development Officer, Tanga.

The risks which are involved in illicit transactions i.e. of being detected and heavily fined, are born by producers and consumers. Where prices are higher in illicit markets than in official markets the producer will of course, benefit. Correspondingly, he will lose financially when illicit prices are lower. During periods of scarcity a consumer may have little choice but to purchase maize from a private trader at a price higher than that in the regulated market. Of special concern, is the fact that the higher the incidence of illicit trading the smaller are the supplies going through the official channel. The rationale behind illicit transactions therefore warrants investigation.

Another set of problems concerns distribution. Experience has shown that local shortages have frequently been reported even when total domestic supplies have been reported to be sufficient. This is to some extent attributed to poor distribution, particularly in the transport system. Shortages can also be aggravated by poor crop forecasting. Discussions with Ministry of Agriculture officials provided evidence in support of the fact that crop forecasting is very unsatisfactory. Other causes of shortages could be poor stock-taking, insufficiency of adequate storage facilities or inefficiency on the part of those in charge of distribution in general and of transport in particular.

Crop losses result from the insufficiency, poor condition and obsolescence of most storage facilities in the institutions handling maize. Numerous farmers and other interviewed stated that damage by pests and weather are rife, and, under present

conditions, inevitable. Part of the storage problem at farm level is connected with the primitive nature of the traditional storage methods, which result in high crop losses almost automatically.

Processing facilities for maize are also inadequate and call for improvements. The milling industry can be divided into commercial and non-commercial sectors. The former refers to mills which purchase maize through commercial channels and prepare it for sale to wholesalers and retailers. The latter category refers to 'contract mills' which simply mill maize on behalf of subsistence consumers in return for a milling fee.

Contract mills are usually relatively small, mostly privately owned, employ few people and are very common in rural areas. There appears to be no shortage of milling capacity of this type (28, p. 11).

The largest single group of milling plants is that owned by the N.M.C. with a capacity of 100,000 MT per year (28, p. 11). There is insufficient commercial milling capacity to cater for domestic requirements[5].

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[5]Total domestic commercial consumption is about 125,000 MT per annum (28, p. 10).

The host of problems dominating the maize market seriously impedes the smooth operation of the market at every level. In the light of these difficulties, the Government, in July, 1974, re-organized the marketing system, authorising the N.M.C. to purchase maize directly from primary co-operative societies, thus by-passing co-operative unions.

3. Future policy objectives

The expansion of food production for domestic consumption and export continues to be a major goal of the Government of Tanzania. High priority is given to maize, in which crop it is planned to achieve self-sufficiency by 1980, even though the population may have increased from about 15 million in 1975 to about 18 million by then (5, p. 105). To be self-sufficient by 1980, the 1973 production of about 880,000 MT must be increased by some 450,000 MT i.e. by about 51%, or 6% annually. The above estimates of national demand up to and including 1980 are considerably higher than those by FAO, cited in Table II. Since the Tanzanian planners had the benefit of FAO statistics and made their estimates several years later, their forecasts can be regarded as more reliable.

The following strategies are being used to achieve the Government objective:-

a) Improving farming techniques by using hybrid seed varieties, increased use of fertiliser and adoption of complimentary practices such as early planting and weeding and employing effective pest control measures.

b) Developing effective agencies and policies for the distribution of inputs such as improved seed and fertiliser. To encourage farmers to adopt improved methods of production, the input prices will be heavily subsidized. Hybrid seed will be subsidized by 80% and fertilizers by 75%.

c) Increasing producer prices, which, it is hoped will provide the required incentive for increased production.

d) Improving marketing facilities: the line of action to be pursued here will be to improve institutional marketing facilities and policies so as to assure markets at remunerative prices for the increased output. Improved transport systems at regional level will be provided so as to ensure timely delivery of farm inputs and prompt disposal of any maize which is surplus to the farmers' own needs. Additional buying centres will be established to speed up marketing.

e) Finally, storage facilities are to be improved at regional, district and village levels. New storage facilities will be established when necessary and existing ones will be improved.

4. Role of maize in the economy of Tanzania

4.1. Staple food

Maize is the most important cereal crop in Tanzania and indeed the whole of East Africa and

is a staple food in most of the country (1, p.124). The importance of maize is manifested by the cultivated area as compared to other important food crops. In Tanga Region, more than 25% of the arable land was, in 1973, under maize, more than half being in Handeni district (25, p.76). Cassava, the next most important subsistence enterprise, occupied only 7.7% of the region during the same period.

Some idea of importance of maize as a staple food can be gauged from data available in Table II. A survey of 95 labourers in Dar-Es-Salaam in 1950 revealed that maize represented about 69% of the daily purchases of food calories (12, p.113). The other principal calorie sources (i.e. cassava, bread and rice) each accounted for about 11%. Other important statistical indicators of the relative importance of maize are summarized in Table II.

TABLE II

THE RELATIVE IMPORTANCE OF MAIZE IN TANZANIAN DIET

Food crop	Per caput consumption[1]		Income elasticity of demand[2]	Indices of total demand (projected)[3]			Level of total demand (1000 MT)[4]			
	Quantity (kg/yr)	Cal/ day		1970/65	1975/70	1980/75	1965	1970	1975	1980
Maize	50	500	0.4	118.7	116.7	117.4	592	703	820	963
Wheat	3.7	37	1.0	127.6	121.6	121.7	43	55	67	81
Rice	10.5	103	0.5	123.8	117.9	..8.5	122	151	178	211
Millet/ Sorghum	70.8	663	0.3	117.4	116.1	116.9	826	970	1126	1316

Source: [1](6, p 105) [3](6, p 328)

[2](6, p 203) [4](6, p 376)

The above table shows that maize is an important cereal crop with a per caput consumption of 50 kg/year and 500 cal/day. The relatively low income elasticity of demand for maize compared to wheat and paddy, is a strong indicator that maize is more popular among low income earners. Studies by Odegaard based on 1969 retail data show that the consumption pattern of maize follows a varying marginal rate and decreases as income increases (17,pp. 56-57).

According to F A O estimates, total demand indices show that there will be a slight decrease in per caput consumption for maize and the other cereals during the period 1965/70 to 1975/80. The decrease in per caput consumption could be explained by the expected increase in income per capita and the corresponding changes in consumption habits.

Due to the expected continuation of population increase of about 3.1% per year (7, p32) total demand for maize, and indeed other cereals, is expected to rise substantially as the table indicates.

The total annual subsistence consumption is about 450,000 MT i.e. 38 kg. per caput (28, p.7). Commercial consumption[6] is estimated at 125,000 MT per annum and represents 27% of the total annual consumption of 459,000 MT or 47 kg. per caput[7].

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[6] Commercial consumption is represented by N.M.C. sales less utilization for manufacture of animal feed and maize which is commercially milled but not supplied through the N.M.C.

[7] F A O estimates total consumption at 50 kg. per caput.

4.2 Employment

The maize industry also provides substantial employment. Apart from production carried out by small farmers, the work of transportation, marketing, milling and ancilliary operations also provides a substantial number of jobs.

4.3. Foreign exchange earning

Another contribution made by maize to the economy is the earning of foreign exchange. When dealing with the export market, it is necessary to distinguish between overseas exports and those of neighbouring countries. The former are usually less profitable due to high freight charges.

In 1967 and 1968 maize contributed about 27% of the value of exports from basic food crops for each of the two years. In 1968, the contribution of maize to export earnings from basic food crops was about 42%.

5. Evolution of organized maize marketing in Tanzania

Before Independence (1961) maize was channelled from producers to consumers in a free market environment with supply and demand forces determining prices. Soon after Independence a policy of greatly increased Government intervention was applied to many sectors of the economy including the marketing of maize and other agricultural products. One of the first manifestations of this policy was the passage of the Agricultural Products (Control and Marketing) Act of 1962. Thus the N.A.P.B. was established the following year to handle, inter alia, maize

passing through commercial channels.

Although not explicitly stated, the objectives of the board included the following (22, p. 139):

a) Guaranteeing minimum and fair prices to producers and maximum and fair prices to consumers. Of special importance the price differential between the producer and consumer was to have been minimized.

b) Ensuring, by means of stockpiling, self-sufficiency in maize even in years of low production.

c) Pursuing the above two goals with least cost and disruption to the economy and in particular minimizing exports and imports since these normally involve losses to the board.

In July, 1973, a new parastatal institution, the N.M.C., took over the functions of the N.A.P.B. with regard to trading in grain (maize, paddy, wheat and sorghum).

As a result of the above developments, commercial maize marketing in Tanzania has the characteristics of a 'one channel system'. Before July, 1973 the farmers were required to sell to the monopoly first buyer - the local primary co-operative society - which resold to its co-operative union, which in turn resold to the N.A.P.B. All commercially marketed maize was thus required by law to pass through this channel. Since illicit trading continued to be the rule rather than the exception, the term 'one channel system' is highly misleading.

In July, 1974, co-operative unions ceased operating in the maize trade and their functions were taken over by regional branches of the N.M.C. Organising marketing on a co-operative basis stems from the Government's policy of 'collectivization' and is regarded as being suitable for achieving the socialist aims of Tanzania. In this respect co-operatives are expected to protect farmers from exploitation by middlemen.

Furthermore, the Co-operative Movement continues to be regarded by Government as the crucial legal and economic instrument which enables farmers to have a direct control over their economy (27, p.1). In addition, the performance of a marketing system on a collective basis has the positive effect of reducing the aggregate marketing margins. The margin per ton may be lowered by increasing the volume of throughput of products and also by changing the quality of services offered by the marketing sector. When marketing activities are performed on a collective basis, the extent by which the margin is reduced is a reflection of the profits foregone by private marketing agencies. Such views are doubtless quite justifiable provided that the co-operatives or other collective marketing organizations are at least as efficient as the agencies they succeed. Regrettably it has to be said that collective organizations often achieve disappointing performance standards, particularly in their early years.

As noted earlier, N.M.C. purchases maize from primary co-operative societies and after processing, re-sells to wholesalers and retailers, who then supply to consumers. Another function is to regulate exports and imports. Table III gives a summary of the above transactions from 1965/66 to 1974/75.

TABLE III

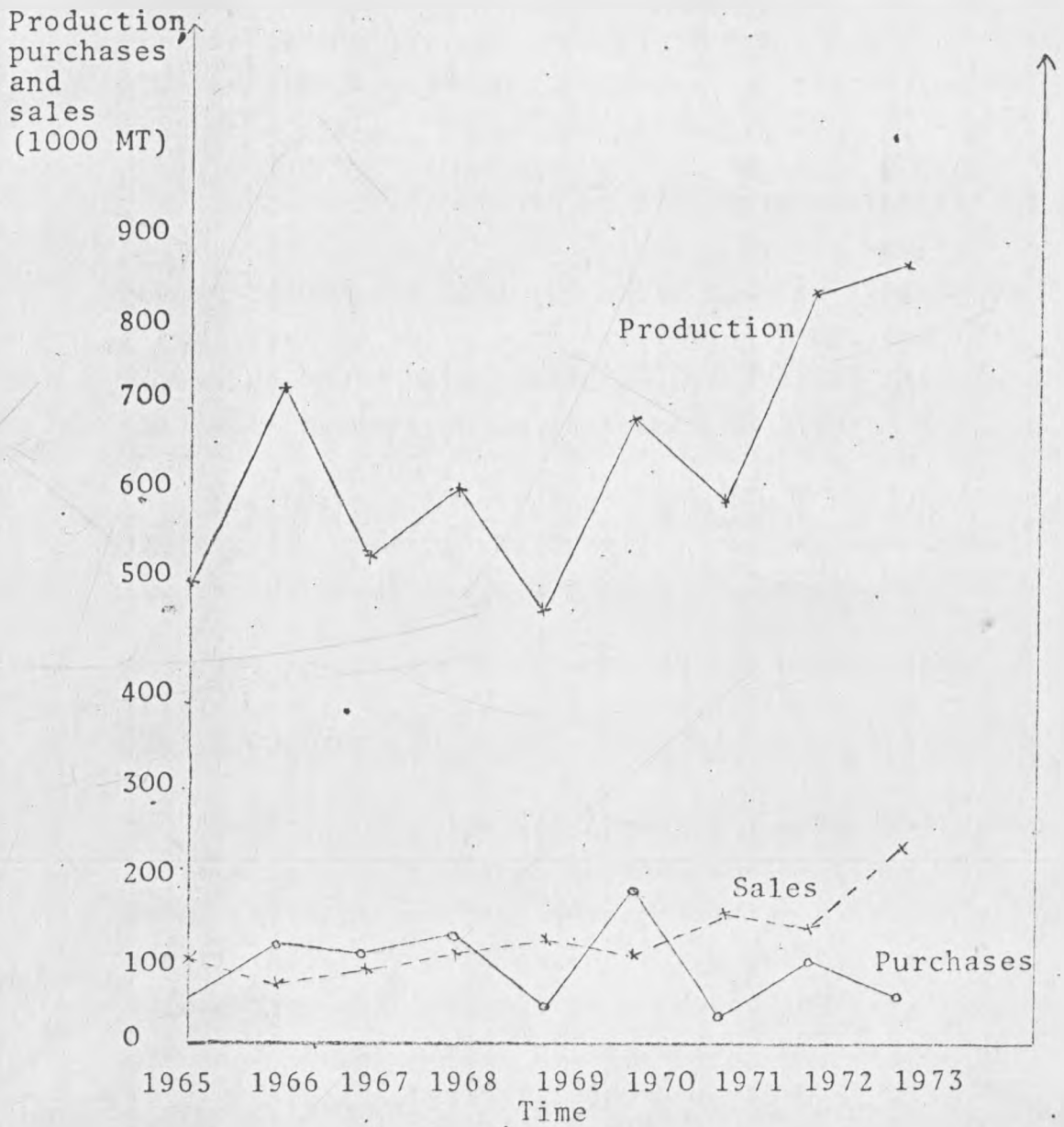
QUANTITIES OF MAIZE HANDLED THROUGH THE OFFICIAL MARKETING CHANNEL, TANZANIA, 1965/66 to 1974/75 (1000 MT)

Year	Central marketing institution	Purchases		Sales		Export	Imports
		Quantity	% change over last year	Quantity	% change over last year		
1965/66	N.A.P.B.	70.0	-	89.5	-	-	8.8
1966/67	"	112.9	+61	74.8	-17	6.4	14.3
1967/68	"	104.3	- 8	93.1	+25	0.3	-
1968/69	"	127.5	+18	104.5	+12	51.8	-
1969/70	"	54.1	-58	123.4	+15	-	46.9
1970/71	"	185.0	+242	116.6	- 6	53.4	-
1971/72	"	43.0	-77	160.0	+37	-	92.3
1972/73	"	106.4	+147	154.0	- 4	-	78.9
1973/74	N.M.C.	73.6	-31	242.4	+57	-	187.2
1974/75	"	n.a.	-	n.a.	-	-	247.3
Average		97.4		128.7		11.2	67.6

Source: Adapted from data supplied by Ministry of Agriculture.

DIAGRAM I

RELATIONSHIP BETWEEN QUANTITIES OF MAIZE MARKETED THROUGH OFFICIAL CHANNEL AND QUANTITIES PRODUCED, TANZANIA, 1965/66 TO 1973/74



Source: Table III and Appendix 6

From table III it can be seen that during the nine years ended in 1973/74 the average level of sales exceeded that of purchases. The fact that the average level of domestic sales exceeds that of purchases is to be expected due to stock piling from previous years and also due to famine relief stocks from friendly countries. The table also shows that the 1971/72 season was particularly a bad one for the official marketing agency since there was a considerable decline in domestic purchases. Diagram I shows that this was a year of low production.

In general, there is no particular trend in the pattern of official transactions. On the whole, however, domestic sales of maize show an increasing trend. In the years of poor or good crop, domestic purchases would be expected to synchronise fairly well with production as indicated in Diagram I.

Maize imports increased steadily from 1965/66 to 1974/75. During this period, the average annual import was about six times that of exports.

The year 1974/75 was one of low production, mainly due to adverse weather conditions, and this necessitated imports of 273,300 MT.

Imports of maize are normally regarded as being particularly detrimental to the economy since they necessitate payments in scarce foreign exchange which might otherwise be diverted to the purchase of commodities which cannot be produced locally. Normally import parity prices are high, largely due to high freight charges. Another drawback of imports comes in the form of losses of potential domestic income which would have otherwise been realized by farmers. Losses in employment also occur since imported maize could have been produced

locally using otherwise idle resources such as land and labour.

Apart from outright purchases of foreign grain, some shipments have been gifts from friendly governments. Whilst the generosity and motives of donor countries are greatly appreciated, there is a significant and growing body of opinion which feels that such 'grain aid' is degrading to the recipient state, since it reduces it to the status of a beggar.

6. Price policy

6.1. Introduction

Farming in late developing countries is in most cases of a peasant nature. Farmers are increasingly being confronted with new alternatives and problems which do not fit their experience-based decision framework (4, p. 61).

In addition farmers in developing countries are poorly organized and lack the knowledge to enable them to market their produce to best advantage. This implies that a degree of inefficiency in the agricultural system is inevitable as a traditional agriculture is transformed into a modern one.

Private traders have various advantages over peasant farmers. Firstly, the traders have a better understanding of the market situation concerning supply, demand, and price and have an added advantage of trade expertise. They also, in most cases, have money or access to it. Experience shows that peasant farmers, before harvesting time, have in most cases little or no money and indeed many of them are in debt.

Often, private traders have control over storage and transport facilities, sacks and other containers. Generally speaking, therefore, private traders are much better equipped with the necessary 'marketing tools' as compared to farmers.

To say that farmers are seriously exposed to the risk of exploitation by the traders and hence do not obtain the full benefits of their crops is by no means an overstatement of the case .

In view of the above circumstances, many governments have created parastatal bodies to cater for farmers' interests in selling their maize and other crops (2, p. 49). In a number of developing countries, and particularly in Africa, state-owned companies have been established. In part, their purpose is to help finance development projects and to help farmers market their products advantageously and hence offer them protection from exploitation by trade intermediaries.

Producer price setting is an important policy instrument for agricultural marketing and development. There is evidence to suggest that small-scale farmers respond favourably to producer prices in their allocation decisions (16, p.62). The intensity of such response differs from area to area and from crop to crop. Evidence also suggests that this response can be maximised by the announcement of prices well in advance of planting time (16, p. 47).

Mellor (13, p.25) contends that producer prices not only allocate resources within the agricultural sector, but also between the agricultural and non-agricultural sectors; help to distribute income among sectors, regions and income groups, and contribute to

the growth of additional resources such as capital.

Guaranteed prices also reduce or eliminate price uncertainty and hence allow for a more efficient allocation of scarce resources at farm level. Such prices provide farmers with a very reliable decision-making tool to the extent that it sets a stage for increasing the elasticity of response to price incentives or disincentives. Production can, without question, be regulated by manipulating the guaranteed price.

In this context, therefore, Government can effect overall allocation decisions in the agricultural sector in keeping with its perception of national priorities through manipulation of producer price.

6.2. Price policy for maize in Tanzania

Producer prices are announced by the Ministry of Agriculture before the planting season. Until July 1973, producer prices were normally what could be termed the 'residual' since they were arrived at after the estimated marketing margins for primary co-operative societies and co-operative unions were deducted from the N.A.P.B. 'Into-store-price' (26, p. 3).

Under the pre-1973 circumstances, producer prices varied from area to area by virtue of transportation costs and the relative efficiency of the different co-operatives. Until 1973 the Government determined the N.A.P.B. 'Into-store' price. Each co-operative union was required, before the start of the marketing season i.e. in advance of a crop year, to calculate its marketing costs and submit them to the Registrar of Co-operatives for approval. However, this proce-

dure was not closely followed for it was generally impossible to obtain accurate details of costs in advance during periods of steep inflation.

This delay on the part of co-operative unions inevitably interfered considerably with the producer price-fixing scheme. In many cases the prices were announced after planting, which of course to a large extent defeated the whole purpose of determining prices in advance. After 1973, there was a complete change in the price policy and a system of uniform pan-territorial price was introduced.

The fixing of a uniform producer price means that differences in transportation costs are ignored. With this price policy, the farmers are now isolated from any relative inefficiency of co-operative societies. The above contingency, will largely have to be absorbed by the N.M.C. Any unforeseen increase in costs arising after the ex-farm price has been fixed for the season, will put an added burden on the N.M.C. Of course, in the event of expected cost increases not occuring, the N.M.C. will gain.

The price announced before the beginning of the planting season holds until the harvested produce has been marketed. Produce price is therefore, not only fixed with respect to space, but also time. This means that farmers have no incentive whatsoever to store maize, since official buyers do not offer a differential to at least compensate for inventory cost, including loss of weight.

A more efficient maize market calls for the marketing system to register grade price differentials and transmit these price messages without distortion all the way to farmers. Four grades of maize are distinguished in Tanzania. Grades I and II fetch the same price and the only basis of distinguishing between them is that Grade I is white whereas Grade II is yellow. Grade III is priced lower than the first two since it is inferior. The last grade is regarded as being just fit for human consumption. Personal experience and discussion with various officials gives evidence in support of the fact that the above grading system is not closely adhered to by maize dealing agencies. This is especially true at primary co-operative society level.

Evidence furnished by one researcher (20, p150) shows that before 1973, a lower grade of maize could fetch a higher price in one place than a higher grade in another place. For example in 1967/68 farmers in Tanga region received a lower price for Grade I maize than farmers in almost all other parts of the country received for Grade III maize. The same event occured in other parts of the country during the following two years.

The rationale behind this price anomaly is difficult to account for since the different marketing margins do not reflect the authenticity of the different economic costs of operating the marketing functions.

CHAPTER III

METHODOLOGY AND DATA

Against the background of the market system described in Chapter II, a set of hypotheses was laid down to attempt to seek answers to some of the more important maize marketing problems. Information gathered will therefore be used to test the hypotheses that:

(i) Shortening of the maize marketing chain by removing co-operative unions from the 'one channel' system will decrease marketing costs and hence marketing margins. In this case, a detailed cost analysis of the various marketing activities will be carried out.

(ii) The quantity of maize passing through the official channel is controlled by the prescribed price. Time series data of prices and quantities of maize will be analysed to find out the relationship among them. Factors such as prices in alternative outlets, quantities produced and risks involved in by-passing the legal commercial channel will not be taken into consideration due to data limitations.

(iii) The current marketing system is able to provide better marketing services to farmers as compared to the previous one.

The last two hypotheses are both mainly concerned with focussing attention on conditions which result in illicit maize transactions. A knowledge of why such transactions occur will contribute to devising

market improvement policies and possibly help to stop or reduce the practice.

Two surveys were conducted, one on maize producers and the other on the primary co-operative societies to which these farmers are affiliated. The primary data consists of information relating to marketing problems facing farmers and co-operative societies; available marketing services and facilities; distances from farm units to markets and modes of transport; causes of illicit maize transactions; outlets for maize traded illicitly; and, finally, improvements which have been made in marketing services since the N.M.C. and primary co-operative societies became the sole official dealers in maize. The data were collected by means of personal interviews. The main tool used in the survey was a structured questionnaire (Appendix 1): The questionnaire was pre-tested on 10 farmers.

The following steps were followed in sampling farmers:

(i) Firstly, details[8] of maize marketing primary co-operatives in Handeni district were obtained from the Regional Ujamaa and Co-operative Society (R.U.C.S.) headquarters, the Tanga Branch Manager of N.M.C., the regional headquarters of the Ministry of Agriculture and the Tanga

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[8]Details included volume of maize handled, location, accessibility, and membership.

Region Co-operative Union (T.R.C.U.) headquarters. The above procedure was adopted to minimise bias which might have occured if only one source of information had been employed.

(ii) Of the primary co-operative societies in Handeni district, ten were selected after studying the information supplied by the above sources. The original plan was to select farmers from each primary society but two societies were eliminated because they were located over 150 k.m. from Tanga in areas of poor communication.

(iii) A list of farmers registered with the eight selected primary co-operatives was obtained from the society secretaries. From membership registers, random samples of ten farmers per society were drawn by using table of random numbers.

After drawing the samples, the addresses and locations of the farmers were obtained from society records. Guides were provided by leaders of the respective U.Vs. The author then visited each area, and, with the help of the local guide, located the individual farmers. The presence of guides did not introduce bias since interviews were conducted on an individual farmer basis and in isolation. The interviews were conducted between September 1975 and December 1975.

The task of contacting farmers was facilitated by virtue of nearly all living close to roads or tracks. In six cases, the sampled farmers were inaccessible and substitutes were obtained from among other producers located near roads. There is an element of bias in the sample on account of the fact that those interviewed are less representative than would be the case if the sample had contained more farmers from the remote holdings.

The collection of primary information from farmers was hampered by three main factors. In some cases respondents were unco-operative at first and it took time to convince them of the relevance and confidentiality of the study. On seven occasions it was necessary to pay repeat visits as farmers were absent at the first time of calling.

A further problem was that of minimising influence on replies given by the respondents. As farmers live in clusters, it was possible for them to have a tendency of giving similar answers to questions. To avoid this possibility, farmers were interviewed individually.

The survey on primary co-operatives was centred on the institutional and organizational marketing problems facing the respective primary co-operatives. Storage and transportation facilities as well as the quality of the marketing services offered to members were all assessed.

Officials of the following agencies were interviewed:

Marketing Development Bureau, Ministry of Agriculture (Dar-es-Salaam); Tanga Regional headquarters, Ministry of Agriculture; the N.M.C. (Dar-es-Salaam and Tanga); T.R.C.U., and, lastly

various officials of Ujamaa and Co-operative Societies at regional and district levels. These interviews were informal and helped to throw more light on maize marketing problems.

There is a need to comment on why personal interviews of farmers were used to collect information. One could also have mailed the questionnaires to the farmers, or alternatively, have attempted to use a telephonist to obtain the data. Both of these methods may well be satisfactory when conditions happen to be favourable. In the case of Tanga Region, the degree of literacy is widely known to be very low[9] and for this reason alone, few farmers would be likely to respond.

The telephone density in Tanga Region was 0.062 telephones per 100 inhabitants in 1970 (25, p.313). With such a low density, the number of farmer-telephone subscribers is probably zero, so the method of using telephone services was also impracticable.

This left only the use of a personal interview questionnaire survey as the most suitable way of obtaining information. The method has the merits of accuracy and flexibility compared to the others. Contradictory statements can always be reconciled by further questioning. However, due to the influence of the interviewer, there can be a tendency for the respondents to give what they think are the expected answers. For example, people may say they

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[9] Personal communication with Mr. W. Nielaender (TIRDEP).

will do something in response to a certain question but would not necessarily do so in practice.

Secondary data were obtained from the N.M.C. (Dar-es-Salaam and Tanga); T.R.C.U., Ministry of Agriculture and from the sampled primary co-operative societies. Such data included types, volumes and values of commodities handled including maize; costs of marketing for the various operations; and, lastly, services provided by the various institutions. The data were obtained from annual reports, files, bulletins and other publications of the various agencies.

CHAPTER IV

DATA ANALYSIS AND RESULTS

1. Marketing costs

The costs of marketing maize include: transportation, containers, insurance, shrinkage, bank interest, society and union levies and record-keeping. The primary co-operative societies have control only over society costs which are paid for by the society levy and cover salaries, wages and handling. Handling charges are paid by primary co-operative societies to casual labourers for bagging, weighing, stacking and loading.

Apart from the society levy, all other costs were, before 1974/75, under the control of the regional unions, which were reimbursed by the N.M.C. which paid a 'union levy' to cover the cost of marketing services provided for affiliated primary co-operatives.

The unions also acted as main N.M.C. agents in respect of the provision of storage facilities; receiving and distributing money to affiliated primary co-operative societies, and for arranging for transport and record-keeping. To cover these costs, the unions were paid a 'main agent' fee by the N.M.C.

In Tanga region the N.M.C. established a branch in 1974 and this performs, inter alia, all the above functions instead of the regional union. Since the N.M.C. is purchasing maize directly from primary co-operative societies, the co-operative union receives no 'main agent' fee. Although it is no longer trading in maize, or indeed making the slightest direct contribution to its marketing, the

union is still paid half the levy by the N.M.C. The reason for this contribution is understood to be the need to keep the unions in existence and ensure that they continue to service primary co-operatives in such ways as staff training, co-ordination, formation of new societies and general supervision.

The cost structure for maize marketing in Tanga region from 1973/74 to 1975 is given in Table IV.

TABLE IV

MAIZE MARKETING COSTS IN TANGA REGION - 1973/74 TO 1975/76

(Tsh/MT)

Item	1973/74		1974/75		1975/76[a]	
	cost	Proportion of total margin (%)	cost	Proportion of total margin (%)	cost	Proportion of total margin (%)
1. Co-operative margin	130.00	69.2	15.00	20.3	20.00	16.7
2. N.M.C. costs						
a) Main agent fee[1]	4.45	2.4	-	-	-	-
b) Storage[2]	13.05	6.9	13.05	17.6	14.45	12.0
c) Branch costs[3]	14.40	7.7	15.45	20.9	23.10	19.2
d) Cash insurance[4]	0.65	0.3	.90	1.2	1.50	1.2
e) Bank interest[5]	8.40	4.5	9.00	12.2	16.90	14.1
f) Shrinkage[6]	7.00	3.7	10.00	13.5	15.00	12.5
g) Fumigation[7]	2.80	1.5	2.80	3.8	2.80	2.3
h) Head office charges[8]	7.20	3.8	7.75	10.5	26.95	22.4
N.M.C. margin	57.95	30.8	58.95	79.7	100.70	83.3
Total marketing margin	187.95	100.0	73.95	100.0	120.70	100.0
% change in margin over 1973/74	-		61	-	- 36	-

Source: 1973/74 to 1974/75: Ministry of Agriculture; 1975/76: N.M.C.

[a] Up to December, 1975 only.

\- means not applicable.

1 40 cts/90 kg bag;

2 5ct/bag/week for 23½ weeks (1973/74-1974/75) and for 26 weeks (1975/76);

3 3% of N.M.C. into-store price;

4 ½ of 7% of N.M.C. buying price (1973/74-1974/75) and 9% of N.M.C. buying price (1975/76);

5 36ct./200sh. (1973/74-1974/75), sh.4.00/shs.2000;

6 Based on 2% per 90 kg.bag;

7 25ct/bag (1973/74-1974/75) and 25ct/bag (1975/76);

8 1½% of N.M.C. buying price (1973/74-1974/75),
3½% of N.M.C. buying price (1975/76).

The value of the information contained in Table IV is severely limited in that several costs, including some of the larger ones, are arbitrary or supported by few, if any details.

The table shows that between 1973/74 and 1974/75 there was a slight increase in the N.M.C. marketing costs and that during the following year, the margin increased steeply. On the other hand, the margins of co-operatives decreased even more steeply. The decline in the co-operative margin is explained by the fact that co-operative unions no longer take part in maize marketing. The N.M.C. margin increased from 57.95 to 100.10 sh/MT i.e. by about 73% between 1973/74 and 1975/76.

The total marketing margin decreased steeply from 187.95 sh/MT in 1973/74 to 73.95 sh/MT in 1974/75 but showed a considerable increase to 120.10 sh/MT the following season. The total margin decreased by 36% from 1973/74 to 1975/76 at current prices.

An overview of the N.M.C. margin shows a generally rising trend from 1973/74 for nearly all the cost items. The only cost item which can directly be controlled by the marketing institutions is probably shrinkage. This is an allowance to cover crop losses after farmers have sold the produce. The degree of shrinkage largely depends on the quality of the harvested crop, availability and quality of storage facilities and moisture content of maize on purchase. The maximum shrinkage allowance for maize is 4% (25, p.27). Table IV shows that shrinkage cost has been increasing steadily from 1973/74 season.

Other cost items with a considerable increase include 'Branch costs' and 'Head office charges.' This rising trend in cost could partly be explained by the fact that the N.M.C. has to absorb an extra cost burden since the co-operative unions no longer

take part in maize marketing.

2. Relationship between unit cost and scale of operations of primary co-operative societies

2.1 Introduction

An attempt is made in this section to examine variation of unit costs and quantities of produce handled. This analysis is however subject to two data limitations. On the one hand, it should be noted that the primary co-operatives handle produce other than maize and that there is no separate account kept for the marketing costs of each product. Instead the marketing costs are pooled.

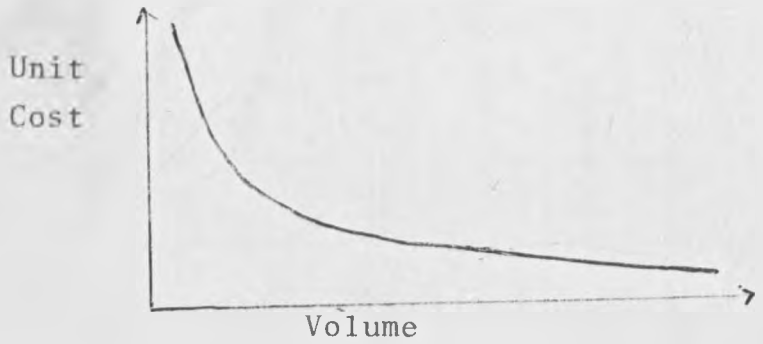
Another problem of the analysis to be reckoned with is that the sample size is small. The above two contingencies seriously hamper the use of econometric models to test the variation of unit costs with scale of operations. In what follows therefore, only the pooled quantities of the crops handled and the respective unit costs of marketing for each primary co-operative are compared.

2.2 Theory

As in most areas of economic activity, it is to be expected, cet. per., that co-operatives should bear an inverse relationship with unit costs as shown in Diagram III.

DIAGRAM III

EXPECTED VARIATION OF UNIT OF COST WITH VOLUME OF PRODUCE HANDLED.



In general, as the volume of produce handled increases, an economic enterprise is enabled to achieve various scale economies. Under such circumstances, costs are spread over the larger volume. From Diagram III it is seen that in theory, the decrease in unit cost is initially steep and gradually falls off as volume increases to that at higher volumes, at higher volumes of throughput, the decline in costs is relatively slow.

2.3 Practical approach

From Table V, it will be seen that in practice the unit cost/volume relationship of the primary co-operatives differs greatly from the ideal situation described above.

TABLE V

RELATIONSHIP BETWEEN VOLUME AND UNIT COST OF MARKETING FOR SELECTED PRIMARY CO-OPERATIVE SOCIETIES IN TANGA REGION, 1974

Unit cost (Sh/MT)	Volume of produce (MT)
151	684
173	163
180	512
188	439
190	541
193	656
196	1432
211	144
224	2666
503	252
503	476
508	94
574	144

Source: Adapted from data supplied by T.R.C.U.

Table V shows that unit costs and quantities handled do not bear an inverse relationship characteristic of an enterprise experiencing economies of scale. For example, a primary co-operative society operating at 151 sh/MT handled 584 MT of produce whereas another society with unit cost of 508 sh/MT marketed only 94 tons of produce. These two extreme cases clearly represent a state of scale dis-economies.

Variations in costs between co-operatives which handle similar volumes of produce is attributable to differences in marketing efficiency. Variations in such cost items as travelling allowances for committee men, salaries and wages and the number of buying-posts the society is operating will, undoubtedly, bring about differences in unit costs. The operation of buying posts brings about increased costs to primary co-operatives such as additional weighing machines, travelling allowances and wages for casual labourers. Due to inadequate storage facilities produce losses may also occur.

Table VI gives the number of buying posts for the sampled primary co-operatives, the average distances between the buying posts and the average number of people working at each of them during buying of produce. The last column is included to show the volumes of produce handled within a 4 month period from June to October 1975.

TABLE VI

NUMBER OF BUYING POSTS, AVERAGE DISTANCES BETWEEN THEM AND NUMBER OF PEOPLE EMPLOYED AT EACH, AND APPROXIMATE QUANTITY OF PRODUCE HANDLED, HANDENI DISTRICT, 1975

Society code reference	Number of buying posts	Average distance between buying posts (km)	Average number employed	Approximate volume of produce (MT)[1]
A	24	13	5	2632
B	13	5	6	489
C	11	8	5	44
D	4	6	6	80
E	7	9	8	1007
F	4	11	7	3834
G	6	6	9	238
H	9	8	9	295

Source: Field survey, 1975

[1]From 1/6/75 to 31/10/75 only

The table shows that there is a high degree of variation in the number of buying posts per society, the average number of people employed at each buying post and average distance between the buying posts. There is also variation in the volume of produce handled through buying posts. Primary society A has the highest number of buying posts and the highest volume of produce handled within

the four-month period covered. The average distance between the buying posts is 13 km and the average number of employees is 5.

The volume of produce sold through the buying posts under society A within the 4 month period was 2632 MT. At the other extreme is primary co-operative D with only 4 buying posts at an average distance of 4 km between them. The volume of produce marketed through the buying posts during the 4 month period was only 80 MT and the average number of employees operating the buying posts was 6. A comparison should be drawn between primary societies D and F. The latter, inspite of having only 4 buying posts, spaced further apart and employing more or less the same number of people as D, was able to collect 3834 MT of produce as compared to only 80 MT collected by D.

Another conclusion to be drawn from the table is that some of the primary co-operatives e.g. C and D are operating far too many buying posts despite the small quantities of produce available. In some cases, e.g. in primary co-operatives B, D and G, the average distance between the buying posts is only 5-6 miles but the number of employees varies from 6 to 9.

3. Effect of prescribed producer price on quantities passing through the official channel

The model: the quantities of maize which farmers are willing to sell in the legal commercial channel and the pre-announced producer prices may be represented by the relationship

$$Y_t = \alpha + \beta x_t$$

where Y = quantity of maize in MT;
β = regression coefficient;
X = producer price in sh/MT;
α = intercept of the y-axis;
t = time in years.

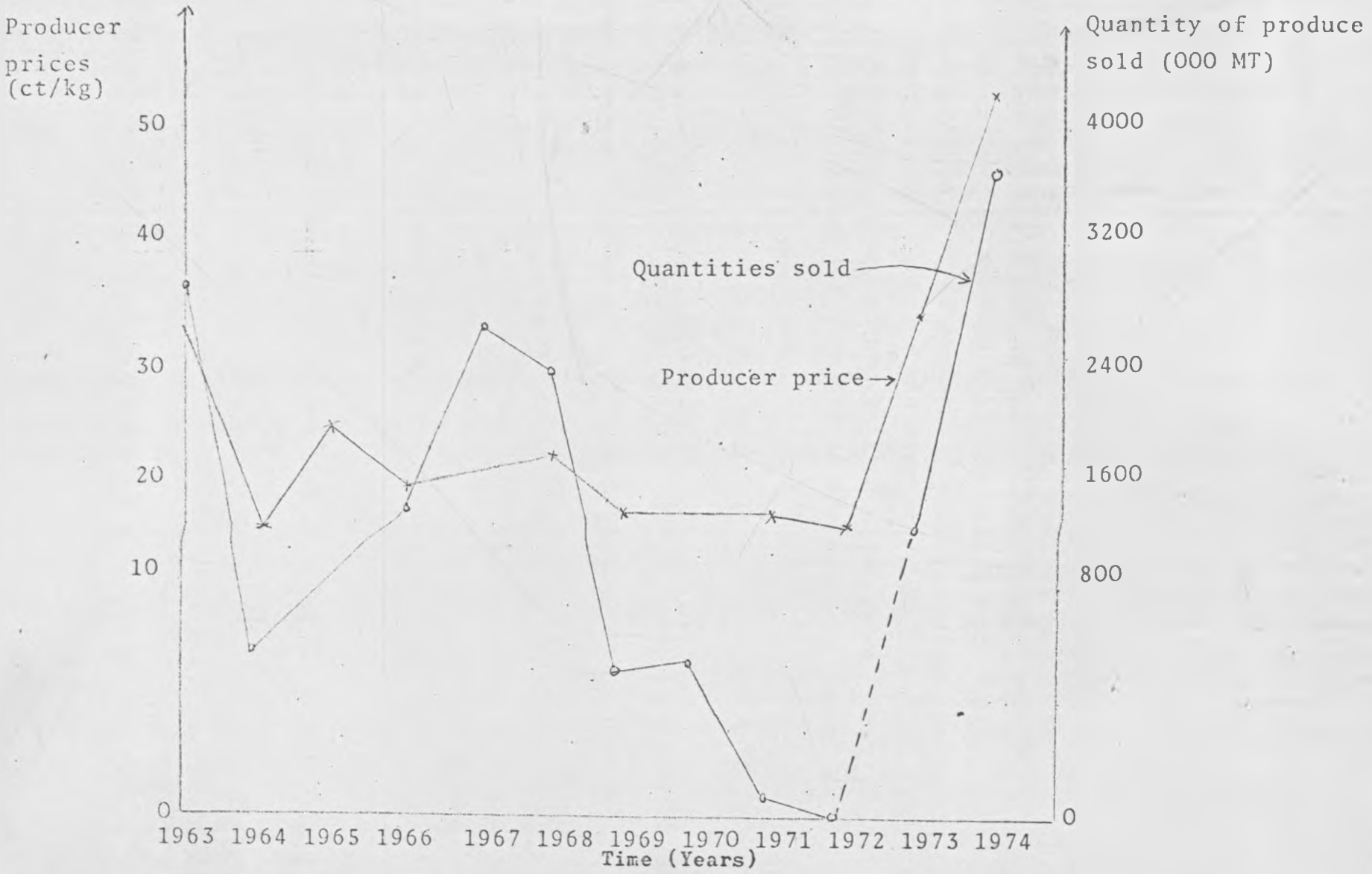
The coefficient of regression, β, gives the average effect of prices on quantities. β is computed in Appendix III-A and is found out to be 3.4. The regression coefficient, β, is found to be significant at 90% confidence interval.

To allow for inflation in time series, producer prices are 'weighted' by using retail price indices for consumer goods (Appendix III-B).

Normally, quantities offered for sale would be expected to synchronise fairly well with pre-announced prices. If prices are favourable, farmers would be expected to sell more of their produce through official channels, and vice-versa. An examination of Diagram II shows that this has not been the case for the period between 1966/67 to 1972/73. Factors such as unfavourable weather conditions and hence low production, availability of alternative market outlets and/or existence of more favourable prices for the other crops cultivated, could have contributed to this unexpected behaviour of producer prices and quantities marketed.

DIAGRAM II

RELATIONSHIP BETWEEN PRODUCER PRICES IN OFFICIAL CHANNEL AND QUANTITIES OF PRODUCE SOLD, TANGA REGION, 1963-1974



Source: Appendix III-B

4. Effect of price of maize relative to that of other crops in quantities of maize marketed through the official channel.

In practice, the above factors other than price, will be expected to have a bearing on the quantities of maize marketed through the official channel. As noted earlier on, the primary co-operatives market crops other than maize. If prices of the other crops are higher than that of maize, the market may be flooded with the commodities whose prices are more favourable. Table VII shows the price ratios of maize and some other commodities marketed. Since we are dealing with ratios, the effect of inflation on prices has not been taken into account.

TABLE VII

PRODUCER

PRICE RATIOS OF MAIZE AND SOME SELECTED COMMODITIES MARKETED THROUGH PRIMARY CO-OPERATIVES, TANGA REGION, 1963-1974

Time	Price ratios			
	Maize/ paddy	Maize/ beans	Maize/ cashew	Maize/ castor
1963	0.8	1.2	-	0.7
1964	0.5	0.3	0.3	0.4
1965	0.3	-	0.2	0.3
1966	0.5	0.5	0.3	0.4
1967	0.5	0.4	0.3	0.5
1968	0.5	0.6	0.4	0.5
1969	0.4	0.4	0.3	0.3
1970	0.4	0.4	0.3	0.4
1971	0.4	0.3	0.3	0.4
1972	0.4	0.3	0.3	0.4
1973	0.6	0.5	0.5	0.7
1974	0.8	-	0.7	0.7

Source: Appendix IV

Note: - means not available.

Table VII shows a generally decreasing trend for maize/paddy price ratio indicating that the price of paddy has been increasing more favourably than that of maize. As for beans, the price ratio decreased steeply from 1963 to 1964. From 1964 to 1974 the maize/beans price ratio varied from 0.3 to 0.5 with an all out peak of 0.6 in 1968. The table also shows that there has only been modest changes in relative

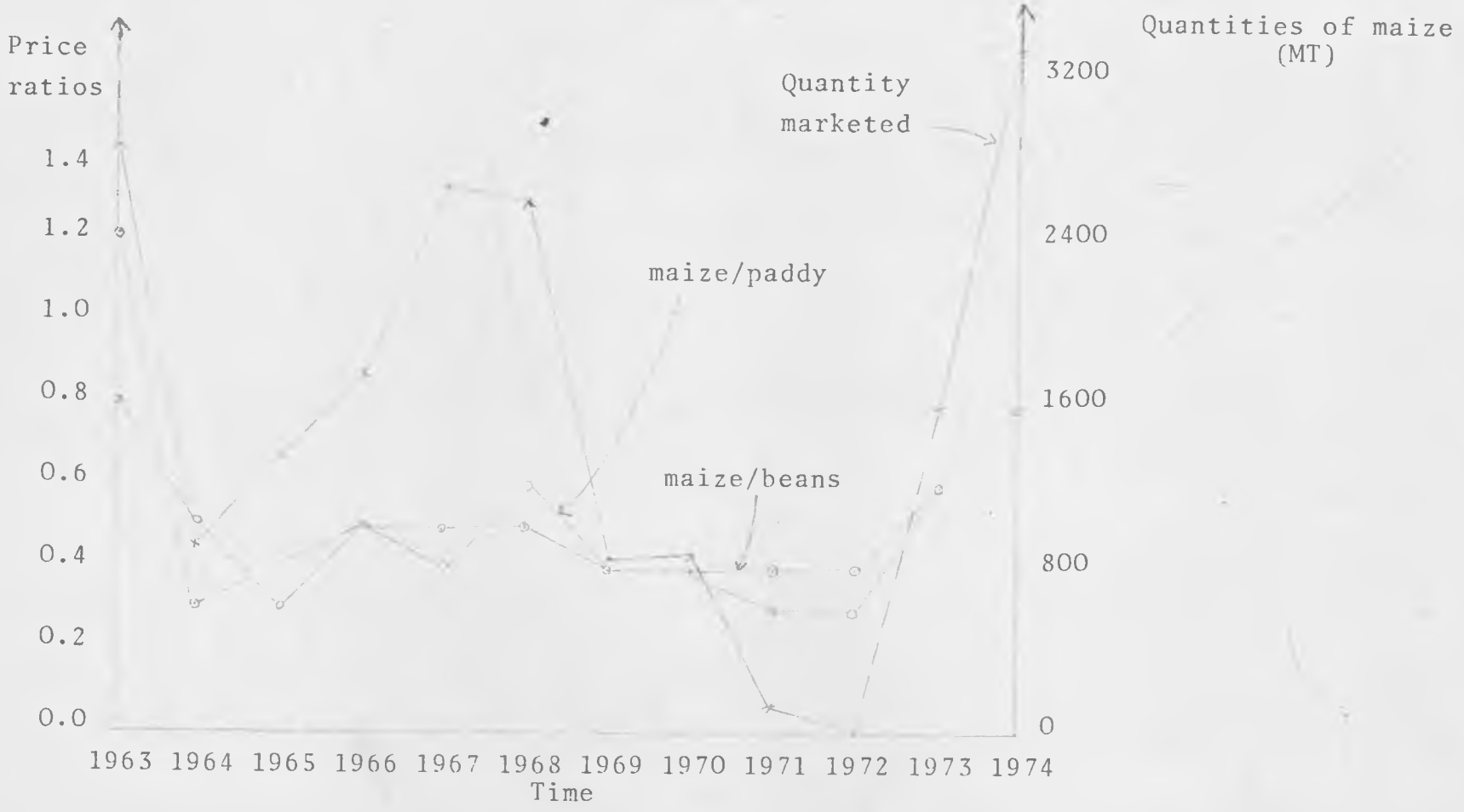
prices of maize and cashew from 1964 to 1974, indicating that the prices of the two commodities did not vary greatly. From 1972 to 1974 there was a steep increase of price ratio from 0.3 to 0.7.

The table also shows the maize/castor price ratio varied widely and that it was similar for 1963, 1973 and 1974. In between these three seasons, the ratios varied from 0.3 to 0.5.

The price ratios in Table VII are plotted in Digarams III and IV together with quantities of maize marketed through the primary co-operatives. The two diagrams show that the pattern of the price ratios and that of marketed quantities of maize is very varied.

DIAGRAM III

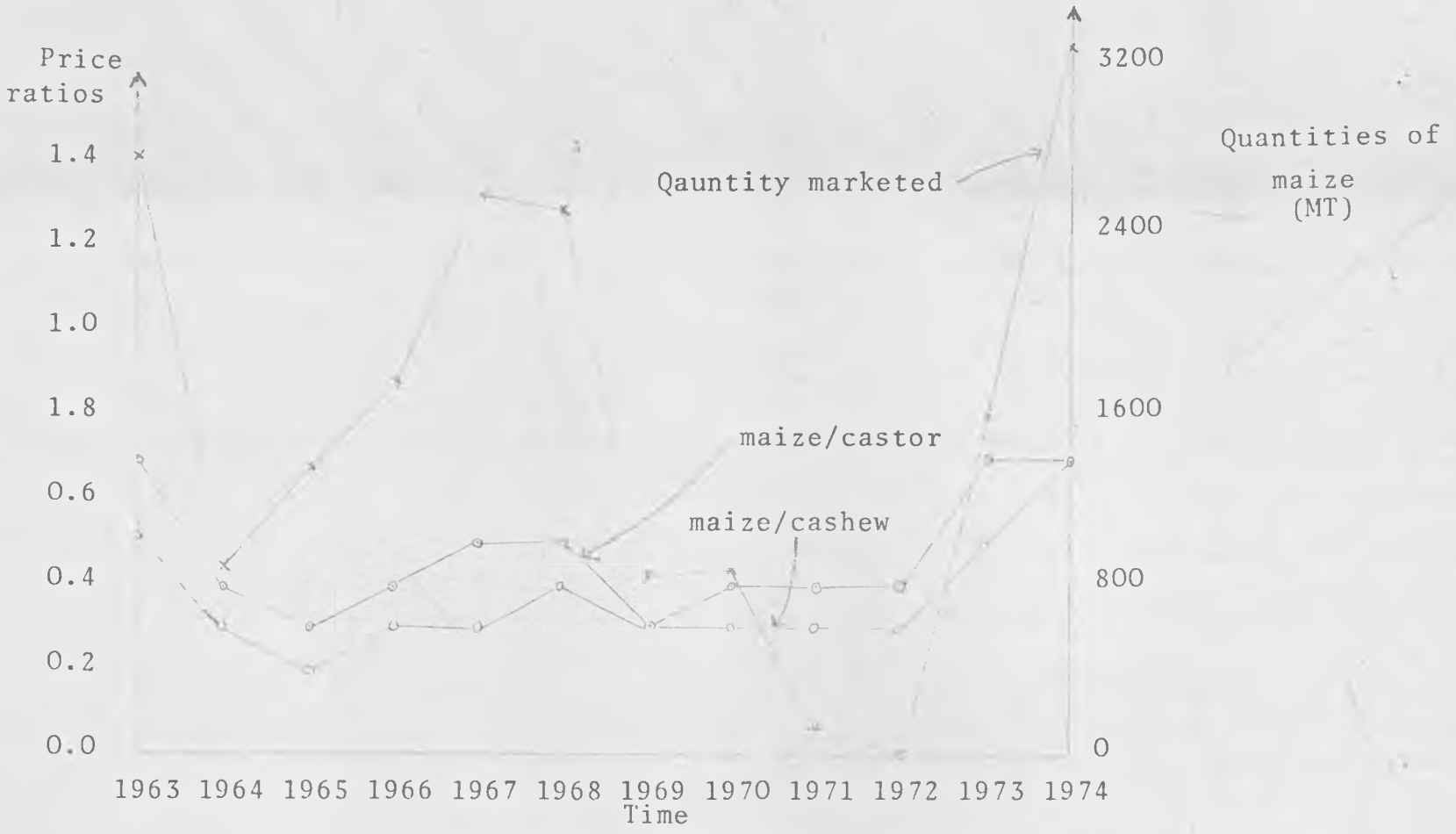
RELATIONSHIP BETWEEN MAIZE/PADDY, MAIZE/BEANS PRICE RATIOS AND QUANTITIES OF MAIZE MARKETED THROUGH OFFICIAL CHANNEL, TANGA REGION, 1963-1974



Source: Appendix IV

DIAGRAM IV

RELATIONSHIP BETWEEN MAIZE/CASTOR, MAIZE/CASHEW RATIOS AND QUANTITIES OF MAIZE MARKETED THROUGH OFFICIAL CHANNEL, TANGA REGION, 1963-1974



Source: Appendix IV

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Table VII shows a generally decreasing trend for maize/paddy price ratio indicating that the price of paddy has been increasing more favourably than that of maize. As for beans, the price ratio decreased steeply from 1963 to 1964. From 1964 to 1974 the maize/beans price ratio varied from 0.3 to 0.5 with an all out peak of 0.6 in 1968. The table also shows that there has only been modest changes in relative prices of maize and cashew from 1964 to 1974, indicating that the prices of the two commodities did not vary greatly. From 1972 to 1974 there was a steep increase of price ratio from 0.3 to 0.7.

The table also shows the maize/castor price ratio varied widely and that it was similar for 1963, 1973 and 1974. In between these three seasons, the ratios varied from 0.3 to 0.5.

The price ratios in Table VII are plotted in Diagrams III and IV together with quantities of maize marketed through the primary co-operatives. The two diagrams show that the pattern of the price ratios and that of marketed quantities of maize is very varied.

From Diagram III, it is seen that from 1963 to 1970, both the price ratios of maize/paddy and maize/beans have almost the same trend with quantities of maize marketed. In general, as the price ratios decrease, indicating higher prices and hence a more favourable market for paddy and beans as compared to maize, the quantities of maize traded are observed to decline.

The low relative price for maize from 1969 to 1972 characterize the 3 seasons whereby only small quantities of maize were sold through the official channel. From 1972 to 1974, there was a steep increase in the price ratios and this was reflected by the larger quantities of maize forthcoming in the official market.

The above views can also be gathered from Diagram IV which indicates generally that price ratios have a relationship on quantities of maize marketed. From the above discussion, a conclusion can be drawn that when the prices of other commodities marketed are higher than that of maize, the quantities of maize which farmers are able to offer for sale through the legal commercial channel are low. The reverse is, however, true when maize prices are higher. This is to be expected since high prices act as an incentive for farmers to produce.

5. Marketing services before and after the 1974/75 season

Introduction. In this section an attempt is made to test the hypothesis that 'The current marketing system is able to provide better marketing services to farmers than the previous one.' In this context, the 'current marketing system' is the system whereby primary co-operative societies sell maize directly to the N.M.C. The phrase 'the previous one' is used to mean the system prevailing before 1st July, 1973[10] under which primary co-operatives were authorized to buy from farmers, sell to co-operative unions which in turn re-sold to the N.M.C.

5.1. Marketing problems facing farmers

The set of problems facing farmers in marketing their produce conveniently and at reasonable prices is an important indicator of marketing inefficiency (24; p39). Among other things, farmers are most interested in the timeliness of payment, collection arrangements and availability of markets at remunerative prices. The problems faced by farmers in marketing maize are analysed below to examine the overall efficiency of maize marketing before 1974. The year 1974 is taken as a base for comparison because at that time the market structure was modified in a bid to increase efficiency. Marketing problems experienced by primary co-operative societies are examined. The factors which induce farmers to sell maize to private

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[10] A marketing season starts on 1st July and ends on 30th June of the following year.

traders instead of selling the produce through the legal commercial channel are also discussed.

In the analysis the 8 primary co-operative societies from which farmers were sampled, are coded by the letters A to H (Appendix VI). The sample of farmers from the 8 primary co-operatives, highlighted various problems in the marketing of maize as seen from Table VIII

TABLE VIII

MARKETING PROBLEMS EXPERIENCED BY FARMERS IN HANDENI DISTRICT WHEN MARKETING MAIZE THROUGH OFFICIAL CHANNEL BEFORE THE 1974/75 SEASON

	Number of farmers reporting a particular problem								Total	Proportion of sample
Society code reference	A	B	C	D	E	F	G	H	8	%
Number interviewed	10	10	10	10	10	10	10	10	80	
Problem										
1. Inadequate farm storage facilities	5	4	4	2	3	2	0	1	21	26
2. Containers provided very late	5	2	3	5	4	3	4	4	30	38
3. Poor collection system	8	8	4	6	5	6	3	2	42	53
4. Society depot/buying post										
a) Far from farm-units	7	6	4	7	7	3	2	3	39	49
b) Produce having to be re-sorted	5	3	2	4	3	2	4	5	28	35
c) Congestion	6	5	2	2	3	2	1	1	22	28
5. Delays										
a) Before produce is purchased	3	5	1	6	6	4	7	2	34	43
b) Before farmer payment	4	4	3	7	3	3	5	1	30	38
6. Markets not always available	2	3	5	3	6	5	2	2	28	35
7. Low producer prices	10	9	7	8	6	4	5	6	55	69
8. Do not know	0	0	0	1	0	1	1	0	3	4
Total number of problems	55	49	35	51	46	35	34	27	332	

Source: Field survey, 1975

Table VIII shows that farmers are particularly concerned about the low prices paid for their produce (69%); poor collection system (53%) and distances they have to transport their produce to society depots or buying posts (49%). The poor collection system could have resulted from the poor road network, shortage of transport facilities and insufficiency of buying posts.

Farmers are also concerned about the speed of produce purchase and delay in obtaining payment. Of the 80 farmers interviewed, 43% experienced delays before their maize was purchased and 38% before they were paid.

Containers were not always provided on time as reported by 38% of the respondents. Again this could have been in part due to the poor transport system or sheer incompetence of those concerned.

Another contentious matter among farmers is that if the officials in charge of primary co-operative society depots or buying posts consider that the maize delivered is below the permitted standard, the consignment must be 're-sorted'. 'Re-sorting' involves emptying every sack, removing weeds, straw, soil or any other extraneous matter - an extremely wearisome operation. No less than 35% of the farmers interviewed reported concern over this problem.

The largest number of complaints were expressed by farmers from primary co-operative society designated A. Other societies, ranked in order of the frequency of their complaints were B, E, D, and C. Examination of Figure II and personal observation and local inquiries shows that primary

co-operatives A, B, C, and D are situated in areas served by roads and tracks which are so poor that they can only be used during favourable weather and not at all during rainy seasons. This could probably partly explain the more frequent occurrence of marketing problems such as poor collection system and late provision of containers.

Figure II also shows that the above 4 societies which are the most dissatisfied are all located over 150 km. from Tanga town, the largest administrative and business centre in the region. In contrast the 3 primary co-operatives which are the least dissatisfied are all within 100 km. from Tanga town.

Proximity to large towns such as Tanga could have a bearing on farmers problems. Apparently, farmers living in more remote areas are exposed to more marketing problems than those farmers living close to administration centres from which marketing services can easily be provided.

5.2 Delays before produce is purchased and before farmers are paid

From Table VIII it may be seen that delays in produce purchase and farmer payment were identified as two of the problems experienced by farmers in Handeni District. Table IX gives details of the number of days which farmers had to wait in each case. The table also shows that every single farmer had to remain one or more days at the society depot or at a buying post before selling produce. Of the 80 farmers interviewed, 48% could recall having waited for 1 day only. A delay of 2 days before produce purchase was reported by 24% of the farmers and in 6 out of 8 primary co-operatives. A delay of more than seven days was reported by 4(5%) of the farmers.

TABLE IX

NUMBER OF DAYS WHICH FARMERS HAD TO WAIT AT CO-OPERATIVE DEPOTS OR BUYING POSTS BEFORE THEY COULD SELL MAIZE OR RECEIVE PAYMENT, HANDENI DISTRICT, 1975

Society code reference	Number of farmers								Total	Proportion of sample
	A	B	C	D	E	F	G	H	8	%
Number interviewed	10	10	10	10	10	10	10	10	80	100
Number of days waited										
A. Before produce purchase										
1	6	5	4	5	7	3	4	4	38	48
2	3	4	2	0	3	0	5	2	19	24
3	1	0	0	2	0	1	1	0	5	6
4	0	0	0	0	1	0	2	0	3	4
5	1	0	0	1	2	1	2	1	8	10
6	0	0	1	0	0	0	1	0	2	3
7	1	1	1	2	1	0	0	1	7	9
>7	0	1	0	0	1	2	0	0	4	5
Sub-total	12	11	8	10	15	7	15	8	86	
B. Before farmer payment										
1	3	2	3	4	5	2	3	4	26	33
2	0	3	3	2	1	3	4	2	18	23
3	3	2	1	2	0	1	2	3	14	18
4	2	0	1	2	1	3	1	0	10	13
5	1	2	3	2	2	1	1	1	13	16
6	0	0	0	0	0	2	0	0	2	3
7	0	0	0	1	0	2	1	2	6	8
>7	0	1	0	0	2	0	0	0	3	4
Sub-total	9	10	11	13	11	14	12	12	92	
Grand total	21	21	19	23	26	21	27	20	178	

Source: Field survey, 1975

The delays in obtaining payment were also very serious. The most fortunate, 72% of those interviewed, only had to wait either one day or two days in order to receive monies due to them. At the other extreme were 9 farmers (about 12%) who had to wait at the depots or buying posts for 7 days or longer to obtain payment.

The above two cases of marketing inefficiency were reported, in order of importance, by farmers from primary co-operative societies G, E and D (Figure II). Thus, proximity to good roads on Tanga town appears not to be responsible for these particular problems.

Delays before farmers can sell produce or receive payment obviously exacerbate existing problems and generate new ones. For instance, farmers are frequently forced to incur extra expenses such as for food, accommodation or hiring of watchmen to look after produce. And, of course, when the farmer is absent waiting around, his holding is bound to be neglected. Farmers may also be forced to defer important financial commitments for farm or domestic purposes due to delays in payment.

From the above marketing problems, it is evident that the standards of marketing efficiency are low. The expense, humiliation and frustration which farmers are forced to endure at co-operative society depots and buying posts are almost unbearable. The wonder is not so much at the fact that many farmers risk the rigours of the law and sometimes sell to private traders at low prices; rather it is a case of amazement that any farmers still sell maize through the so-called official channel.

5.3 Primary co-operative society marketing problems

A summary of response by secretaries of the selected primary co-operative societies in reply to the question 'What were the major problems encountered by the co-operative society in the marketing of maize in the seasons immediately before 1974/75?' is given in Table X

TABLE X

MARKETING PROBLEMS EXPERIENCED BY PRIMARY CO-OPERATIVE SOCIETIES IN HANDENI DISTRICT DURING THE SEASONS IMMEDIATELY BEFORE 1974/75

Problem	Society code reference								Total
	A	B	C	D	E	F	G	H	8
1. Competition from private traders	-	1	-	1	1	-	-	1	4
2. Farmers deliver poor quality maize	1	1	1	-	-	1	-	-	4
3. Inadequate storage facilities	1	1	1	-	1	1	1	1	7
4. Produce spoilage	-	-	1	-	1	-	-	1	3
5. Seasonality peaks	1	-	-	1	-	-	1	1	4
6. Money to pay farmers sometimes not available	1	1	-	1	1	-	1	-	5
7. Poor transportation system	1	1	1	1	1	1	1	1	8
8. Others	-	1	1	-	1	-	1	-	4
Total	5	6	5	4	6	3	5	5	39

Other problems include: shortage of containers, weighing machines and skilled manpower

Source: Field survey, 1975

All the 8 primary co-operatives experienced marketing problems to a varying degree with the highest number of problems registered in primary co-operatives B and E and the least number in F. The most acute problems reported were lack of proper transportation and storage facilities, reported in 8 and 7 primary co-operatives respectively. As the least serious problem was that of produce spoilage, it would seem quite possible that although the prevailing inventory losses are not regarded as being very serious. As a result of the poor transportation system, problems of produce collection from buying posts and society depots are made worse, with consequent produce losses. The transport problem is two-fold. On the one hand transport facilities are insufficient. On the other hand, the co-operative unions arranged for transport but in many cases this arrived one or more days after the date promised.

In 7 cases, the existing storage facilities were reported to be insufficient and/or in poor condition. There are 3 cases of produce spoilage reported. Apart from the poor transport system, which causes delay in collection of maize, spoilage of produce could also have resulted from the observed low standards of available storage facilities and from sales of poor quality of maize by farmers.

5.4. Illicit maize marketing

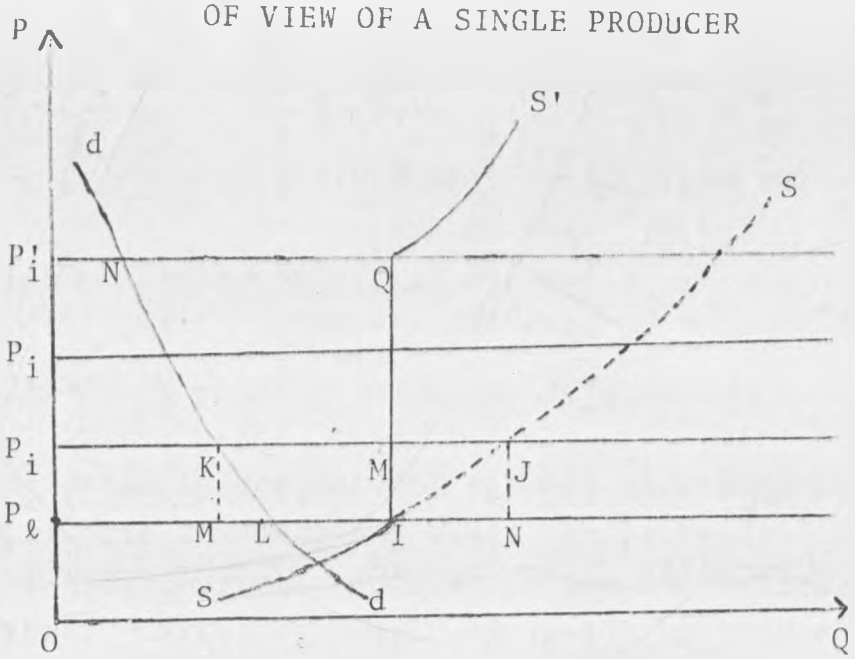
Introduction. In this section an attempt is made to establish the nature of illicit maize marketing. Illicit trading in maize occurs when trade is carried on across district frontiers without prior authorization from the N.M.C. Prices in markets outside the official 'one-channel' system are determined by free forces of supply and demand.

On one hand, we can assume to a very good extent therefore, that a farmer will divert sales from the legal market into illicit markets when prices paid by private traders are sufficiently high to offset the risks involved.

A: Single producer

DIAGRAM V

DEVELOPMENT OF ILLICIT MARKETING FROM THE POINT OF VIEW OF A SINGLE PRODUCER



In the diagram above, dd and ss are individual producer's demand and supply curves respectively. From Diagram V, suppose the price of maize, extra-N.M.C. is P_i and suppose that the N.M.C. pre-determined price is P_1. Suppose also $P_1 < P_i$, then the producer will be able to:

(i) supply P_1I;

(ii) demand P_1L for consumption;

(iii) sell quantity LI to co-operative society.

The above three conditions will hold in the legal or authorized market.

In market outlets other than the official one channel system, the producer will be faced with the following alternatives:

(i) supply P_iJ;

(ii) demand quantity P_iK for consumption and

(iii) sell KM to co-operative society.

The effect of price in the official channel being fixed at a lower level than that in markets outside the authorized one is therefore three-fold:

(i) individual's consumption is increased by an amount equal to ML;

(ii) supply is reduced by IN

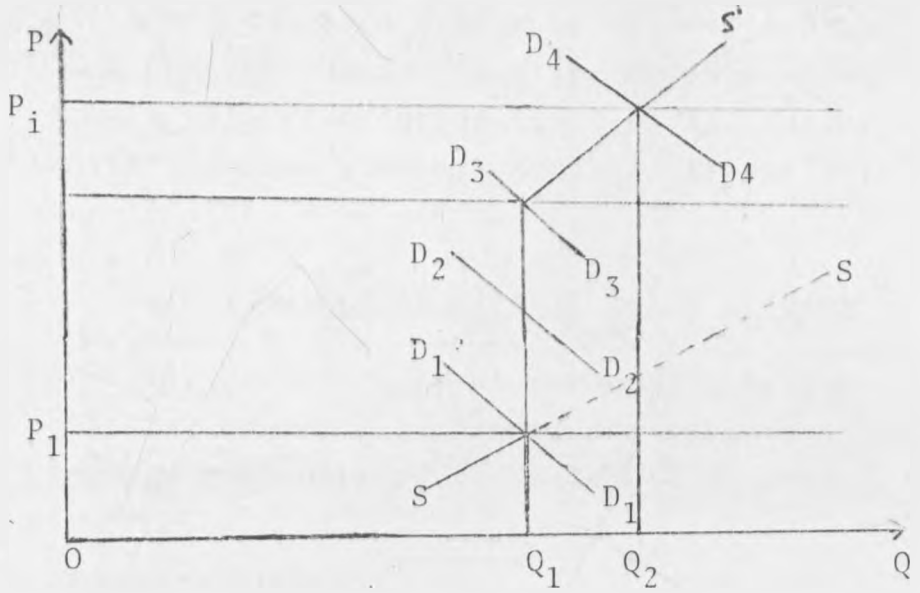
(iii) quantity marketed is reduced from KJ to LI

Prices higher than P_i e.g. P_j will be a sufficient inducement for farmers to engage fully in illicit transactions since the price differential in illicit markets and that in the authorized "one-channel" market system (P_j-P_1) will be high enough to offset the risks involved. When prices are as high as P_j, the individual's supply will shoot up as shown in the diagram by the discontinuity of ss at I. Hence with the existence of illicit maize trading the producer's supply curve is now ss'. In times of acute shortage, price in markets other than the official one, would rise to P_i' and the producer would curtail his consumption to $P_i'N$ and sell NQ to private traders.

B: The entire market

DIAGRAM VI

DEVELOPMENT OF ILLICIT MAIZE TRADING FROM THE POINT OF VIEW OF MANY PRODUCERS



The above diagram is analogous to that in case A, but considers an entire market situation and not on an individual producer basis. At demand levels such as D_1D_1, farmers will be willing to offer quantity OQ, for sale. At D_2D_2 and throughout the inelastic zone, only OQ will be forthcoming in the market at the official price P_1 inspite of the increased demand.

Beyond D_3D_3, the pressure of excess demand and prices are high enough to induce farmers to break the law and enter into illicit transactions. When prices are as high as P_i' farmers are willing to sell large quantities (OQ_2) of maize to private traders. In general therefore, if demand in one area is high, due to, for example, scarce supply or overpopulation, illicit maize trading is likely to occur.

So far, the above theoretical approach to illicit trading has been centered solely on suppliers. On the other hand, it should be noted that the consumer is faced with a fixed price, which is the N.M.C. selling price and can also engage in illicit transactions. If a consumer buys at a price below that fixed by the N.M.C; this transaction is illegal. In the analysis which follows, however, emphasis is put only on the supply side.

5.5 Nature of illicit maize trading

Factors which tempt farmers to by-pass the official commercial channel and sell in illicit markets are outlined in Table XI.

TABLE XI

CAUSES OF ILLICIT MAIZE SELLING REPORTED BY FARMERS IN HANDENI DISTRICT, 1975

Society code reference	A	B	C	D	E	F	G	H	Total 8	Proportion of sample %
Number interviewed	10	10	10	10	10	10	10	10	80	100
Causes										
1. Private traders offer										
a) Better container service	4	5	5	2	2	3	2	3	26	33
b) Ex-farm collection	4	2	7	6	5	4	6	5	39	49
c) Buying of other produce besides maize	3	4	4	3	4	3	5	4	30	38
d) Immediate payment	5	5	3	2	6	2	3	5	31	39
e) Higher prices	5	5	4	4	3	5	3	4	33	41
f) Assured outlet	3	1	4	3	1	4	3	4	23	29
Total	24	22	27	20	21	21	22	25	182	

Source: Field survey, 1975

Table XI shows that the standard of a number of very important services offered by private traders was considered by a substantial proportion of interviewed farmers to be better than similar services provided by official buyers.

In general, private traders, were reported by dissatisfied farmers to offer better marketing services than official traders in such respects as prompt collection from farm units, higher prices, provision of containers, speed of payment and willingness to buy other produce[11] in addition to maize. The occurrence of illicit maize trading was attributed mainly to the above factors.

In order of importance, the most serious factors contributing to the massive scale of illicit transactions include ex-farm collection by private traders (49%), higher prices in illicit markets (41%), and immediate payment offered by the private traders (39%).

Of the 80 farmers interviewed, 23 (29%) reported that cases of illicit trade occurred due to lack of official outlets for maize.

The survey on primary co-operative society secretaries revealed that farmers were tempted to sell maize to private traders by a number of factors as outlined in Table XII.

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11 Other crops sold illegally include paddy, pulses and cardamon.

TABLE XII

CAUSES OF ILLICIT MAIZE SELLING REPORTED BY CO-OPERATIVE SOCIETY SECRETARIES IN HANDENI DISTRICT, 1975

Cause	Society code reference								Total
	A	B	C	D	E	F	G	H	8
1. Private traders offer									
a) Better container service	1	1	-	-	-	1	-	-	3
b) Better collection service	1	1	1	-	1	-	1	1	6
c) Speedy payment	1	1	-	1	-	1	-	-	4
2. Farmers' urgent need of money	-	1	1	1	1	-	1	1	6
3. Others	1	-	1	-	-	-	-	1	3
Total	4	4	3	2	2	2	2	3	22

Other causes include: lack of sufficient official market outlets in some areas, ex-farm collection of other produce

Source: Field survey, 1975

Private traders, in comparison with official buyers, were, according to primary co-operative society officials, able to procure maize because they provided more reliable and early collection arrangements, higher prices and speedy payment.

Other contributing factors were reported to be: farmers' urgent need for money, ex-farm collection of other produce and lack of assured outlets in the official market especially in areas of scattered supply.

An examination of Tables VIII, XI and XII leaves no doubt whatsoever that illicit maize trading is a direct and inevitable result of a range of marketing inefficiencies. From the three tables it can be seen that private traders have been able to offer, with relative ease, better marketing services as compared to official dealers. The better marketing services offered by illicit traders 'syphon off' considerable quantities of maize from the official channel.

5.6 Outlets for maize sold outside the official channel

As seen in the Table XIII, maize sold to private traders is eventually channelled to various destinations.

TABLE XIII

FINAL DESTINATION OF MAIZE IN ILLICIT MARKETS AS REPORTED BY FARMERS IN HANDENI DISTRICT, 1975

	Society code reference								To-tal	Proportion of sample
	A	B	C	D	E	F	G	H		%
Number interviewed	10	10	10	10	10	10	10	10	80	100
Destination										
1. Same district	3	2	4	2	3	4	1	4	23 22	27
2. Other districts within Tanga Region	2	6	4	4	5	7	7	3	38	48
3. Outside Tanga Region	3	5	6	3	5	4	3	2	35	44
4. Other countries	0	0	1	0	0	0	1	0	2	3
5. Do not know	2	1	3	0	2	1	3	2	14	18

Source: Field survey, 1975

Table XIII shows that a substantial amount of maize traded outside the official channel finds its way in Districts other than Handeni. Of the 80 farmers interviewed, 48% were of the opinion that maize marketed through the illicit channels is sold in other districts

within Tanga Region whereas 44% said the maize finds its way areas outside the region. The areas which surround Handeni District, it should be noted are areas of low maize production (25, p 76). In one case, the adjoining district has, in addition, a high population density (25, p 38). In both cases therefore, there is excess demand for maize in surrounding areas.

Only in 22 cases (27%) did farmers express the opinion that the maize is sold in other parts of Handeni District. Selling of maize within the same district but outside the official channel is, however, permitted. Nevertheless, this transaction can still be considered to be unlawful since the private trader can sell the maize at prices higher than the authorized one.

A small proportion (3%) of farmers replied that maize is sold in other countries whereas 18% were not aware of the final destination of maize sold to private traders.

5.7 Observed improvements in the current marketing system

Ever since the N.M.C. and primary co-operative societies became the sole authorized dealers in the internal maize trade in July, 1974, several improvements in the marketing services have been made in the official market system. Table XIV gives a summary of such improvements.

TABLE XIV

IMPROVEMENTS IN MARKETING SERVICES* OBSERVED BY FARMERS IN HANDENI DISTRICT DURING THE 1974/75 MARKETING SEASON

Society code reference	Number of farmers A	B	C	D	E	F	G	H	Total 8	Proportion of sample (%)
Number interviewed	10	10	10	10	10	10	10	10	80	100
Observed improvements:										
1. Collection system	6	5	5	7	3	5	4	5	40	50
2. More buying posts	8	7	9	7	6	8	9	7	61	76
3. Payment less slow	10	9	8	8	9	9	10	9	72	90
4. Higher producer prices	8	9	9	10	6	8	9	9	68	85
5. Others	5	4	4	2	3	4	5	3	30	38
Total	37	34	35	34	27	34	37	33	271	

Other improvements include: Assured markets, reduced congestion at buying points and less delay before produce purchase

Source: Field survey, 1975

*"Marketing Services" here refers to those provided by the official agencies.

Of the 80 farmers interviewed, half were of the opinion that the collection system has been improved. Cases of reduced distances over which produce had to be transfered and cases of faster payment were reported by 76% and 90% of the farmers respectively. Higher ex-farm prices were reported by 85% of the respondents. Other improvements noted included: more assured market, less congestion at society depot/buying posts and less delay before purchase of produce.

5.8 Improvements in collection system

The observed improvements in produce collection system are two-fold. On the one hand, provision of transport facilities by the N.M.C. has been more reliable and more frequent. This means that maize delivered to buying posts is more easily transported to society depots or N.M.C. godowns. In turn, this has reduced congestion and farmer delays at buying posts and has also reduced produce spoilage.

On the other hand, distances over which farmers have to transport maize to society depots or buying posts have been reduced by the establishment of more buying posts in producing areas. Table XV gives details of distances from individual farms to society depots and buying posts.

The table shows that most of the farmers are within easy reach of sales outlets so that even with the available modes of transportation[12] maize can be more easily transported.

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12 Produce is delivered to markets, mainly in hand carts and head-loads. When distances to be covered are considerable, groups of farmers hire lorries.

TABLE XV

DISTANCES FROM FARM UNITS TO SOCIETY DEPOTS/BUYING POSTS, HANDENI DISTRICT, 1974/75

Society code reference	Number of farmers within particular distances								Total	Proportion of sample
	A	B	C	D	E	F	G	H	8	
Number interviewed	10	10	10	10	10	10	10	10	80	(%)
Distance interval (km)										
0-0.5	1	0	1	1	0	1	0	0	4	5
0.5-1.0	2	5	1	2	4	5	1	1	21	26
1.0-1.5	0	2	1	2	0	0	2	2	9	11
1.5-2.0	3	0	1	1	0	0	1	1	7	9
2.0-2.5	0	0	2	0	1	1	1	2	7	9
2.5-3.0	0	1	1	0	0	0	2	1	5	6
3.0-3.5	1	0	0	3	0	1	2	0	7	9
3.5-4.0	0	1	2	0	1	1	0	0	5	7
4.0-4.5	0	1	1	0	1	0	0	1	4	5
4.5-5.0	1	0	0	0	2	0	1	0	4	6
>5.0	2	0	0	1	1	1	0	2	7	9
Total	10	10	10	10	10	10	10	10	80	100

Source: Field survey, 1975

Of the 80 farmers interviewed, 5% and 26% had to transport maize for distances of between 0-0.5 and 0.5-1.0km. respectively. The survey also revealed that only 9% of the farmers live more than 5 km. away from the nearest society depot or buying post.

5.9 Future participation of farmers in illicit maize trade

The quality of marketing services has been observed to be the main force dictating the direction of trade. The persistence of extensive and serious deficiencies in marketing services provided by official marketing channel has, to a large extent, sustained the widespread illicit trading in maize.

Asked about their likelihood of selling maize to private traders in future, farmers gave various reasons for their disinclination to do so as shown in Table XVI.

TABLE XVI

REASONS FOR FARMERS' UNWILLINGNESS TO PARTICIPATE IN ILLICIT MAIZE TRADE IN HANDENI DISTRICT

Society code reference	Number of farmers giving particular reason								Total	Proportion of farmers
	A	B	C	D	E	F	G	H	8	
Number interviewed	10	10	10	10	10	10	10	10	80	(%)
Reason										
1. Marketing services offered by official channel have greatly improved	7	5	6	6	8	7	5	6	50	63
2. Private traders										
a) not readily available	4	3	2	1	1	3	2	1	17	21
b) sometimes offer lower prices	4	5	3	4	2	6	4	3	31	39
3. Legal restrictions being more strictly enforced	2	3	1	2	3	2	1	1	15	19

Source: Field survey, 1975

The table shows that 63% of the farmers believed they received better marketing services from the legal commercial channel than private traders during the 1974/75 season. Some 21% expressed their reluctance to sell to private traders in future due to scarcity of private traders in their locality. Furthermore, the unwillingness of many farmers to participate in illicit maize trading stems from the fact that prices offered by traders are sometimes lower than those paid by official dealers (39%). Of the 80 farmers interviewed, 15 (19%) expressed their concern not to sell to private traders in future due to the more strict legal restrictions.

5.10 Test of hypotheses

5.10.1 One of the hypotheses of this study is concerned with the effect of shortening the marketing chain on the marketing costs and hence marketing margins. The hypotheses states that "shortening of the maize marketing chain by removing co-operative unions from the 'one channel system' will decrease the marketing costs and hence marketing margins."

A detailed marketing cost analysis was carried out in two steps. The first step involved cost analysis during the period when co-operative unions were providing maize marketing services and the second one when they had ceased.

The shortening of the marketing chain was seen in Table IV to have the effect of reducing the marketing margin by 25% from 1973/74 to 1975/76.

5.10.2 The second hypothesis concerned the effect of prescribed producer prices on the quantities of maize farmers offer for sale through the legal commercial channel. Stated in short the hypothesis was

$$H_1 : \beta \neq 0$$

Where β = the average effect of prices on quantities marketed = regression coefficient.

A model relating prices to quantities marketed was constructed and the value of β was established as being 3.4. The observed value of t-statistic was calculated (Appendix III-A) by the formula

$$t = \frac{\hat{\beta}}{\sqrt{S^2/\Sigma x_i^2}}$$

β was found to be significant at 90% confidence interval. The hypothesis that prescribed prices has an effect on quantities of maize marketed through the official channel is accepted at 90% level of significance. This leaves only a 10% probability that prices have no effect on marketed quantities. This 10% probability could be accounted for by other factors including quantities produced, price of other crops, and existence of alternative markets.

5.10.3 The final hypothesis was concerned with comparing the quality of marketing services offered to farmers by the two market systems i.e. one with co-operative unions as part of the marketing chain and the other without them.

The following steps were used to test the hypothesis:

(i) the set of marketing problems which farmers experienced when co-operative unions were dealing in internal maize trade were examined. Marketing problems experienced by primary co-operative societies were also examined.

(ii) Competition from private traders was seen to be a major problem facing primary co-operative. The factors which cause farmers to sell maize through illicit channels were investigated from farmers' point of view and also from the standpoint of selected primary co-operative societies.

(iii) Improvements in marketing services which have taken place since the N.M.C. and primary co-operatives became the sole authorized dealers in maize in July, 1974, were examined.

It was found out that farmers have been exposed to a wide range of marketing problems, some of them of considerable importance. Furthermore it was observed that the physical and financial problems facing farmers give rise to others such as illicit maize trading which undermines the entire marketing system and threatens the viability of business in the official commercial channel.

CHAPTER V

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

The 'one-channel' maize marketing system in Tanzania has been the subject of much and well justified criticism. Among other things the price differential between the producer and consumer has been steadily increasing and one authority describes it as the highest in the world.

The above state of marketing inefficiency has given rise to new problems such as illicit maize trading, which constitutes a threat to the viability of maize trade in the official market channel.

In an attempt to alleviate the above marketing problems the Government re-organized the market structure, including the establishment of uniform pan-territorial producer price and terminated the involvement of co-operative unions. Primary co-operative societies now sell maize direct to the N.M.C. which is also responsible for exporting and importing.

This study had five objectives. The first objective was to determine the effect of the current maize marketing system i.e. without co-operative unions as part of the marketing chain, on the marketing margin. A detailed cost analysis was carried out for the periods before and after the co-operative unions had ceased to trade in maize.

The analysis showed that, shortening of the marketing chain by eliminating co-operative unions from maize trade had the effect of reducing the total marketing margin. The margin could be further narrowed by reducing the produce losses which arise through shrinkage.

To achieve this goal, it is suggested that the system of farmer payment on quality basis should be enforced more strictly, especially at point of first sale. This, it is hoped, will encourage farmers to practice thorough sorting and grading of maize before sale, and hence make the industry more competitive and efficient. Improving the quality of storage facilities is also suggested as an additional method of minimizing produce losses.

The study also showed that unit marketing costs of primary co-operative societies do not bear an inverse relationship with volumes of throughput, a phenomenon which is characteristic of an enterprise experiencing dis-economies of scale. Some of the primary co-operatives are operating far too many buying posts in spite of the low throughput.

The second objective of the study was to identify the conditions which surround the existence of illicit maize trading. Analysis of primary data obtained from farmers and primary co-operative society surveys showed that a wide range of factors contribute to the viability of illicit maize trade.

The principal reason for farmers to sell maize to private traders, was the superior marketing services provided by private traders. Private traders have provided the following services with relative ease, which the official buyers have not been able to provide: more reliable and speedier collection of produce from farms; speedier payment, higher prices in some cases; a 'package deal' involving collecting and marketing of produce other than maize; and lastly, better container services.

The price of maize, relative to that of other crops, was found to have an effect on the quantities of maize marketed through the official channel. Analysis showed that when maize prices are higher than those of other commodities, more maize is sold through the official channel. Lower maize prices were seen to have a constricting effect on quantities marketed through the official channel. Also, it was found out that maize traded through illicit channels is eventually sold in areas of high demand. Enforcing of legal restrictions on illicit maize trading is therefore questionable especially when maize is the staple food and when the official marketing system has proved to be inefficient in some respects.

The third objective was to investigate the possible areas of market improvement. The minimization of shrinkage losses by improving the quality of storage facilities at farm and primary co-operative levels, and by encouraging thorough grading and sorting by farmers was suggested as a possible way of reducing the cost of shrinkage.

Although operation of buying posts is necessary, this activity, in some cases, only inflates the already high marketing margin. In a bid to reduce marketing costs it is therefore further suggested that:-

(i) buying posts should be established only when and where the volume of throughput is sufficiently high to cover the costs involved;

(ii) during periods of glut, temporary buying posts can be established where necessary;

(iii) in societies where there are many buying posts and the volume of throughput is low, some of the buying posts should be closed down;

(iv) where primary societies are operating buying posts which are close together, the buying posts can be amalgamated especially when volume of throughput is low;

(v) finally, it is suggested that, a minimum possible number of people should be employed to man the buying posts. An additional number of staff can be employed during peak of buying season.

Despite the fact that co-operative unions are no longer involved in maize trade they still receive a proportion, 50%, of the union levy they used to be paid when they were authorized maize dealers. A suggestion was made, that this amount of levy could be diverted to primary co-operative societies to improve marketing facilities such as storage.

The fourth objective of the study was to find out whether or not the current market system extends better marketing services than the one preceding it. Analysis of data showed that ever since it was instituted, the present marketing system has improved certain marketing services including; the collection system; introduction of additional buying posts in producing areas to reduce the distances over which farmers have to transport their maize for sale; speedy produce purchase and payment; higher producer prices; and finally, more assured outlets.

The fifth objective was to find out whether the current market system will induce farmers to sell more maize through the legal commercial channel than formerly and thus check the incidence of illicit transactions. The principal reason for farmers' willingness to sell through official channel in favour of illicit channels was found to be the greatly improved marketing services. With a continuation of improved quality of marketing services, possibilities of greatly reduced occurrence of illicit maize trade were visualized.

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APPENDIX 1

FARMER QUESTIONNAIRE

Name..... Date interviewed.....

Co-op. society .....

A. Introduction: Good morning/afternoon. I am a student from the University of Nairobi. I am conducting a research on 'Maize Marketing in Tanga Region.' The research is confidential to the University and I hope to show how the marketing of maize can be improved for farmers. Most of my questions concern the maize crop which you harvested last season.

B. Questions:

1. What crops do you usually grow on your farm?

(a) Maize .....
(b) Paddy .....
(c) Coconuts .....
(d) Pulses .....
(e) Sunflower .....
(f) Sorghum .....
(g) Cardamon .....
(h) Castor .....
(i) Cashew .....
(j) Cocoa .....
(k) Cotton .....
(l) Other(s) .....

(2) What was the area under maize last season?

(a) Pure stand ..... Ha.

(b) Mixed stand ..... Ha.

3. How much maize did you harvest last season?

..... bags (90 kg)

4. How much of this maize has been kept aside for consumption on your farm?

..... bags (90 kg)

5. How much has been set aside to be used as seed the following season?

.....

6. Did you sell any of the maize?

(a) Yes .....

(b) No .....

(c) Don't remember .....

7. (a) If the answer is yes; how much maize did you sell?

..... bags (90 kg)

..... debes

..... don't remember

(b) If the answer is no; what were the reasons?

(i) No surplus to sell .....

(ii) Prices not favourable .....

(iii) No markets available .....

(iv) Stored the maize anticipating to fetch higher prices later in the season.....

(v) Crop spoiled by weather, pests, etc.....

(vi) Other reason(s) .....

8. How much maize did you store?

..... bags (90 kg)

..... debes

9. What were the methods of storage?

   (a) Silo .....

   (b) Smoked in a barn .....

   (c) Open air .....

   (d) Tarpaulin storage .....

   (e) Other(s) .....

10. Did you store the maize in

   (a) Cobs? .....

   (b) Bags? .....

   (c) Loose storage? .....

11. Why did you decide to store your maize?

   (a) Expected better prices from co-operative societies later in the season .....

   (b) Expected better prices from traders later in the season .....

   (c) No market at the time of harvest .....

   (d) Stored for use as seed .....

   (e) For consumption on the farm .....

   (f) Other reason(s) .....

12. Where did you sell your last maize crop?

   (a) Co-operative Society .....;
   Distance from farm;..... km; Quantity:.....
   bags ..... debes .....

   (b) Buying post .....; Distance from farm
   ..... km
   Quantity :..... bags ..... debes

   (c) Local market .....; Distance from farm
   .....km; Quantity :..... bags ....debes

(i) District .....; Distance from farm:.....km; Quantity :..... bags ..... debes.

(ii) Region .....; Distance from farm :.... km; Quantity :..... bags ..... debes

(iii) Other place(s) ..... ; Distance from farm .....km; Quantity .....bags ..... debes.

13. What do you think are the main reasons which cause farmers to sell maize illegally?

(a) Can't transport the maize to co-operative society or co-operative society buying post .....

(b) Co-operative take ..... days to pay whereas private traders pay in ..... days.

(c) Private traders offer higher prices than co-operative societies .....

(d) Private traders collect the maize from farm.....

(e) Co-operative societies are sometimes not ready to buy maize .....

(f) Not aware of price offered by co-operative societies .....

(g) Co-operative societies do not provide bags .....

(h) Private traders provide bags .....

(i) In addition to maize, private traders also buy other crops on the farm .....

(j) Private traders pay in advance .....
Offer loans .....

(k) Temptations to sell for higher prices so as to cope up with the increased cost of living .....

(l) Want foreign exchange .....

(m) Other reason(s) .....

14. When you sold to co-operative societies or Co-operative Society buying post, after how long did you get your money?

(a) Same day ..... (b) After ..... days

(c) After ..... weeks (d) After .....months

(e) Don't remember .....

15. If you sold to co-operative society or co-operative society buying post, how did you transport the maize and over what distance?

(a) Headloads ..... Men ..... Women.....
Distance .....km; Society/Buying Post.

(b) Bicycle ..... Distance.....km; Society/ Buying Post

(c) Hand cart ..... Distance .....km; Society/ Buying Post

(d) Donkey ..... Distance .....km; Society/ Buying Post

(e) Ox/Donkey cart .... Distance .....km; Society/Buying Post

(f) Lorry ..... Own ..... Hired.....
Rate..... cts/km/ton

(g) Tractor trailer ..... (h) Bus .....

(i) Other(s) .....

16. When farmers sell to private traders, how is collection arranged?

(a) Produce collected at farm ..... by ..... (mode of transportation).

(b) Use own transport ..... for a distance of .....km (also specify mode of transportation) .....

17. What are disadvantages, if any, of selling to private traders?

(a) Legal restrictions .....

(b) Lower prices .....

18. What have been the disadvantages, if any, of selling to co-operative societies/co-operative society buying post in the past few seasons?

(a) Produce re-sorting .....

(b) Poor collection arrangements .....

(c) Had to wait long (....days) before produce is finally bought .....

(d) Long distances from farms to points of first sale .....

(e) Poor services at buying posts/co-operative society .....

(f) Lack of official markets sometimes.....

(g) Had to wait long (.....days) before payment is finally effected .....

(h) Low produce prices .....

(i) Others .....

19. Delays

No of days	Purchase	Payment
1		
2		
3		
4		
5		
6		
7		
8		

20. (a) Do you think you will sell all or some or none of your maize to a private trader in the coming season?

(i) All..... (ii) Some ..... (iii) None...

(b) Reasons :

(i) All (a) Satisfied with services offered by traders in previous seasons....

(b) Official buyers sometimes not available .....

(c) Other (s) .....

(ii) Some (a) Satisfied last year .....

(b) Legal restrictions .....

(c) Other (s) .....

(iii) None (a) Dissatisfied last year .....

(b) Private traders not available .....

(c) Legal restrictions .....

(d) Legal prices higher than prices in illicit markets last season .....

(e) Better services offered by legal buyers last season .....

(f) Others .....

21. Where do you normally sell the other crops?

	Crops	Co-operative society	Trader
(i)	Rice	.....	.....
(ii)	Pulses	.....	.....
(iii)	Sunflower	.....	.....
(iv)	Sorghum	.....	.....
(v)	Cardamon	.....	.....
(vi)	Castor	.....	.....
(vii)	Cocoa	.....	.....
(viii)	Cotton	.....	.....
(ix)	Coconuts	.....	.....
c)	Other(s)	.....	.....

22. Where do you think maize bought by private traders is finally sold?

i) Same district .....

ii) Other districts in Tanga Region .....

iii) Other districts outside Tanga Region ...

iv) Other countries .....

v) Don't know .....

23. If you compare last year with previous years, do you think marketing services for maize as offered by co-operative societies/NMC have improved?

a) Yes .....

b) No .....

c) Remained the same .....

d) Became worse than ever .....

24. What marketing services have been improved?

a) Collection system .....

b) Early payment .....

c) Availability of sacks .....

d) Sorting/grading .....

e) Official outlets always available .....

f) Number of buying posts increased .....

25. In order to improve the commercial marketing of maize even further, what do you suggest the government should do?

a) .....

b) .....

c) .....

d) .....

APPENDIX II

QUESTION TO BE ANSWERED BY PRIMARY CO-OPERATIVE SECRETARIES.

Name of Society .....

Name of Secretary .....

Date interviewed .....

District .....

Membership (1973/74) .....

A. Introduction: Good morning/afternoon. I am a student from the University of Nairobi.

I am conducting research on "Maize Marketing in Tanga Region." I assure you that the research is confidential to the University. It is intended that the findings of this research will be of use in showing how the marketing of maize can be improved.

B. Questions

1. What are the major crops marketed by the Society?

(a) Maize ..... (b) Rice .....

(c) Coconuts ..... (d) Beans .....

(e) Sunflower ..... (f) Coffee .....

(g) Sorghum ..... (h) Millet .....

(i) Castor ..... (j) Other(s).....

2. Are there times of the year when the Society is unwilling or reluctant to purchase certain crops or from certain districts?

	(a) Crop	(b) Month	(c) District
(i)	.....	.....	.....
(ii)	.....	.....	.....
(iii)	.....	.....	.....
(iv)	.....	.....	.....
(v)	.....	.....	.....
(vi)	.....	.....	.....
(vii)	.....	.....	.....
(viii)	.....	.....	.....

3. How do you organize collection of maize from farmers?

   (a) Maize collected at farm .....

   (b) Maize collected at buying posts .....

   (c) Maize collected at Society depot .....

   (d) Other(s) .....

4. When do you usually pay farmers for the maize (or other products) delivered?

   (a) Same day as you receive the maize .....

   (b) After ..... (number of) days.

5. If 3 (a) or (b) are applicable: how do you transport the maize from buying post or farm?

   (a) Lorry..... Own ..... Hired .....
   From ..... Rate ..... cts/km/ton

   (b) Tractor trailer .....

   (c) Other(s) .....(Specify)

6. How many buying posts is the Society operating?

Buying post	No. of farmers and quantity of maize		Distance from nearest buying-post (km)	Distance from Co-operative Society	No. of Staff employed
	No.	Quantity			
1.	...	.....	.....	.....	.....
2.	...	.....	.....	.....	.....
3.	...	.....	.....	.....	.....
4.	...	.....	.....	.....	.....
5.	...	.....	.....	.....	.....
6.	...	.....	.....	.....	.....
7.	...	.....	.....	.....	.....
8.	...	.....	.....	.....	.....
9.	...	.....	.....	.....	.....
10.....	...	.....	.....	.....	.....

7. What are the major problems encountered by the co-operative society in the marketing and movement of maize?

(a) Seasonality peak..... Suggested remedies .....

(b) Container availability .....
Suggested remedies .....

(c) Poor storage facilities .....
Suggested remedies .....

(d) Money not available sometimes .....
Suggested remedies .....

(e) Poor quality of maize .....

Suggested remedies .....

(f) Competition from traders .....

Suggested remedies .....

(g) Poor transport facilities .....

Suggested remedies .....

(h) Produce losses .....

Suggested remedies .....

(i) Others..... Suggested remedies .....

8. If (f) is applicable, where is the maize sold?

(a) Private traders in some districts .....

(b) Private traders in other districts .....

(c) Other regions .....

(d) Outside the country .....

9. If illicit trade occurs, what do you think are the main reasons?

(a) Higher price in illicit markets .....

(b) Late payment by co-operative societies.....

(c) Transport bottlenecks .....

(d) Storage bottlenecks at farm level.....

(e) Poor collection system especially in areas of scattered supply .....

(f) Farmers want to get rid of their maize because badly in need of money .....

(g) Traders provide sacks ..... Loans.....

(h) Low efficiency of crop handling at co-operative society .....

(i) Other(s) .....

10. Do you store maize at co-operative society premises?

    (a) Yes.....

    (b) No.....

11. If 10 (a) is applicable;

    (i) Own..... (ii) Seasonal rent.....

    (iii) Long term rent .....

12. What are the methods of storage used?

    (i) Tarpaulin storage..... Duration.....

    Capacity ..... Bags

    (ii) Godowns ..... Duration .....

    Capacity ..... Bags

    (iii) Silos ..... Duration.....

    Capacity ..... Bags

    (iv) Open air storage..... Duration.....

    Capacity..... Bags

    (v) Other(s)..... Duration.....

    Capacity..... Bags

13. In general how do you think marketing of maize can be improved?

    (a) .....

    (b) .....

    (c) .....

    (d) .....

    (e) .....

    (f) .....

APPENDIX III-A

LEAST SQUARES CALCULATION OF α, β AND S^2

t	X_i	Y_i	$x_i = X_i - \bar{x}$	$y_i = Y_i - \bar{Y}$	xy	x_i^2	$\hat{Y}_i = \alpha + \beta x_i$	$Y_i - \hat{Y}_i$	$(Y_i - \hat{Y}_i)^2$
1963	290	2850	+15.5	+1284.6	+19911.3	240.3	1618.1	+1231.9	1517577.6
1964	170	890	-104.5	- 675.4	+70579.3	10920.3	1210.1	- 320.1	102464.0
1965	130	1352	-144.5	- 213.4	+30836.3	20880.3	1074.1	+ 277.9	77228.4
1966	210	1733	- 64.5	+ 167.6	-10810.2	4160.3	1346.1	+ 386.9	149691.6
1967	230	2705	- 44.5	+1139.6	-50712.2	1980.3	1414.1	+1290.9	1666422.8
1968	250	2483	- 24.5	+ 917.6	-22481.2	600.3	1482.1	+1000.9	1001800.8
1969	210	852	- 64.5	- 713.4	+46014.3	4160.3	1346.1	- 494.1	244134.8
1970	220	876	- 54.5	- 689.4	+37572.3	2970.3	1380.1	- 504.1	254116.8
1971	230	103	- 44.5	-1462.4	+65076.8	1980.3	1414.1	-1311.1	1718983.2
1972	240	0	- 34.5	-1565.4	+54006.3	1190.3	1448.1	-1448.1	2096993.6
1973	-	-	-	-	-	-	-	-	-
1974	840	3375	+565.5	+1809.6	+1023328.8	319790.3	3488.1	-113.1	12791.6
	$\Sigma X_i =$ 3020	$\Sigma Y_i =$ 17219	$\Sigma x_i = 0$	$\Sigma y_i = 0$	$\Sigma xy =$ 1263321.8	$\Sigma x_i^2 =$ 368873.3			$\Sigma (Y_i - \hat{Y}_i)^2 =$ 8842205.2
	$\bar{X} = \frac{\Sigma X_i}{n}$	$\bar{Y} = \frac{\Sigma Y_i}{n}$							
	$= \frac{3020}{11}$	$= \frac{17219}{11}$							
	$= 274.5$	$= 1565.4$							
		$\alpha =$ 1565.4							

$$\beta = \frac{\Sigma xy}{\Sigma x_i^2} = \frac{1263321.8}{368873.3} = 3.4$$

Computation of variance (S^2)

$S^2 = \frac{1}{n-2} (Y_i - \hat{Y}_i)^2$ where n-2 = degrees of freedom = 9

$S^2 = \frac{1}{9} \times 8842205.2 = 982467.2$

$S = \sqrt{S^2} = 991$

Testing hypothesis for β

H_o: $\beta = o$ i.e. Producer prices have no effect on marketed quantities.

$$t = \frac{\hat{\beta}}{\sqrt{S^2/\Sigma x_i^2}}$$

$$= \frac{3.4}{\sqrt{982467.2/368873.3}}$$

$$= \frac{3.4}{\sqrt{2.7}}$$

$$= \frac{3.4}{1.6}$$

$$= 2.125$$

Since the observed t value > the critical $t_{.05}$ value of 1.833 at n-2 = 9, the null hypothesis (H_o) is rejected.

∴ Producer prices have an effect on marketed quantities.

90% confidence interval for β

$$\beta = \hat{\beta} \pm t_{.05} \frac{S}{\sqrt{\Sigma x_i^2}}$$

$$= 3.4 \pm 1.833 \times \frac{991}{607}$$

$$= 3.4 \pm 1.833 \times 1.633$$

$$= 3.4 \pm 3.0$$

$$0.4 < \beta < 6.4$$

APPENDIX III-B

RETAIL PRICE INDEX OF GOODS CONSUMED BY WAGE EARNERS IN DAR-ES-SALAAM

BASES: 1951 = 100, 1969 = 100

TIME (YEARS)	ACTUAL INDICES[1]
1963	121
1964	121
1965	125
1966	135
1967	139
1968	142
1969	145
1970	103
1971	107
1972	119
1973	129
1974	169

[1]Average of 8 months for each year

Sources: Statistical Abstract, 1970;
East African Community,
Economical and Statistical Review,
March, 1970.

CORRECTING THE RETAIL PRICE INDICES

Steps: 1. Base for 1969 = 100 but the actual index for that year = 145

Correction factor = $\frac{100}{145}$ = .69

2. Multiply the actual values of the indices for all the year preceeding 1969 by the correction factor (0.69) to get the corrected values of indices.
   Example: for 1963 the corrected index = 0.69 x 121 = 84. Likewise for 1964 the corrected retail price index becomes 84 and for 1965, it is computed as 86.

3. For the time period after 1969, the indices given in statistical abstracts do not need to be corrected since they are based on the 1969 index of 100.

APPENDIX III-C

WEIGHTED PRODUCER PRICES FOR MAIZE, TANZANIA, 1963 TO 1974

TIME (YEARS)	NOMINAL PRICE (cts/kg)	RETAIL PRICE INDICES		WEIGHTED PRODUCER PRICES (cts/kg)
		ACTUAL	CORRECTED	
1963	34	121	84	29
1964	20	121	84	17
1965	27	125	86	23
1966	23	135	93	21
1967	24	139	96	23
1968	25	142	98	25
1969	21	145	100	21
1970	21	103	103	22
1971	21	107	107	23
1972	20	119	119	24
1973	-	129	129	-
1974	50	169	167	84

Sources: Statistical Abstracts, 1970; East African Community, Economic and Statistical Review, March 1970.
Own calculations.

APPENDIX IV

PRICES OF SOME SELECTED COMMODITIES HANDLED BY PRIMARY CO-OPERATIVES, TANGA REGION, 1963-1974

Time	Commodity prices (ct/kg)				
	Maize	Paddy	Beans	Cashew	Castor
1963	34	43	30	-	50
1964	20	43	60	65	50
1965	27	44	-	77	56
1966	23	44	63	74	50
1967	24	44	40	70	45
1968	25	51	41	65	52
1969	21	53	51	75	65
1970	21	55	55	75	57
1971	21	53	64	75	50
1972	20	57	64	75	53
1973	35	57	70	75	53
1974	50	65	-	75	70

Source: (17, Annex Table No.1.17)

APPENDIX V

MARKETED PRODUCTION OF MAIZE ON REGIONAL BASIS, TANZANIA, 1972 TO 1974 (1000MT)

Region	1972	1973	1974
Arusha	72.0	48.8	-
Coast	3.7	5.0	1.6
Dodoma	67.2	90.0	41.2
Iringa	83.5	67.8	57.0
Kigoma	23.9	21.9	22.0
Kilimanjaro	41.7	30.0	42.0
Mara	21.6	40.0	-
Mbeya	60.1	89.0	47.5
Morogoro	41.3	30.0	29.0
Mwanza	42.8	15.1	23.5
Mtwara	11.4	4.9	7.9
Lindi	25.0	16.0	13.0
Ruvuma	27.8	48.0	81.2
Shinyanga	31.1	79.9	56.6
Singida	29.9	30.0	5.6
Tabora	69.9	95.0	-
Tanga	105.9	170.2	-
West Lake	3.1	3.0	-
Rukwa	-	-	20.0

Source: Ministry of Agriculture

N.B. Where there is a dash (-) it means that the respective figures were not available.

APPENDIX VI

PRODUCTION ESTIMATES FOR MAIZE, TANZANIA, 1965/66 - 1974/75 (1000 MT)

Time (Years)	Quantities (1000 M.T.)
1965/66	510
1966/67	739
1967/68	551
1968/69	638
1969/70	488
1970/71	719
1971/72	621
1972/73	858
1973/74	887

Source: Ministry of Agriculture.

APPENDIX VII

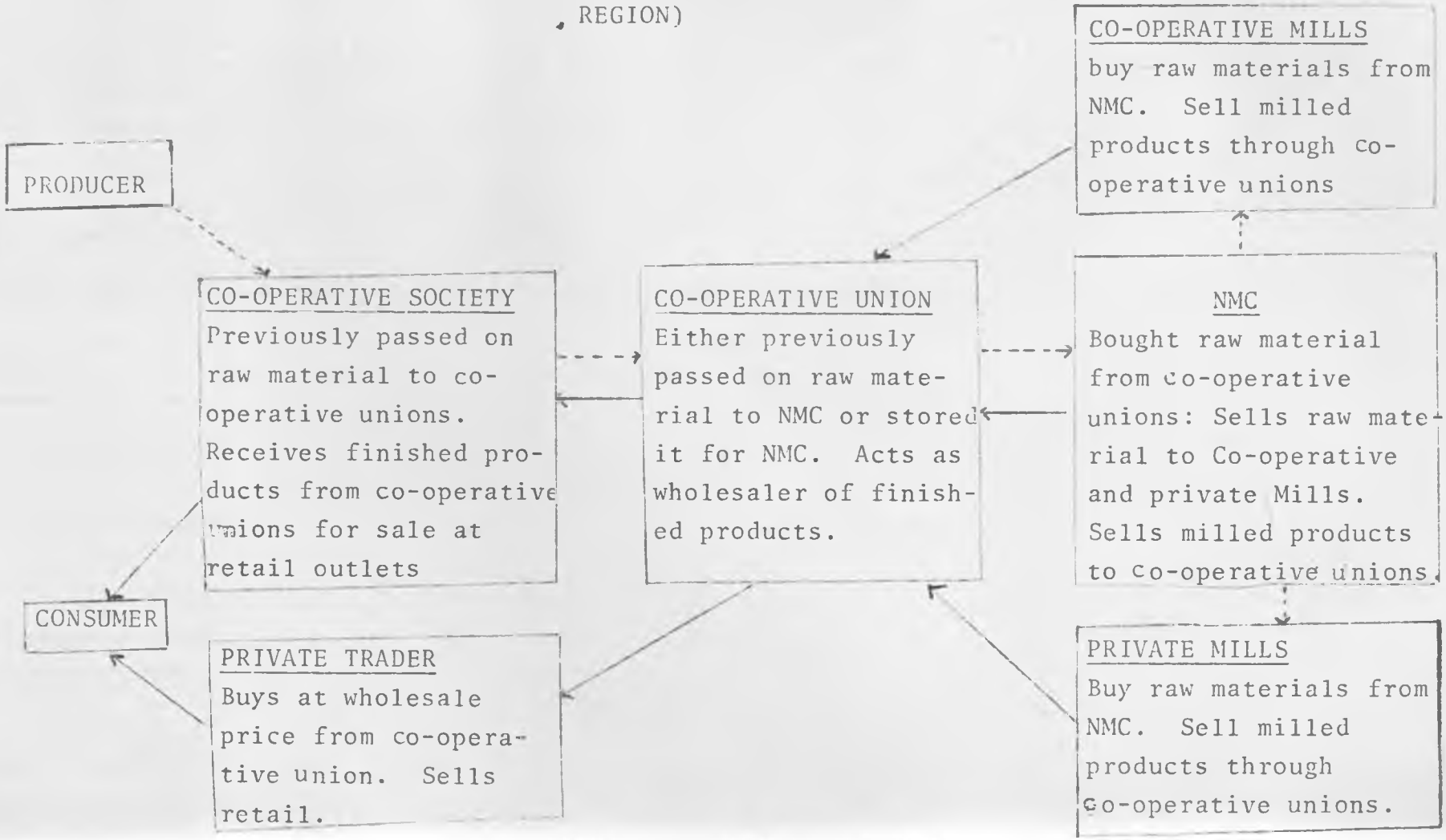
SOCIETY CODE REFERENCE

Code letter	Name of Co-operative Society
A	Chanika
B	Kwinji
C	Mgera
D	Suwa
E	Mkata
F	Manga
G	Kabuku
H	Segera

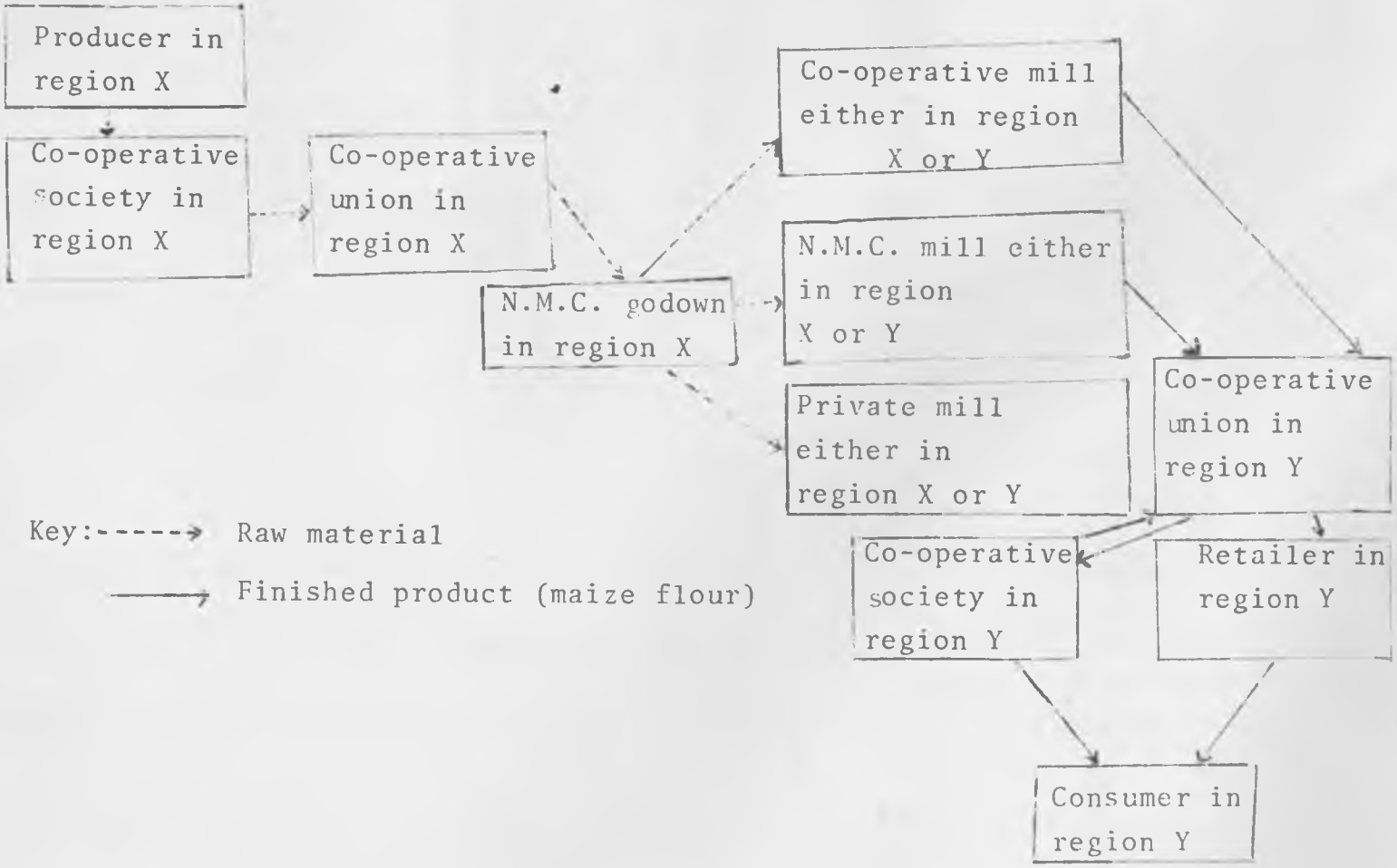
APPENDIX VIII

MAIZE FLOW CHARTS IN OFFICIAL CHANNEL

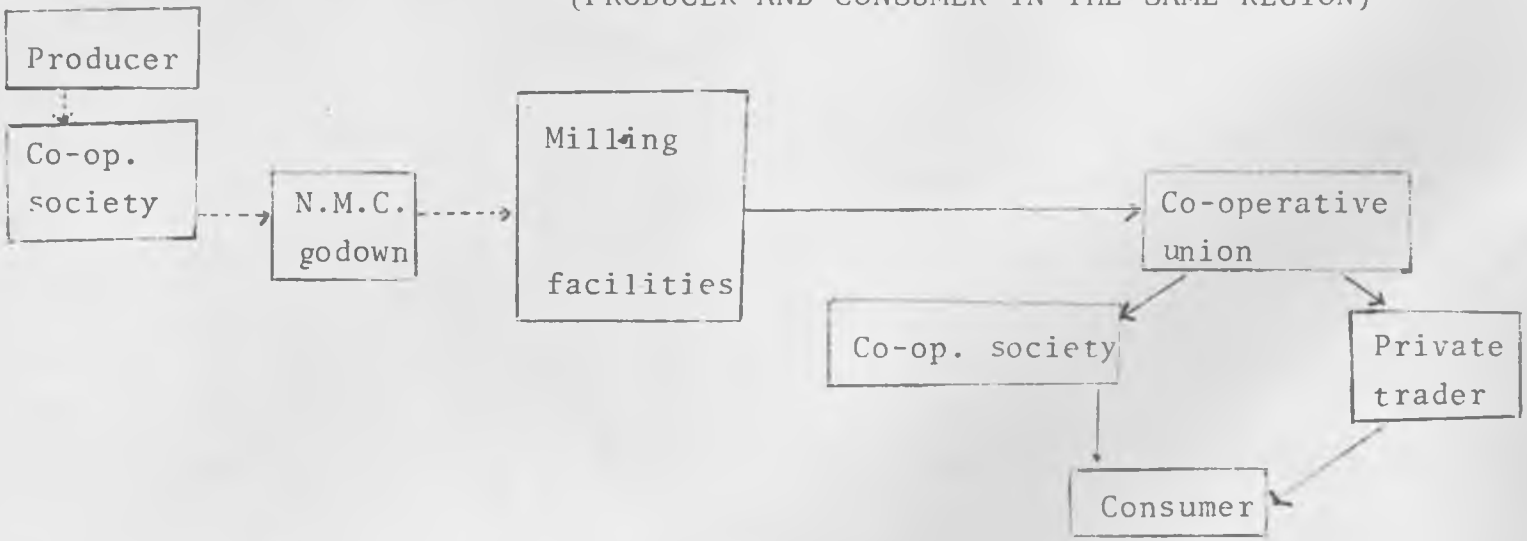
A: WITH CO-OPERATIVE UNIONS IN THE MARKETING CHAIN (PRODUCER AND CONSUMER IN THE SAME REGION)



B: WITH CO-OPERATIVE UNIONS IN THE MARKETING CHAIN (PRODUCER AND CONSUMER IN DIFFERENT REGIONS)

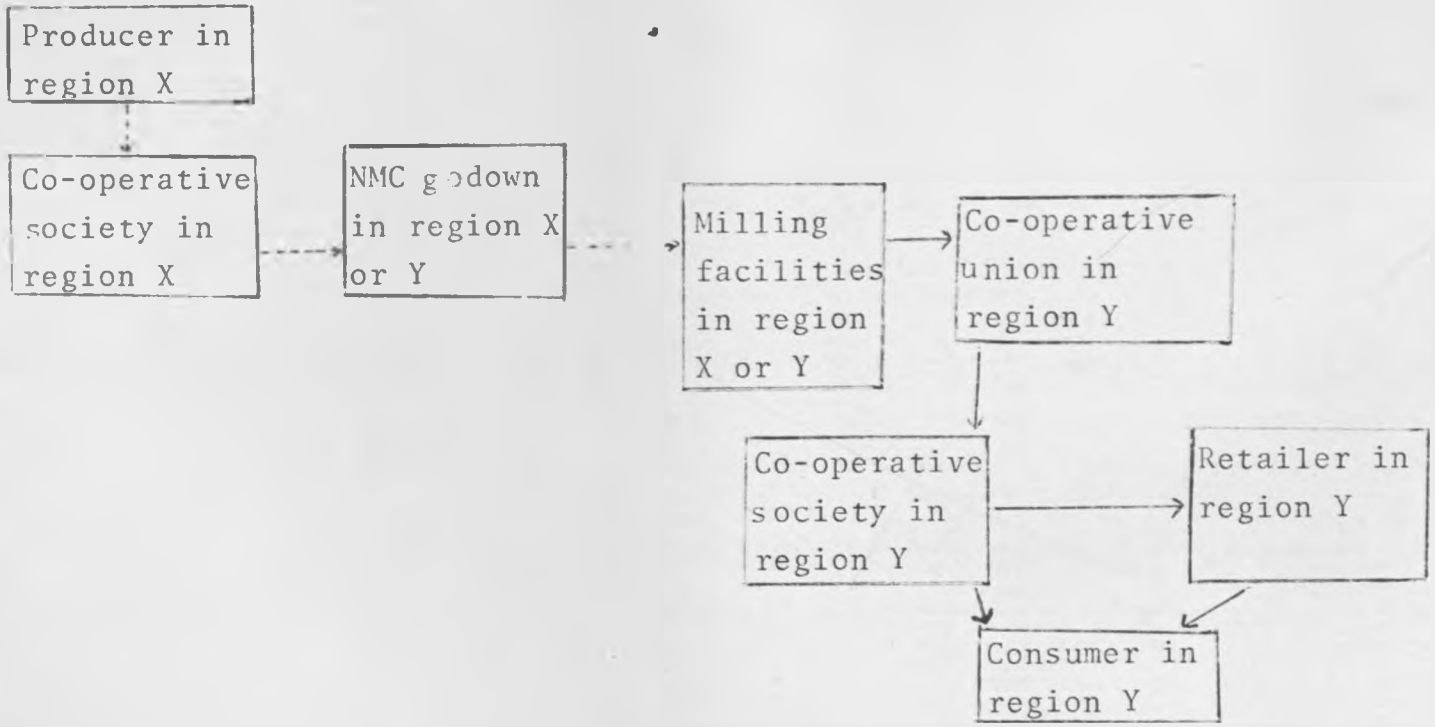


C: WITHOUT CO-OPERATIVE UNION IN THE CHAIN
(PRODUCER AND CONSUMER IN THE SAME REGION)



Key: ------→ Raw material
——→ Finished product

D: WITHOUT CO-OPERATIVE UNIONS IN THE MARKETING CHAIN
(PRODUCER AND CONSUMER IN DIFFERENT REGIONS)

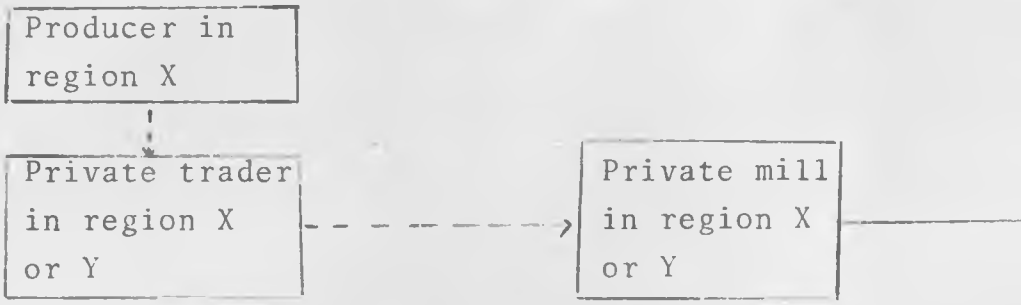


Key: - - - → Raw material

——→ Finished product (maize flour)

APPENDIX IX

MAIZE FLOW CHART IN ILLICIT CHANNELS,



Key: - - - - → Raw material

——— → Finished product (maize flour)

TANZANIA, 1975