PRODUCTION AND MARKETING OF PADDY AND COTTON IN ULANGA DISTRICT OF TANZANIA

BY

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ABSTRACT

Agriculture market reforms have been underway in Tanzania since mid 1980s. The ultimate objective of such policy change was to improve agricultural marketing efficiency in the economy. The extent to which this goal has been achieved in various parts of the country needs to be analysed. This study therefore attempts to assess the agricultural marketing problems in Ulanga district, Morogoro, Tanzania.

The main objective of the study was to assess the marketing efficiency of paddy and cotton systems in the study area with a view to identifying areas of weaknesses which need improvements. A sample of 85 paddy and/or cotton producers and 40 paddy traders were interviewed using structured questionnaires. The production season was confined to 1994/95 production season. The tools of analysis used include descriptive statistics, correlation and regression.

The results of the analysis revealed that (i) farm gross margin and returns to inputs for both crops were very low; (ii) in terms of market concentration ratio, and pricing efficiency there was some improvements in the paddy marketing system due to competition among traders; (iii) operational and pricing efficiency indicated that there is still a lot more to be done to improve the situation. For both crops, production and marketing costs in some operations were found to be unnecessarily high because of poor infrastructure and lack of competition on the part of cotton sector; and (iv) paddy producers were being discouraged by price instability.

From the above results it is recommended that (i) paddy productivity be increased using appropriate technology to enable producers benefit from low average production cost; (ii) crop buying posts be established in each village where exchange could take place. Apart from reducing collection cost to traders the buying posts would increase market transparency thereby motivating market participants which could result into improved marketing efficiency; (iii) the problem of small working capital for traders could be solved by carefully planned and monitored revolving fund scheme. This could start by identifying honest traders in the area; (iv) to minimise price fluctuations in the paddy marketing systems forward contracts and futures trading could be encouraged.

For cotton marketing it is recommended that (i) cotton productivity should be increased so that private buyers could be motivated to invest in the cotton sector in Ulanga District; (ii) the present ginneries should be privatised so that cotton buyers in the area could have access to them at a ginning fee; (iii) the long bureaucratic procedure before obtaining licences to handle cotton should be minimised. This could be achieved by leaving this task with the Tanzania Cotton Lint and Seed Board TCLSB); (iv) road communication system in the study area if improved could facilitate production and marketing of agricultural products in the study area.

DECLARATION

I **DAMIAN MULOKOZI GABAGAMBI**, do hereby declare to the Senate of Sokoine University of Agriculture that this thesis has not been submitted for a degree award to any other University and that it is my own original work.

Signature: 

Date: 18/09/1998

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DEDICATION

Dedicated to my father Leonard Gabagambi (late) and mother Yustina Gabagambi who laid foundation stone for my education.

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LIST OF ABBREVIATIONS

BOT	Bank of Tanzania
CGA	COTRA General Agency
Co-W	Covered Wagon
DALDO	District Agriculture and Livestock Development Officer
DSM	Dar es Salaam
ECGA	Eastern Cotton Growing Area
F.O.B	Free on Board
G.C.S	Global Consult Services
GDP	Gross Domestic Product
GOT	Gin Out-turn Test
GM	Gross Margin
ICRISAT	International Crops Research Institute for the Semi- Arid and Tropics
MALD	Ministry of Agriculture and Livestock Development
MDB	Marketing Development Bureau
MRCU	Morogoro Regional Co-operative Union
MRSA	Morogoro Region Statistical Abstract
NAFCO	National Agricultural and Food Corporation
NAPB	National Agricultural Products Board
NBC	National Bank of Commerce
NMC	National Milling Corporation
NPF	National Provident Fund
PCS	Primary Co-operative Societies
RTD	Radio Tanzania Dar-es- Salaam

SCP	Structure-Conduct-Performance Model
SIRECU	Singida Regional Co-operative Union
TARECU	Tanga Regional Co-operative Union
TAZARA	Tanzania - Zambia Railway Authority
TCLSB	Tanzania Cotton Lint and Seed Board
TCMB	Tanzania Cotton Marketing Board
TET	Tanzania Economic Trends
URT	United Republic of Tanzania
UKICU	Ulanga - Kilombero Co-operative Union
WCGA	Western Cotton Growing Area
WB	World Bank

CHAPTER I

1. INTRODUCTION

1.1 Background

The production and distribution of agricultural products is an important mechanism for raising the income levels of farmers and promoting the economic development of a country. This is particularly so if agriculture is the foundation of that economy. Tanzania has a predominantly rural agricultural economy with a population[1] estimated at 28 million (Population Census, 1988). Approximately 90% of the population dwell in rural areas engaged directly or indirectly in agricultural activities. The agricultural sector constitutes about 90% of total exports and more than 50% of Gross Domestic Product (GDP) (BOT, 1996).

Despite all these, the growth rate of agricultural sector in Tanzania has remained low in the past decades and there has been a general decline in its performance. For example, in 1985, the rate of growth of the agricultural sector was 6% and dropped to 0.4% in 1994 with a corresponding fall in GDP growth rate from 4.6% to 3% respectively (BOT, 1995). With the population growth rate estimated at 2.8 percent, the need to increase output in agriculture remains imperative in Tanzania.

In general, raising farm productivity as well as output depends mainly upon the use of increased quantities of purchased inputs. The ability to purchase inputs, however, depends very much upon farmers' receipts from sales of farm products. This in turn is determined by an efficient marketing system linking rural supply and demand

areas. If market channels are efficient, they will normally induce farmers to become more commercialised. As argued by Raju and von Open (1980), access to efficient markets serves as an incentive for farmers to specialise in the production of certain crops which are comparatively advantageous for the region. A more efficient interregional trade within a country will accelerate aggregate production. For this reason, a knowledge of the operation and contribution to development of marketing channels is required.

After a long period of strong intervention in the economy, the governments of many developing countries including Tanzania started implementing marketing reforms (Abbott, 1986). Many studies have been done on the marketing reforms but to generalise their results for the entire area could be erroneous. As recommended by Limbu (1993) case by case analysis of the situation is imperative. This study is set to analyse the production and marketing system in Ulanga District of Morogoro Region, Tanzania.

1.2 Description of the Study Area

1.2.1 Location

This study was conducted in Ulanga District one of the five districts of Morogoro region[2]. The district is located between latitude 8° 10' S and 9° 58' S and between longitude 35° 13' E and 37° 44' E (Jatrold and Bum, 1968). It also lies south of the Tanzania-Zambia Railway Authority (TAZARA) and Kilombero River (Fig.1.1).

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[1] Tanzania population figure for 1988 inflated to 1996 by an estimated mean annual growth rate of 2.8%

[2] Other districts inlude Kilosa, Kilombero, Morogoro rural and Morogoro urban.

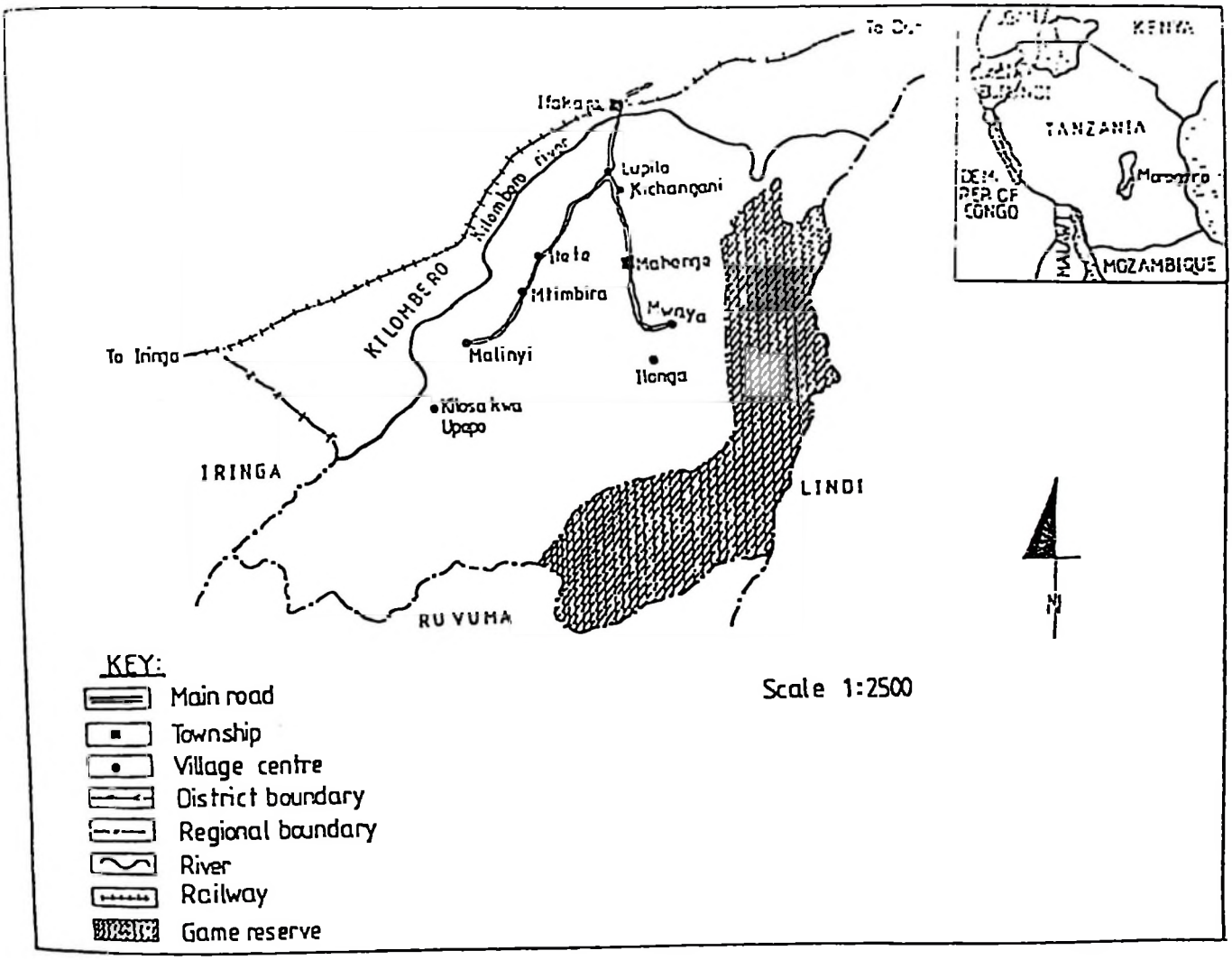

Fig 1:1 Ulanga District

1.2.2 Climate

The climate of the district is characterised by bimodal rainfall falling mostly between November and May with two peaks occurring in December and March (Figure 1.2). The actual rain days are 121 per year (MRSA. 1995).

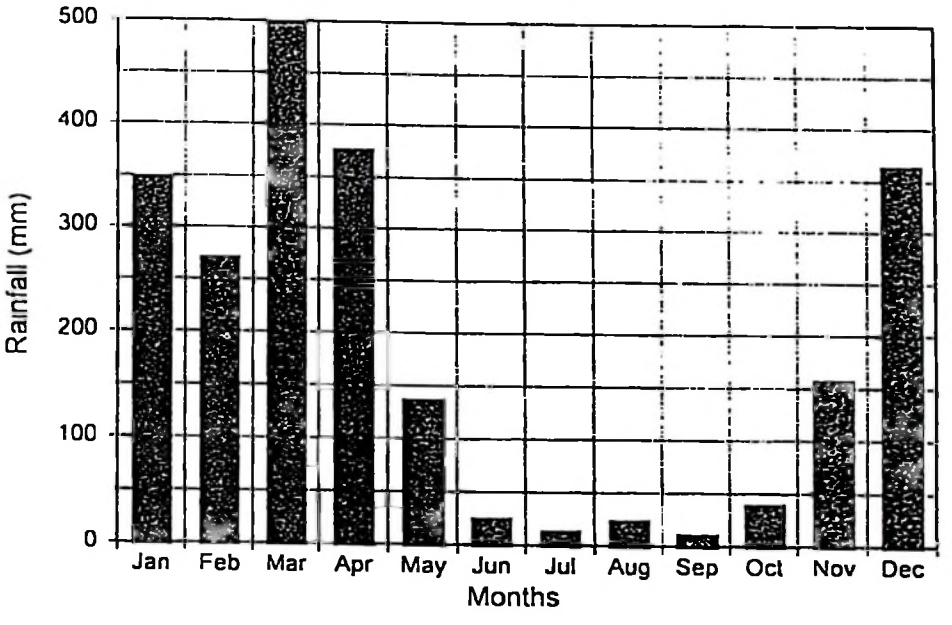

Figure 1.2 Ulanga District: average annual rainfall distribution, 1986/87 - 1991/92

Source: MRSA, 1995

1.2.3 Soil and Vegetation

The district has rich soils watered by permanent river flows. Detailed information about types of soils and their structures is not available since no detailed soil survey had ever been conducted in the district (Mlambiti and Mlay, 1992). However, soils in the river valleys and basins are characterised by fertile alluvial soils. The hills are covered by thick tropical forests and on the plains are savannah grasses intermingled with miombo trees. The soil and the ecology of the area can support a wide range of agricultural crops such as maize, paddy, cotton, coffee, cassava, coconut, sugarcane, fruits, banana, millet, sunflower, and vegetables. Livestock as well as game also survive in the district.

1.2.4 Population

Ulanga district is divided into 5 administrative divisions (namely Mwaya, Mahenge, Lupiro, Mtimbira and Malinyi), with a total population[3] of 172 656 growing at the rate of 2% annually. The average household size is 6.3 (Population Census, 1988). Mwaya and Mahenge alone account for 70 percent of the total population for the district. The main ethnic groups are the Pogoro, Ndamba, Ngindo, Bena, Ngoni and Mbunga. The Ndamba, Bena, and Ngindo are mainly fishermen whereas the Pogoro, Ngoni and Mbunga are peasant farmers (Mlambiti and Mlay, 1992). However, there has been an influx of nomadic Sukuma in the district.

[3]District poulation figure for 1988 inflated to 1996 by 2%

1.2.5 Economic Activities

The main economic activity in Ulanga district is agriculture involving both food and cash crops. Maize and paddy are the main staple food grains in the district (Mlambiti and Rutachokozibwa, 1993). Cotton is the main cash crop in Ulanga district. The German colonial administration tried to propagate commercial cotton production with no success. Cotton has remained a crop of minor importance primarily because of high crop losses caused by insects (Jatrold and Baum 1968).

For a long time none of the cash crops grown in Ulanga district has proved to be a leading cash crop as is the case with cotton in Sukumaland or Coffee in Kilimanjaro and Kagera regions. At present, new cash crops are being introduced. These include coffee, teak tree and macadamia nuts, the last two being cultivated under plantations mainly by foreign companies. Mlambiti and Mlay (1992) identify the main problem of the farming population in Ulanga district as being, *inter alia*, poor system of marketing and distribution of agricultural inputs.

1.2.6 Justification for Choice of Ulanga District for the Case Study

Ulanga district has been chosen for this study because it belongs to Morogoro region, one of the famous regions which produce paddy and cotton. At national level paddy and cotton are the second most important food and cash crops after maize and coffee respectively (Marketing Development Bureau, 1994). Morogoro is among the four regions in Tanzania renown for production of surplus rice (Table 1.1). Despite the high agricultural potential in the district, the agricultural sector continues to have poor performance. This necessitates a critical examination of state of affairs in the sector.

Table 1.1 Production of paddy in major paddy surplus regions, 1989/90 - 1994 (Tonnes)

Year	Region				Total	Morogoro % of Total
	Shinyanga	Mwanza	Morogoro	Mbeya		
1989/90	191	145	104	67	507	21
1990/91	95	100	129	59	383	34
1991/92	64	66	67	51	268	25
1992/93	117	113	109	112	451	24
1993/94	112	113	118	120	461	26

Source: MDB, 1994.

With regard to cotton, Tanzania Cotton Lint and Seed Board (TCLSB) statistics show that Morogoro is the second largest producer of cotton after Mbeya in the Eastern Cotton Growing Area (ECGA). Between 1992/93 and 1995/96, Morogoro region alone produced 16 444 tonnes of seed cotton. This was 35% of total seed cotton produced in the zone during the same period. Out of this, 5 586 tonnes came from Ulanga district making it the largest producer of seed cotton in Morogoro region (Table 1.2). In the contrary Kilombero is the least cotton producer of all the districts in the region and produced only 5% of all cotton in the reference season.

Table 1:2 Morogoro region annual seed cotton purchases by district, 1992/93 - 1995/96 (Tonnes)

Year	District				
	Morogoro	Kilosa	Ulanga	Kilombero	total
1992/93	4 037	4 094	4 694	609	13 433
1993/94	281	153	239	64	738
1994/95	400	221	145	24	790
1995/96	316	600	509	59	1 484
Total	5 035	5 067	5 586	756	16 444

Source: TCLSB, Morogoro Zonal Office

The potential for cotton could be exploited further by improving efficiency of its pricing and marketing system. Previous studies have shown that farmers are very responsive to changes in real prices of cotton. Elasticity of cotton supply with respect to price has been estimated at between 0.65 and 2.00 (Ashimogo, 1996).

1.3 Problem Statement

Tanzania started reforming agricultural sector since mid 1980s. To date it is not well established whether such policy changes have improved efficiency in the

agricultural marketing system. It was pointed out by Mlambiti, et al. (1992) that private traders in Tanzania are in infancy stage and lack of capital. Therefore, they should not be relied upon to improve marketing efficiency. Private traders concentrate buying in accessible areas leaving remote ones unattended.

On the other hand farmers complain of low and fluctuating prices offered by private traders. To generalise the situation for the whole country can be difficult because of varied natural factors, and historical backgrounds. Thus, the need to carry out case studies aimed at establishing area specific agricultural marketing problems is justifiable.

In Ulanga district, the marketing of agricultural products is handled by private traders dealing with food crops especially paddy and the Ulanga - Kilombero Co-operative Union (UKICU) handling mostly cotton. The present situation in the district is that farmers are not satisfied with the performance of both marketing channels. They complain that they are being exploited by private traders. On the other hand the co-operative union has failed to live up to the expected obligations such as distribution of inputs, timely procurement of crops, and dissemination of agricultural information to the farmers.

Delays in paying farmers are still common in spite of government's strong stance that farmers have to be paid promptly for their crops. Delays in payments imply that part of the increase in producer prices are effectively not passed on to the producers, that is, by the time such payments are received by farmers, their purchasing power has fallen as a result of persistent inflation[4] in the economy. These problems indicate gross inefficiency in the agricultural marketing system in the district. Thus,

this study is set to examine the sources of such inefficiencies, by examining paddy and cotton marketing sub-systems in the area, and suggest ways of improving the situation.

1.4 Objectives of the Study

The main objective of the study was to undertake analysis of marketing systems for paddy and cotton using Ulanga district as a case study. The specific objectives were:

i) to carry on profitability analysis for smallholder production process by analysing Gross Margins per hectare and returns per resource invested in paddy and cotton production.

ii) to describe existing marketing channels and the roles of different marketing participants for paddy and cotton sub-systems in the district; and

iii) to assess the marketing efficiency of paddy and cotton systems in terms of buyers concentration, transparency, barrier to entry, operational and pricing efficiency.

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4 Inflation rate has been estimated at 15.1% in 1997 (BoT, 1997)

1.5 Hypotheses

To meet these objectives, the study is guided by the following hypotheses:

i) farming activity in Ulanga district is not a profitable venture as returns to land, labour, and shilling invested are implicitly low;

ii) the number of buyers (buyers concentration ratio) in the paddy marketing system is sufficiently high to prevent monopsonistic tendencies; and

iii) the paddy marketing system is inefficient in terms of operational and pricing efficiency, but the operational efficiency is relatively higher than in the cotton marketing system.

CHAPTER II

2. LITERATURE REVIEW

2.1 Overview

The importance of agricultural sector in the economy of a developing country such as Tanzania is widely recognised. Because of that, the farm sector has a key role in economic development. The role of the sector has been summarised by Southworth (1967), as; (i) meeting the additional demand of food resulting from population increase and remedy nutritional deficiencies; (ii) significant contribution to GDP and export earnings, (iii) supply raw materials required by industries; (iv) employment for idle labour and reserve it for industries; and (v) important market for industrial products.

However, the sector is faced with numerous problems. Some of these problems include scarcity of capital (Miller, 1977), low productivity, lack of storage facilities, seasonality in supply of farm products, and inefficient marketing system linking rural supply and urban demand (Abbott and Makeham, 1970). According to Southworth (1967) the latter has too often been taken for granted. This view is supported by Kriesel et al. 1970, who argue that the marketing system can serve a crucial coordinating role which is frequently overlooked because it is an invisible process. They emphasize that shortcomings in agricultural marketing can seriously delay development progress and may substantially nullify investment in other sectors of the economy.

2.2 Importance of Rice in Tanzania

According to the National Agricultural Policy (URT, 1995), rice is placed in the category of preferred staples which also include maize and wheat. These crops form the most important cereal crops and the dietary mainstay of the majority of Tanzanians. Cereal consumption in Tanzania is estimated at 2 897 thousands tonnes per annum. Maize constitutes 78% of this amount while rice and wheat contribute 16.6% and 3.2% respectively (Food Strategy Unit 1989).

In Tanzania paddy is produced mainly by small scale farmers. Large scale commercial production used to be limited to the National Agricultural and Food Corporation (NAFCO). Rice is grown almost throughout the country. The leading producers being Shinyanga, Mwanza, Morogoro, Mbeya and Tabora region which together account for about 70 - 80% of the national rice production per annum (Lemweli, 1992).

Rice is a highly preferred food in urban area and institutions such as hospitals, schools, and hotels because of its simplicity in preparation and catering for a large number of people. Given this situation, means to improve production and marketing of rice in the country should be welcome in order to relieve the government from the burden of spending meagre foreign currency for importation of a crop that can sufficiently be produced domestically.

2.3 The Importance of Cotton in Tanzania

Cotton is one of the most important cash crops in Tanzania which contribute significantly to the growth of the economy. Cotton ranks second after coffee in foreign earnings (See Table 2.1). The crop is extensively grown in two zones. The Western Cotton Growing Area (WCGA) which comprises Mwanza, Shinyanga, Mara, Tabora, Singida, Kagera and Kigoma regions, and the Eastern Cotton Growing Area (ECGA) which includes Morogoro, Coast, Mbeya, Iringa, Arusha, Kilimanjaro and Tanga. The marketing season starts much earlier in WCGA than in ECGA because of difference in the rainfall patterns.

Table 2.1: Tanzania exports of major cash crops (5 year average), 1991 - 1996

Crop	Quantity (000 tonnes)	Unit price (US $/tonne)	Value (US $ Millions)
Coffee	36	2 447	47
Cotton	37	1 861	27
Sisal	2	646	2
Tea	11	1 769	6
Tobacco	9	1 784	10
Raw cashewnut	24	1 123	43
Total	101		135

Source: BOT, 1997.

These include Tanga Region Cooperative Union (TARECU), Singida Region Cooperation Union (SIRECU), TCLSB and in some areas by large private commercial farmers such as Kwamsisi Cotton Farm in Tanga which is jointly owned by TCLSB and F.A. Kwamcot Ltd (TCLSB, 1997).

Cotton is highly susceptible to pests and if not sprayed is attacked by insects and bolls fail to open properly. Stained cotton lint fetches low prices in the world market. This if unchecked might cause Tanzanian cotton to lose the premium it used to enjoy in the world market (MDB, 1994).

2.4 The History of Crop Marketing System in Tanzania

At the time of independence, well established marketing co-operatives handled export crops such as coffee, cotton tea and tobacco (Matiku, 1993). Food crops were relatively given little attention by the colonial administrators. Thus, in 1963 the post-independence government established the National Agricultural Product Board (NAPB) to handle commercial purchases of grain in the country.

In 1975, cooperative unions and marketing boards were abolished and their roles taken over by crop authorities (one for each cash crop) and National Milling Corporation (NMC) responsible for all food crops (Amani et al. 1988). Maliyamkono and Bagachwa (1990) argue that *inter alia* cooperative unions were abolished because the government feared that they could achieve too much political influence. Most crop authorities had no sound financial basis and resorted to overdrafts. The consequence of high indebtedness and inherent liquidity problems was reflected in their poor services

to farmers. The effect of this was loss of interest among farmers in the production of food and cash crops. In 1982, the cooperative unions were re-establish and they became operational in 1985/86 marketing season (MDB, 1992). Buying of crops was based on officially announced pan-territorial producer price.

Since their re-establishment performance of the cooperative unions had been poor. This led peasants to resort to parallel markets where prices were higher or transactions were carried out conveniently (Maliyamkono and Bagachwa, 1990; Bryceson, 1993; Putterman, 1995; and Nindi, 1990). By 1992, cooperative unions had accumulated a debt of more than TSh 38 billion from the National Bank of Commerce (NBC) (Table 2.2). At the moment, the government has removed financial support for cooperative unions and many are incapable of continuing their marketing functions (MDB,1992).

Table 2.2: Cooperative unions debts to NBC between 1987/88 and 1992/93

Period	Amount unpaid (Billion TSh)	Average number of unions
1987/88 - 1990/91	20.4	24
1991/92	17.4	18
1992/93	0.4	2
Total	38.2	44

Source: Summary Review of Agricultural Marketing, MDB,1994.

2.5 Agricultural Marketing Reforms in Tanzania

The agricultural policy reforms included: (i) the redefinition of the roles of the cooperative unions and the NMC in food marketing, (ii) purchasing system and management of the Strategic Grain Reserve (SGR), (iii) reduction of the role of the export marketing boards to managers of the auctions or tender arrangements, (iv) giving more autonomy to the co-operatives in terms of crop procurement and (v) recognising the roles of the private sector in export crop marketing, and (vi) rehabilitation of processing and storage facilities (Ponte, 1996). These and other reforms were explained in detail in the Tanzania Agricultural Adjustment Programme, agreed between the World Bank and the Government in 1990 (World Bank, 1990).

2.5.1 Reforms in the Food Crop Marketing System

Public supply of food staples at controlled prices effectively ended in 1989 (Putterman, 1995). At present they are determined by the market forces. The studies carried out by Santorum and Tibaijuka (1992), Limbu (1993), and MDB (1994) and Ashimogo (1996) on maize and rice marketing systems reveal that the grain marketing systems is occupied by numerous small traders operating with no stable government policy to support them. Santoram and Tibaijuka (1992), observed that, the open marketing system is characterised by the purchase of grain by urban traders in regional assembly markets or producers locations and direct sales to urban retailers in main cities.

The response of producers and traders to liberalisation in the food crop sector has increased production of grain in the country and has decreased grain imports (Putterman, 1995; Amani 1992). This argument is rejected by Ponte (1996), who argues that there is no evidence of improved efficiency since agricultural production did not increase as much as it is published in government statistics.

2.5.2 Reforms in the Cash Crop Marketing System

With regard to cash crops, state control remained in place till 1993 when private marketing agents were legally allowed to compete with public marketing organisation in marketing of export crops (MDB, 1995). But effective participation of private traders in the procurement and ginning of cotton started in 1994/95 marketing season (Putterman, 1995). These reforms have been criticised by Maliyamkono and Bagacwa (1990) and Ponte (1996). They argue that reforms have made smallholder farmers more vulnerable to spatial and temporal price fluctuations especially in periphery areas.

2.6 Cross-country Experience of Agricultural Marketing control and Reforms

In essence, Tanzania's agricultural market reforms have been similar to reforms in other developing countries. Many studies done in these countries conclude that privatisation should not be seen as an easy solution to the problem created by public sector marketing.

There need to be ways to prevent the development of monopsonistic power that would enable private traders exploiting farmers. Nevertheless the notion of private

traders to exploit farmers has been refuted by Schmidt (1979). when he argues that high profit margins in agricultural markets are largely due to the imperfections of marketing framework created by government distortions rather than due to the exploitative nature of traders. This view has been supported by Ellis (1988), Kydd (1988), Thomson (1988), Tollens (1992), Kadenge (1992), and Riddel (1992).

Harvey (1988) strongly advocates interventions because reasons for government intervention in agricultural marketing and pricing remain relevant, and can not be ignored simply because some past interventions had bad effects. But it does not necessarily follow that the right response is to eliminate all interventions and really entirely on the private sector. He stresses that any policy change that takes no account of these objectives are likely to be unsustainable.

Lamming (1980) shows that efforts to make agricultural marketing system efficient in many developing countries through promoting co-operatives have failed to yield expected results. He argues that though Asian countries such as Japan, Bangladesh, Burma, Indonesia, Korea, Nepal, Philippines, Sri Lanka, and Thailand have well established co-operatives, there are some inherent problems which make them inefficient. Problems have been observed in management, ignorance of the members, delinquency, marketing of perishables, and organisation. In this connection, Kandaswamy (1988) gives an example of liberalisation of cotton marketing sector in India. He observes that organisation of both private and co-operatives has failed to make a notable contribution to cotton production.

Pakistan has been cited as a country where private sector has succeeded in improving cotton marketing system. The reason mentioned is good infrastructure and a

long history of commerce. Attempts to replicate this in other countries without proper understanding of these issues, or of the effects of local political economy, would be highly irresponsible (Doward A, personal communication). This concurs with observations by Wilson (1992) who cautions governments of developing countries that there is no uniform approach to agricultural market reforms. Countries are unique, thus, he advises each country to select an approach that best meets its particular national needs.

In the light of the arguments presented in previous paragraphs, it can be argued that the fate of agricultural marketing system in Tanzania is not yet known. Instead detailed studies on the sector are still imperative. This view is supported by Santorum and Tibaijuka (1992), Limbu (1993) and, Kashuliza and Mbiha (1995) who assert that in developing countries such as Tanzania, little has been written about the private sector.

2.7 The Conceptual Framework of Market Efficiency Studies

2.7.1 Agricultural Marketing

Agricultural marketing has been defined in various ways by different authors depending on the schools of thoughts. For the purpose of this study the definition by Kohls and Uhl (1990) has been adopted. He defines agricultural marketing as the performance of all business activities (marketing functions) involved in the flow of goods and services from the point of initial agricultural production until the same goods are in the hands of the ultimate consumer. By this definition it means that the

performance of an economic system will depend very much on the efficiency with which the marketing functions are carried out.

2.7.2 Efficiency in Agricultural Marketing System

Efficiency in economic studies is a broad concept subject to different definitions and interpretations. The concept ranges from simple notion of the ratio of outputs to inputs to the complex notion of the maximisation of total welfare flowing from an economy. The way inputs and outputs of an agricultural marketing system can be measured has been given by Kohls and Uhl (1990) who cite labour, packaging, machinery, and energy to be marketing resources needed to perform the marketing functions.

On the other hand marketing outputs include time, place, form and possession utilities. When a monetary measure (value) is used the concept becomes a ratio of benefit to cost. So in the marketing sense, resources are costs and utilities are the benefit of the marketing efficiency ratio. The best measure of utility is the price paid for a given function.

2.7.3 Schools of Marketing Efficiency

Some theoretical frameworks to guide tools used in studying marketing efficiency have been given by Scarborough and Kydd (1992) and are briefly described below.

2.7.3.1 Internal Productive Efficiency of Marketing Enterprises

This is a measure of firm level economic efficiency which is a combination of technical and operational efficiency. It is a good theoretical framework for measuring costs, and analysing the efficiency of individual firms. Under this school, the method of descriptive analysis of accounting data is commonly used because data for the purpose are relatively more available (Scarborough and Kydd 1992).

2.7.3.2 The Structure-Conduct-Performance Model (S-C-P)

The emphasis by this model is not on the relationships between functionally similar firms and their market behaviour as a group, that is, given certain basic conditions the performance of particular industries depends on the conduct of its sellers and buyers which in turn is strongly influenced by the structure of relevant markets.

2.7.3.3 The Food Systems Framework

This concept attempts to broadens other models by injecting some dynamic aspects. To this end it goes beyond industry boundaries and assesses structure and conduct vertically and horizontally over the entire commodity flow from input supplier to ultimate consumer.

In this study, the S-C-P model will be used to assess the marketing efficiency because it provides the only well developed framework for examining behaviour of

imperfectly competitive markets (Scarborough and Kydd, 1992). Its important features are concisely described below.

2.7.4 Features of the S.C.P Model

2.7.4.1 Market Structure

This refers to the organisational characteristics of a market that influence the nature of competition and pricing within the market. The common measure of efficiency of this component is the degree of concentration (number and size of market participants), market transparency (information) and market entry. According to this concept, performance is expected to be satisfactory under the following conditions; if sufficient number of buyers and/or sellers exist to provide alternative outlets without one of them having the market power to dominate the others; if market transparency with regard to product quality, varieties, grades and prices is given; and if no serious barriers to market entry exist.

2.7.4.2 Market Conduct

Market conduct is second to market structure as a major determinant of the performance of the marketing system. Analysis of market conduct entails an examination of: the buying and selling behaviour of various market participants; forms which competition amongst them takes (pricing, terms of payment, credit); level of activity; and actions to avoid competition by for example, collusion.

2.7.4.3 Market Performance

Performance is the end result of firms' objectives. The common indicators of performance in food industry include: trends in retail prices and consumer food costs, level and stability of farm prices and income, marginal propensity to consume, spread of marketing margin and farmer's share of the consumer's shilling spent on agricultural products, middlemen profit and parity farm prices (Kohls and Uhl, 1990). Analysis under this concept normally include evaluation of operational, technical and pricing efficiency.

CHAPTER III

3. RESEARCH METHODOLOGY

3.1 Sampling and data collection procedure

3.1.1 Preliminary Survey

A preliminary survey was conducted in the district in September 1996. The survey was intended to help the researcher identify data sources and basic variables to be addressed in the final questionnaire. During preliminary survey, informal discussions were held with several smallholder farmers and paddy traders in each of the villages visited. With appointment made prior to each visit, formal discussions were conducted with village leaders and the purpose of the study was introduced to them. From the preliminary survey it was clear that some villages were located in extremely remote and inaccessible areas. Therefore, due to time and resource constraints these places were excluded when choosing villages for study.

Other aspects which became apparent during the preliminary survey included (i) every farmer in the study area at least grow paddy and/or cotton, (ii) paddy is grown basically as food crop and occasionally as cash crop, (iii) since farmers never kept records of production and marketing transactions they could not remember properly the quantities of crops produced and marketed when the reference period was very long, thus the reference period was limited to only one production season, 1994/95, and (iv) there were no large scale farm plantations for paddy and cotton.

3.1.2 Data Source

3.1.2.1 Primary Data

Primary data used in this study were collected from farmers and traders using two different structured questionnaires (Appendix 1a and 1b). The questionnaires were designed to collect quantitative and qualitative data on farming systems, production, marketing and other socio-economic variables. The variables were then used in the analysis of the farmers' and traders' practices on farming and marketing aspects. Other primary sources of data included personal observations, informal discussion with knowledgeable individuals and through participation by the researcher in a five day workshop held in early 1997. The workshop was organised by the District Council to prepare the district's three year development programme.

3.1.2.2 Secondary Data

Secondary data were obtained from various sources such as Marketing Development Bureau (MDB), Bank of Tanzania (BoT), Tanzania Cotton Lint and Seed Board (TCLSB), District Agricultural and Livestock Development Officer (DALDO) for Ulanga district, TAZARA, COTRA General Agency Ltd, and Ulanga - Kilombero Co-operative Union (UKICU), and the libraries of the Sokoine University of Agriculture and the University of Dar es Salaam.

There was no formal questionnaire for the secondary data, instead, discussion guides were prepared before hand and discussed with respective authorities of the data source. With the exception of UKICU officials most people contacted were very co-

operative and willingly provided relevant data. However, it was only after a series of appointments with UKICU officials that some useful information was obtained.

3.2 Sampling Design

In this study the population was all farmers growing paddy and/or cotton in Ulanga district and paddy traders. The sampling frame was paddy and/or cotton growers in the villages surveyed. The intention was to obtain a cross sectional information of the population. Basing on the information gathered during the preliminary survey, four divisions in the district were selected for the study. Mahenge was not inluded in the farmers survey because people living there are most employees and traders. From each division, three villages from different wards were selected based on their accessibility. Villages which were selected in Mwaya division were Chigandugandu, Mwaya and Ruaha whereas in Lupiro the villages included Lupiro, Minepa and Kichangani. In Mtimbira division, the villages were Itete, Mtimbira and Minazini while in Malinyi the villages involved were Malinyi, Igawa and Isegese.

The interview was conducted by the researcher with the assistance of four trained enumerators. The sample sizes for farmers and trader interviewed are presented in table 3.1 and table 3.2.

Table 3.1: Sample size by division in the study area

Division	Male	Female	Total
Mwaya	21	3	24
Lupiro	17	5	22
Mtimbira	18	6	24
Malinyi	11	4	15
Total	67	18	85

source: Own survey, 1996

Table 3.2: Traders sampled on basis of selling point

Selling point	Number	Percent
Mahenge	7	16
Ifakara	26	61
Dar es salaam	10	23
Total	43	100

Source: Own Survey 1997

Three questionnaires from the second class of traders (Ifakara) were discarded because they were incomplete. Thus only 40 questionnaires were considered in the analysis.

3.3 Primary Data Collection and Questionnaire Administration

Primary data collection was done in two phases. Phase I was carried out in October 1996 and entailed collection of data from smallholder farmers. Phase II in which data from paddy and rice traders were collected was carried out in January 1997.

During phase one, in each village chosen for study, a village meeting was held on the interview date scheduled in advance. After a brief discussion with the villagers, between 5 to 8 smallholder farmers were randomly interviewed depending on availability of respondents.

In phase two, only the headquarters of the five divisions in the district were visited. After reporting to the division leader, the researcher guided by the leader assembled traders and an interview conducted based on the availability and willingness of traders to co-operate. From each division at least 6 traders were interviewed. Occasionally the researcher interviewed paddy traders based outside the district who travelled to Ulanga district on business. In this way, traders based in Ifakara and Dar es Salaam were also interviewed. A total of 85 smallholder farmers and 43 rice traders were interviewed.

3.4 Data Analysis

To achieve the study objectives quantitative and qualitative analyses were carried. No single measure was sufficient to lead to meaningful interpretation of the production pattern and efficiency of the marketing system. Therefore a combination of tools have been used in the analyses to arrive at a conclusion about marketing efficiency. The main analytical methods used include; descriptive statistics, buyers concentration index, gross margin analyses, price and operational efficiency analyses. Each of these tools is described in the following sections.

3.4.1 Descriptive Statistics

The analysis involved the use of statistical means, standard deviations, ranges and frequency distribution to describe the general characteristics of the data. The approach was important in understanding and evaluating existing paddy and cotton farming and marketing practices in the study area. The results were tabulated using frequency tables and charts to enable perception of the situation in the study area.

3.4.2 Gross Margin Analysis per Hectare for Paddy and Cotton.

Analysis of gross margin (GM) per hectare aimed at estimating the cost of production and the return to labour, land and liquid capital invested for paddy and cotton in the 1994/95 production season. The return to labour and capital invested were obtained by dividing the gross margin by man-days and production cost per hectare respectively. Analysis of gross margin per hectare was important because the two crops compete for production resources such as labour, land and other inputs especially during land preparation, cultivation and weeding. The crop whose annual return to labour is low, stands a chance to losing in the competition. In this study the analysis of gross margin per hectare was carried out based on 1994/95 production season and the 1995/96 marketing season. The definitional relation is presented in equation 3.1.

$$GM = TR - TVC \quad (3.1)$$

Where: GM = Gross margin for each crop (TSh/ha)

TR = Total revenue from sale of each crop (TSh/ha) obtained by multiplying quantity produced by unit price.

TVC = Total variable costs spent on production of each crop (labour, chemicals and seeds) obtained by multiplying quantity of resource by their corresponding unit price unit prices

3.4.3 Buyers Concentration Index

In food marketing, very large numbers of buyers and producers along the marketing chain are suggestive of competitive conditions and, therefore, the main focus in analysing market structure is on the number and size of enterprises within the system. If at any point along the marketing chain only one or a few buyers or sellers dominate the market in terms of volume of commodity handled, uncompetitive behaviour is possible. Sellers and buyers concentration indices are the common measures of market structure (Caves, 1992). In this study only buyers concentration index has been examined because the production side of paddy is occupied by numerous smallholder farmers (MDB, 1993).

According to Scarbourough and Kydd (1992) the concentration index is defined as the percentage of total industry sales accounted for by a few largest enterprises in the industry (Equation 3.2)

$$C = (XP/IP)100 \quad (3.2)$$

where:

C = index of concentration;

XP = aggregate output of a few largest enterprises in volumetric terms (kg);

IP = the total output of the industry in volumetric terms (kg).

The concentration ratio of over 50% is an indication of a strong oligopolistic industry; of 33% - 50% a weak oligopoly and less than that, an unconcentrated industry (Kohls and Uhl, 1990).

In this study, buyers concentration index was calculated. To obtain the output in volumetric terms for the largest few paddy buyers, the respondents were divided into two groups. The first group comprised of respondents whose volumes handled, were above the sample mean, and the second group comprised respondents whose volumes were less than the sample mean. The mean for the first group was calculated and those above the mean were taken as a few largest buyers in the marketing system.

3.4.4 Operational Efficiency

This is the analysis of the marketing costs involved in the marketing process. If a market system performs its functions at higher costs than necessary, there is a scope for increasing operational efficiency (Schmidt, 1979). Raju and Oppen (1982) assert that operational efficiency is obtained by comparing prices at different points of the marketing chain and deriving gross and net marketing margins. Net margins are obtained by subtracting all marketing costs from gross margins of respective market

participants with a view of calculating percentage share of a consumer's shilling among them.

But in developing countries the deconstruction of market margins is difficult because of lack of data on cost (Scarborough and Kydd, 1992). Therefore, in this study gross market margin analysis was estimated. Some costs which could easily be determined were incorporated in the analysis.

The size of gross marketing margin provide an insight into some aspects of marketing efficiency. The size of different gross marketing margins over time within a given season was assessed to see if any patterns could be observed and explanations offered. Explanation is based on the argument put forward by Harris (1981) that if a market is efficient, margins should move independently of raw product prices. If gross marketing margins rise with farm production, bottlenecks in the provision of marketing services may be implied.

With regard to cotton the costs at the nodes along the marketing chain were examined to identify areas of improvement. The chain was traced up to the point of Free on Board (F.o.B.) price level.

3.4.5 Technical Efficiency

In evaluating technical efficiency, regression analysis was carried out for traders who operated between Ulanga villages and Ifakara town. The most important variable inputs used in rice marketing were found to be labour and working capital. A technical relationship between rice marketing inputs was represented as Y being a

function of a vector of inputs (Equation 3.3)

$$Y = f(X_i) \quad \text{.....(3.3)}$$

Where Y is total paddy (Output) traded in kg for the 1995/96 season and X_i is a vector of inputs used in the trading of rice

The Cobb - Douglas (C-D) production function was estimated for the traders who operated between villages in Ulanga district and Ifakara town. This kind of production function was chosen because of the fact that, according to the economic theory many production observations fit well in it. For detailed information about homogeneous production functions including C-D functions see Tisdel (1992), Henderson and Quandt (1988), Varian (1980) and Gujarati (1988). Following the general form of the C-D production function, the model used in this study was specified stochastically as in equation 3.4.

$$Y=AX_1^{B1}X_2^{B2}e^{ui} \quad \text{.....(3.4)}$$

where:

Y	=	Total rice[5] traded in kg of rice equivalence for the season.
X_1	=	Labour input in man-days[6] for the season.
X_2	=	Mean working capital[7] in Tsh for the season.
B_i	=	A vector of elasticities of output.
ui	=	Error term
e	=	Base of natural logarithm

[5] Paddy is expressed in rice equivalence where 1 kg of paddy is equivalent to 0.675 kg of rice.

[6] Man-days were estimated from the effective number of months a trader was in business (excluding sundays). For each working day only 12 hours were considered to be spent on business

[7] Mean working capital was obtained by asking trader to estimate their working capital by the time of interview

In equation 3.4 the relationship between output and the two inputs is non linear. For the sake of estimation the equation was log-transformed to become:

$$\ln Y = \ln A + B_1 \ln X_1 + B_2 \ln X_2 + u \quad \text{.....(3.5)}$$

Thus the model becomes linear in the parameters A, B1, and B2 and is therefore a linear regression model. The model was then estimated using ordinary least square method (OLS) under the assumption that the residual term (error term) was independently distributed from trader to trader with a zero mean and finite variance. The approach employed were also used by Mbogo et al (1993), Bravo-Ureta and Evenson (1994), and Mlay, et al (1994). The coefficients of the variable (elasticities) indicate the responsiveness of quantity traded as a result of a unit change in an input used, *ceteris puribus*.

3.4.6 Pricing Efficiency Analysis

This is concerned with evaluation of price behaviours (trends) in response to changes of demand and supply conditions in the marketing system over space, time and form in view of determining market integration. Market integration is the extent to which changes in prices in one part of the market lead to changes in prices in another part horizontally and/or vertically among sellers for the same product in a given area (Wyeth, 1992). This study has used this procedure in measuring market integration and analysing price movements over time for the same commodity in the same place but in different periods in a season to see if any pattern can be unveiled on how those prices were related to each other.

Independent margins are statistically indicated by a low correlation between the margins and prices and a slope coefficient of the linear regression equation which is not significantly different from zero. This corresponds to a situation in which selling and buying prices are highly correlated and the regression coefficient is very close to 1.00.

A test of the relationship between margins and buying prices was carried out for paddy traders' margin and selling prices. This was achieved through correlation and regression analysis to test to what extent market margins are statistically dependent on buying and/or selling prices, an indication that price changes are being passed on to the next market channel level. Analysis of pricing efficiency in this study was confined to examining the extent to which marketing participants pass on price changes to subsequent marketing channel levels (pricing efficiency at channel interfaces).

The regression model used is shown in equation 3.6.

$$Y = A + BX + U \quad \text{.....(3.6)}$$

where; Y and X represent margin and buying or sell prices respectively for the unit of the product in Tanzanian shillings, A is a constant term, U is an error term, and B indicates the degree to which buying and selling prices influence marketing margin of a commodity at a given marketing level. Also the regression analysis was used to determine the extent to which buying price influence selling price in the 1995/96 season.

3.5 Limitations of the Study

The conclusions drawn from this study are strictly applicable to Ulanga district alone because of varied physical characteristics and historical background among districts. However, the study gives clues of what could be happening in the paddy and cotton industries in the entire country.

In selecting villages for study it was inevitable to give attention to accessibility. So, there was likelihood that the samples would be weighted towards one or more factors and thus distort results.

Primary data used in this study were obtained mainly through interviewing farmers and paddy traders whose replies were liable to errors due to inadequate knowledge, or faulty memory, or because of untruthful replies evoked by considerations of pride or suspicion. Secondary data were extracted from secondary sources in the public institutions. The accuracy and reliability of such data could not be guaranteed. However, data kept by the public agencies such as TCLSB and BOT might have been more reliable because they are the same data used for calculation of sensitive economic indicators such as GDP and Balance of Payments for the country.

Calculating and using concentration ratios as a measure of market structure is subject to empirical, theoretical and inferential problems. First, this single measure does not reveal anything about the distribution of sales between the number of largest enterprises. Secondly, market conduct is not revealed. For instance, a large number of similar-sized enterprises may result in a low concentration index, the possibility that these enterprises could collude to form effective oligopolistic conditions has to be kept

in mind. Lastly, the concentration index in one area can not be used to generalise the situation in the whole industry. For example, the level of concentration for the industry as a whole may be low whilst, simultaneously, local instances of high concentration may be found. Nevertheless, the technique is useful in determining local circumstances as the case in this study.

The key analysis under this technique involved gross marketing margins. The weakness in these margins is their static nature. They were calculated by noting price differences between different levels of the market, for example between local assemblers and interregional traders in the same district at the same time. Therefore they do not allow for the temporal realities of storage implications of inter-market transfers. However the size of gross margins computed in this manner provide insight into other important market characteristics concerning market efficiency.

CHAPTER IV

4. RESULTS AND DISCUSSION

4.1 Demographic Characteristics

The demographic characteristics examined include age, level of education, family size and its composition. Age composition in the smallholder farmers sample indicated that the economically active population (18 - 60 Years old) compose 94% of total population. From table 4.1 and 4.2, it can be noted that there is an inverse relationship in the trends of ages of farmers and traders. Farmers above 30 years account for 60% of all the farmers interviewed whereas traders below 30 years occupy 68% of all traders. The implication of this is that agricultural production in Ulanga district is dominated by older members of the society (average 39 years). Young individuals are mainly engaged in trading activities.

Table 4.1 Age Distribution for Farmers and Traders

Age class (Yr)	Farmers		Traders	
	Number	%	Number	%
Below 20	2	2	-	-
21 - 30	23	27	27	68
31 - 40	29	34	12	30
41 - 50	12	14	1	1
Above 51	19	22	-	-
Total	85	100	40	100

Source: Own Survey, 1996

If this trend continues there is a possibility of having decreased farm output with time. Efforts to boost output by sustainable technology need to be strengthened.

The household size was found to be 6.2 (4.0 man equivalent)[8] persons. This figure concurs with the one reported in the government statistics for the same district, that is, 6.3 persons per household (MRSA 1995). This has an implication on food security and labour availability. With regard to education, the results indicate that 89% of the total respondents and all the traders could read and write. This is a good attribute as far as dissemination of information about improved farming and marketing practices through simple publications is concerned.

4.2 Farming Practices in Ulanga District

4.2.1 Land Use

In general availability of arable land is not a problem in Ulanga District. This is supported by the fact that more than 26% of total arable land was under fallow during 1994/95 cropping season. More than 49% of the farmers sampled obtained land through clearing bushes while 38% acquired it by inheritance. The remaining 13% either hired or bought the land. Area allocated to paddy was greater than cotton (Table 4.2). This might be attributed to the importance farmers attach on food security and profitability considerations.

[8] Average house size was calculated by dividing the total number of persons by the number of respondents. Man-equivalence was calculated as explained in section 3.4.1 in this text.

Table 4.2 Area Distribution for paddy and cotton (hectares)

Division	Paddy		Cotton		Other land use[a]		Total area cultivated (Ha)
	ha	%	ha	%	ha	%	
Mwaya	11.4	39	8.7	30	9.0	31	29.1
Lupiro	29.6	77	2.5	7	6.2	16	38.3
Mtimbira	40.7	86	1.7	4	42.4	10	46.7
Malinyi	13.7	63	3.7	17	4.2	33	21.6
Average	23.9	70	4.2	12	5.8	18	33.9

a Area not cultivated to paddy and cotton was either fallowed or used to grow other crops such as maize, cassava and soy bean

Source: Own survey, 1996.

Sample farmers were divided into 3 major groups according to the sizes of their paddy and cotton holdings. In the small size group of paddy farmers (below 1.0 ha) the mean area was 0.5 ha whereas in the medium size (1.0-2.0 ha), the mean area was 1.2 ha. In the large group (over 2 ha), the mean area was 3.9 ha. In the case of cotton the mean for the smallest and medium groups (below 0.5 and 0.5-1.0 ha) was 0.3 and 0.7 ha respectively. In the largest group (above 1.0 ha) the mean area was 1.2 ha. Land under cotton was only 12% of all cultivated land. By induction these results, indicate that farming activities in the district are mainly on the subsistence basis.

Land fragmentation is very common in the study area. Every smallholder farmer cultivates on average 2 small plots of farm land. These are located three Km on average from the farmers household. Long distance to plots from the household

implies loss of several man-days in walking which affects productivity and efficiency in the farming process.

4.2.2 Cropping Pattern

It were observed that all the farmers interviewed grow rice. Only 58% and 25% grow cotton in Mwaya and Lupiro respectively. In Mtimbira and Malinyi the respective proportion of farmers is 17% and 53% respectively. Paddy is normally grown as a single stand but in rare case it is inter-cropped with maize. Normally farmers grow cotton in plots of maize on relay-cultivation basis. This practice reduces appreciably the number of man-days in preparing land for cotton planting. Times for planting and harvesting of paddy and cotton vary from one division to another (Table 4.3). It can be noted that paddy is mainly planted January and harvested in June.

Table 4.3 Planting months for paddy and cotton in the, 1994/95 cropping season

Month	Planting		Harvesting	
	Paddy	Cotton	Paddy	Cotton
Mwaya	Dec	Feb	May	Aug
Lupiro	Jan	Feb	Jul	Sept
Mtimbira	Jan	Mar	Jun	Aug
Malinyi	Jan	Mar	Jun	Sept

Source: Own survey 1996.

On the other hand planting of cotton began in February/March, and harvesting was done in September/August. The interlapping farming cycles of the two crops implied immense competition for production resources between them.

4.2.3 Labour Requirements

A permanent source of farm labour is provided by the household family which often include relatives. Labour hiring in most cases with implicit payments, *togwa*[9], is common in some farm operations such as weeding and harvesting.

4.2.4 Production technology

4.2.4.1 Farm Tools

Most smallholder farmers in Ulanga district use elementary tools in the farming process such as machetes, hand hoes and axes to prepare land for paddy and/or cotton farming. The ratio of Solo sprayers to farmers is 6 people per sprayer. This gives an insight on the spraying problem during weeding in paddy and pest control in cotton. This undoubtedly has a serious impact on the yield of respective crops. On the part of tractor only 40% of the farmers interviewed used the service in farming activities mainly in primary land tillage and haulage. Nonuse of tractor services was caused by unavailability of tractors for hiring.

4.2.4.2 Use of Chemicals

Use of pesticide in paddy is not very common in Ulanga district. But selective herbicides for control of weeds in paddy farms are highly demanded. Forty two percent of all the farmers interviewed used herbicides in paddy farms. In regard of cotton, insecticides are very important. Farmers complained about the prices and ineffectiveness of the insecticides supplied by the co-operative union.

On the other hand, use of inorganic fertiliser is not common in the district. Non of the interviewed farmers used fertiliser in his or her farm land. The reason given are summarised in table 4.4.

Table 4.4 Reason for not using inorganic fertilizer in Ulanga by division (%).

Division			Soils are fertile		Fertilizer is not available	Fertiliser is expensive
	Frequency	(%)	Frequency	(%)	Frequency	(%)
Mwaya	8	33	9	38	7	29
Lupiro	2	10	1	6	19	84
Mtimbira	21	88	1	4	2	8
Malinyi	4	25	2	13	9	62
Total	35	41	13	15	37	44

Source: Own survey, 1996

The preference of inorganic fertiliser in Lupiro might be attributed to the location of the division. The division is along the main road to Ifakara and thus more accessible to the urban market. This stimulates the desire to produce more paddy for urban markets.

[9] Special juice made from maize grain drunken by farmers during labour sharing.

4.2.4.3 Varieties

There are no specific improved varieties of rice and cotton grown in the study area. Farmers grow local varieties. Paddy is identified by the topography of the land on which it is grown, that is, upland or lowland paddy. However, most cultivars belong to *Oryza sativa (Linn)* and specifically to sub-group indica variety. According to Dibwe (1984), local upland varieties are a typical sample of indica types. Super indica is the variety most widely cultivated in lowlands throughout the country. For cotton, IL 74 and EG 2 were observed to be the main cotton varieties grown in the ECGA.

4.2.4.5 Extension Services

Extension services are important in raising productivity of the agricultural sector. The survey indicated that extension services are poorly rendered. Of all the farmers interviewed only 15% contacted the extension agent for some advice. Other means of getting farm knowledge such as newspapers, agricultural newsletters were not available. However, 50% of farmers owned radios. In this way, information dissemination of agricultural knowledge through radio broadcast is feasible.

4.3 Profitability Analysis per Hectare for Paddy and Cotton

4.3.1 Man-equivalent

In calculating labour input three major groups have been distinguished. The first group comprises of male adults between the age of 18 and 60 years whose labour unit is taken as one man-equivalent. The second group is made up of female adults with age between 18 and 60 years and their unit labour has been taken to be 0.75 of man-equivalent. The last group of people between 10 and 17 and over 60 years has 0.5 unit of man-equivalent value. Such labour categorisation by man equivalent values for the respective groups was arrived at by taking into consideration effective participation in farm activities. Women are normally occupied with a multitude of other non-farm activities such as domestics and maternal responsibilities. Children and old men because of their physiological nature are not energetic enough to work like adults males or females. Men are responsible for ensuring household food security and thus devote appreciable time on farming activities. This approach was also used by Mlambiti et al (1992).

Appendix 2a, 2b and 2c show the calculation of man-equivalent values for paddy and cotton. In all divisions the contribution of male labour is highest for both crops. Overall male labour contribution to the agricultural production activities in traditional technology is about 54%, women 37% and children and old men nine percent for paddy. In cotton production the overall contribution of male, women and children labour is 53%, 40% and seven percent respectively. This is contrary to the widely held contention that farming activities are mainly carried out by women. However female

labour contribution on operations such as weeding, bird scaring and harvesting was found to be prominent.

4.3.2 Crop Yield

The overall average paddy yield per hectare on farms were tractor technology was not used was 1 079 kg whereas where tractor was used, the average yield was 981 kg (Table 4.5 and Appendix 2g). The trend in price of paddy in the district indicate relative location and accessibility of the divisions. It was lower in Mwaya and Malinyi which are located in remote parts of the district.

Table 4.5 Gross margin analysis of smallholder paddy production (1994/95)

Particulars		Without tractor				With tractor			
		Mwaya	Lupiro	Mtimbira	Malinyi	Mwaya	Lupiro	Mtimbira	Malinyi
a.	Land area under paddy (Ha)	11.4	13.0	8.6	9.2	1.8	16.6	32.1	4.5
b.	Total production (000 kg)	16.7	10.8	10.9	7.1	1.0	18.1	28.4	6.6
c.	Yield per Ha (000 kg (b/a)	1.5	0.8	1.3	0.8	0.5	1.1	0.9	1.5
d.	Farm-gate price (TSh/kg)	37.0	70.0	75.0	61.0	37.0	70.0	75.0	61.0
e.	Total revenue (000 TSh) (b*d)	619.4	757.9	817.1	431.7	35.6	1 263.8	2 128.4	399.5
f.	Total Revenue per Ha (000 TSh) (e/a)	54.3	58.3	95.0	47.0	19.8	76.1	66.3	88.8
g.	Variable cost/ha (000 TSh)	9.2	9.6	10.0	10.7	18.3	24.6	21.7	24.9
h.	Gross margin/Ha (000 TSh) (f-g)	45.1	48.7	84.0	38.2	1.5	51.5	44.6	63.9
i.	Total labour/Ha	210.0	241.0	228.0	177.0	171.0	116.0	150.0	218.0
j.	Gross margin/Ha/ man-day (000 TSh) (h/i)	215.0	202.0	369.0	215.0	9.0	444.0	297.0	293.0
k.	Gross margin/Ha/ shilling of variable cost (h/g)		5.0 5.0	8.0	4.0	0.1	2.0	2.0	3.0

Source: Own survey, 1997

Mwaya Division was found to have least gross margins under tractor farming. This might be attributed to the fact that the topography of the area is hilly especially in Ruaha Division. This discourages production of paddy. On top of that because of the remoteness of the division, the price per kilogram of paddy was relatively low as compared to other divisions. This kind of situation resulted into low gross margin in the division. The overall average yield per hectare for cotton was found to be 357 kg (Table 4.6 and Appendix 2h).

Table 4.6 Gross margin analysis of smallholder cotton production (1994/95)

Particulars	Mwaya	Lupiro	Mtimbira	Malinyi
a. Land area under cotton (Ha)	8.5	2.5	1.7	3.7
b. Total production (000 kg)	3.6	0.7	0.3	1.3
c. Yield per Ha 000 kg (b/a)	415.0	296.0	200.0	357.0
d. Farm-gate price (TSh/kg)	160.0	160.0	160.0	160.0
e. Total revenue (000 TSh) (b*d)	577.6	118.4	54.4	211.2
f. Total Revenue per Ha (000 TSh) (e/a)	6.6	47.4	36.3	57.1
g. Variable cost/ha (000 TSh)	27.0	1.6	25.5	21.1
h. Gross margin/Ha (000 TSh) (f-g)	39.3	5.8	10.7	365.0
i. Total labour/Ha	89.0	202.0	84.0	198.0
j. Gross margin/Ha/ man-day (000 TSh) (h/i)	442.0	29.0	128.0	182.0
k. Gross margin/Ha/ shilling of variable cost (h/g)	2.0	0.1	0.4	2.0

Source: Own survey, 1997

The average output per hectare is generally higher in traditional technology farms. This is probably because tractor farming is done on much drier lands where water is scarce as compared to non-tractor farming where rice is grown on wet valleys. Furthermore, the use of tractor alone does not guarantee high yields. Tractor save time and fatigue on the part of human being, that is why the service is highly demanded. Yield is a function of many other factors such as crop husbandry, weather and varieties. If tractor use is not accompanied with modern seed and fertiliser, significant increase in yield can not be realised. However if tractor technology is used on the basis of economies of scale it can contribute significantly to increased production of crops.

Cotton yield is highest in Mwaya and Malinyi, the two divisions where ginneries are located. Lupiro and Mtimbira performed poorly. This can be explained by the fact that the two divisions were seriously hit by floods in the 1994/95 season.

4.3.3 Gross Margin per Hectare

Gross margin per hectare for each crop was derived by subtracting revenue per hectare from important variable input costs per hectare. Some of the variable costs left out include implicit and explicit payments to hired labour, family labour, sacks and depreciation of equipment and tools. Revenue per hectare and input cost per hectare were calculated by dividing total income and total input cost by total area under the crop respectively. Total income from respective crops for the sampled farmers was obtained by multiplying total output by farm-gate prices for each division.

It was also observed that gross margin per hectare for paddy was comparatively highest in Malinyi, which had GM/ha of TSh 63 837 under tractor farming, followed by Lupiro, Mtimbira and Mwaya. In the case of non-tractor farming Mtimbira had the highest gross margin followed by Lupiro, Mwaya and Malinyi (Table 4.5).

4.3.4 Returns per Man-day per Hectare

Man-days were calculated by dividing total man-equivalent (see section 4.3.1) by 8 hours. The man-days were divided by area under the crop to obtain labour input per hectare. Then gross margin per hectare was divided by labour input per ha to get return per man-day per ha. A comparison on the basis of returns per man-day reveals that paddy gives higher overall returns per man-day of TSh 250 as compared to only TSh 47 for cotton. In Mwaya district return per man-day in cotton is higher than in paddy for farmers who did not use tractor technology. This implies that farmers in Mwaya can benefit from putting much emphasis on cotton production is fixed by the co-operative union and thus uniform in the whole district. But for paddy, the price vary from place to place and time to time basing on the accessibility of the area and scarcity of the produce.

4.3.5 Return per Liquid Capital Invested

This was calculated by dividing gross margin per hectare by total cost per hectare. It indicates the amount of money a farmer gains from each of his/her shilling spent on the production process. Return per shilling invested in paddy without tractor farming is six shillings whereas with tractor is only two shillings. Return per shilling invested is lowest in cotton where a farmer experiences a loss of TSh 0.8 for each shilling spent on the farm. This is because cotton requires extensive use of chemicals

which are expensive. Without using chemicals yield can be seriously affected. Also, farmers give little attention to cotton. This is mainly because of market problems. for example Farmers were lamenting that the Co-operative union had not paid them for their cotton purchased as far back as the 1992/93 season. In addition, farmers still had a negative attitude towards cotton farming because at one time the government used forceful means to induce production.

Average area under paddy cultivation using tractor was 1.6 ha while that without tractor was 0.8 ha. It was also found that return per shilling invested is lower in farmers who used tractors than those who didn't. This implies that using tractor in farming in Ulanga district is not a rational decision at the moment. This can be attributed to diseconomies of scale that farmers using tractors experience in the district. In order to benefit from tractor use farmers ought to increase their farm sizes so as to enable tractor owners to spread overhead cost. This would make tractor hiring cheaper. Return per shilling invested in cotton production could be raised significantly if a relatively cheaper insecticide was used in cotton production. The insecticide used in the 1994/95 season was too expensive and accounted for more than 90% of the total cost (Appendix 2h).

4.4 Characteristics of Paddy and Cotton Marketing Participants

4.4.1 Paddy Marketing Participants

In this study marketing participants refer to all individuals or firms that are involved in the marketing process. Five participants have been identified along the paddy/rice marketing chain. They comprise smallholder farmers, private traders,

wholesalers, retailers and consumers. The wholesalers, retailers and consumers located far away from the study area are beyond the scope of this research. The most important market participants in the study area are described in the subsequent sections. The paddy marketing chain is presented in figure 4.1 below:

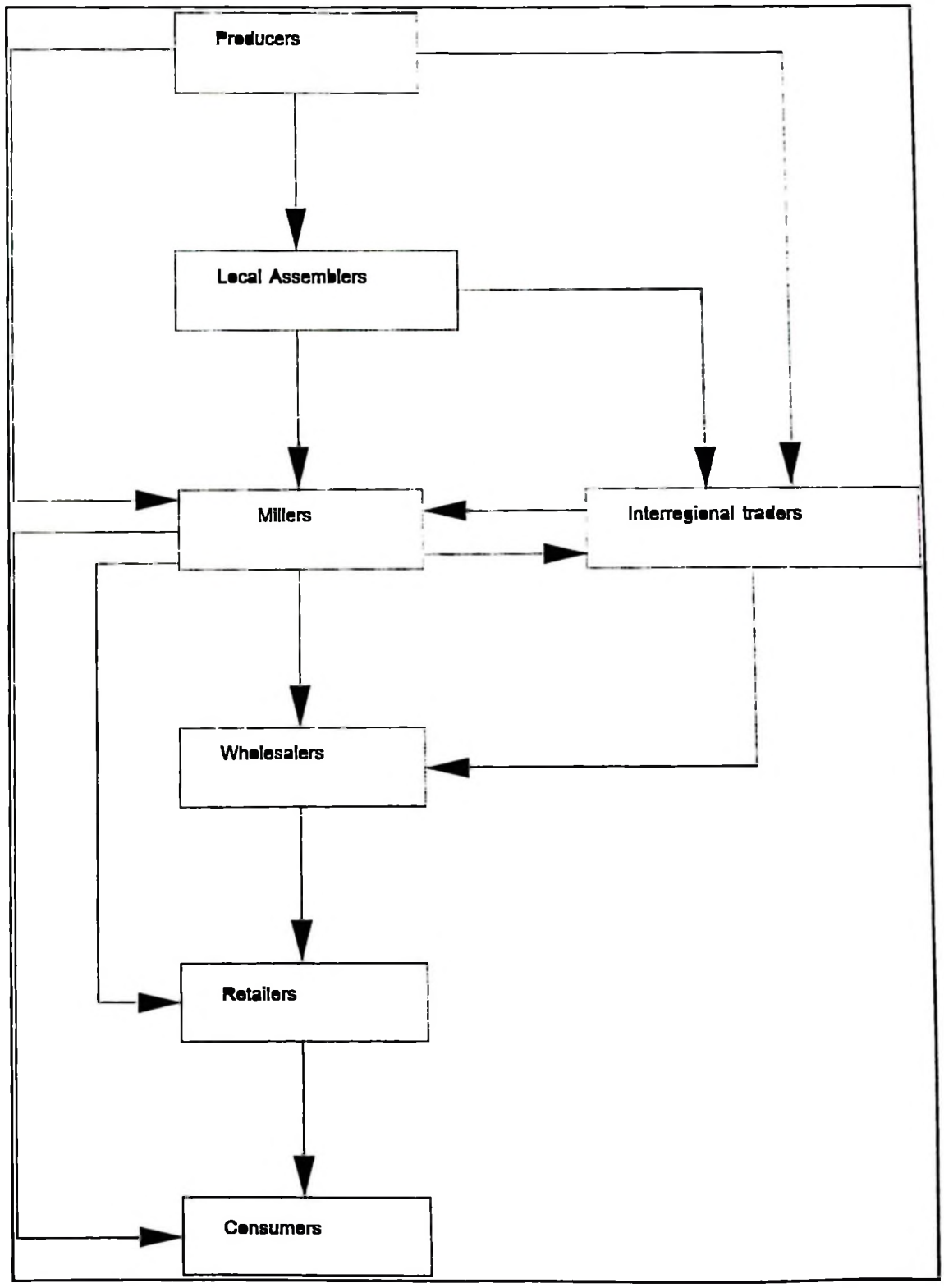


Fig. 4.1: Rice marketing chain in Ulanga district.

4.4.1.1 Smallholder Farmers

The main role played by smallholder farmers is paddy production. The bulk of paddy in Ulanga district comes from a large number of very small and scattered smallholder farmers each operating independently. According to survey results, 40% of the rice produced in the district is consumed within the first 3 months after harvesting. Out of this 45% is traded. Also it was found that 49% of smallholder farmers are not self sufficient in rice and rely on buying and exchange from neighbours. This shows that production of rice is not high enough in the area. Thus, a move to improve marketing system should go hand in hand with measures to ensure increased production of paddy.

Smallholder farmers sell primarily to small traders who resell the produce to bigger traders. Paddy and/or rice is sold in small lots whenever the household's need for cash arises. Producer prices are based on the market forces. They are usually lowest in June/July during harvesting time and picks up slowly as the season advances and rice supply declines. The critical shortage of rice occurs in February/March when farmers supplement rice with other less preferred food such as maize, cassava, and banana. This phenomenon has a repercussion on the marketing process as there is no surplus for the market.

4.4.1.2 Private Traders

The transactions of the traders are not affected by any direct control in their day to day activities. As noted earlier the majority of traders are young men and women. This can be attributed to lack of alternative employment opportunity in the rural areas. Their standard of education is generally low. Only three percent had secondary

education, and non of them had ever attended a commercial course or seminar. This could have enhanced the ability of paddy traders to exploit existing market potential.

Paddy trade is conducted absolutely on competitive basis. Traders usually operate alone and each handle two farm crops on the average. Other traded crops include maize, beans and soybean. Some few paddy traders operated kiosks and transport services. Eighty percent of all traders mentioned farming as their main activity during lean season. On average traders had a five year experience in paddy trading business. This can be explained by the fact that traders have recently been allowed in paddy business. Since 1967 when the government started implementing socialistic policies, no private trader was allowed in crop marketing activities. The situation was changed mid 1980s when the government liberalised the economy.

Significant correlation was noted between the quantity of rice traded and income from rice and mean working capital (Appendix 3). The trading income depends largely on the scale of operation. Traders operating with an average working capital of below TSh 100 000 had an average annual turnover of 4 429 Kg of rice. Those with working capital between TSh 100 000 and 300 000 the turnover was 7 784 kg whereas the turnover for working capital above TSh 300 000 was 32 596 kg.

(a) Local Assemblers

This category comprises of rice traders who move from house to house collecting paddy in small lots from the farmers. Collection of paddy and/or rice is done by the trader. In rare circumstances agents are used to assemble the product usually under the supervision of the trader. Occasionally farmers take produce to the trader at

specified locations. This reduces traders collection costs. This phenomenon is more prevalent in remote areas of Ilonga and Mtimbira ward. Once traders attain a satisfactory load they transport the consignment to the selling points. There are three sub-groups in this category. There are those who destines at Mahenge market and sell to the retailers, and those who move the consignment outside the district. These either sell their produce at Ifakara to other traders or take it directly to Dar es Salaam.

(b) Retailers

The retailers referred to in this study are those situated at Mahenge market. They basically buy rice from assemblers in large quantities and sell it in small quantities to a wide range of consumers. These traders rarely move to the villages to collect rice on their own.

(c) Inter-regional Traders

Interregional traders are those involved in buying rice from various regions and selling it to deficit areas in the country. They are colloquially known as "Wapemba" because previously this trade was dominated by traders from Pemba Island who used to transport rice to Zanzibar and abroad. These normally wait for rice in Ifakara and buy after the paddy has been hulled to rice. No single trader sent rice consignments to areas other than Dar es Salaam because in Dar es Salaam the market is assured regardless of the quality of the product. The summery characteristics of traders are presented in table 4.7.

Table 4.7 Summary features of various categories of paddy traders in Ulanga district.

Category	No	%	Mean working capital (000 TSh)	Average paddy traded (000 kg)	Mean paddy income (000 TSh)	Mean total income (000 TSh)	Paddy income as a (%) of total income
Local Assemblers							
Village-Mahenge	3	8	120	6.1	386	1 428	27
Village-Ifakara	23	58	143	6.5	326	446	73
Village-DSM	6	15	172	6.5	252	41	62
Retailers:							
Mahenge market	4	10	150	2.2	199	4 322	46
Inter-regional traders:							
Ifakara-DSM	4	10	788	61.5	1 884	3 364	56

Source: Own Survey, 1997.

Smaller percentage of income from paddy trade for local assemblers implies alternative sources of income available to the traders. This poses a threat to the paddy sector as it is easy for the traders to shift to other business should problems arise in the paddy marketing process.

Traders transporting rice from villages to Ifakara or DSM are essentially farmers who keep themselves busy during dry season. The business is done on part-time basis. During paddy cultivation period they all go back to farming. They spend all the money in paddy farming. When they harvest paddy the produce forms the principal for that particular marketing season. In case the crop fails a trader is virtually eliminated from the business.

4.4.2 Cotton Marketing Participants

4.4.2.1 Smallholder Farmers

Cotton is produced exclusively by smallholder farmers in the district. Farmers have no option but to sell the produce to the co-operative union (UKICU) which is the only buyer in the district. After harvesting, cotton is sorted and stored waiting for the market. When money is available from UKICU Headquarters information is passed on to farmers. This procedure favours farmers who live close to the buying posts. Cotton is brought to the buying centres (PCSs) where buying proceeds on " first in first served" principle.

The problem is that funds brought to the buying centre is usually not enough to buy the quantity of cotton offered is for sale by the farmers. As a result some farmers return home with their loads and wait for the next trial. This creates an environment for favouritism. Fifteen percent of the sampled cotton growers had not sold cotton as at October, 1996. This is a disincentive to the producers and jeopardises the development of the cotton sector in the district.

4.4.2.2 Primary co-operative societies (PCSs)

The PCSs buy cotton from farmers on behalf of the Co-operative Union. They also distribute farm inputs such as seeds and chemicals to the farmers under the directives of the Union. Buying of seed cotton is on agency basis. The PCSs are paid a commission determined by the Co-operative Union. However, the Ulanga - Kilombero Co-operative Union (UKICU) and its predecessor MRCU had never paid this commission to the PCSs in the area for a couple of years. In addition, the officials of the PCSs are charged with the responsibility of grading seed cotton. According to section 9 of the Government Notice No. 536 of 1995 (URT, 1995), every cotton grower is supposed to grade his or her seed cotton into Grade A or Grade B before selling (Appendix 4a). In Ulanga district grading is not done on ground that seed cotton is fairly clean. Cotton is stored in PCSs' warehouses pending haulage to ginneries by UKICU.

Farmers in the study area are against the co-operative union activities. Only four percent of the farmers interviewed were members of the primary co-operative societies. This is because it makes no difference whether a farmer is a member or not.

All cotton growers are treated equally by the PCSs. Farmers assert that the entrance fee of TSh 3 500 was too high for them. Although there are 15 Primary Co-operative Societies in the district it was found that there was high level of unawareness among farmers with regard to co-operative principles.

4.4.2.3 Ginneries

The main responsibility of the ginneries is to gin and bale cotton. Ginneries are owned by the Co-operative Union (UKICU). The transportation costs from the PCSs to the ginneries are met by the UKICU. However, procurement of cotton from farmers and storage costs are borne by the PCSs. At the ginneries cotton is ginned and baled. A bale of lint cotton weighs 181 kg excluding all the accessories such as cores and wrapping materials.

There are two ginneries in the district. One is located at Mwaya and the other at Malinyi. The two divisions are leading in seed cotton production in the area. Of all the cotton produced by the surveyed farmers 87% came from Mwaya and Malinyi alone. It was observed that the two ginneries are very old and poorly maintained. Mwaya ginnery was installed in 1951 whereas the ginnery in Malinyi in 1941. Factory buildings, offices, staff quarters and most warehouses were almost running down at the time of the survey..

4.4.2.4 Ulanga-Kilombero Co-operative Union (UKICU)

UKICU was formed in 1994 on the eve of the collapse of the Morogoro Regional Co-operative Union (MRCU). UKICU serves two districts namely Ulanga and Kilombero. Formation of one co-operative union for the two districts was necessary because cotton production in Kilombero district was not sufficient to justify a separate co-operative union. The co-operative union had no funds and could not get loans from the financial institutions because of the debt burden it inherited from MRCU. Thus, the best alternative was to enter into contracts with private buyers. The contracts essentially make UKICU an agent of the partner. The private buyer releases funds to purchase, gin and bale cotton. UKICU charges all the operational costs including the ginning fees to the buyer. The ginning fee for 1994/95 season was TSh 110. From the ginnery, UKICU hauls the lint to TAZARA Railway Station in Ifakara where it is handed over to private buyers. The cotton marketing chain in Ulanga District is presented in figure 4.2 below.

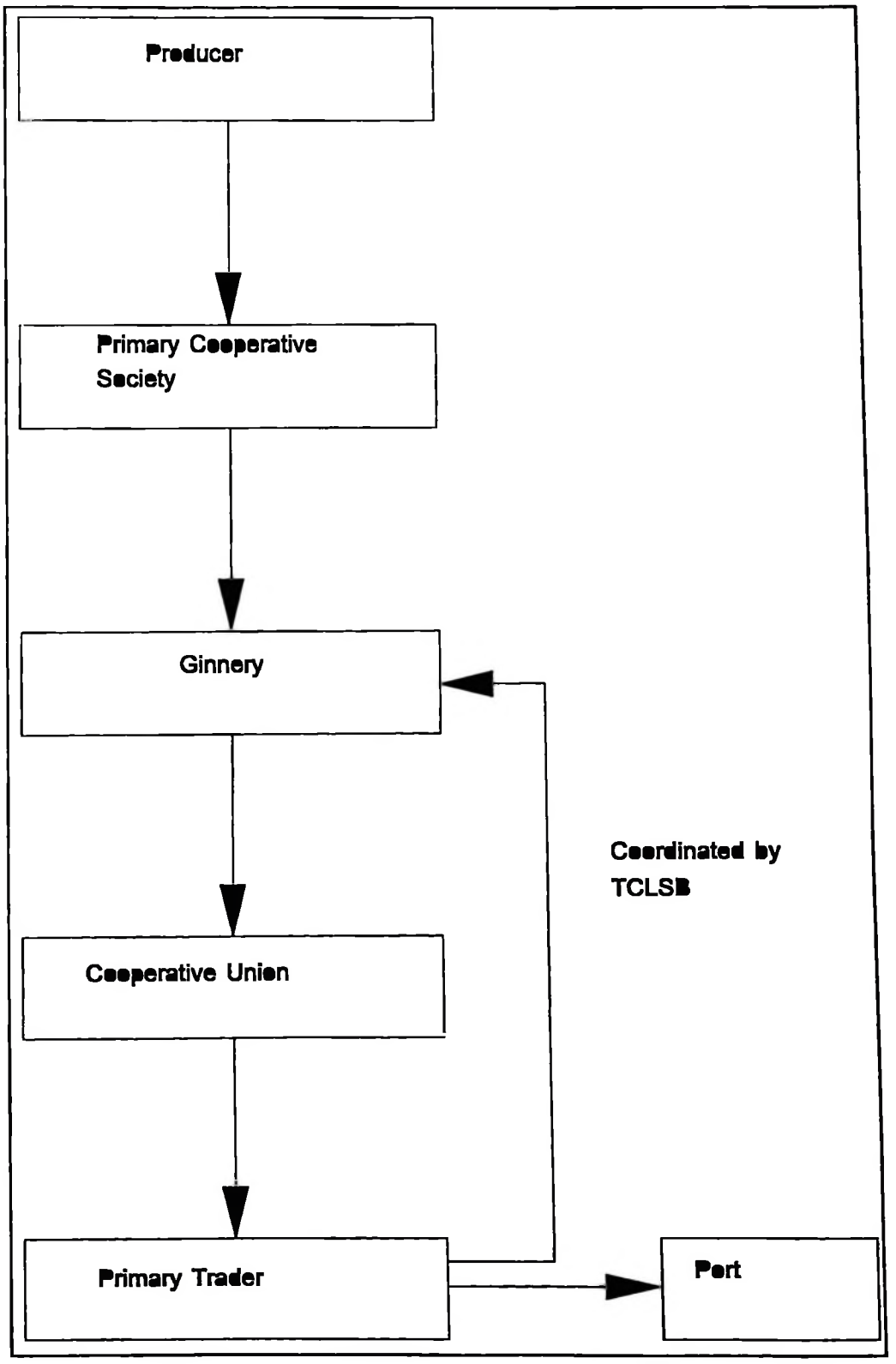


Fig. 4.2: Cotton marketing chain in Ulanga district.

(a) Role of the Private Sector in Cotton Trading in Ulanga District

In Ulanga district private sector involvement in cotton marketing is not well established. The sector participates in an indirect way through the Co-operative Union (UKICU). At present there is only one private buyer, COTRA General Agency Ltd (CGA). CGA entered into a contract with UKICU in which the company supplies funds to the union and the union purchases and gins cotton. Reconciliation is made at TSh 760 per kg of lint cotton. The presence of only one buyer in the area is attributed to UKICU preventing rivals from using her go-downs (at PCSs) and ginneries. During the survey, arrangements were under way by another private buyer, Global Consultant Services (GCS) to establish a modern ginnery at Lupiro within the district.

(b) The Role of Tanzania Cotton Lint and Seed Board (TCLSB)

The main responsibility of TCLSB is to issue licences to cotton buyers and ginners. There are well-established condition for the licences. Every cotton buyer must get permission from the Distinct and Regional Commissioners, pay application fee of TSh 20 000 and another TSh 20 000 for licence fee per buying post. In addition every licencee is obliged to pay TSh 12 for every kilogram of seed cotton purchased to be used in cotton research. The board has to ensure that the conditions are met (Appendix 4b.)

A ginning licence is issued at a fee of US $ 2 000 and is valid for ten months, subject to extension. Cotton lint buyers pay a levy of 1.3% of ex- ginnery price to the board to finance regulatory functions of the Board and cotton research. Also every trader is required to produce on annual report to the board. The survey observed that

most of the regulations are not fulfilled and the board takes no legal action against the offenders. Grading is not done private traders are not producing records promptly. The board fails to exercise its powers conferred on it under section 10 (2) of the Tanzania Cotton Marketing Board Act No. 19 of 1984 (URT, 1984). For example, it can cancel or suspend a licence if the licencee fails to comply with terms and conditions of the licence. The reason given is lack of working facilities. However, ginnery inspection was found to be done accordingly (Appendix 4d)

4.5 Marketing Infrastructure in Ulanga District

4.5.1 Paddy Hulling Operations

Paddy hulling is mainly done in Ifakara where there are lots of mills. Fifty eight percent of all traders sampled hulled their paddy in Ifakara. Only 20% of the traders hulled paddy in Ulanga district. However, rice hulling using mortar and pestle is common in the district.

4.5.2 Transport

4.5.2.1 Roads

Ulanga district is well linked to Ifakara, the nearest town in Kilombero District. Mahenge, the headquarters of Ulanga district, is 74 km from Ifakara. The road from Ifakara to Mahenge branches off at Lupiro. The Eastern wing ends at Malinyi some 147 km from Ifakara. The Western branch via Mahenge ends at Mwaya, 114 km from Ifakara. Although these roads is not bituminous they are passable throughout the year,

because of general maintenance done regularly. The rest of the feeder roads are seasonal and become virtually impassable during the rainy season. These roads are extremely important because they link smallholder farmers with the rice demand areas. Some feeder roads such as Mwaya - Ketaketa, Mwaya - Puti, Malinyi - Kilosa kwa Mpepo, Ruaha - Sali, Ruaha Ngolo, Malinyi - Igawa, Malinyi - Biro and Chilombola - Ebuyu are in pathetic situation and need serious rehabilitation. This in a way affect producer prices received by smallholder farmers in those areas. Figure 4.3 shows main infrastructure and features in the study area.

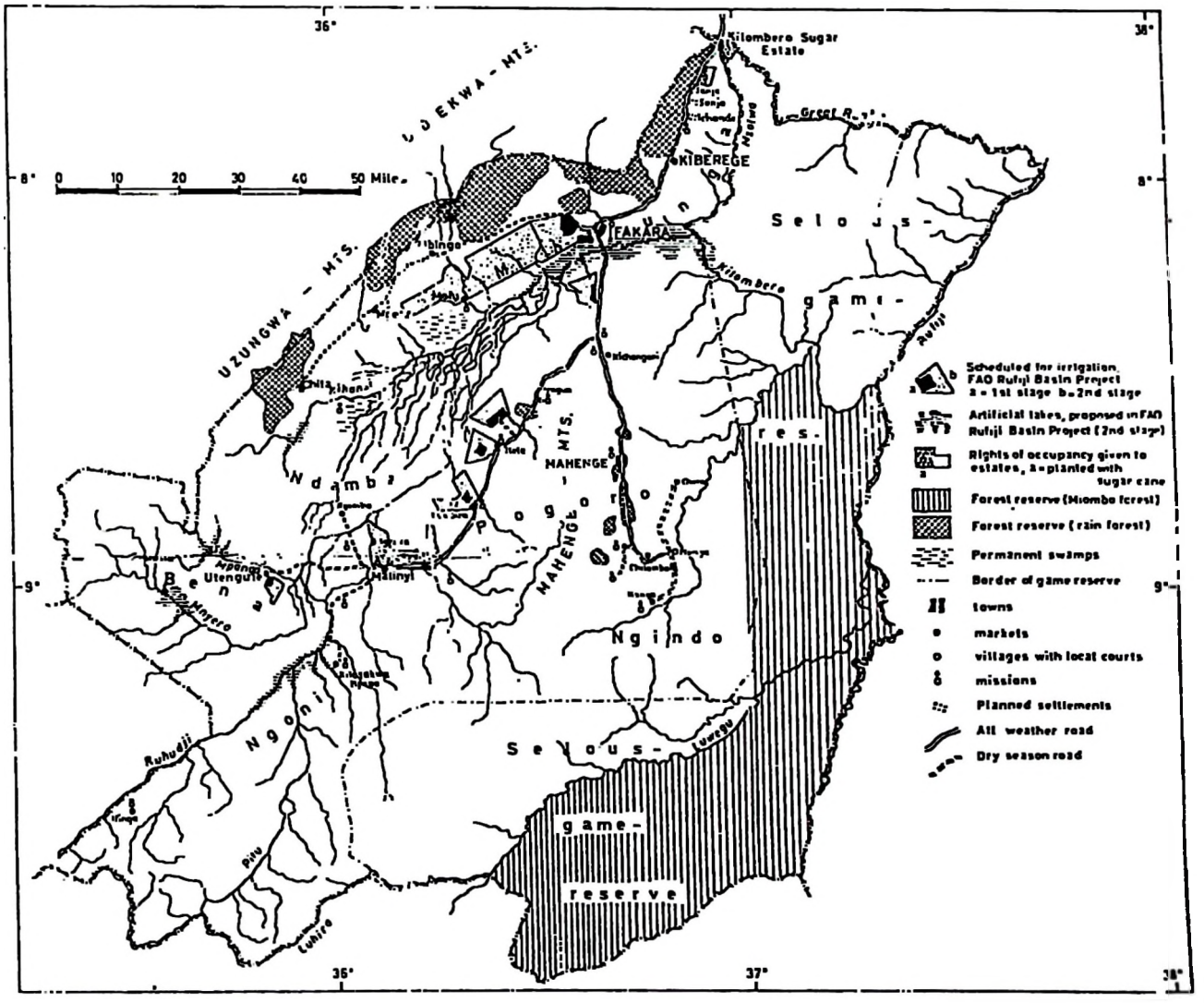


Figure 4.3 Ulanga District: Infrastucture and main features

Transport costs within the district are exorbitantly high. For instance from Mahenge to Mwaya, 40 km apart, the fare ranged between TSh 1 500 and TSh 2 000. This is over 200% of the official rate of TSh 12 per km per person authorised by the Tender Board. The survey was conducted during the time when the Irish Aid was supporting the district council to rehabilitate its infrastructure, October, 1996.

4.5.2.2 Water Way

A Kilombero river separates Ulanga district from Kilombero district. There is a ferry operating between the two sides. This causes a considerable delay in the transport process. The ferry operates only during daytime. So a trader arriving there late in the evening is likely to spend the whole night. Another problem regarding this river is that there is a tendency for water level to decrease during dry season to the extent that a smaller ferry powered by ordinary tractors renders services across the river. This causes hardship to the traders because only small vehicles are allowed to cross the river. This increases marketing cost because traders must unload and reload their consignments across the river.

4.5.2.3 Railway

Railway is very important, particularly for transportation of large quantities over longer distances. The railway line, TAZARA, that joins the area to the port city and the major consumption area of the Ulanga rice is located 80 km from Mahenge. Many traders desire its services but because of considerable delays in the clearance process they avoid it. Most paddy traders depend on unreliable transport. Once they

have assembled the consignment they wait alongside the road for any returning truck that might have come in the area for a different purpose. Occasionally a group of traders collectively hire a truck. But there are no economies of scale in it because the charge is based on a bag. However, there is economies of scale with TAZARA because cargo charge is based on the size of the wagon.

4.5.3 Telecommunication

Closely related to the transport communication is the telephone system. In the vast Ulanga district telephone services are found at Mahenge only. At the time of the survey the telephone charge per minute to DSM was TSh 580 and the operator had to try several times before getting a line. No single paddy trader interviewed had ever done business communication to DSM on the phone. The common way of exchanging market information is by personal communication.

4.5.4 Credit Facilities

It was observed that traders do not run bank accounts neither do they keep cash. The way of keeping the principal cash during off-season is to invest it in farming activities and the paddy harvest acts as a principal for the following trading season. All traders interviewed had never got access to formal credit. However, 10% of the traders raised their capital through either an informal source of credit by borrowing money from relatives and friends or grants from parents. Traders have no access to formal credit because they have no collateral.

4.5.5 Storage Facilities

On the part of farmers, storage is done in traditional structures, *vihenge,* and in residential houses. The only problem cited by the farmers is the presence of rodents. No trader has proper storage facilities. They normally use their homes to temporarily store paddy pending haulage to selling centres. Only 38% percent of all traders stored paddy to take advantage of increased prices later in the season. Temporary storage is done at the mills on agreement that the trader would hull his paddy where he or she stored it. For localised traders such as those at Mahenge town temporary storage is provided at the market place.

A big grain storage go-down exists at Lupiro. The go-down used to receive food crops such as paddy, maize, beans, soybean and dried cassava from PCSs under the directives of co-operative union. But since the collapse of MRCU in 1994/95 the warehouse had remained idle. Under proper arrangements the Lupiro go-down could be used profitably by private traders.

4.6 Market Efficiency Analysis for Paddy Sector

4.6.1 Market Structure

According to the concept of competition a marketing system performs satisfactorily under the following conditions: (i) market transparency with regard to product quality, variety, grades and prices; (ii) absence of serious barriers to market

entry and exit; and (iii) existence of sufficient number of buyers to provide alternative outlets without one of them having the market power to dominate others (Schmidt, 1979).

(a) Market Transparency

The most important aspect of market transparency is information transmission in the marketing system. This implies information about prices, grades, and standard weights of the product in question. In Ulanga district the most important way of collecting price information is personal communication among market participants. However, price is not an important factor whether a trader delivers his produce to the market. The majority of traders (93%) send their consignments to the market without knowing price in advance or prices in adjacent districts.

Ninety five percent of the traders did not know prices in regions other then Dar es Salaam. This is why the flow of rice is mainly from Ulanga district to Dar es Salaam. Also traders did not sell rice in Morogoro town because the market is very small to absorb all the rice from Ifakara line and the competition from Dakawa rice is very stern. The quality of Dakawa rice is higher and preferred in Morogoro town. By implication there is quality problems with rice from Ulanga district. Traders interviewed were aware of the prices broadcasted by Radio Tanzania Dar es Salaam (RTD). They asserted that those prices are unrealistic.

The marketing of rice in Ulanga district is not under direct control by the Central Government. The District Council controls paddy traders through imposing fees and direct ban to control outflow of the crop in the district. However the District

Council paid little attention on the quality control. This leads to problems of standards in grades and weights. There is no differential bagging based on product quality during collection. Common instruments used during selling paddy and rice include *kopo*, tins and sacks. Standard metric scales are not common. Six tins make up a bag and multiplying a tin's price by six, a price for a bag is arrived at. The kopo is believed to be equivalent to a kilogram of rice in weight, and 20 kopos make up one tin full of rice. The researcher found that on average one kopo was 1.25 kg.

This is a serious shortcoming in the rice marketing system because more often than not the tins used are not uniform. All this is to the disadvantage of the producer. Usually the measuring tools belong to the traders. Incidences exist where traders use instruments with bulged surfaces. Therefore it can be concluded that as far as market transparency is concerned the paddy and rice marketing system in Ulanga district is not efficient.

(b) Barriers to Entry in the Paddy Marketing System

There is absolutely no restriction imposed by the government to entry in the rice marketing system. No licence is required to start trade. Forty two percent of traders described a fee charged per bag of paddy or rice by the district council as prohibitive in the marketing process. During the time of the survey the fee per bag of paddy and rice was Tsh 800 and TSh 1 500 respectively. At harvesting time this is almost 20% of the farm gate price per bag. The fee mechanism is used by the district council to regulate food outflow and hence to ensure food security in the area.

On the part of business skills rice traders have very limited knowledge on basic marketing principles. No single trader interviewed had ever attended any formal commercial course or seminar. Their knowledge was obtained through experience. New entrants into the marketing business learn by doing. The factor mentioned by 56% of traders as most important obstacle was lack of initial capital. In a well functioning economy capital can be increased by borrowing funds from the financial institutions. But in Tanzania in general and Ulanga in particular the financial sector is virtually non-existent. The important sources of initial capital include farming (48%), other business (37%), relatives (7%) informal credit from friends (3%) and other sources (10%). Transactions at farm-level take place on cash basis.

However, some forms of credit in terms of delayed payments prevailed at milling machines and in Dar es Salaam where auctioneers (Dalali) pay traders after a couple of days. About 43% of traders hulled their paddy on credit basis. The initial capital among traders was generally low. On average, traders started paddy trade with an initial capital of Tsh 65 650. The standard deviation was extremely high, Tsh 70 497 indicating that the variation between traders was very high (Table 4.8).

Table 4.8 Initial capital in rice trade by capital groups

Capital groups	Frequency	Valid percent	Cumulative percent
Below 50000	22	55	55
50000 - 100000	13	33	87
Above 100001	5	12	100

Source: Own Survey, 1997

(a) Market Concentration

Observation and discussion with knowledgeable individuals revealed that there is a multitude of traders in the rice marketing system. This was confirmed by the district authoritics. This is also supported by the results of buyers concentration ratio obtained. The total output for the sample was 259 640 kg of rice with an average of 6 491 kg. The total output above this average was 107 768 kg, and the average of this group was 13 471 kg per trader. The total average above this average was 67 532 kg and was used in the calculation of buyer's concentration index (Appendix 5)

$$C = 100\ (67\ 532/259\ 640) = 26\% \quad \text{.....(4.1)}$$

Such level of index (Equation 4.1), according to Scarborough and Kydd (1992) shows unconcentrated industry, that is, there is no group of traders that is strong enough to control the paddy market. This is an indication of competitive situation in the marketing system (see section 3.5.3 of this text). Thus, it can be concluded that the number of buyers in the rice marketing system in Ulanga district is high enough to break monopsonistic tendencies among traders.

4.6.2 Market Conduct

Market conduct implies the way marketing participants behave towards avoiding competition. For example pricing and selling tactics, traders' co-operation, or rivalry, and research and development activities. Rice traders operate individually without any appreciable co-operation. Sixty five percent of the traders interviewed had

no personal business relationship with fellow traders. Thirty five percent co-operated in co-transport and selling on each other's behalf in case one was absent. No forms of co-operation in determining prices was noted because each trader buys independently at varied prices and collection costs and sometimes varied transport charges. Thus, selling at a unified price would mean losses to some traders. Rice traders are price takers. However, those with relatives where they sell rice can afford to delay selling rice until price improves. The living expenses during this time are met by their relatives.

Just like any other food crops, the selling price of rice is very unstable. Traders have no certainty about the actual selling price when buying. This reduces their willingness to pay high prices to the farmers especially if the quality of rice is poor. The quality of rice has a positive contribution to the competition. That is why traders willingly offer high prices for high quality rice.

In Ulanga district traders have developed means to control costs. They transport paddy instead of rice outside the district and process it at Ifakara. They argue that this is cheap because they pay only a fee of TSh 800 per bag and transport charge of TSh 1 200 per bag. The District Council fee for rice is TSh 1 500 per sack and transport cost is TSh 2 500 per sack. According to the survey a normal sisal twine sack full of paddy weighs 73 kg while that of rice weighs 108 kg. Also a sack of paddy gives 45 kg of rice. This means a kilogram of paddy is levied TSh 18 and transported at TSh 27. On the other hand rice is levied TSh 14 and transported at TSh 23. This implies that as compared to those who pay fees on paddy and transport paddy, get a loss of eight shillings per kg. In this respect, traders' argument is unrealistic. However real saving on fee and transport is achieved by overfilling the bags, commonly referred

to as *"Lumbesa"*. *"Lumbesa"* of paddy weighs 105 kg on average while that of rice 170 kg. In this regard traders save eight shillings per kg of paddy and TSh 14 per kg of rice.

4.7.3 Market Performance

(a) Operational Efficiency

The costs in the rice marketing system are variable in nature; they include collection costs, transport, fees and labour charges (Table 4.9 and 4.10)[1] Traders who processed paddy in Ulanga and transported it to Dar es Salaam saved explicitly one shillings as compared to their counterparts.

Table 4.9 Marketing costs of paddy hulled at Ifakara and sold in Dar es Salaam

Cost item	TSh/kg	%
Collection (house to house)	8	7
Bagging & stitching paddy-Ulanga	3	3
District council fee/bag	12	10
Transport charges Ulanga to Ifakara	23	20
Loading & off - loading paddy	6	5
Milling charges	9	8
Weighment charges	2	2
Bagging & stitching rice-Ifakara	3	3
Loading & off-loading rice (Ifakara - Dar es Salaam)	6	5
Transport charges Ifakara to Dar es Salaam	32	27
Other personal costs per trip*	12	10
Total cost	116	100

* Accommodation and meals

Source: Own survey 1997.

Table 4.10 Marketing costs for paddy processed in Ulanga District and sold in Dar es Salaam

Cost item	TSh/Kg	%
Collection of rice	8	7
Milling charges	12	11
Bagging & stitching	3	3
District council fee	12	11
Transport charge	46	41
Loading & off-loading	6	5
Weighing charge	2	2
Other costs per trip*	23	20
Total cost	112	100

* Cost such as accommodation and meals

Source: Own survey, 1997

An alternative transport route exists with TAZARA. According to TAZARA cargo Transport arrangement, the charge rate on agricultural products is based on chargeable minimum weight, 60% of wagon capacity. The wagons commonly used to transport agricultural products are covered wagons (CO-Ws) capable of carrying a maximum of 30 tonnes each. Thus, the chargeable minimum weight is only 18 tonnes (US $ 10.80/tonne). According to TAZARA, a wagon type CO-W, can carry as much as 200 bags of rice at a time. This is equivalent to 22 tonnes (4 tonnes above chargeable minimum weight). On this ground, the transport cost per kg of rice is TSh 5 thus saving TSh 27 per kg on transport (Table 4.11).

Table 4.11 The cost structure for using TAZARA (TSh/kg)

Cost item	TSh	%
Off-loading and loading-Ifakara (TAZARA)	6	21
Transport charge to TAZARA station Ifakara	6	21
Off-loading/loading/off-loading-DSM	6	21
Transport charge - (TAZARA (DSM) - Market place)	6	21
Transport charge (Ifakara - Dar es Salaam)	5	16
Total	29	100

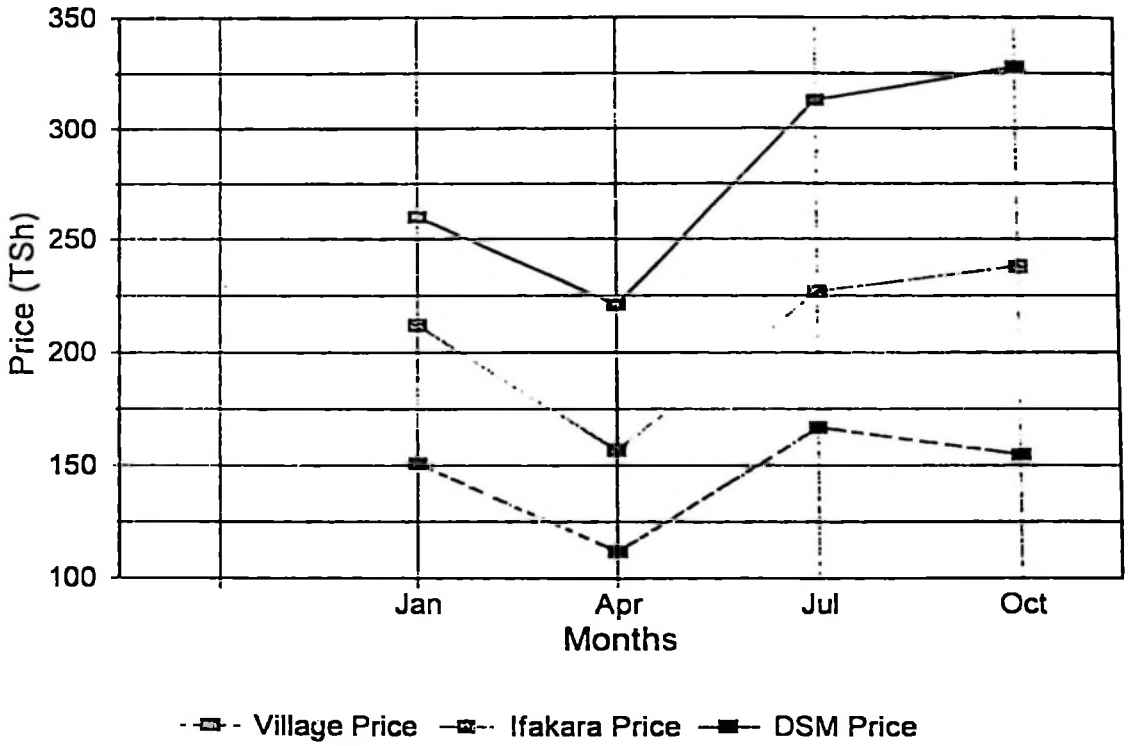
Source: Own survey. 1997

Rice collection cost at village level could be minimised if buying posts were established in each village. However, this could mean shifting costs to farmers as they would have to bear collection and transportation cost of the product to the selling posts. But since the posts would be close to the farmers the burden is insignificant. From Appendix 6a it can be noted that the most expensive operation is transport which accounts for 47% of all marketing costs. The problem could be solved by improving road communication system in the district. Fixed costs such as fare and boarding, could be reduced if traders increased the quantity of rice traded as such cost would be spread over a large quantity of the product.

(b) Paddy Pricing Efficiency

Pricing efficiency as discussed previously in this text (section 3.5.6) involved examining price trends in view of identifying relationship between selling and buying price. The buying and selling prices at different levels along the marketing chain are

presented in figure 4.4, and seem to move together across the season (See also Table 4.12). These results indicate that as far as pricing efficiency is concerned the paddy marketing system is efficient to some extent.



Source: Own Survey, 1997.

Fig. 4.4 **Buying and selling prices of paddy along the marketing chain in a season.**

From figure 4.4. price declined in January when in fact it was expected to raise because during this time there normally occur shortage of food stuffs. This is explained by speculation among producers and traders that there was going to be a shortage of paddy in the following seasonal, and thus stocked the product. Instead the weather was good and no shortage ensued. The rice previously hoarded was released into the market. The behaviour of prices and margins in the marketing season are presented in table 4.12.

Table 4.12 Prices and marketing margins in the rice marketing system (TSh).

Participant	Month											
	April			July			October			January		
	Buy price	Sell price	Margin	Buy price	Sell price	Margin	Buy price	Sell price	Margin	Buy price	Sell price	Margin
Wholesalers	221	-	-	313	-	-	328	-	-	260	-	-
Inter-regional traders	157	221	64	227	313	86	238	328	90	212	260	48
Local assemblers	112	157	45	167	227	60	155	238	83	151	212	61
Producers	-	112	-	-	167	-	-	155	-	-	151	-

Source: Own survey

Also, the correlation analysis between prices and margins was carried out for a group of traders who operated between Ulanga district and Ifakara town (Table 4.13).

Table 4.13 Correlation between buying and selling price

Correlation	Margin	Selling price	Buying price
Margin	1.0000	0.2639	-0.3889
Selling price		1.0000	0.7860**
Buying price			1.0000

Number of cases: 23 1-tailed significance: **-0.001.

Source: Own Survey, 1997

As expected the marketing margin is not significantly correlated with selling and buying prices. Also, a very strong association (r<= 0.7860; p = 0.001,) was observed between buying and selling prices. This indicates that the marketing system is efficient in this respect. A negative correlation between marketing margin and buying price implies that as buying price increases margin decreases and vice versa. It can be deduced that selling prices were relatively stable than buying prices. This is attributed to Ifakara being a centre for selling rice not only from Ulanga District but also from other areas such as Ifakara District. Basing on the results of correlation analysis the marketing system can be viewed as being efficient.

Further analysis was conducted to establish causality between the variables. The results of regressions are presented below as suggested by Gujarati (1988). The regression between buying and selling prices, selling price being a dependent variable, yielded equation 4.2:

$Ys = 67.1614 + 0.7507X_b$ .....(4.2)

(13.0142) (0.1289) R^2 (adjusted) = 0.5996

t=(18.014) (3.7280) F1,21 = 33.94

F = 0.0000

Where: Ys = Selling price

Xb = Buying price

It means a one unit change in buying price would change selling price by 75%. The F-value shows a high significance at 1%. However, buying price accounts for only 60% of all variations observed in selling price (R^2 = 0.599). The causality effect was also examined between prices and the marketing margin. It was found that:

$Ym = 9.8746 + 0.1771Xs$ .....(4.3)

(24.2197) (0.1413) R^2 (adjusted) =0.0253

t=(0.408) (0.4040) $F_{1,21}$ = 1.5715

Significance F = 0.2238

and,

$Ym = 67.1614 + 0.2493X_s$.....(4.4)

(18.0142) (0.1289) R^2 (adjusted) = 0.1109

t=(3.728) (-1.9350) $F_{1,21}$ =3.743

Significance F = 0.0666

where: Y_m = Marketing margin

X_s = Selling price

X_b = Buying price

The above results equation (4.2) and (4.3) are in consistent with the correlation analysis results and indicate that there is no significant influence of product prices on the marketing margins. A one unit increase in selling price corresponded to only 18% increase in the margin. The F - value indicated significance at 10% ($p<=0.2238$). Selling price accounted for only 2.5% of all variations in the margin. On the other hand buying price accounts for only 1% of all the variations observed in the margin. The F-value was also significant at 10% ($p<=0.0666$).

Technical Efficiency

The log-linearised Cobb - Douglas production function was estimated and the following equation fitted:

$$Y = -3.7757 - 0.4610X_1 + 1.1492X_2 \quad \text{.....(4.5)}$$

(2.103) (0.2514) (0.1655)

t = (-1.795) (-1.8340) (6.9040) .

R^2 (adjusted) = 0.7305 F = 26.7504 Significance F = 0.000

where: Y = Quantity of rice traded in the season

X_1 = Labour input in man days

X_2 = Mean working capital

The two inputs accounted for more than 73% of all the variations in the quantity of rice traded. A unit increase in capital increased the quantity of rice traded by over 100%. This implies that means to increase the working capital of the paddy traders could increase their volume handled. However the negative contribution of labour input to the amount of rice traded was observed. The possible explanations for this is the law of diminishing marginal returns that might be operating among rice traders. that is with the available technology accessible to the traders additional unit of labour results into decrease of corresponding output.

4.7 Market Efficiency Analysis for Cotton Sector

4.7.1 Market Structure

(a) Market Transparency

On the part of farmers, there was gross ignorance. They did not consider the co-operative union to be for their own good. Only four percent were members of UKICU. They were complaining about poor services of the co-operative union and demanding resignation of leaders of the organisation which they are not members. This indicates a need to create awareness concerning co-operative principles among farmers.

Grading is another area in cotton industry where transparency is lacking. The mixing of various grades of seed cotton is unlawful (Appendix 4a). In Ulanga district grading is virtually not done and if this remains unchecked might affect price of Ulanga

cotton in the international markets.

Seed has been observed to be another area of confusion. It is not clearly known whether cotton seed is taken into account when setting producer price and selling price. Cotton seed has value and it has demand. In the 1994/95 season the price of cotton seed was TSh 35 per kg to outsiders and TSh 15 per kg for producers in Ulanga district. The buyer, COTRA, has recently realised that in their contract the issue of seed is not well addressed and the situation was going to be rectified in the next buying season (Kizito D., Personal communication).

(c) Barriers to Entry

As far as policy is concerned competition has been allowed to genuine buyers. However, a trader has to be furnished with a licence, under specified conditions (See Appendix 4b). These conditions have to be fulfilled on annual basis. In a sense this frustrates traders and impede cotton sector development.

Such move can be explained by the importance of cotton in the economy of the country. The government is tries to make sure that she retains some control on the foreign currency obtained from exporting crops. On the other hand, though no exact figure was obtained the initial capital was explained to be in the tune of millions of Tanzanian shilling as compared to just a few hundreds in the paddy marketing sector (Director of CGA - Personal communication). It can be concluded that capital is an important limiting factor in entering into the cotton buying business.

(b) Number of Buyers

The number of cotton buyers in the district is very limited and the buying process is centralised. The co-operative union procures and gins cotton on behalf of M/S Paul Rernhart of Switzerland through CGA which co-ordinates the buying process. The co-operative union charges 0.6 pound per kg of cotton lint. A new American company MEMPMIS in collaboration with Global Consultancy Services of Tanzania was planning to get into the business. It can be concluded that the Number of buyers is still very low in Ulanga District.

4.7.2 The Market Conduct

It was observed that the co-operative union is a stumbling block in the development of a private sector in the cotton industry. The problem emanates from the ownership of ginneries and go-downs. It is not known who owns the go-downs between PCSs and UKICU. Each party claims to be its property. Therefore a private buyer is forced to co-operate with the Union. The government has to declare ginneries independent economic entities. To establish the real owner requires a separate study.

At the moment the co-operative union is in a five year contract (1995/96 - 2000) with the present buyer, CGA. Such a contract is a threat to new entrants in the market unless a potential entrant has enough finance to construct own go-downs and

ginnery. At the time of the survey the co-operative union was under negotiation with her partner, CGA, to terminate the contract on grounds that they want to enter into a contract with a

new buyer. CGA is planning to buy a mobile Chinese ginnery which presumably will solve much of the problems encountered in Ulanga district. However it can be concluded that most of the problems take roots in the ignorance of the smallholder farmers and the leaders of the PCSs.

4.7.3 Market Performance

With regard to cotton sector, marketing performance has been restricted to operational efficiency. This is because the price is set in advance by the Co-operative Union. The effort has been placed on looking into ways by which costs could be reduced. At primary co-operative society level, the cost structure is presented in (Table 4.14).

Table 4.14 Cost structure for a primary co-operative society (TSh/kg of lint).

Cost item	Primary co-operative Society TSh/kg)	
	Mwaya	Malinyi
Watchmen	1.2	63
Chairman	0.6	120
Clerk	0.6	14
Committee man	0.2	28
Stationary	0.3	10
Bagging in Jute bag	1.0	68
Loading /off- loading	2.0	136
Other costs	2.0	2.8
Total	7.9	9.2

Source: Own Survey, 1997.

At the ginnery level the costs include pay roll levy, salaries, insurance, maintenance, labour charges, stationery, license, internal factory transport, fumigation and social benefits to workers (NPF). All these costs are incorporated into a ginning fee. The costs directly borne by the co-operative union (UKICU) include produce levy, union levy, society levy, transport of both seed cotton from primary societies to the ginneries and lint cotton from the ginneries to TAZARA station in Ifakara. The buyer bears transport costs from Ifakara to DSM and export costs (Appendix 6b).

It can be seen that the price which the buyer, CGA offers to UKICU is US $ 0.6 per pound[1] of lint cotton (US $ 1.323 per kg of lint). At the Exchange rate of TSh 500 per US Dollar[2] this is equivalent to TSh 661 per kg of lint cotton. At this level the farmer receives only 36% of the buying price[3] (TSh 455).

At the time of the survey the f.o.b. price in Dar es Salaam was $ 1695.60 per tonne equivalent to TSh 848 per kg of lint (BOT, 1996). At this point the margin between produce and export price is TSh 393 per kg of lint. Thus the share of a producer in the export price is 46%. It would be unrealistic to conclude that the buyer is unfair to the producer. It is crucial therefore to look into same aspects of marketing costs involved for the purpose of identifying practices which escalate costs. These are presented in table 4.15.

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1 One pound (lb) is equivalent to 0.4536 kg
2 Exchange rate for 1994/95 (BOT)
3 Price for seed cotton has been expressed in lint equivalence

Table 4.15 Cost summary for a cotton buyer (TSh/kg of lint)

Cost particular	(TSh/Kg)
Producer Price of seed cotton	455
Society levy	30
Union levy	45
District cess	3
Ginning fee	110
Transport from PCSs to Ginneries	18
Transport from ginneries to Ifakara (TAZARA)	3
Transport, Ifakara-Dar es Salaam	105
License application fee (TSh 20 000) and fees for 15 cotton buying posts each TSh 20 000	3
Research fund per kg of seed cotton	6
Total	668

Source: Own Survey, 1997.

However, the cost of TSh 668 per kg is a misleading figure because some important costs such as transit insurance, export tax, and other port handling charges were excluded in the analysis.

(i) The Fate of Cotton Seed

The co-operative union owns cotton seeds. The seeds were sold to farmers for planting at TSh 15/kg and the outsiders at TSh 35/kg. The area under cotton cultivation in Ulanga district for 1994/95 season was 4 429 hectare and the seed rate was 49 kg/ha. In the same season cotton output was 1 071 358 kg. By implication UKICU obtained TSh 20 624 325 from seeds. If this was distributed to the farmers the price of a kg of seed cotton would rise by 12% to TSh 185 and farmers would be motivate.

(ii) Aspects of processing

The weight of a standard cotton bale is 181 Kg but the volume is not uniform. Most bales are bigger than required. This has an implication on the number of bales that can be loaded in the TAZARA's type CO-Ws wagons. The variation in bale sizes is in most cases due to inefficient bale pressers. This could be solved by ideal maintenance of plant parts. If bale pressers were maintained to keep bale sizes constant at recommended dimensions of 30" by 54" by 35" the chargeable minimum weight for agricultural products would be utilized. Also, if the current bale standard was changed to 20" by 54" by 26", it would be possible to load more bales in a wagon (CO-W), and thus reduce average cost on transport. It can be concluded that under proper marketing arrangement, significant cost saving is possible in the cotton sector.

CHAPTER V.

5. CONCLUSIONS AND RECOMMENDATIONS

5.1 Summary of Study Findings

5.1.2 Gross Margin (GM) per Hectare Analysis

Gross margin per hectare was estimated for both paddy and cotton. Paddy was assessed for farmers who used tractors and those who did not. On average the gross margin per hectare for farming without tractor was TSh 53 while that tractor farming, TSh 40, that is TSh 13 below the non-tractor farming. This is because tractor was being used on small plots.

In the case of cotton gross margin per hectare was highest in Mwaya (TSh 39 300 followed by Malinyi (36 500), the divisions where ginneries are located. In general, gross margin per hectare was higher in paddy farming than cotton. Returns per man-day per hectare and returns per shilling invested were estimated, and were all found to be lower in cotton farming than paddy, that is TSh 3.6 and 1.1 respectively. This was attributed to extensive use of chemicals in cotton and also because of poor market arrangement which makes farmers pay little attention to the crop. It was noted that there is scope for improving cotton returns per shilling invested by using cheaper insecticides.

5.1.3. Existing Paddy Marketing Channels

Five groups of participants were identified along the paddy marketing chain. These include smallholder farmers, private traders, wholesalers, retailers and consumers. Smallholder farmers sold small lots of paddy primarily to small traders, who subsequently sold to bigger traders at Ifakara after hulling the paddy. Smallholder farmers sold the produce whenever need for cash arised. Farmers had alternative outlets, the main ones being private traders, Co-operative Union and food shortage families. Usually in February/March there occurs a critical shortage of paddy and farmers rely on less preferred food stuff such as cassava.

The private trading sector in the district was occupied by young men with an average age of 28 years and a five year trading experience. Apart from trading in paddy traders deal in other businesses. However, in terms of income generation paddy trading accounted for 70% of total income. Based on the nature of their business, three categories of traders were identified. The groups include local assemblers, who collected paddy in small lots from house to house; retailers at Mahenge town, and inter-regional traders who transported rice to Dar es salaam. It was found that the trading income depended largely on the scale of operation. Most paddy was processed at Ifakara. The general feeling among smallholder farmers was that the marketing arrangement was not satisfactory.

5.1.4 Existing cotton marketing channels

The only cotton procurement process in the study area is Co-operative Union (UKICU) which buys cotton on behalf of a private trader. COTRA General Agency (CGA). UKICU and CGA are on a five year contract. All cotton marketing infrastructure for example warehouses and ginneries were owned by the Co-operative Union. From the Co-operative union cotton was hauled to ginneries where it was being ginned and baled. The lint was then transported to TAZARA - Ifakara station where it was handled by CGA. At the time of the study another private trader, Global Consultancy Services of Dar es Es Salaam in collaboration with MEMPMIS Cotton Inc. of America was planning to establish cotton plantation and erect a ginnery at Lupiro.

5.1.5 Efficiency of the Paddy Marketing Sector

The mechanism of collecting market information (price) was poor. Farmers relied on traders and traders relied on each other. Also, measuring instruments were not standardised. With regard to barriers to entry, the study revealed that no restriction was imposed by the government on entry into the paddy marketing system. However, capital and costs limited traders from expanding their paddy business. No formal credit system was working in the area to support traders. It was found that some costs in the marketing system could be reduced in some areas such as paddy collection.

There was a strong correlation between buying and selling prices (r<= 0.7860; p = 0.001,) and indication that prices were moving together across the season. These results were supported by regression analysis results were the coefficient of regression between buying and selling prices, selling price being a dependent variable was found to be R^2 = 60. The regression analysis between marketing margin and prices. marketing margin being a dependent variable showed that there were little influence of prices on marketing margins. This indicated some degrees of efficiency in the paddy marketing system (See section 3.5.6).

5.1.6 Efficiency of the Cotton Marketing Sector

The transparency in this case was extremely poor. Farmers were ignorant of the co-operative system. They were demanding resignation of Co-operative leaders of which they were not members. Grading of cotton is never done and this breaches section 9 of Government Notice No. 536 of 1995. Poor grading jeorpadises the future of cotton industry in Tanzania. Other observations in the system include lack of transparency in the handling of cotton seed and small number of cotton buyers. At the time of the survey there was only one private buyer who bought cotton through the Ulanga Co-operative Union.

The entry into the cotton marketing sector is limited by government policy which entails bureaucratic procedure for obtaining licences. The procedure had to be repeated on annual basis. In addition, the monopsony of the co-operative union was noted to be a limiting factor to the participation of the private sector in the cotton industry. The production of cotton was still too low to attract private buyers. In

addition, the available facilities were owned by the Co-operative Union. This meant that private buyers were being forced to co-operate with the co-operative union. The issue of who exactly owned warehouses between villagers and the co-operative union was unresolved.

Marketing costs for cotton were traced. The cost structure for cotton was found to be different from the paddy marketing chain because the two systems operated under two different marketing environments. The areas where costs could be minimised include: buying at ginneries instead of Primary Co-operative Societies (PCS); use of cheap but effective insecticides; privatisation of ginneries; and adjusting presser so that the weight of a bale could be increased by approximately 38%. This would make it possible for traders to benefit from low average cost on transport. In addition if the issue of seeds was sorted out the producer price could be raised by 12%. This would in a way motivate farmers.

5.2 Recommendations

5.2.1 Boost paddy and cotton output

Production of paddy and cotton was very low in the area. That is why paddy traders stopped business in some months because there were no more product to trade In the case of cotton, the district had failed to attract potential buyers because production was very low so much so that erecting new ginneries by private dealers was not justifiable. What is important is for farmers to increase productivity of the crops by using appropriate farming technology, such as manure, ox-ploughs, improved seed

varieties and timing of the farm operations. Increased productivity would enable farmers to reduce average production cost.

5.2.2 Use of manure

Use of inorganic fertiliser was not common in the area except some parts of Lupiro. It is recommended that where farmers have not started using fertiliser, inorganic fertiliser should not be adopted because it affects soil characteristics. This necessitates its application every cropping season. With the cost of fertiliser escalating farmers may be unable to purchase fertiliser and lead to poor crop yield. Therefore, farmers are advised to stick to appropriate methods of increasing crop yield such as organic fertilisers and proper crop husbandry.

5.2.3 Reorganise the co-operative system

It was found that most problems related to marketing of agricultural crops in the study area lie with the failure of co-operative system to perform its role. The importance of co-operatives in an economic system is widely recognised. This is because farmers are scattered and have very little information about the market for their produce. This subjects them to a poor bargaining position. For the co-operative unions to be effective they must be formed on bottom-up approach.

The history of co-operative movement in Morogoro region has been a top-down approach. It should be born in mind that the co-operative movement in this region was introduced by the post-independence government mainly to focus on

production rather than marketing activities. To date, people tend to feel that co-operative system is one of the state machinery. That is why the Morogoro Regional Co-operative Union (MRCU) collapsed. The same tragedy is likely to face the Ulamga-Kilombero Co-operative Union (UKICU). The farmers in Ulanga District had feelings that they were being exploited by their counterparts in Kilombero District, because Ulanga District produces more cotton and rice than Kilombero District, although the Union's Headquarters is located in Kilombero district. It is recommended that UKICU be dismantled and the process of forming co-operative union be started from the grass-root (bottom-up approach) after the farmers are aware of the co-operative principles.

5.2.4 Privatise ginneries

The number of cotton buyers in the district is very low. This is attributed to the stringent conditions set by UKICU. UKICU requires every private cotton buyer to be affiliated to it because it owns all the go-downs and ginneries. This is taxing practice on the part of private buyers. The ginneries and go-downs were built during colonial times. Since then they have been changing hands by government decrees. If the government made ginneries independent economic units, individual farmers or traders can gin and pay ginning fee. This might stimulate more cotton buyers.

5.2.5 Establish crop buying posts

The rice buying practice is for the buyer or his/her agent to go house to house and collect the produce. This is a cumbersome job and increases marketing costs. In addition this intensifies farmers segmentation and price unawareness. It is recommended that the District Council put more emphasis on establishment of buying post in each village for major crops such as paddy and cotton. Such posts would provide mechanisms which would make it easier and less costly to negotiate exchange. Information about offers of exchange would be provided at low cost and simplified. However, this would mean shifting some marketing costs such as collection and transport to the farmers. But because buying posts would be close to the producers the cost burden would not be significant.

If exchange mechanism was facilitated, most likely, a farmer would specialise in producing particular crops exchanging part of his or her product, or the income derived from it, for the products of others. This according to economic theory, would enable a greater output to be produced from the same resources and thus increase products available for exchange. On the other hand the buying posts would benefit the District Council as produce fees could easily be collect. In essence, orderly marketing arrangement would promote agricultural growth through increased efficiency and productivity that would be beneficial to farmers, crop buyers, exporters, food consumers, and eventually the whole system.

Furthermore, to enhance market transparency there is a need to sensitise farmers on the use of standard metric scales for measuring weight. At the moment

farmers believe that tins are more accurate than scales. To change this perception, a special program for educating producers could be carried out in the area.

5.2.6 Establish soft loan schemes for farmers and traders

It was observed that traders do not have reliable source of capital. They rely on precarious sources such as friends and relatives. But the amount of capital that can be supplied by these sources is limited. From the regression analysis it was seen that working capital increases quantity of rice traded by over 100%. This implied that if trader could have access to reliable sources of capital they could increase the quantity traded significantly so long as their is demand for the product. The National Bank of Commerce has branches in all district headquarters. But farmers and small-scale traders can not secure loans because of lack of collateral demanded by the bank. It is imperative therefore for the District Council through the stake holders to start a revolving fund to help farmers and small-scale traders.

5.2.7 Improve cross- Kilombero river communication

Ulanga district is separated from Kilombero district by the Kilombero river. There is a considerable delay in the transport process as the ferry closes business at 1800 h in the evening. Furthermore, during dry season when water level is extremely low only small vehicles are allowed to cross. This escalates marketing costs. Under a long term plan it is possible to construct a modern bridge funded from fee collections at the ferry. According to the bridge attendants on average TSh 300 000 is collected per day. If a portion of this is set aside, considerable amount of money could be raised

to construct a modern permanent bridge under the management of Kilombero and Ulanga districts. Crossing the river would be taking place any time of the day. In a way this would reduce marketing costs and improve operational efficiency in the area.

5.2.8 Reduce bureaucratic procedure in the cotton marketing sector

A trader was required to be furnished with a licence to buy, gin and/or export cotton. Regional and District Commissioners are all involved in the process. The licences were given on annual basis and at a fee. In a sense this frustrated traders and impeded cotton sector development. Potential traders were sceptical in committing their resources on a long term plan basis because they were not sure whether the following year they would get a license. It is recommended that licences be provided on a much longer period such as 5 to 10 years or on a permanent basis just like any other merchandise trade. In addition, only TCLSB should be involved in the licencing procedure. This will reduce bureaucracy in the process.

5.2.9 Futures market

Farming just like any other business faces risk and uncertainty. The prices on which production and/or buying decision was made might not prevail during harvesting time. The prices might be low and affect the producers or too high and harm the buyers. To minimise such price fluctuation, forward contracts and futures trading could be encouraged among honest participants in the paddy and cotton marketing sectors.

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7.0 APPENDICES

Appendix 1a: Farmers questionnaire

SECTION I: HOUSEHOLD IDENTIFICATION VARIABLES

1. Questionnaire No.___

2. Farmer's name_____ Village____ Gender__

3. Interviewer's name_____ Date____

4. Age of household head___ years

5. Can you read and write 1= Yes 2= No

6. In the table below give breakdown of the household composition:

Gender 1= Male 2= Female	Age	Relation 1=Self 2=Wife 3=Child 4=Relative	Participation in farming 1= Yes 2= No
TOTAL			

SECTION II: FARMING PRACTICES:

7. Do you possess land? 1= Yes 2= No

8. How big is your land___ hectares

9. How did you acquire this land? 1= Inherited 2= Bought 3= Hired 4= Given by village government

10. In how many plots is your land divided?___

11. What is the average distance to the plots from your homestead?_____km

12. How much of your total land was cultivated during the last season?_____ hectares

13. Do you experience agricultural land scarcity? 1= Yes 2= No

14. Complete the table below about major crops grown, 1995/1996

Crop	Area (ha)	Production (Kgs)	Consumption (Kgs)	Sold (Kgs)	Price TSh/kgs	Stored (kgs)
Maize						
Paddy						
Cotton						
S.bean						
Cassava						
G/Nut						
Other						

15. Is the quantity of food crops stored enough to take you up to the next season? 1= Yes 2= No

16. Do you possess the following equipment?

Item type	Hoes	Panga	Axes	Sprayers	Ox-plough	Tractor	Bicycle	Radio
1=Yes 2=No								

17. Indicate the labour involved in the following farm operations for paddy cultivation:

Operation	Family labour					Hired labour				
	Hrs/day	No.of people			No. days	Hrs/ day	No. Of people			No. days
		M	F	C			M	F	C	
Land clearing										
Cultivation										
Harrowing										
Sowing										
Weeding										
Fert. applic										
Pest control										
Harvesting										
Haulage										
Packaging										

18. Indicate the labour involved in the following farm operations for Cotton cultivation:

Operation	Family labour					Hired labour				
	Hrs/day	No. Of people			No. days	Hrs/day	No. Of people			No. dys
		M	F	C			M	F	C	
Land clearing										
Cultivation										
Harrowing										
Sowing										
Weeding										
Fert. applic										
Pest control										
Harvesting										
Haulage										
Packaging										

19. If used tractor for farming activities, how much were you charged per hectare?
(i) Cultivation_____ TShs (ii)Harrowing_____ TShs

20. Give information about other inputs used in the farming process:

Input type	Quantity (kgs)		Price/unit		Source 1= own 2= trader 3=coop.		Remarks
	Paddy	Cotton	Paddy	Cotton	Paddy	Cotton	
Seed							
Fertiliser							
Pesticide							
Herbicide							
Sacks							
Other (Specify)							

SECTION IV HARVESTING AND POST HARVEST HANDLING

21. State the planting and harvesting month of cotton and rice for the last season

Crop	Planting	Harvesting
Paddy		
Cotton		

22. Did you get any advice from the extension agent on proper production and marketing practice last season?
1= Yes 2= No

23. How do you collect information on market prices?
1= Direct visit to the market place
2= Crosscheck with many middlemen
3= Hear from friends
3= Radio

24. How far was the selling point from you homestead?
(i) Paddy ___ Km (i) Cotton ____Km

25. Are you a member of the cooperative union (UKICU)
1= Yes 2= No

26. Where do you experience problems most in your agriculrural business?
1= Production 2= Marketing
(i) Paddy____ (i) Cotton ___

Appendix 1b: Traders questionnaire

SECTION I: BACKGROUND INFORMATION

1. Questionnaire No _____ Date of interview 2.Name of respondent_____, Age _ (years) ender 1= Male 2= Female

3. Trader's residence: 1 = Mwaya 2= Mahenge 3= Lupiro 4=Mtimbira 5= Malinyi 6= Ifakara 7= Dar es Salaam

4. Level of Education: 1 = Primary school 2 = Secondary school 3= Higher education

5. Have you ever attended any commercial course? 1= Yes 2=No

6. What type of trade are you doing: 1 = Wholesale
2 = Commissioned Agent 3 = Retailer

7. Years in business _____

8. Business nature 1= Full time 2= Part time

9. Farm produce handled:_____

10. Do you handle non-farm goods too? 1= Yes 2= No

11. What other activities apart from trade do you normally do ?
1= Farming 2= Hunting 3= Fishing 4= Other (Specify)_____

12. What was your occupation before getting into paddy business? 1 = Farming 2 = Other business 3 = Employment 4 = Student 5= Other (Specify)_____

13. What was your initial capital_____TShs.

14. How did you obtain the capital? 1= Given by parents
2= Loan/Credit 3= Other business 4= Farming
5= Other (Specify)_____

SECTION II: COMMODITY FLOW AND MARKETING PRACTICES

(a). Buying:

15. What kind of product do you normally buy? 1= Paddy
2= Rice 3= Both 1 & 2

16. Who buys produce for you? 1= Self 2= Relative 3= Commissioned agent 4= Inter- village collector

17. From whom did you buy most produce in the last 12 months? 1= Farmers 2= Wholesalers 3= Village collectors 4= Other (Specify)_____

18. From how many different sources did you buy produce?
1= One 2= Two 3= Three 4= Four or more

(b) Selling:

19. What kind of product do you normally sell? 1= Paddy
2= Rice 3= Both 1 & 2

20. Where did you sell most of your paddy/rice? 1= Village 2= Mahenge 3= Ifakara 4= Dar es Salaam 5= Other (Specify)__

21. How did you transport your produce to the selling point?
1= Bicycle 2= Ox-cart 3= Own lorry 4= Hired lorry 5= Bus
6= Other (Specify) _____

24. Who bought your produce? 1 = Farmers 2 = Other traders
3= Institutions 4= Consumers 5= Other (Specify)_____

22. How many bags of paddy and rice did you trade during the last Season? (i) Paddy____ bags (ii) Rice_____bags

(c) **General information:**

23. What were the buying and selling prices per bag of paddy and rice during the following periods:

Period	Buying price		Selling Price	
	Paddy	Rice	Paddy	Rice
October - December				
January _ March				
April - June				
July - Sept.				
TOTAL				

24. Do you own a business license? 1= Yes 2= No

25. How do you normally get price information? 1= News papers 2= Radio 3= Telephone 4= Fellow traders 5= Visit market places 6= Other (specify)

26. Do you make use of the prices broadcast by RTD 1= Yes 2= No

27. How do you fix prices of your commodity? 1= Take market price 2= Calculate costs involved 3= Other (Explain)_____

28. Are you aware of the prices on various adjacent markets 1= Yes 2= No

29. Do you normally know prices in advance before taking your consignment to the market? 1= Yes 2= No

30. How many months do you normally spend out of paddy business per year?_____ _ months

31. Estimate your annual income from paddy trade activities _____TShs

32. Estimate your annual income from off-paddy trade activities _____TShs

33. Do you sometimes sell or buy produce on credit? 1= Yes 2= No

34. If yes explain_____

35. Have you ever had access to formal credit to support your paddy/rice trade 1= Yes 2= No. If no explain

36a. Do you normally have any personal relationship with those whom you sell or buy produce? 1= Yes 2= No.

36b If yes, what type of relationship? 1= Relative 2= Friend 3= Other (Specify)____ _____

37. Do you have any form of cooperation with other traders? 1= Yes 2= No. If yes, explain_____

38. Estimate your mean working capital at the moment?_____

39. What kind of measuring instrument do you normally use in determining units of sale for paddy? 1= Kopo 2= Tin 3= sack 4= Scale 5= Other (specify_____ _____

40. What kind of measuring instrument do you normally use in determining units of sale for rice? (Code as question 47 above)

41. What quality problem do you normally face in paddy produce? 1= Infestation 2= Sand 3= High moisture content 4= Broken rice particles 5= Rice colour 6= Aroma 7= Other (Specify)_____

42. Do you normally store produce to take advantage of high prices late in the season? 1= Yes 2= No

43. If yes where do you store the produce? 1= Own rooms 2= Hired rooms 3= Other (Specify)_____

44. What are the major bottlenecks in the paddy business?

(i) _____
(ii)_____
(iii)_____
(iv) _____

45. Please fill in the following table:

ACTIVITY/OPERATION	PARTICULARS
Kgs of rice from milling 1 tin of paddy	
Number of tins per bag of paddy/rice	
Paddy/rice collection cost per bag	
Pressing and stitching cost/bag in the village	
Local fees per bag of paddy	
Local fees per bag of rice	
Cost of milling 1 kg of paddy (TSh)	
Place of milling 1= Ulanga 2= Ifakara	
Paddy loading (village) and off-loading cost/bag (Ifakara)	
Rice loading (village) and off-loading cost/bag (Ifakara)	
Paddy transport cost/bag (village - Ifakara)	
Rice transport cost/bag (village - Ifakara)	
Paddy spreading cost/bag before milling	
Rice packing and stitching cost/bag after milling	
Rice weighment cost/bag after milling	
Rice loading & off-loading cost/bag (Ifakara- Dar es Salaam)	
Rice transport cost/bag (Ifakara - DSM)	
Personal business cost/trip (Ifakara)	
Personal business cost/trip (Dar es Salaam)	
Number of trips made during the last season	
Other costs/season (sacks, twine, needle etc)	
Total variable cost/bag	

Appendix 2a: Labour use on a smallholder paddy farm without tractor (Man-hour)

Operation	Mwaya				Lupiro				Mtimbira				Malinyi			
	Male	Fmale	Child	Man eq	Male	Fmale	Child	Man eq	Male	Fmale	Child	Man eq	Male	Fmale	Child	Man eq
Land prep.	3414	1151	285	4420	3816	2620	472	6017	1093	865	240	1862	2200	1630	872	3859
Sowing	1234	1308	57	2241	2840	2462	300	4837	1060	726	945	2077	1067	1351	290	2225
Weeding	2812	2621	78	4817	2796	3080	218	5215	642	830	660	1595	1546	1422	840	3033
Pest control	214	848	185	943	631	3452	1835	4138	4138	1381	3452	6900	271	498	69	679
Harvesting	2415	3387	949	5430	2161	1770	162	3570	1344	877	1400	2702	1247	1558	222	2527
Post-harv.	642	616	80	1144	686	557	266	1237	243	250	316	589	505	395	80	841
Total	10731	9931	1634	18998	12930	13941	3253	25014	8520	4929	7013	15725	6836	6854	2373	13164

Source: Own Survey, 1997

Appendix 2b: Labour use on a smallholder paddy farm with a tractor (Man-hour)

OPERATION	MWAYA				LUPIRO				MTIMBIRA				MALINYI			
	Male	Fmale	Child	Man eq.	Male	Fmale	Child	Man eq	Male	Fmale	Child	Man eq	Male	Fmale	Child	Man eq.
Land prep.	732	462		1079	421	630	946	1358	241	234		417	396	396	56	721
Sowing	270	270		473	1492	1372	740	2891	3599	2870	1601	6552	716	915	458	1631
Weeding	142	142		213	1476	2132	860	3505	2915	3796	984	6254	540	1647	504	2027
Pest control	36	112	31	136	223	1136	83	1117	9131	6452	904	14422	237	277	68	479
Harvesting	252	312	60	516	2056	1556	1530	3988	4211	5125	791	8450	709	1648	610	2250
Post-harv.	29	17		42	1397	1349	375	2596	1358	1089	100	2375	512	27	126	778
Total	1461	1315	91	2459	7065	8175	4534	15455	21455	19566	4380	38470	3110	4910	1822	7886

Source: Own Survey, 1997

Appendix 2c: Labour use on smallholder cotton farm (Man-hour)

Operation	Mwaya				Lupiro				Mlimbira				Malinyi			
	Male	Fmale	Child	Man eq	Male	Fmale	Child	Man eq	Male	Fmale	Child	Man eq.	Male	Fmale	Child	Man eq
Land prep.	802	348		1063	511	411	321	980	122	125		210	802	756	264	1501
Sowing	159	134	26	273	159	103	18	245	25	25	7	47	246	218	36	428
Weeding	739	718	175	1365	376	438	156	783	220	256		412	764	1063	258	1690
Pest control	441	237	44	641	39	39		68	48	48		84	169	158		288
Harvesting	1454	1481	208	2669	511	1051	643	1621	140	56	56	210	708	796	64	1337
Post-harv.	181	176	74	350	142	144	194	337	35	35	210	166	316	343	20	586
Total	3776	3094	527	6361	1728	2186	1332	4034	590	545	273	1129	3005	3334	642	5830

Source: Own Survey, 1997

Appendix 2d: Mandays per ha for smallholder paddy farm without tractor

Operation	Mwaya				Lupiro				Mtimbira				Malinyi			
	Hours	Man days	ha	Man days/ha	Hours	Man days	ha	Man days/ha	Hours	Man days	ha	Man days/ha	Hours	Man days	ha	Man days /ha
Land prep	4420	553	11.4	49	6017	752	13	58	1862	233	8.6	27	3859	482	9.2	52
Sowing	2244	281	11.4	25	4837	605	13	47	2077	260	8.6	30	2225	278	9.2	30
Weeding	4817	602	11.4	53	5215	652	13	50	1595	199	8.6	23	3033	379	9.2	41
Pest control	943	118	11.4	10	4138	517	13	40	6900	863	8.6	100	679	85	9.2	9
Harvestin	5430	679	11.4	60	3570	446	13	34	2702	338	8.6	39	2527	316	9.2	34
Post-harv	1144	143	11.4	13	1237	155	13	12	589	74	8.6	9	841	105	9.2	11
Total	18998	2376	11.4	210	25014	3127	13	241	15725	1967	8.6	228	13164	1645	9.2	177

Source: Own Survey, 1997

Appendix 2e: Mandays per hectare for smallholder paddy farm with tractor

Operation	Mwaya				Lupiro				Mtimbira				Malinyi			
	Hours	Man days	Ha	Man day/ha	Hours	Man days	Ha	Man day/ha	Hours	Man days	Ha	Man day/ha	Hours	Man days	Ha	Man day/ha
Land prep.	1079	135	1.8	75	1358	170	16.6	10	417	52	32.1	2	721	90	4.5	20
Sowing	473	59	1.8	33	2891	361	16.6	22	6552	819	32.1	26	1631	204	4.5	45
Weeding	213	27	1.8	15	3505	438	16.6	26	6254	782	32.1	24	2027	253	4.5	56
Pest control	136	17	1.8	9	1117	140	16.6	8	14422	1803	32.1	56	479	60	4.5	13
Harvesting	516	65	1.8	36	3988	199	16.6	30	8450	1056	32.1	33	2250	281	4.5	62
Post-harv.	42	5	1.8	3	2596	325	16.6	20	2375	297	32.1	9	778	97	4.5	22
Total	2459	308	1.8	171	15455	1633	16.6	116	38470	4809	32.1	150	7886	985	4.5	218

Source: Own Survey, 1997

Appendix 2f: Mandays per hactare for a smallholder cotton farm.

Operation	Mwaya				LUPIRO				Mtimbira				Malinyi			
	Hours	Man days	ha	Man days/ha	Hours	Man days	ha	Man days/ha	Hours	Man days	ha	Man days/ha	Hours	Man days	ha	Man days/ha
Land prep.	1063	133	8.7	15	980	123	2.5	49	210	26	1.7	15	1501	188	3.7	51
Sowing	273	34	8.7	4	245	31	2.5	12	47	6	1.7	4	428	54	3.7	15
Weeding	1365	171	8.7	20	783	98	2.5	39	412	52	1.7	31	1690	211	3.7	57
Pest control	441	55	8.7	6	68	9	2.5	4	84	11	1.7	7	288	36	3.7	10
Harvesting	2669	334	8.7	38	1621	203	2.5	81	210	26	1.7	15	1337	167	3.7	45
Post-harv.	350	44	8.7	5	337	42	2.5	20	166	21	1.7	12	586	73	3.7	20
Total	6 161	771	8.7	88	4 034	506	2.5	205	1 129	142	1.7	84	5 830	729	3.7	198

Source: Own Survey, 1997

Appendix 2g Profitability analysis of smallholder paddy production system in Ulanga district,1994/95

Particulars	Without tractor					With tractor				
	Mwaya	Lupiro	Mtimbira	Malinyi	Total	Mwaya	Lupilo	Mtimbira	Malinyi	Total
Basic information:										
Total growers %	92.0	59.0	29.0	60.0	60.0	8.0	41.0	71.0	40.0	40.0
Area under crop	11.4	13.0	8.6	9.2	42.20	1.8	16.6	32.1	4.5	55.0
Revenue:										
Tot output (000 kg)	16.7	10.8	10.9	7.1	45.5	1.0	18.1	28.4	6.6	53.9
Output per hectare (000 kg/ha)	1.5	0.8	1.3	0.8	1.1	0.5	1.1	0.9	1.5	1.0
Farm gate price	37.0	70.0	75.0	61.0	61.0	37.0	70.0	75.0	61.0	61.0
Total revenue (000 Tsh)	619.4	757.9	817.05	431.7	2 626.6	35.6	1 263.8	2 128.4	399.5	3 827.3
Revenue/ha (000 TSh/ha)	54.3	58.3	95.0	47.0	254.6	19.8	76.1	66.3	88.8	251.0
COSTS										
(a)Seed:										
Seed quantity (Kg)	433.0	676.0	361	276	1,746.0	59	855	1156	171	2,241.0
Seed quantity/ha	38.0	52.0	42	30	162.0	33	52	36	38	159.0
Seed price/Kg	193.0	173.0	162	211	739.0	244	209	147	255	855.0
Subtotal cost (000 TSh)	83.4	116.7	58.4	58.3	316.8	14.4	179.0	170.0	43.5	407.3
(b)Insecticide:										
Chemical quantity (L)	3.5	1.5	6.0	7.0	18.0	-	7.0	30	4.0	41.0
Chemical quantity/ha	0.3	0.1	0.7	0.8	1.9	-	0.4	0.9	0.9	2.2
Chemical price/L (000 TSh)	6.1	5.3	6.0	5.8	23.3	-	6.0	5.9	5.8	17.7
Subtotal cost (000 TSh)	21.5	8.0	36.0	40.5	106.0	-	42.0	177.0	23.1	242.1
Tractor charge (000 TSh)	-	-	-	-	-	18.5	187.8	349.2	45.6	601.1
Total cost (000 TSh)	104.9	124.7	94.4	98.8	324.0	33.0	408.8	696.6	12.2	1,150.5
Total cost/ha (000 TSh)	9.2	9.6	10.0	10.7	40.5	18.3	24.6	21.7	24.9	89.5
Gross margin/ha (000 TSh)	45.1	48.7.0	84.0	38.2	216.1	1.5	51.5	44.6	63.9	161.5
Labour input/ha (Man days)	210.0	241.0	228.0	177.0	856.0	171.0	116.0	150.0	218.0	655.0
Return per labour	215.0	202.0	369.0	215.0	1,001.0	9.0	444.0	297.0	293.0	1,043.0
Return/TSh invested	5.0	5.0	8.0	4.0	22.0	0.1	2.0	2.0	3.0	7.1

Source: Own survey, 1997

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Appendix 2h Profitability analysis of smallholder cotton system in Ulanga district, 1994/95.

Particulars	Mwaya	Lupiro	Mtimbira	Malinyi	Total
Basic information:					
% of Total growers	58.0	7.0	18.0	53.0	100.0
Area under the crop	8.7	2.5	1.7	3.7	16.6
Revenue:					
Total output (000 Kg)	3.6	0.7	0.3	1.3	5.7
Output/ha (Kg/ha)	415.0	296.0	200.0	357.0	340.0
Farm gate price	160	160.0	160.0	160.0	160.0
Total revenue (000 TSh)	577.6	118.4	54.4	211.2	904.0
Revenue/ha (000 TSh/ha)	6.6	47.4	36.3	57.1	54.5
Costs:					
(a) **Seed:**					
Seed quantity (Kg)	316.0	330.0	145.0	263.0	1 054.0
Seed quantity/ha	36.0	132.0	85.0	98.0	63.0
Seed price/Kg	15.0	15.0	15.0	15.0	15.0
Subtotal cost (000 TSh)	4.7	4.9	2.2	4.0	15.8
(b) **Insecticide:**					
Chemical quantity (l)	14.0	6.0	2.5	4.5	27.0
Chemical quantity/ha	1.6	2.4	1.5	1.2	1.6
Chemical price/l (000 TSh)	16.5	16.5	16.5	16.5	16.5
Sub-total cost (000 TSh)	231.0	99.0	41.3	74.3	445.5
Total cost (000 TSh)	235.7	104.0	43.4	78.2	461.3
Total cost/ha (000 TSh)	27.1	1.6	25.5	21.1	27.8
Gross margin/ha (000 TSh)	39.3	5.8	10.7	365.0	26.7
1Lab inp/ha (TSh)	89.0	202.0	84.0	198.0	573.0
Retn/labor (TSh)	442.0	29.0	128.0	182.0	47.0
Ret/Sh invested (TSh)	2.0	0.1	0.4	2.0	0.8

Source: Own survey. 1997

Table: 3 Correlation analysis between quantitative variables

Correlation	AGE	BYRS	INITC	RQUIV	MONNO	PINCO	OFPIN	TOLIN	MECAP	TRIPN
AGE	1.000	0.502*	0.343	0.472*	-0.139	0.437**	0.337	0.230	0.332	0.289
BYRS		1.000	-0.003	0.2750	-0.053	0.230	0.077	0.069	0.046	0.081
INITC			1.000	0.2578	0.008	0.198	0.097	0.071	0.570**	0.404
RQUIV				1.000	-0.374	0.948**	0.290	0.745**	0.4796*	0.508*
MONNO					1.000	-0.335	0.079	-0.285	-0.265	-0.339
PINCO						1.000	0.366	0.747**	0.411	0.523*
OFPIN							1.000	0.189	0.315	0.077
TOLIN								1.000	0.2324	0.236
MECAP									1.000	0.568**
TRIPN										1.000

N of cases: 31 1-tailed Significance * - .01 ** - .001

" . " is printed if a coefficient cannot be computed

AGE Age of the trader
BYRS Years in business
INITC Initial capital
RQUIV Quantity of rice traded in rice equivalence
MONNO Number of effective months spent on paddy trading per marketing season
PINCO Income from paddy trading
OFPIN Income from other nonpaddy business
TOLIN Total income from various sources
MECAP Mean working capital for the season
TRIPN Number of trips made to selling point

Apppendix 4(a) Government Notice No. 536: The Tanzania Cotton Marketing Board Act, 1984

Cotton Regulations

G.N. No. 536 (contd.)

without prejudice to any penalty which he may have incurred by reason of such failure, he liable to pay all the costs of such undertaking which costs shall be recoverable as a debt due to the Government.

PART II
GRADING

Grower to grade seed cotton before sale

9. Every grower shall grade all seed cotton intended for sale into Grade A cotton or Grade B cotton before any such cotton is sold by him.

Board may determine the grade of cotton

10. The Board may, by order, determine which grades of seed cotton may be sold or bought in any specified area during a specified period.

Mixing of unmerchantable cotton with cotton

11. If any person sells or buys any seed cotton except in accordance with the provisions of such order, or being a grower sells any seed cotton without first grading the same, shall be guilty of an offence and shall, on conviction be liable to a fine not exceeding shillings one hundred thousand or imprisonment for a term not exceeding six months or to both such fine and imprisonment.

Mixing of cotton prohibited

12.—(1) The mixing of various grades of seed cotton is prohibited.

(2) Any person who contravenes the provisions of this regulation shall be guilty of an offence and shall, on conviction be liable to a fine not exceeding shillings one hundred thousand or imprisonment for a term not exceeding six months or to both such fine and imprisonment.

PART III
BUYING OF COTTON

Restriction on buying cotton

13.—(1) No person other than a holder of a seed cotton buying licence shall buy any seed cotton.

(2) Every seed cotton buyer shall buy seed cotton at a cotton buying post or posts specified in the licence.

(3) Any person who contravenes any of the provisions of this regulation shall be guilty of an offence.

Cotton buying licences

14. The Board shall, on application issue to the applicant a seed cotton buying licence in the prescribed form which shall entitle the applicant to buy seed cotton.

No cotton buying licence shall be issued unless it is certified by the Board that the buying posts concerned have been inspected by the Board or its agent and passed for buying of seed cotton for that season.

Apppendix 4(b) Licencing procedure for buying seed cotton

Cotton Regulations

G.N. No. 536 (contd.)

7.- Declaration:

I/We hereby declare that I/We shall abide by the regulations governing the purchase of seed cotton as issued and as will be directed by the Board from time to time.

Signature	*Capacity*	*Official Stamp*

Date:_____

NOTE: See procedure to be followed overleaf.

PROCEDURE TO BE FOLLOWED BY APPLICANTS FOR SEED COTTON BUYING LICENCE

The Applicant must do the following:

(a) visit the area where he intends to buy cotton.
(b) register with the Regional Development Director of the respective area and abide by directions of such Director.
(c) visit and obtain confirmation from a ginnery that the seed cotton purchased shall be ginned at that designated ginnery.

QUALIFICATIONS FOR OBTAINING SEED COTTON BUYING LICENCE

(a) The applicant should be in possession of a valid trading licence.
(b) The applicant must show financial ability with the support of a reputable bank or financial institution.
(c) The application should be supported by certification by the Board or its agent that the intended buying posts have been inspected and passed for cotton buying for that season.
(d) Upon submission of the application form, the applicant shall pay shillings twenty thousand (Shs. 20,000/-).
(e) The successful applicants will be required to pay shillings twenty thousand only (T.Shs. 20,000/-) Licence Fee per Buying Post.

Apppendix 4(c) Licencing procedure for ginning and exporting lint cotton

Cotton Regulations

G.N. 536 (contd.)

CONDITIONS FOR OBTAINING A GINNING LICENCE

(a) An applicant must own a ginnery or must have hired/leased one from a ginnery owner. Proof of hiring/leasing must be shown.

(b) The ginnery concerned must have been inspected and approved by the Board's Ginnery Inspectors.

(c) It is the responsibility of the ginner to cause the Inspectors from the Board to inspect and certify the ginnery for issuance of a ginning licence.

No ginner shall operate a ginnery without a valid ginning licence for the respective season.

(d) A ginning licence will be issued at a fee of US Dollars two thousand (US$ 2,000) or its equivalent.

(e) Holders of ginning licence shall be bound to observe the rules and regulations governing the operation of ginnery.

(f) Cotton lint buyers shall pay a levy of 1.3% of ex-ginnery price to the Board to finance regulatory functions of the Board and cotton research.

(g) The ginning licence issued shall be valid from the 1st June instant to 31st March following year, subject to extension in writing being granted by the Board.

Cotton Regulations

G.N. No. 536 (contd.)

CONDITIONS FOR LINT EXPORTERS

(a) The exporter shall show financial ability endorsed by a reputable Bank/Financial Institution.

(b) The exporter shall pay a non-refundable application fee of US $ 100.

(c) Successful applicants shall be issued with export licence payment of US $ 2,000 per annum or its equivalent.

(d) No exporter shall export cotton lint without valid export permit issued by the Board for every consignment.

(e) CONDITIONS FOR ISSUANCE OF EXPORT PERMITS

1. Lint exports to have valid seed cotton buying licence, evidence of agency for seed cotton buyer or ownership of lint.
2. Lint quality certificate issued by the Board to be provided for every consignment.
3. Payment to the Board for a levy of 1·3% of FOB value.

(f) Exporters shall perfect the export permit issued for each consignment and return to the Board within 14 days from the date of shipment.

(g) All cotton lint for export shall be sold through Central Tender Committee to be comprised of representatives of owners of lint. The Board shall be the cordinator of the Committee provided that where circumstances allow, owners of cotton lint may be permitted by the Board to be exempted from the requirement of the above clause for specific contracts.

(h) Exports shall pay a levy of 1·3% of FOB value to the Board to finance regulatory functions of the Board and cotton research.

(i) The exporter who sells through the Board will pay 1% of F.O.B. price as Commission.

(j) The exporter will be required to be member of one of the International Associations such as Liverpool Cotton Association, Bremen Cotton Exchange and the like.

Apppendix 4(d) Ginnery inspection report

BODI YA PAMBA TANZANIA

RIPOTI YA UKAGUZI KWA UFANISI WA VIWANDA VYA PAMBA

KWA MENEJA MKUU CROP SEASON 1996/97
T.C.M.B. Dar-es-Salaam

EXKILANGA No 716

JINERI [illegible] TAREHE 17/04/97 SAA 7:51 ALASIRI.

PAMBA (SEED COTTON)

Kiasi Kilichonunuliwa/Kandani AR Kilos ______ BR Kilos ______

Pamba iliyoletwa Ginnery hadi 12/4. AR Kilos 244,156 BR Kilos ______

Jumla ya Pamba iliyochambuliwa 16/4. AR Kilos 227,466 BR Kilos ______

Mabaki ya Pamba Ghalani AR Kilos 16,690. BR Kilos ______

Usafi wa Pamba Unaridhisha Mstoo Nafasi ipo

Usafirishaji wa pamba toka vyanzoni hadi Jineri Unaendelea taratibu.

Malori Mangapi Trekta 1 Tripu ngapi kila siku -4-

HALI YA ZIMA MOTO

1. Fire Engine 100 HORSE-PIPE ZINAUNGANA 4. Dry Powder ✓
2. Water Co2 ✓ 5. Carbon Dioxide ✓
3. Foam ✓ 6. Hydrant System Hakuna

UCHAMBUAJI (GINNING)

Jumla ya Vyerehani 12 Aina [illegible] Vinavyofanya kazi 6

Rola Mbaya ______

Rola ndogo zitoazo takataka zafanya kazi HAKUNA

Cherehani (Gins) zinazofanya kazi vibaya FEEDER CANVAS ZIREKEBISHWE.

ROBOTA (BALES)

Wastani wa Robota kwa kipindi cha masaa manane (shift)	AR. 7.	BR	—
Robota zinazotolewa kutoka kwa kipindi (Shift)	AR 12.	BR	—
Jumla ya Robota tangu mwanzo wa Msimu	AR 421.	BR	—
Robota zilizopimwa na Kukabidhiwa COTRA.	AR 421.	BR	—
Robota zilizopelekwa stesheni ya Reli KAHAMA.	AR 334.	BR	—
Kiasi kilichosafirishwa kwenda Dar-es-Salaam	AR 334.	BR	—
Hali ya Robota kwa Ujumla HALI NZURI			—
Robota zilizoko Kiwandani	AR 87	BR	—

MBEGU (COTTON SEED) Aina UK 74.

Jumla ya mbegu zilizopatikana tani	AR 147.35	BR	—
Makadirio ya mbegu za kupanda	AR 180.00.	BR	—
Mabaki ya Mbegu za mwaka jana dusted tani	AR —	BR	—
Kiasi kilichotiwa dawa tani	AR 42.08.	BR	—
Mbegu zilizopelekwa kupandwa tani	AR 41.84.	BR	—
Mbegu zilizohamishwa tani	AR —	BR	—
Mbegu za mafuta tani	AR 105.27	BR	—
Mbegu zilizokabidhiwa kwa Millers tani	AR 68.16	BR	—
Mabaki ya Mbegu ambazo hazijakabidhiwa tani	AR 37.11	BR	—

HALI YA SHUGHULI ZA KIWANDA KWA UJUMLA:

1) HAKUNA KUUZA MBEGU HADI HAPO ALLOCATION YA MBEGU ZA KUPANDA ITAKAPOFIKIWA.

2) ANNUAL RETURNS PAMOJA NA DAILY GINNERY PERFOMANCE REPORTS ZIANDALIWE NA KUTUMWA OFISI YA KANDA - MOROGORO.

SAHIHI YA MENEJA WA KIWANDA — MANAGER GINNERY ... UNION LTD

SAHIHI YA MKAGUZI WA BODI YA PAMBA

Apppendix 5: Calculation of buyers concentration index

a. Total industry output = 259 640 kg of rice

b. Total number of cases = 40

c. Average output of the sample (a/b) = 6 491 kg

d. Quantity of rice above the sample average = 107 768 kg

e. Number of cases = 8

f. Average output of the quantity of rice above the sample average (d/e) = 13 471 kg

g. Quantity of rice above the 13 471 kg average = 67 532 kg

It follows that:

C = 100 * (67 532/259 640) = 26%

Apppendix 6a: Cost items and conversion factors in the rice marketing system (1995/96)

ITEM/ PARTICULARS	UNITS
1 Bag of paddy	73 kg
1 Bag of Rice	108 kg
1 Bag of Paddy/Rice	6 tins
1 Tin of Paddy	12 kg
1 Tin of Rice	18 kg
1 Tin of Rice	18 kopos
1 Lumbesa	9 tins
1 Lumbesa of Paddy	108 kg
1 Lumbesa of Rice	162 - 180 kg
Fare (Ulanga - Ifakara)	TSh 2 500/person
Fare (Ulanga - Dar es Salaam	TSh 6 000/person
Fare (Ifakar - Dar-es-Salaam	TSh 3 500/person
Corgo transport charge (Ulanga-Ifakara)	TSh 2 500/bag
Corgo transport charge (Ulanga-DSM)	TSh 5 000/bag
Cargo transport charge (Ifakara-DSM)	TSh 3 500/perbag
Milling charge (Ulanga)	TSh 1 300/bag
Milling charge (Ifakara)	TSh 1 000/bag
Rice Equiv. Buying price (Ulanga)	TSh 15 700/bag
Rice Equiv. Buying price (Ifakara)	TSh 22 400/bag
Rice Equiv. Selling price-DSM	TSh 30 300/bag
District council fee	TSh 1 300/bag
Bagging and stitching	TSh 200/bag
Loading and off-loading	TSh300/bag
Transport charge by TZR (IF-DSM)	10.8 S /tonne
Transport charge (TZR-DSM-Markets)	Tsh 600/bag
Transport charge (Ifakara-TZR station)	TSh 500/bag
Weighing fee	TSh 200/bag
Collection costs	TSh 800/bag
Other business cost/trip*	TSh 29,200/trip

* **Such cost as sacks, twine, needles, meals, accommodation, tins, kopos etc.Source:** Own survey, 1997

Appendix 6b: Some important costs & conversion factors along the cotton marketing system 1995/96

ITEM / PARTICULAR	UNIT
Weight of a jute bag of seed cotton	40 kg
Producer price (Grade A) per kg seed cotton	TSh 160
Union levy per kg of seed cotton	Tsh 15
Society levy per kg seed cotton	TSh 10
Ginning fee per kg of seed cotton	TSh 110
District cess (levy) per kg seed cotton	TSh 1
Bale weight	TSh 181 kg
Producer price (Grade B) per kg	TSh 50
Proportion of lint from 1 kg seed cotton	33%
Proportion of seed from 1 kg seed cotton	64%
Proportion of Foreign matters from 1 kg seed cotton	3%
Price of Polytrin per litre	TSh 16,500
Selling price for lint cotton to CGA	S 0.6 /Lb
Transport (seed cotton collection per season)	TSh 3,600,000
Transport cost per tonne - (Ifakara to DSM, TZR)	S 12.54
Seed price per kg to outsiders	TSh 35
Seed price per kg to the farmers	TSh 15
Licence fee for each buying post/year	TSh 20,000
Licence application fee	TSh 20,000
Total cotton output - 1996/97	1,071,358 kg
Research fee for cotton buyers per kg of seed cotton	TSh 12
Ginning licence fee	S 2,000
Research fee for cotton ginners/Exporters	1.3% Ex-ginnery price
Export licence application fee	S 100
Export licence fee/year	S 2,000
Export tax	2% f.o.b price
Transport charge (Ginneries to TZR Ifakara)	TSh 1,000/ton/km
Cotton F.O.B. Price	S 1,650/ton

Source: Own survey, 1997